Case: 22-1228 Document: 29 VE Rage: 187 Filed: 04/25/2022 Confidential Material Omitted on this Page

UNITED STATES INTERNATIONAL TRADE COMMISSION WASHINGTON, D.C. 20436

In the Matter of

CERTAIN HIGH-DENSITY FIBER OPTIC EQUIPMENT AND COMPONENTS THEREOF

Inv. No. 337-TA-1194

FINAL INITIAL DETERMINATION

Administrative Law Judge David P. Shaw

Pursuant to the notice of investigation, 85 Fed. Reg. 16653 (Mar. 24, 2020), this is

the Initial Determination in Certain High-Density Fiber Optic Equipment and

Components Thereof, United States International Trade Commission Investigation No.

337-TA-1194.

It is held that a violation of section 337 (19 U.S.C. § 1337) has occurred with

respect to U.S. Patent No. 9,020,320; U.S. Patent No. 10,444,456; U.S. Patent No.

10,120,153; and United States Patent No. 8,712,206.



TABLE OF CONTENTS

I.	Background					
	А.	Institution of the Investigation; Procedural History	1			
	В.	The Parties	5			
	C.	Asserted Patents and Technological Background	6			
	D.	The Accused Products	10			
	E.	The Domestic Industry Products	14			
II.	Jurisc	liction and Importation	16			
III.	Gener	ral Principles of Applicable Law	18			
IV.	United States Patent No. 9,020,320					
	А.	Claim Construction	35			
	В.	Infringement	46			
		1. Accused Products	46			
		2. Importation (All Asserted Patents)	50			
		3. Direct Infringement	61			
		4. Indirect Infringement	92			
	C.	Domestic Industry (Technical Prong)	111			
	D.	Validity				
V.	Unite	United States Patent No. 10,444,456				
	А.	Claim Construction				
	B.	Infringement	206			
		1. Accused Products	206			

Case: 22-1228 Document: 29 VERsee: 189 Filed: 04/25/2022

-1228	DOCUMEBERS VERSEON 89	Filed: 04/25/2022
	Confidentia	I Material Omitted on this Page

		2. Direct and Indirect Infringement	209	
	C.	Domestic Industry (Technical Prong)	227	
	D.	Validity	229	
VI.	United	d States Patent No. 10,120,153	258	
	A.	Claim Construction	258	
	B.	Infringement	261	
		1. Accused Products	262	
		2. Direct and Indirect Infringement	264	
	C.	Domestic Industry (Technical Prong)	300	
	D.	Validity	302	
VII.	United	d States Patent No. 8,712,206	323	
	A.	Claim Construction	324	
	B.	Infringement	334	
		1. Accused Products	335	
		2. Direct Infringement	338	
	C.	Domestic Industry (Technical Prong)	360	
	D.	Validity	363	
VIII.	Dome	estic Industry (Economic Prong)	384	
IX.	Concl	usions of Law	414	
X.	Initial	Determination on Violation	414	
XI.	Recor	nmended Determination on Remedy and Bonding	415	
XII.	Order			

The following abbreviations may be used in this Initial Determination:

ALJ	-	Administrative Law Judge
CDX	-	Complainant's Demonstrative Exhibit
CPX	-	Complainant's Physical Exhibit
CX	-	Complainant's Exhibit
Dep.	-	Deposition
EDIS	-	Electronic Document Imaging System
JPX	-	Joint Physical Exhibit
JX	-	Joint Exhibit
P.H.	-	Prehearing
RDX	-	Respondents' Demonstrative Exhibit
RPX	-	Respondents' Physical Exhibit
RWS	-	Rebuttal Witness Statement
RX	-	Respondents' Exhibit
Tr.	-	Transcript
WS	-	Witness Statement

I. Background

A. Institution of the Investigation; Procedural History

By publication of a notice in the Federal Register on March 24, 2020, pursuant to

subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission

instituted this investigation to determine:

[W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1-3 of the '320 patent [U.S. Patent No. 9,020,320]; claims 1, 2, 10, 11, 14, 22, and 23 of the '206 patent [U.S. Patent No. 8,712,206]; claims 1, 2, 5-16, 19, and 23-27 of the '153 patent [U.S. Patent No. 10,120,153]; claims 22-29 of the '996 patent [U.S. Patent No. 10,094,996]; and claims 11, 12, 14-21, and 27-30 of the '456 patent [U.S. Patent No. 10,444,456]; and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

85 Fed. Reg. 16653 (Mar. 24, 2020).

Pursuant to section 210.10(b)(1) of the Commission's Rules of Practice and

Procedure, 19 C.F.R. § 210.10(b)(1):

[T]he plain language description of the accused products or category of accused products, which defines the scope of the investigation, is "high-density fiber optic equipment and components thereof, which consist of (1) a chassis with sliding trays that fits within the standardized racks used in data centers, and (2) removable modules that are inserted into the sliding trays of the chassis, wherein the chassis and modules are used to terminate large numbers of fiber-optic cables using standardized connectors (at least 98 connections per standard rack unit (or 'U space'))."

Id.



The complainant is Corning Optical Communications LLC of Charlotte, North

Carolina. The respondents are:

- 1. AFL Telecommunications Holdings LLC d/b/a AFL of Duncan, South Carolina;
- 2. FS.com Inc. of New Castle, Delaware;
- 3. Huber+Suhner AG of Herisau, Switzerland;
- 4. Huber + Suhner, Inc. of Charlotte, North Carolina;
- 5. Legrand North America, LLC of West Hartford, Connecticut;
- 6. Leviton Manufacturing Co., Inc. of Melville, New York;
- 7. Panduit Corporation of Tinley, Illinois;
- 8. Shanghai TARLUZ Telecom Tech. Co., Ltd. d/b/a TARLUZ of Shanghai, China;
- 9. Shenzhen Anfkom Telecom Co., Ltd. d/b/a Anfkom Telecom of Shenzhen, China;
- 10. The LAN Wirewerks Research Laboratories Inc. d/b/a Wirewerks of Québec, Canada;
- 11. The Siemon Company of Watertown, Connecticut;
- 12. Total Cable Solutions, Inc. of Springboro, Ohio; and
- 13. Wulei Technology Co., Ltd. d/b/a Bonelinks of Shenzhen, China.

The Office of Unfair Import Investigations is a party to this investigation. Id.

The target date for completion of this investigation was originally set at 15

months, *i.e.*, June 24, 2021, with an evidentiary hearing scheduled to commence on

October 21, 2020. Order No. 3 (Apr. 14 2020).

The Commission affirmed the following initial determinations:

- Order No. 5 (Initial Determination Granting Complainant's Motion to Terminate the Investigation As to Legrand North America, LLC Based on Withdrawal of Allegations in the Complaint) (Apr. 16, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Terminating the Investigation with Respect to a Respondent (May 7, 2020).
- Order No. 7 (Initial Determination Finding Respondent Huber+Suhner AG in Default) (June 9, 2020), Order No. 8 (Initial Determination Finding

Respondent Huber+Suhner Inc. in Default) (June 9, 2020), *aff'd*, Commission Determination Not to Review Initial Determinations Finding Two Respondents in Default (June 22, 2020).

- Order No. 9 (Initial Determination Granting Motion to Amend the Complaint and Notice of Investigation to Substitute AFL Telecommunications for Respondent AFL Telecommunications Holdings) (June 19, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Granting a Motion to Amend the Complaint and Notice of Investigation (July 20, 2020).
- Order No. 11 (Initial Determination Granting Complainant's Motion to Terminate the Investigation As to Certain Claims) (July 29, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Terminating the Investigation with Respect to Certain Asserted Claims (Aug. 13, 2020).
- Order No. 13 (Initial Determination Finding Respondents Anfkom, Tarluz, and Wulei Bonelinks in Default) (Aug. 21, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Finding Three Respondents in Default (Sept. 15, 2020).
- Order No. 16 (Initial Determination Granting Complainant's Motion to Terminate the Investigation As to Total Cable Solutions Based on Consent Order) (Sept. 10, 2020), *aff'd*, Commission Determination to Review and, on Review, to Affirm with Modification an Initial Determination Terminating the Investigation as to Respondent Total Cable Solutions, Inc. Based on Consent Order Stipulation, Issuance of a Consent (Sept. 29, 2020).
- Order No. 18 (Initial Determination Granting Complainant's Motion to Terminate the Investigation As to Claim 1 of U.S. Patent No. 8,712,206) (Sept. 14, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Terminating the Investigation with Respect to an Asserted Claim (Oct. 14, 2020).
- Order No. 19 (Initial Determination Granting Complainant's Motion to Terminate the Investigation As to Certain Claims) (Oct. 2, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Terminating the Investigation with Respect to Certain Asserted Patent Claims (Oct. 27, 2020).
- Order No. 27 (Initial Determination Granting Motion to Terminate the Investigation As to AFL Telecommunications LLC Based on Settlement Agreement) (Oct. 20, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Terminating the Investigation as to Respondent AFL Telecommunications LLC Based on a Settlement (Nov. 2, 2020).



As a result of termination of certain asserted claims, the following 17 claims remain at issue in this investigation:

Asserted Claims for Infringement					
Patent	Dependent Claims				
' 320	1	3			
' 456	11, 27	12, 14-16, 19, 21, 28			
·153	23	9, 16, 26			
' 206	none	22, 23			

A prehearing conference was held on October 21, 2020, with the evidentiary hearing in this investigation commencing immediately thereafter. The hearing concluded on October 26, 2020. *See* Order No. 6 (May 4, 2020); P.H. Tr. 1-16; Tr. 1-1086. The parties were requested to file post-hearing briefs not to exceed 300 pages in length, and to file reply briefs not to exceed 80 pages in length. *See* Order No. 28 (Oct. 20, 2020) at 3. On November 10, 2020, the parties filed a joint outline of the issues to be decided in the Final Initial Determination. *See* Joint Outline of the Issues to Be Decided ("Joint Outline") (EDIS Doc. ID No. 724602). On November 3, 2020, the parties filed a joint outline of the Issues to Be Decided – Reply Brief ("Joint Outline – Reply Brief") (EDIS Doc. ID No. 726188).

On February 17, 2021, the administrative law judge issued an order setting the target date at approximately 16 months, *i.e.*, July 23, 2021, which makes the deadline for this initial determination March 23, 2021. Order No. 29 (Feb. 17, 2021).

B. The Parties

1. Complainant

Complainant Corning Optical Communications LLC ("Corning") is located in Charlotte, North Carolina. Complaint, ¶ 11. According to the complaint, from its industrial research lab in Corning, New York, Corning and its affiliates have developed expertise in glass science, ceramics science, and optical physics. *Id.*, ¶ 12. Corning developed the first optical fiber that could maintain laser light signals over long distances in 1970. *Id.*, ¶ 13.

2. Remaining Respondents

Respondent FS.com Inc. ("FS") is a Delaware corporation with a principal place of business in New Castle, Delaware. Complaint, ¶ 17. Corning asserts that according to U.S. Customs records, Fiberstore Co., Ltd., a Chinese corporation located in Shenzhen, China, has shipped "FIBER ENCLOSURES" and "PATCH PANELS" from China to the United States with FS.com listed as the consignee. *Id.* FS denies that it is an affiliate of Fiberstore Co., Ltd. FS Response to Complaint, ¶ 17.

Respondent Leviton Manufacturing Co., Inc. ("Leviton") is a Delaware corporation with a principal place of business in Melville, New York. Complaint, ¶ 21; Leviton Response to Complaint, ¶ 21. Corning alleges that Leviton sells for importation, imports, or sells after importation high-density fiber optic equipment that infringes the asserted patents. Complaint, ¶ 21.

Respondent Panduit Corp. ("Panduit") is a Delaware corporation with a principal place of business in Tinley, Illinois. Complaint, ¶ 22.; Panduit Response to Complaint, ¶ 22. Corning alleges that Panduit sells for importation, imports, or sells after

5

importation high-density fiber optic equipment that infringes the asserted patents. Complaint, ¶ 22.

Respondent The Siemon Company ("Siemon") is a Connecticut corporation located in Watertown, Connecticut. Complaint, ¶ 26; Siemon Response to Complaint, ¶ 26. Corning alleges that Siemon sells for importation, imports, or sells after importation high-density fiber optic equipment that infringes the asserted patents. Complaint, ¶ 26.

Respondent The LAN Wirewerks Research Laboratories Inc. d/b/a Wirewerks ("Wirewerks") is a Canadian corporation with its principal place of business in Baied'Urfé, Québec, Canada. Complaint, ¶ 25; Wirewerks Response to Complaint, ¶ 25. Corning alleges that Wirewerks sells for importation, imports, or sells after importation high-density fiber optic equipment that infringes the asserted patents. Complaint, ¶ 25.

* * *

As noted, the Office of Unfair Import Investigations is also a party to this investigation. 85 Fed. Reg. 16653 (Mar. 24, 2020).

C. Asserted Patents and Technological Background

The four asserted patents are related. The '320 and '456 patents share a specification. The '153 patent is in the same family as the '320 and '456 patents. The '206 patent is from a different family, but shares 25 figures with the '320 and '456 patents. *See* Compl. Br. at 8.

As noted, Corning asserts the following 17 claims for infringement:

Case: 22-1228 Document: 29 VERSION 97 Filed: 04/25/2022

Asserted Claims for Infringement				
Patent	Dependent Claims			
' 320	1	3		
' 456	11, 27	12, 14-16, 19, 21, 28		
·153	23	9, 16, 26		
' 206	none	22, 23		

See Compl. Br. at 8.

Table 2 below identifies the claims asserted against each respondent and for

domestic industry.

Table 2. Asserted Claims for Infringement and Domestic Industry Technical Prong					
·320 ·456 ·153 ·20					
		Participating Respondents			
Panduit	1, 3	11, 12, 14-16, 19, 21, 27, 28	9, 16, 23, 26	22, 23	
Leviton	1, 3	11, 14-16, 19, 27			
Siemon	1, 3	11, 12, 14-16, 19, 21, 27, 28	9, 23	22	
FS.com	1, 3	11, 12, 14-16, 19, 21	9, 16, 23, 26	22, 23	
Wirewerks				22, 23	
		Defaulting Respondents			
Anfkom	1, 3	11, 12, 14-16, 19, 21	9, 16, 23, 26	22, 23	
Huber+Suhner	1, 3	11, 14-16, 19, 21, 27	9, 16, 23, 26		
TARLUZ	1, 3	11, 12, 14-16, 19, 21		22, 23	
Wulei Bonelinks	1, 3	11, 12, 14-16, 19, 21		22, 23	
Domestic Industry Technical Prong					

Case: 22-1228 Document: 29 VERSION 98 Filed: 04/25/2022 Confidential Material Omitted on this Page

Table 2. Asserted Claims for Infringement and Domestic Industry Technical Prong					
·320 ·456 ·153				'206	
Corning	1, 3	11, 12, 14-16, 19, 21, 27, 28	9, 16, 23, 26	22, 23	

See Compl. Br. at 9.

The '320 Patent

U.S. Patent No. 9,020,320, entitled "High Density and Bandwidth Fiber Optic Apparatuses and Related Equipment and Methods," was filed on January 22, 2013 and issued on April 28, 2015. JX-0004 ('320 Patent). The '320 patent is assigned to Corning. JX-0006 ('320 Patent Assignment Record). The '320 patent is related to, and shares a specification with, the '153 and '456 patents. The '320 patent states, "The technology of the disclosure relates to fiber optic connection density and bandwidth provided in fiber optic apparatuses and equipment." JX-0004 at 1:32-34. The '320 patent has a total of 28 claims, of which Corning asserts independent claim 1 and dependent claim 3. *See* Compl. Br. at 8.

The '153 Patent

U.S. Patent No. 10,120,153, entitled "Independently Translatable Modules and Fiber Optic Equipment Trays in Fiber Optic Equipment," was filed on January 23, 2017 and issued on November 6, 2018. JX-0007 ('153 Patent). The '153 patent is assigned to Corning. JX-0009 ('153 Patent Assignment Record). The '153 patent is related to, and shares a specification with the '320 and '456 patents. The '153 patent states, "The technology of the disclosure relates to fiber optic modules for fiber optic equipment. The fiber optic modules can be included in fiber optic equipment rack and/or trays." JX-0007

8

at 2:4-6. The '153 patent has a total of 29 claims of which Corning asserts independent claim 23 and dependent claims 9, 16, and 26. *See* Compl. Br. at 8.

The '456 Patent

U.S. Patent No. 10,444,456, entitled "High Density and Bandwidth Fiber Optic Apparatuses and Related Equipment and Methods," was filed on April 5, 2019 and issued on October 15, 2019. JX-0010 ('456 Patent). The '456 patent is assigned to Corning. JX-0012 ('456 Patent Assignment Record). The '456 patent is related to and shares a specification with the '320 and '153 patents. The '456 patent states, "The technology of the disclosure relates to fiber optic connection density and bandwidth provided in fiber optic apparatuses and equipment." JX-0010 at 1:33-35. The '456 patent has a total of 30 claims, of which Corning asserts independent claims 11 and 27 and dependent claims 12, 14-16, 19, 21, and 28. *See* Compl. Br. at 8.

The '206 Patent

U.S. Patent No. 8,712,206, entitled "High-Density Fiber Optic Modules and Module Housings and Related Equipment," was filed on April 30, 2010 and issued on April 29, 2014. JX-0001 ('206 Patent). The '206 patent is assigned to Corning. JX-0003 ('206 Patent Assignment Record). The '206 patent states, "The technology of the disclosure relates to fiber optic modules and fiber optic modules housings provided in fiber optic equipment to support fiber optic connections." JX-0001 at 1:17-19. The '206 patent has a total of 73 claims, of which Corning asserts dependent claims 22 and 23. *See* Compl. Br. at 8.

D. The Accused Products

The accused products consist of chassis, modules, and combinations thereof. There are three categories of accused products, Base-8, Base-12, and Base-24, which are defined by the number of fiber connections available per module. First, a Base-8 module supports eight fiber connections, and a Base-8 chassis supports eighteen Base-8 modules per 1U space. CX-0001C (Pruenal WS) Q/A 63. Second, a Base-12 module supports twelve fiber connections, and a Base-12 chassis supports twelve Base-12 modules per 1U space. *Id.* Finally, a Base-24 module supports twenty-four fiber connections, and a Base-24 chassis supports six Base-24 modules per 1U space. *Id.* In each case, there are a total of 144 connections available in a 1U space; the difference in the three categories is in the number of modules needed to fill that space.

Within each category, there are three chassis sizes: 1U, 2U, and 4U, which refer to the chassis height. *Id.* Apart from the total height, these types are materially the same for each respondent. *Id.* That is, the fiber optic connection density for a 1U chassis from a given respondent is the same as the density for a 2U or 4U chassis from that respondent. *Id.* Q/A 64. Complainant argues that therefore "for each Respondent, and within each fiber connectivity configuration (Base-12, Base-8, and Base-24), a 1U chassis is representative of a 2U chassis and a 4U chassis for purposes of the asserted patents." *Id.*; *see also* CX-2042 (Compl. & Siemon Stip. Re Representative Accused Prods.) (stipulating that within each of the three categories, Siemon's 1U chassis is representative of its 2U and 4U chassis for purposes of the asserted patents).

Complainant's infringement expert, Dr. Prucnal, testified that he identified representative products and product combinations for each respondent. For example,

10

Siemon produces chassis and modules in Base-8 and Base-12 configurations, and is accused of infringing all four asserted patents. Accordingly, Dr. Prucnal identified the following representative products for Siemon:

Asserted Patents	Representative Siemon Product	Model Nos.
'320 Patent '153 Patent	Representative Siemon Base-12 combination (Siemon Base-12 chassis with Siemon Base-12 modules)	Chassis: LS-1U-01 Module: LS-12-LSSM-01
'456 Patent (claims 11-12, 14-16, 19, 21)	Representative Siemon Base-8 combination (Siemon Base-8 chassis with Siemon Base-8 modules)	Chassis: LS8-1U-01 Module: LSF8-LS5V- 04B2
'456 Patent	Representative Siemon 4U Base-12 chassis with Representative Siemon Base-12 module	Chassis: LS-4U-01 Module: LS-12-LSSM-01
(claims 27-28)	Representative Siemon 4U Base-8 chassis with Representative Siemon Base-8 module	Chassis: LS8-4U-01 Module: LSF8-LS5V- 04B2
	Representative Siemon Base-12 module	Module: LS-12-LSSM-01
'206 Patent	Representative Siemon Base-8 module	Module: LSF8-LS5V- 04B2

See Staff Br. at 19 (citing CDX-0001C (Prucnal demonstratives) at 9, 679-82).

Complainant has offered a complete list of representative accused products for each respondent, along with the group of accused products represented by each such product, through the testimony of Dr. Prucnal. CX-0001C (Prucnal WS) Q/A 62; *see* CDX-0013 (Prucnal list of accused products).

Not all respondents market all types of accused products. The following describes the accused products allegedly imported and/or sold in the United States by each respondent:

			Chassis			Module	
Respondent	Brand	Base-8	Base-12	Base-24	Base- 8	Base- 12	Base- 24
FS	FHX	1U	1U		Х	Х	
Leviton	OPT-X		1U/2U/4U			Х	Х
Panduit	HD FLEX	1U/2U/4U	1U/2U/4U	1U/2U/4U	Х	Х	Х
Siemon	LightStack	1U/2U/4U	1U/2U/4U		Х	Х	
Wirewerks	NextSTEP					Х	

Summary of Accused Products

See Staff Br. at 20.

1. FS

The FS accused products are marketed under the names "FHX Series" and "FHX-FCP/FHX-C Series" and include both chassis and modules. The accused FS chassis fall into two categories (Base-8 and Base-12) and are available in just one size (1U). The accused FS modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 117; CPX-0053 (FS Base-8 1U chassis); CPX-0054 (FS Base-12 1U chassis); CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module).

2. Leviton

The Leviton accused products are marketed under the names "OPT-X UHDX Enclosures" and "HDX Enterprise Cassettes." The accused Leviton enclosures are all Base-12 chassis, available in three sizes (1U, 2U, and 4U). The accused Leviton modules are available in two configurations (Base-12 and Base-24). Both the Base-12 and the Base-24 modules are used with the Leviton Base-12 chassis. *See* CX-0001C (Pruenal WS) Q/A 98; CPX-0057 (Leviton Base-12 1U chassis); CPX-0060 (Leviton Base-12 module); CPX-0061 (Leviton Base-24 module).

3. Panduit

The Panduit accused products are marketed as "HD FLEX Fiber" enclosures and cassettes. The accused Panduit chassis fall into three categories (Base-8, Base-12, and Base-24), and are available in three sizes (1U, 2U, and 4U). The accused Panduit modules are available in three configurations (Base-8, Base-12, and Base-24). *See* CX-0001C (Pruenal WS) Q/A 85; CPX-0062 (Panduit Base-8 1U chassis); CPX-0063 (Panduit Base-12 1U chassis); CPX-0065 (Panduit Base-24 1U chassis); CPX-0073 (Panduit Base-8 module); CPX-0074 (Panduit Base-12 module); CPX-0075 (Panduit Base-24 module).

4. Siemon

The Siemon accused products are marketed under the name "LightStack Ultra High-Density Fiber Plug and Play system." The accused Siemon chassis fall into two categories (Base-8 and Base-12) and are available in three sizes (1U, 2U, and 4U). The accused Siemon modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 106; CPX-0076 (Siemon Base-8 1U chassis); CPX-0077 (Siemon Base-12 1U chassis); CPX-0078 (pre-Aug. 2019 version of Siemon Base-12 1U chassis); CPX-0079 (Siemon Base-8 module); CPX-0080 (Siemon Base-12 module).

5. Wirewerks

The Wirewerks accused products consist of modules only, marketed under the name "NextSTEP." The NextSTEP modules all have LC adapters supporting twelve fiber connections on the front and a twelve-fiber MPO adapter on the rear. *See* CX-0001C (Prucnal WS) Q/A 117; CPX-0081 (Wirewerks Base-12 module).

In addition to the Wirewerks accused products, Order No. 23 provided that the parties may seek adjudication of an additional Wirewerks product identified as the "Wirewerks First Alternative Design." Order No. 23 at 5 (Oct. 14, 2020); RPX-0078C (First Alternative Design module). The First Alternative Design includes a new adapter, which is used in the same housing as the accused NextSTEP module. RX-0006C (Min RWS) Q/A 227-28. The adapter includes additional material on the front side that, according to Wirewerks, increases the "connection density" of the total product when using the method for measuring density that was used in the complaint. *Id.*; RX-1673C (Tabet WS) Q/A 41-53.

E. The Domestic Industry Products

Corning's high-density fiber optic equipment is referred to as the "EDGE" product line. CX-0002C (Ralph WS) Q/A 23. Corning's technical prong expert, Dr. Ralph, testified as follows:

The Corning EDGE Products are a plug-and-play system for providing high-density connections in data centers. A plug-and-play system typically refers to a modular system – a system in which you can readily insert and remove different types of components. The EDGE system is a new way of packing fiber optic connections into a standardized rack unit (or U space) and improving access for technicians, while protecting the fibers from damage or excessive bends.

Id. The EDGE product line includes at least the following products: "EDGE Chassis, EDGE Modules, EDGE MTP Trunks, EDGE Panels, EDGE Duplex Jumpers, EDGE MTP Jumpers, EDGE Duplex Jumper Accessories, EDGE Harnesses, and a variety of EDGE accessories." *Id.* Q/A 35. The relevant products, the EDGE chassis and modules, are available in Base-12 and Base-8 configurations. *Id.* EDGE Base-12 and Base-8 chassis are available in 1U, 2U, and 4U heights, and there is also a 5U version of the Base-12 chassis. *Id.* Q/A 36. As with the accused products, Corning argues that the 1U versions of the chassis are representative of the other available heights. *Id.*

Corning asserts that the following representative products, and the groups of Corning products that they represent, satisfy the technical prong of the domestic industry requirement by practicing at least one valid claim of an asserted patent:

Asserted Patents	Representative Product	Model Nos.
'320 Patent '153 Patent	Representative EDGE Base- 12 combination (EDGE Base-12 chassis with EDGE Base-12 modules)	Chassis: EDGE-01U-SP Module: ECM-UM12-05-93T
'456 Patent (claims 11-12, 14- 16, 19, 21)	Representative EDGE Base-8 combination (EDGE Base-8 chassis with EDGE Base-8 modules)	Chassis: EDGE8-01U-SP Module: ECM8-UM08-05-E6Q- ULL
'456 Patent	Representative EDGE 4U Base-12 chassis with Representative EDGE Base-12 module	Chassis: LS-4U-01 Module: ECM-UM12-05-93T
(claims 27-28)	Representative EDGE 4U Base-8 chassis with Representative EDGE Base-8 module	Chassis: LS8-4U-01 Module: ECM8-UM08-05-E6Q- ULL

Case: 22-1228 Document: 29 VERSO 206 Filed: 04/25/2022 Confidential Material Omitted on this Page

Asserted Patents	Representative Product	Model Nos.
206 Detent	Representative EDGE Base- 12 module	Module: ECM-UM12-05-93T
200 Fatent	Representative EDGE Base-8 module	Module: ECM8-UM08-05-E6Q- ULL

See Staff Br. at 23 (citing CX-0002C (Ralph WS) Q/A 43-48; see CDX-0002C (Ralph demonstratives) at 142-49).

II. Jurisdiction and Importation

A. Jurisdiction

Section 337(a)(1)(B) declares unlawful, *inter alia*, "[t]he importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that . . . infringe a valid and enforceable United States patent." 19 U.S.C. § 1337(a)(1)(B). Complainant has filed a complaint alleging a violation of this subsection, and the Commission therefore has subject matter jurisdiction. *See Amgen, Inc. v. United States Int'l Trade Comm'n*, 902 F.2d 1532, 1535-37 (Fed. Cir. 1990).

No respondent contested the Commission's personal jurisdiction. *See* Resps. Br. at 23. Indeed, all respondents have appeared and participated in the investigation. The Commission therefore has personal jurisdiction over those respondents. *See e.g., Certain Liquid Crystal Display Modules, Products Containing Same, and Methods for Using the Same*, Inv. No. 337-TA-634, Final Initial and Recommended Determinations at 3 (June 12, 2009) (unreviewed).

The Commission has in rem jurisdiction over the accused products. See e.g.,

Sealed Air Corp. v. United States Int'l Trade Comm'n, 645 F.2d 976, 985-86 (C.C.P.A.

1981).

Respodents argue that the Commission has jurisdiction over Wirewerks' First

Alternative Design for adjudication of infringement. It is argued:

The Commission has jurisdiction over Wirewerks' First Alternative Design for adjudication of non-infringement. The Commission looks at the following four factors to determine whether redesigned products should be adjudicated: whether the product is (1) within the scope of the investigation, (2) imported, (3) sufficiently fixed in design, and (4) subject to extensive discovery." *Certain Human Milk Oligosaccharides and Methods of Producing The Same*, Inv. No. 337-TA-1120, Comm'n Op. at *11 (Dec. 18, 2018) ("*Certain Human Milk*").

Wirewerks' First Alternative Design satisfies these factors. First, the First Alternative Design is a Fiber-Optic module, similar to the accused NextSTEP module. There can be no dispute that it is within the scope of the investigation. Second, this product was imported and produced to Corning during fact discovery. RX-1673C Q/A 41-45, 53; Tabet Tr. 445:11-17. Third, the First Alternative Design is fixed in design – its key measurements can be ascertained from the produced prototype and it is ready to be sold to customers. *Id.*; Tabet Tr. 446:9-18, 449:7-10, 450:21-451:10. Fourth, Corning had substantial discovery over the product, including analysis of a prototype and specification, two fact depositions, timely contentions, and expert testimony. *Id.*

Resps. Br. at 9-10.

Complainant argues, "Wirewerks has also imported two non-functioning samples

of its First Alternative Design into the United States." Compls. Br. at 30 (citing Tabet Tr.

445:11-19).

The Staff argues:

In addition to the Wirewerks accused products, Order No. 14 provided that the parties may seek adjudication of an additional Wirewerks product identified as the "Wirewerks First Alternative Design." Order No. 23 at 5 (Oct. 14, 2020); RPX-0078C (First Alternative Design module). The First Alternative Design includes a new adapter, which is used in the same housing as the accused NextSTEP

Case: 22-1228 Document: 29 VERSO 208 Filed: 04/25/2022 Confidential Material Omitted on this Page

module. RX-0006C (Min RWS) Q/A 227-28. The adapter includes additional material on the front side that, according to Wirewerks, increases the "connection density" of the total product when using the method for measuring density that was used in the opined. *Id.*; RX-1673C (Tabet WS) Q/A 41-53.

Staff Br. at 22.

In Order No. 23, the administrative law judge provided his ruling on this issue. It

states:

Accordingly, the administrative law judge has determined that Wirewerks' First Alternative Design may be adjudicated in this investigation, including during the evidentiary hearing. The parties may supplement their prehearing briefs and witness statements with respect to the First Alternative Design, to the extent necessary, although it appears that little if any supplementation will be required. The administrative law judge acknowledges the Staff's situation with respect to its ultimate position on the question of infringement.

Order No. 23 at 5 (Oct. 14, 2021).

Thus, as noted in Order No. 23, the administrative law judge determined

that Wirewerks' First Alternative Design may be adjudicated in this investigation,

including during the evidentiary hearing.

B. Importation

Issues relating to importation of accused products are discussed in the

Infringement section for the '320 patent, infra.

III. General Principles of Applicable Law

A. Claim Construction

Claim construction begins with the plain language of the claim.¹ Claims should

¹ Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l*

Case: 22-1228 Document: 29VERSO Filed: 04/25/2022 Confidential Material Omitted on this Page

be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent.² *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).

In some instances, claim terms do not have particular meaning in a field of art, and claim construction involves little more than the application of the widely accepted meaning of commonly understood words. *Phillips*, 415 F.3d at 1314. "In such circumstances, general purpose dictionaries may be helpful." *Id*.

In many cases, claim terms have a specialized meaning, and it is necessary to determine what a person of skill in the art would have understood the disputed claim language to mean. "Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to 'those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." *Phillips*, 415 F.3d at 1314 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). The public sources identified in *Phillips* include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant

Trade Comm., 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

² Factors that may be considered when determining the level of ordinary skill in the art include: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

Case: 22-1228 Document: 29 VERSON 710 Filed: 04/25/2022 Confidential Material Omitted on this Page

scientific principles, the meaning of technical terms, and the state of the art." *Id.* (quoting *Innova*, 381 F.3d at 1116).

In cases in which the meaning of a claim term is uncertain, the specification usually is the best guide to the meaning of the term. *Phillips*, 415 F.3d at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Id.* at 1316.

Claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) ("[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims."). Nevertheless, claim constructions that exclude the preferred embodiment are "rarely, if ever, correct and require highly persuasive evidentiary support." *Vitronics*, 90 F.3d at 1583. Such a conclusion can be mandated in rare instances by clear intrinsic evidence, such as unambiguous claim language or a clear disclaimer by the patentees during patent prosecution. *Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.*, 214 F.3d 1302, 1308 (Fed. Cir. 2000); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002).

20

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, and includes inventor testimony, expert testimony, and learned treatises. *Phillips*, 415 F.3d at 1317. Inventor testimony can be useful to shed light on the relevant art. In evaluating expert testimony, a court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent. *Id.* at 1318. Extrinsic evidence may be considered if a court deems it helpful in determining the true meaning of language used in the patent claims. *Id.*

B. Infringement

1. Direct Infringement

Under 35 U.S.C. §271(a), direct infringement consists of making, using, offering to sell, or selling a patented invention without consent of the patent owner. The complainant in a section 337 investigation bears the burden of proving infringement of the asserted patent claims by a "preponderance of the evidence." *Certain Flooring Products*, Inv. No. 337-TA-443, Comm'n Notice of Final Determination of No Violation of Section 337, 2002 WL 448690, at *59, (Mar. 22, 2002); *Enercon GmbH v. Int'l Trade Comm'n*, 151 F.3d 1376 (Fed. Cir. 1998).

Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.*, when the properly construed claim reads on the

Case: 22-1228 Document: 29 VERSON 212 Filed: 04/25/2022 Confidential Material Omitted on this Page

accused device exactly.³ *Amhil Enters., Ltd. v. Wawa, Inc.,* 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.,* 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. "Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.,* 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.,* 339 U.S. 605, 609 (1950)). "The determination of equivalence should be applied as an objective inquiry on an element-by-element basis."⁴ *Id.* at 40.

"An element in the accused product is equivalent to a claim limitation if the differences between the two are insubstantial. The analysis focuses on whether the element in the accused device 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005) (quoting *Graver Tank*, 339 U.S. at 608); *accord Absolute Software*, 659 F.3d at 1139-40.⁵

³ Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). If an accused device lacks a limitation of an independent claim, the device cannot infringe a dependent claim. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n.9 (Fed. Cir. 1989).

⁴ "Infringement, whether literal or under the doctrine of equivalents, is a question of fact." *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

⁵ "The known interchangeability of substitutes for an element of a patent is one of the express objective factors noted by *Graver Tank* as bearing upon whether the accused

Prosecution history estoppel can prevent a patentee from relying on the doctrine of equivalents when the patentee relinquished subject matter during the prosecution of the patent, either by amendment or argument. *AquaTex*, 419 F.3d at 1382. In particular, "[t]he doctrine of prosecution history estoppel limits the doctrine of equivalents when an applicant makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to an examiner." *Id.* (quoting *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005)).

2. Direct Infringement

a. Induced Infringement

Section 271(b) of the Patent Act provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b).

Under 35 U.S.C. § 271(b), whoever actively induces infringement of a patent shall be liable as an infringer. In contrast to direct infringement, liability for inducing infringement attaches only if the defendant knew of the patent and that the induced acts constituted patent infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1926 (2015); *see also Microsoft Corp. v. Datatern, Inc.*, 755 F.3d 899, 904 (Fed. Cir. 2014) (to prove induced infringement, patentee must show that accused inducer took an affirmative act to encourage infringement with knowledge that the induced acts constitute patent infringement). Induced infringement requires a finding that the infringer

device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge." *Warner-Jenkinson*, 520 U.S. at 36.



possessed a specific intent to encourage another's infringement. *i4i Ltd. Partnership v. Microsoft Corp.*, 598 F.3d 831, 851 (Fed. Cir. 2010), *aff'd*, 564 U.S. 91 (2011).

b. Contributory Infringement

Section 271(c) of the Patent Act provides: "Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer." 35 U.S.C. § 271(c).

Section 271(c) "covers both contributory infringement of system claims and method claims."⁶ *Arris*, 639 F.3d at 1376 (footnotes omitted). To hold a component supplier liable for contributory infringement, a patent holder must show, inter alia, that (a) the supplier's product was used to commit acts of direct infringement; (b) the product's use constituted a material part of the invention; (c) the supplier knew its product was especially made or especially adapted for use in an infringement" of the patent; and (d) the product is not a staple article or commodity of commerce suitable for substantial noninfringing use. *Id*.

⁶ "Claims which recite a 'system,' 'apparatus,' 'combination,' or the like are all analytically similar in the sense that their claim limitations include elements rather than method steps. All such claims can be contributorily infringed by a component supplier." *Arris*, 639 F.3d at 1376 n.8.

C. Validity

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Nevertheless, each claim of a patent is presumed to be valid, even if it depends from a claim found to be invalid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986).

A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by "clear and convincing" evidence of invalidity. *Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995).

1. Anticipation

Anticipation under 35 U.S.C. § 102 is a question of fact. z4 Techs., Inc. v.

Microsoft Corp., 507 F.3d 1340, 1347 (Fed. Cir. 2007). Section 102 provides that, depending on the circumstances, a claimed invention may be anticipated by variety of prior art, including publications, earlier-sold products, and patents. *See* 35 U.S.C. § 102 (*e.g.*, section 102(b) provides that one is not entitled to a patent if the claimed invention "was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States").

The general law of anticipation may be summarized, as follows:

A reference is anticipatory under § 102(b) when it satisfies particular requirements. First, the reference must disclose each and every element of the claimed invention, whether it does so explicitly or inherently. *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1375 (Fed.Cir.2006). While those elements must be "arranged or combined in the same way as in the claim," *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed.Cir.2008), the reference need not satisfy an ipsissimis verbis test, In re Bond, 910 F.2d 831, 832-33 (Fed.Cir.1990). Second, the reference must "enable one of ordinary skill in the art to make the invention without undue experimentation." Impax Labs., Inc. v. Aventis Pharms. Inc., 545 F.3d 1312, 1314 (Fed.Cir.2008); see In re LeGrice, 49 C.C.P.A. 1124, 301 F.2d 929, 940-44 (1962). As long as the reference discloses all of the claim limitations and enables the "subject matter that falls within the scope of the claims at issue," the reference anticipates -- no "actual creation or reduction to practice" is required. Schering Corp. v. Geneva Pharms., Inc., 339 F.3d 1373, 1380-81 (Fed.Cir.2003); see In re Donohue, 766 F.2d 531, 533 (Fed.Cir.1985). This is so despite the fact that the description provided in the anticipating reference might not otherwise entitle its author to a patent. See Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1562 (Fed.Cir.1991) (discussing the "distinction between a written description adequate to support a claim under § 112 and a written description sufficient to anticipate its subject matter under § 102(b)").

In re Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

2. Obviousness

Under section 103 of the Patent Act, a patent claim is invalid "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."⁷ 35 U.S.C. § 103. While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on "underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of

⁷ The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

nonobviousness." *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

The objective evidence, also known as "secondary considerations," includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). "[E]vidence arising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as commercial success, will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

"One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 550 U.S. at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id*.

Specific teachings, suggestions, or motivations to combine prior art may provide helpful insights into the state of the art at the time of the alleged invention. *Id.* at 420. Nevertheless, "an obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way." *Id.*

27

"Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* A "person of ordinary skill is also a person of ordinary creativity." *Id.* at 421.

Nevertheless, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more than yield a predictable result; combining elements that work together in an unexpected and fruitful manner would not have been obvious).⁸

3. Enablement

The Patent Act requires that "[t]he full scope of the claimed invention . . . be enabled." *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008); *see also Northpoint Tech. Ltd. v. MDS America Inc.*, 413 F.3d 1301, 1308-10 (Fed. Cir. 2005) (affirming a finding of invalidity for lack of enablement due to the patent's failure to disclose an embodiment with an antenna that met the "directional reception range" limitation of each claim). Namely, "[a] patentee who chooses broad claim language must make sure the broad claims are fully enabled. 'The scope of the claims must be less than or equal to the scope of enablement' to 'ensure[] that the public knowledge is enriched by

⁸ Further, "when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

Case: 22-1228 Document: 29 VERSON 219 Filed: 04/25/2022 Confidential Material Omitted on this Page

the patent specification to a degree at least commensurate with the scope of the claims."" *Sitrick*, 516 F.3d at 999 (quoting *National Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195-96 (Fed. Cir. 1999)). The enablement requirement is satisfied when one skilled in the art, after reading the specification, could practice the claimed invention without undue experimentation. *AK Steel Corp. v. Sollac & Ugine*, 344 F.3d 1234, 1244 (Fed. Cir. 2003), citing *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

The question of undue experimentation is a matter of degree, and what is required is that the amount of experimentation not be "unduly extensive." Chiron Corp. v. Genentech, Inc., 363 F.3d 1247, 1253 (Fed. Cir. 2004) (quoting PPG Indus., Inc. v. Guardian Indus., Corp., 75 F.3d 1558, 1564 (Fed. Cir. 1996)). For example, the fact that a clinician's involvement may be necessary to determine effective amounts of the single compound effervescent agent and its corresponding soluble acid source does not itself constitute undue experimentation. See Ortho-McNeil Pharm., Inc. v. Mvlan Labs., Inc., 520 F.3d 1358, 1365-66 (Fed. Cir. 2008) ("[E]ven if clinical trials informed the anticonvulsively effective amount, this record does not show that extensive or 'undue' tests would be required to practice the invention."). In addition, extensive experimentation does not necessarily render the experiments unduly extensive where the experiments involve repetition of known or commonly used techniques. See Johns Hopkins Univ. v. CellPro, Inc., 152 F.3d 1342, 1360 (Fed. Cir. 1998) (finding that the difficulty in producing certain antibodies could not be attributed to the shortcomings in the disclosure of the patent at issue, but rather, the difficulty was attributed to the technique commonly used during experimentation that generally required repetition). Thus, the focus "is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance" PPG Indus., Inc., 75 F.3d at 1564 (citation and quotation omitted).

Cephalon, Inc. v. Watson Pharms., Inc., 70 F.3d 1330, 1338-39 (Fed. Cir. 2013).

Enablement is determined from the viewpoint of persons of ordinary skill in the

field of the invention at the time the patent application was filed. Ajinomoto Co., Inc. v.

Archer-Daniels-Midland Co., 228 F.3d 1338, 1345 (Fed. Cir. 2000). Thus, a claim in an issued patent can be rendered invalid due to lack of enablement if its scope is not fully enabled. *Id*.

4. Indefiniteness

The definiteness requirement of 35 U.S.C. § 112 ensures that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2; *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004). If a claim's legal scope is not clear enough so that a person of ordinary skill in the art could determine whether or not a particular product infringes, the claim is indefinite, and is, therefore, invalid. *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003).⁹

Thus, it has been found that:

When a proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the composition may be used, and when such determinations are likely to result in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite.

Halliburton Energy Servs. v. M-ILLC, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

The Supreme Court addressed the issue of indefiniteness, and stated that a finding of indefiniteness should not be found if the claims, "viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention

⁹ Indefiniteness is a question of law. *IGT v. Bally Gaming Int'l, Inc.*, 659 F.3d 1109 (Fed. Cir. 2011).

Case: 22-1228 Document: 29 VE Rade: 221 Filed: 04/25/2022 Confidential Material Omitted on this Page

with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

A patent is not indefinite if the claims, "viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). "If, after a review of the intrinsic and extrinsic evidence, a claim term remains ambiguous, the claim should be construed so as to maintain its validity." *Certain Consumer Electronics and Display Devices With Graphics Processing and Graphics Processing Units Therein*, Inv. No. 337-TA-932, Order No. 20 (Apr. 2, 2015) (quoting *Phillips*, 415 F.3d at 1327).

The burden is on the accused infringer to come forward with clear and convincing evidence to prove invalidity. *See Young v. Lumenis, Inc.*, 492 F.3d 1336, 1344 (Fed. Cir. 2007) ("A determination that a patent claim is invalid for failing to meet the definiteness requirement in 35 U.S.C. § 112, ¶ 2 is a legal question reviewed de novo.").

D. Domestic Industry

A violation of section 337(a)(1)(B), (C), (D), or (E) can be found "only if an industry in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). Section 337(a) further provides:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned—

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

These statutory requirements consist of an economic prong (which requires

certain activities)¹⁰ and a technical prong (which requires that these activities relate to the

intellectual property being protected). Certain Stringed Musical Instruments and

Components Thereof, Inv. No. 337-TA-586, Comm'n Op. at 13 (May 16, 2008)

("Stringed Musical Instruments"). The burden is on the complainant to show by a

preponderance of the evidence that the domestic industry requirement is satisfied.

Certain Multimedia Display and Navigation Devices and Systems, Components Thereof,

and Products Containing Same, Inv. No. 337-TA-694, Comm'n Op. at 5 (July 22, 2011)

("Navigation Devices").

With respect to the economic prong, and whether or not section 337(a)(3)(A) or

(B) is satisfied, the Commission has held that "whether a complainant has established that

its investment and/or employment activities are significant with respect to the articles

¹⁰ The Commission practice is usually to assess the facts relating to the economic prong at the time that the complaint was filed. *See Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, Inv. No. 337-TA-560, Comm'n Op. at 39 n.17 (Apr. 14, 2010) ("We note that only activities that occurred before the filing of a complaint with the Commission are relevant to whether a domestic industry exists or is in the process of being established under sections 337(a)(2)-(3).") (citing *Bally/Midway Mfg. Co. v. U.S. Int'l Trade Comm'n*, 714 F.2d 1117, 1121 (Fed. Cir. 1983)). In some cases, however, the Commission will consider later developments in the alleged industry, such as "when a significant and unusual development occurred after the complaint has been filed." *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op., at 5-6 (Jan. 20, 2012) ("[I]n appropriate situations based on the specific facts and circumstances of an investigation, the Commission may consider activities and investments beyond the filing of the complaint.").
protected by the intellectual property right concerned is not evaluated according to any rigid mathematical formula." *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. at 27 (Feb. 17, 2011) ("*Printing and Imaging Devices*") (citing *Certain Male Prophylactic Devices*, Inv. No. 337 TA-546, Comm'n Op. at 39 (Aug. 1, 2007)). Rather, the Commission examines "the facts in each investigation, the article of commerce, and the realities of the marketplace." *Id.* "The determination takes into account the nature of the investment and/or employment activities, 'the industry in question, and the complainant's relative size." *Id.* (citing *Stringed Musical Instruments* at 26).

With respect to section 337(a)(3)(C), whether an investment in domestic industry is "substantial" is a fact-dependent inquiry for which the complainant bears the burden of proof. *Stringed Musical Instruments* at 14. There is no minimum monetary expenditure that a complainant must demonstrate to qualify as a domestic industry under the "substantial investment" requirement of this section. *Id.* at 25. There is no need to define or quantify an industry in absolute mathematical terms. *Id.* at 26. Rather, "the requirement for showing the existence of a domestic industry will depend on the industry in question, and the complainant's relative size." *Id.* at 25-26.

Investments in plant and equipment, labor, and capital that are also related to research and development or licensing may be considered under subparagraph (C) as well as under subparagraphs (A) and (B). *Certain Optoelectronic Devices for Fiber Optic Communications, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-860, USITC Pub. No. 4852, Comm'n Op. at 15 (Nov. 2018); *Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv.

No. 337-TA-1097, Comm'n Op. at 14 (June 29, 2018) ("[T]he text of the statute, the legislative history, and Commission precedent do not support narrowing subsections (A) and (B) to exclude non-manufacturing activities, such as investments in engineering and research and development. Rather, the guiding principle is whether the asserted expenditures satisfy the plain language of the statute."); *Certain Marine Sonar Imaging Devices, Including Downscan and Sidescan Devices, Products Containing the Same, and Components Thereof*, Inv. No. 337-TA-921, Comm'n Op. at 58-59, 64, 66 (Jan. 6, 2016) (reversing finding that expenses could not be counted under both subparagraphs (B) and (C); holding that the same R&D expenses "separately constitute[d]" a domestic industry under each subparagraph).

IV. U.S. Patent No. 9,020,320

U.S. Patent No. 9,020,320, entitled "High Density and Bandwidth Fiber Optic Apparatuses and Related Equipment and Methods," was filed on January 22, 2013 and issued on April 28, 2015. JX-0004 ('320 Patent). The '320 patent is assigned to Corning. JX-0006 ('320 Patent Assignment Record). The '320 patent is related to, and shares a specification with, the '153 and '456 patents. The '320 patent states, "The technology of the disclosure relates to fiber optic connection density and bandwidth provided in fiber optic apparatuses and equipment." JX-0004 at 1:32-34. The '320 patent has a total of 28 claims, of which Corning asserts independent claim 1 and dependent claim 3. *See* Compl. Br. at 8.

As discussed below, the evidence shows that (1) the asserted claims of the '320 patent are infringed by the accused products; (2) complainant has satisfied the technical

34



prong of the domestic industry requirement; and (3) the asserted claims are not invalid.

A. Claim Construction

1. A Person of Ordinary Skill in the Art

Complainant argues:

A person of ordinary skill in the art at the time of the priority date of the Asserted Patents would have had at least a bachelor's degree in mechanical engineering, materials science, or a related field; and 2 years of experience in fiber optic equipment. *See* CX-0001C (Prucnal WS) Q/A 58-59; CX-0002C (Ralph WS) Q/A 30-31. Both Dr. Prucnal and Dr. Ralph were persons of ordinary skill at the time of the inventions. CX-0001C (Prucnal WS) Q/A 60; CX-0002C (Ralph WS) Q/A 32.

Compl. Br. at 30.

Respondents argue:

A person of ordinary skill in the art (POSITA) at the time of the alleged invention of the Asserted Patents would have had a Bachelor's Degree in Mechanical Engineering, Electrical Engineering or similar and at least 5 years of experience designing fiber optic equipment and apparatuses; or a Master's Degree in Mechanical Engineering, Electrical Engineering or similar and at least 3-5 year of experience designing fiber optic equipment and apparatuses. See RX-0001C (Blumenthal WS) Q/A 87. Complainant has asserted a different level of skill in the art, but the arguments in this brief would not change under Complainant's level unless otherwise noted.

Resps. Br. at 26.

The Staff argues, inter alia:

Complainant's expert, Dr. Prucnal, opined that for each of the asserted patents, a person of ordinary skill in the art during that period "would have had at least a bachelor's degree in mechanical engineering, materials science, or a related field; and 2 years of experience in fiber optic equipment." CX-0001C (Prucnal WS) Q/A 58. Respondents' invalidity expert, Dr. Blumenthal, largely agreed, opining that one of ordinary skill would have had "a Bachelor's Degree in Mechanical Engineering, Electrical Engineering or similar and at least 5 years of experience designing fiber optic equipment and apparatuses; or a Master's Degree in Mechanical Engineering, Electrical Engineering, Electrical Engineering or similar and at paratuses.

Case: 22-1228 Document: 29 VERSON 226 Filed: 04/25/2022 Confidential Material Omitted on this Page

at least 3-5 year of experience designing fiber optic equipment and apparatuses." RX-0001C (Blumenthal WS) Q/A 87. The Staff is of the view that, given the relatively uncomplicated nature of the technology claimed in the asserted patents, the shorter time-in-field requirement proposed by Complainant is more appropriate.

Staff Br. at 45-46.

Corning's proposed level of ordinary skill is more persuasive. Corning's proposed level requires at least a bachelor's degree in mechanical engineering, materials science, or a related field, and two years of experience in fiber optic equipment. In view of the technology claimed in the asserted patents, two years of experience in fiber optic equipment is appropriate. Thus, the administrative law judge finds that a person of ordinary skill in the art with respect to the four asserted patents is a person who has at least a bachelor's degree in mechanical engineering, materials science, or a related field, and at least two years of experience in fiber optic equipment.

2. "fiber optic connection density"

Pursuant to Ground Rule 6.d, the parties filed a joint claim construction chart on June 1, 2020. *See* Joint Claim Construction Chart ("Joint Chart") (EDIS Doc. ID No. 711588). As shown in that chart, the parties have agreed on the construction of the following claim term that appears in asserted claim 1 of the '320 patent. Below is a chart showing the parties' proposed claim construction.

Claim Term	Asserted Claims	Agreed-Upon Construction		
"fiber optic connection density"	' 320: 1	"number of fiber optic connections that can be made to the front side of the fiber optic equipment"		

See Joint Chart at 3-4; Resps. Br. at 53; Staff Br. at 46-47.



The claim term "fiber optic connection density" appears in asserted claim 1 of the

'320 patent. Asserted claim 1 reads as follows:

1. A fiber optic apparatus, comprising:

a chassis; and

a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per U space, based on using at least one simplex fiber optic component or at least one duplex fiber optic component.

JX-0004 ('320 Patent) at 19:52-59 (emphasis added).¹¹

The parties have agreed to construe the claim term "fiber optic connection

density" as "number of fiber optic connections that can be made to the front side of the

fiber optic equipment." See Joint Chart; Resps. Br. at 53; Staff Br. at 46-47.

Accordingly, as argued by the parties, the administrative law judge adopts the

joint proposed claim construction and has determined that the claim term "fiber optic

connection density" should be construed to mean "number of fiber optic connections that

can be made to the front side of the fiber optic equipment."

3. "based on using at least one simplex fiber optic component or at least one duplex fiber optic component"

The claim term "based on using at least one simplex fiber optic component or at least one duplex fiber optic component" appears in asserted claim 1 of the '320 patent. Below is a chart showing the parties' proposed claim constructions.

¹¹ In this Initial Determination, unless noted otherwise, when quoting, emphasis are from the original source, and footnotes from the original source are omitted.

Case: 22-1228 Document: 29 VERSON 228 Filed: 04/25/2022 Confidential Material Omitted on this Page

Complainant and the Staff	Respondents			
"based on using at least one fiber optic	"including at least one device that receives			
connector comprising either one or two	connectors to support no more than a two-			
strands of fiber, or at least one fiber optic	fiber connection"			
adapter that receives such a connector"	Otherwise indefinite.			

See Staff Br. at 47-50 (citing Joint Chart at 3); Compl. Br. at 42-44; Resps. Br. at 32-37.

For the reasons discussed below, the administrative law judge has determined that the claim term "based on using at least one simplex fiber optic component or at least one duplex fiber optic component" should be construed to mean "based on using at least one fiber optic connector comprising either one or two strands of fiber, or at least one fiber optic adapter that receives such a connector."

Asserted claim 1 reads as follows:

1. A fiber optic apparatus, comprising:

a chassis; and

a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space, *based on using at least one simplex fiber optic component or at least one duplex fiber optic component*.

JX-0004 ('320 Patent) at 19:52-59 (emphasis added).

First, the intrinsic evidence shows that a "fiber optic component" may be either a fiber optic adapter or a fiber optic connector. JX-0004 ('320 Patent) at 5:16-19 ("FIG. 1 shows exemplary fiber optic components **23** disposed in the fiber optic modules **22** that support fiber optic connections. For example, the fiber optic components **23** may be fiber optic adapters or fiber optic connectors."). The term is not limited to fiber optic adapters,

Case: 22-1228 Document: 29 VERSON 229 Filed: 04/25/2022 Confidential Material Omitted on this Page

as respondent's expert opines. *See* RX-0001C (Blumenthal WS) Q/A 141-42 ("The specification does not describe these devices disposed through the front as fiber optic connectors.").

Second, the claim term refers to two types of fiber optic components: "simplex" and "duplex." A simplex connection is a one-fiber connection, while a duplex connection is a two-fiber connection. See, e.g., RX-0001C (Blumenthal WS) Q/A 111-12; CX-0001C (Prucnal WS) Q/A 26-30. A simplex fiber optic cable contains only a single optical fiber, while a duplex fiber optic cable contains two optical fibers. CX-0001C Q/A 26. A simplex connector terminates a simplex fiber optic cable with a single ferrule containing one fiber. Id. Q/A 29. A duplex connector consists of two ferrules with one fiber each, joined side-by-side to that the two fibers can be connected simultaneously. Id. These are in contrast to a "multi-fiber connector," which contains more than two fibers. See id. Q/A 26-27. Finally, "[a]n adapter is a two-sided device that receives a connector on the front and the rear[,]" such that "[w]hen two fiber optic cables with connectors are plugged into opposite sides of an adapter, a connection between the cables is formed." Id. Q/A 25, 30. A simplex adapter supports simplex connectors, while a duplex adapter supports either simplex or duplex connectors. RX-0001C (Blumenthal WS) Q/A 115; CX-0002C (Ralph WS) Q/A 61.

The parties' dispute regarding this claim term turns on whether a duplex adapter is defined by the number of connectors (and therefore the number of connections) that it can support, or whether it is defined by the type of connectors that it supports (either simplex or duplex). *See* Compl. Br. at 42-44; Resps. Br. at 32-37; Staff Br. at 47-50. Respondents' expert opines that "a person of ordinary skill in the art would understand

the claims to be using 'simplex' and 'duplex' to refer to the maximum number of fiber optic connections that the claimed 'fiber optic components' can support and not the type of connectors that they can receive." RX-0001C (Blumenthal WS) Q/A 140. Under this construction, an adapter that accepted two duplex connectors would not be a duplex fiber optic component. Complainant and the Staff argue that any adapter that can receive simplex and duplex connectors is a duplex adapter, and is therefore a duplex fiber optic component. *See, e.g.*, CX-0001C (Prucnal WS) Q/A 157, 186.

Support for complainant's and the Staff's proposed construction can be found in the specification of the '320 patent, which contrasts embodiments using "duplex fiber optic components" to achieve 120 or 144 fiber optic connections per 1U space with embodiments using "multi-fiber fiber optic components . . . such as MPO components" to achieve 576 or 1152 fiber optic connections in the same 1U space. JX-0004 ('320 Patent) at 5:33-67. When describing the embodiment depicted in Figures 10A and 10B, the specification indicates that duplex fiber optic adapters are adapters that are configured to receive duplex fiber optic connectors. *Id.* at 8:65-9:12 ("In this example, the fiber optic connections with duplex LC fiber optic connectors. However, any fiber optic connection type desired can be provided in the fiber optic module **22**."). Thus, while the patent as a whole is not limited to embodiments with duplex connections, where a duplex fiber optic adapter is specified, it refers to an adapter that accepts duplex connectors. *Id.*

The '320 patent states that "the fiber optic components . . . may be fiber optic adapters or fiber optic connectors." JX-0004 ('320 Patent) at 5:18-19. Context from other claims confirms that the '320 patent uses "component" to include connectors.

Case: 22-1228 Document: 29 VERSON 231 Filed: 04/25/2022 Confidential Material Omitted on this Page

Claim 10 recites "at least one simplex . . . [or] duplex fiber optic component" that "is comprised of: at least one simplex fiber optic connector or at least one duplex fiber optic connector, or at least one simplex fiber optic adapter or at least one duplex fiber optic adapter." JX-0004 ('320 Patent) at cl. 10. *See CIAS, Inc. v. All. Gaming Corp.*, 504 F.3d 1356, 1360 (Fed. Cir. 2007) (" [C]omprising' is well understood to mean 'including but not limited to.'"). Inasmuch as claim 10 depends from claim 1, it is "presumed to be of narrower scope," *AK Steel Corp.*, 344 F.3d at 1242 — so that a "component" within the broader scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 1 should include any "component" within the narrower scope of claim 10.

Further support can be found in extrinsic evidence. For example, industry standard TIA-568-C.0, *Generic Telecommunications Cabling for Customer Premises* (Feb. 2009), defines "adapter; optical fiber duplex" as "[a] mechanical device designed to align and join two duplex optical fiber connectors (plugs) to form an optical duplex connection." CX-0922C (TIA-568-C.0) at 2. It does not define an adapter according to the maximum number of connections, but according to the type of connectors supported. Also, Dr. Prucnal testified that one of ordinary skill in the art would understand that "there is an important difference between, on the one hand, a component that supports simplex (one-fiber) or duplex (two-fiber) connections." CX-0001C (Prucnal WS) Q/A 186. He testified that a "quad" adapter that receives four fibers, for example, nevertheless qualifies as a duplex fiber optic component if those four fibers can only be used for simplex or duplex connections, and not for a single multi-fiber connector. *See id.* ("There is no such thing as a quad LC connector that supports a four-fiber LC

41

Case: 22-1228 Document: 29 VERSO 232 Filed: 04/25/2022 Confidential Material Omitted on this Page

connection."); Prucnal Tr. 372 ("There's no such thing as a quad connector to my knowledge."); 825 ("[T]he only type of connectors that a quad LC adapter could accept are simplex LC connectors and duplex LC connectors[.]"); *see also* Ralph Tr. 243 ("I don't recall hearing of a quad connector.").

Respondents' argument concerning indefiniteness is discussed in the Validity section, *infra*.

4. "U space"

The claim term "U space" appears in asserted claims 1 and 3 of the '320 patent and in asserted claims 11, 19, and 27 of the related '456 patent. Below is a chart showing the parties' proposed claim constructions.

Complainant and the Staff	Respondents			
Plain and ordinary meaning, an example of which is "a rack unit, which is a standardized measurement of 1.75 inches (44.45mm) in height within a standardized 19-inch rack or 23-inch rack.	'320 patent: § 112 (indefinite); if not indefinite, then "space comprising a height of 1.75 inches and width of 19 or 23 inches."			
	'456 patent: "space comprising a height of 1.75 inches and width of 19 or 23 inches"; otherwise §112 (indefinite)			

Staff Br. at 54-55 (citing Joint Chart at 5); Compl. Br. at 44-46; Resps. Br. at 45-47.

For the reasons discussed below, the administrative law judge has determined that the claim term "U space" should be given its "plain and ordinary meaning, an example of which is a rack unit, which is a standardized measurement of 1.75 inches (44.45mm) in height within a standardized 19-inch rack or 23-inch rack." Case: 22-1228 Document: 29 VERSO 233 Filed: 04/25/2022 Confidential Material Omitted on this Page

Asserted claims 1 and 3 read as follows:

- **1**. A fiber optic apparatus, comprising:
- a chassis; and
- a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a fiber optic connection density of at least ninety-eight (98) fiber optic connections per *U space*, based on using at least one simplex fiber optic component or at least one duplex fiber optic component.
- **3**. The fiber optic apparatus of claim **1**, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per *U space*.

JX-0004 ('320 Patent) at 19:52-67 (emphasis added).

The claim term "U space" should be construed in the same manner for related

'320 and '456 patents. See Paice LLC v. Ford Motor Co., 881 F.3d 894, 904 (Fed. Cir.

2018) ("[U]nless otherwise compelled . . . the same claim term in the same patent or

related patents carries the same construed meaning.") (quoting Omega Eng'g, Inc. v.

Raytek Corp., 334 F.3d 1314, 1334 (Fed. Cir. 2003)); accord In re Rambus, Inc., 694

F.3d 42, 48 (Fed. Cir. 2012).

The term "U space" is a standard term that is well understood in the field of fiber optic equipment, and it is explicitly defined in the specification shared by the related '320 and '456 patents, as well as in claims 1, 11, 22, and 27 of the '456 patent. The specification states: "The fiber optic equipment rack **14** may support 1-U-sized shelves, with 'U' equal to a standard 1.75 inches in height and nineteen (19) inches in width. In certain applications, the width of 'U' may be twenty-three (23) inches." JX-0004 ('320

Case: 22-1228 Document: 29 VERSO 234 Filed: 04/25/2022 Confidential Material Omitted on this Page

Patent) at 5:1-5; *accord* JX-0010 ('456 Patent) at 5:13-17. Claims 1 and 11 of the '456 patent define the term as follows: "wherein a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches." JX-0010 ('456 Patent) at 20:55-56, 22:8-9.

Claims 22 and 27 of the '456 patent contain the limitation: "wherein the chassis defines a 4-U space, in which a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches[.]" *Id.* at 23:29-31, 24:28-30. These definitions are consistent with those found in the industry standards. CX-0684 (EIA/ECA Standard, Cabinets, Racks, Panels, and Associated Equipment, EIA/ECA-310-E (Dec. 2005)); CX-0918C (IEC 60297-3-108, Mechanical Structures for Electronic Equipment – Dimensions of Mechanical Structures of the 482.6mm (19 in) Series (Sept. 2014)).

Respondents argue that the claim term "U space" is indefinite. Respondents argue, *inter alia*:

Respondents' proposed construction is supported by the intrinsic record. Complainant's and Staff's proposed constructions are improper in light of the specification, the claims, and the understanding of a POSITA. A POSITA, as of the '320 Patent's priority date, would interpret "U Space" to mean "space comprising a height of 1.75 inches and width of 19 or 23 inches," as Respondents propose. RX-0001C (Blumenthal WS) Q/A 161-176. Additionally, irrespective of whether the term "U space" is construed and irrespective of which construction is adopted, the way in which the term "U space" is used in '320 Patent claims 1 and 3 and '456 Patent claims 11, 12, 14-16, 19, and 21 renders these claims indefinite as explained in detail in Sections VI.B.2 and VII.B.2.a. below. *See also* RX-0001C (Blumenthal WS) Q/A 161-176.

Resps. Br. at 46; see id. at 85-87, 156-57.

This is incorrect for two reasons. First, the asserted patents are concerned with fiber optic connection density. The parties' agreed construction of "fiber optic

Case: 22-1228 Document: 29 VERSON 235 Filed: 04/25/2022 Confidential Material Omitted on this Page

connection density" shows why no depth need be specified to apply the term "U space." Under that construction, adopted by the administrative law judge, density means "the number of fiber optic connections that can be made to the front side of the fiber optic connection equipment." The "front side of the fiber optic connection equipment" is a two-dimensional space. Accordingly, when the claims of the '320 and '456 patents recite limitations such as "a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space," as in claim 1 of the '320 patent, those claims are referring to connections that can be made to a two-dimensional space. *See* CX-2060C (Prucnal RWS) Q/A 155. Depth, which varies by manufacturer and product line, need not be specified.

Second, one of ordinary skill in the art would be familiar with the usual dimensions of a fiber optic rack (or chassis), and would readily understand what would be the typical depth of a 1U space (also known as one rack unit) in various applications. CX-0001C (Prucnal WS) Q/A 159-60; *see*, *e.g.*, CX-0684 (EIA/ECA-310-E) at CORNING-ITC-0086659; CX-0918C (IEC 60297-3-108). A claim is not indefinite if, when viewed in light of the specification and prosecution history, it informs those skilled in the art at the time of the patent application about the scope of the invention "with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). The *Nautilus* standard is satisfied in this instance.

The parties' documents and witness testimony further confirm that a person of ordinary skill understand the phrase "U space" as the two-dimensional size of a standard rack unit. *See* CX-2060C (Prucnal RWS) Q/A 146-152. Corning's and respondents' documents refer to their products as providing a certain number of fibers or connections

in a "U," "1U," "2U" or "4U" space. CX-0666 (EDGE Brochure) at 8; CX-0199 (Panduit HD Flex Enclosures Spec.) at 2. Respondents' witnesses likewise showed familiarity with the term "U space" or "rack unit space." JX-0016C (Kim Dep. Tr.) 91:14-16, 92:9-11; JX-0017C (Kuffel Dep. Tr.) 32:10-13; JX-0018C (Maynard Dep. Tr.) 69:3-5, 87:10-17; JX-0029C (Wiltjer Dep. Tr.) 163:3-18. Respondent Panduit described U space as a "standard rack unit space[] . . . with a height of 1.75 inches and a preferred standard width of 19 inches" in its unsuccessful *inter partes* challenge to the '320 patent. CX-2063 ('320 IPR Petition) at 21; CX-2064 (DeCusatis Decl. '320 IPR) at 15.

Other than Dr. Blumenthal's conclusory opinion, respondents provide no support for their contention that a person of skill "would understand 'space' to comprise three dimensions: a width, a length and a height." RX-0001C (Blumenthal WS) Q/A 164; *but see* CX-2060C (Prucnal RWS) Q/A 153 (disagreeing). Neither the claims nor the specification specifies a depth for a U space; the industry standards contain none; and respondents' witnesses testified they knew of no standard depth. *See, e.g.*, JX-0018C (Maynard Dep. Tr.) 87-88.

B. Infringement Analysis of the '320 Patent

As noted, Corning asserts independent claim 1 and dependent claim 3. For the reasons discussed below, Corning has shown by a preponderance of the evidence that respondent's accused products infringe claims 1 and 3 of the '320 patent.

1. Accused Products

The accused products consist of chassis, modules, and combinations thereof. There are three categories of accused products, Base-8, Base-12, and Base-24, which are defined by the number of fiber connections available per module. First, a Base-8 module

supports eight fiber connections, and a Base-8 chassis supports eighteen Base-8 modules per 1U space. CX-0001C (Prucnal WS) Q/A 63. Second, a Base-12 module supports twelve fiber connections, and a Base-12 chassis supports twelve Base-12 modules per 1U space. *Id.* Finally, a Base-24 module supports twenty-four fiber connections, and a Base-24 chassis supports six Base-24 modules per 1U space. *Id.* In each case, there are a total of 144 connections available in a 1U space; the difference in the three categories is in the number of modules needed to fill that space.

Within each category, there are three chassis sizes: 1U, 2U, and 4U, which refer to the chassis height. *Id.* Apart from the total height, these types are materially the same for each respondent. *Id.* That is, the fiber optic connection density for a 1U chassis from a given respondent is the same as the density for a 2U or 4U chassis from that respondent. *Id.* Q/A 64. Complainant argues that therefore "for each Respondent, and within each fiber connectivity configuration (Base-12, Base-8, and Base-24), a 1U chassis is representative of a 2U chassis and a 4U chassis for purposes of the asserted patents." *Id.*; *see also* CX-2042 (Compl. & Siemon Stip. Re Representative Accused Prods.) (stipulating that within each of the three categories, Siemon's 1U chassis is representative of its 2U and 4U chassis for purposes of the asserted patents).

Complainant has offered a complete list of representative accused products for each respondent, along with the group of accused products represented by each such product, through the testimony of Dr. Prucnal. CX-0001C (Prucnal WS) Q/A 62; *see* CDX-0013 (Prucnal list of accused products).

Not all respondents market all types of accused products. The following describes the accused products allegedly imported and/or sold in the United States by each respondent:

Respondent	Brand	Chassis			Module		
		Base-8	Base-12	Base-24	Base- 8	Base- 12	Base- 24
FS	FHX	1U	1U		Х	Х	
Leviton	OPT-X		1U/2U/4U			Х	Х
Panduit	HD FLEX	1U/2U/4U	1U/2U/4U	1U/2U/4U	Х	Х	Х
Siemon	LightStack	1U/2U/4U	1U/2U/4U		Х	Х	

Summary of Accused Products

See Staff Br. at 20.

a. Panduit

The Panduit accused products are marketed as "HD FLEX Fiber" enclosures and cassettes. The accused Panduit chassis fall into three categories (Base-8, Base-12, and Base-24), and are available in three sizes (1U, 2U, and 4U). The accused Panduit modules are available in three configurations (Base-8, Base-12, and Base-24). *See* CX-0001C (Pruenal WS) Q/A 85; CPX-0062 (Panduit Base-8 1U chassis); CPX-0063 (Panduit Base-12 1U chassis); CPX-0065 (Panduit Base-24 1U chassis); CPX-0073 (Panduit Base-8 module); CPX-0074 (Panduit Base-12 module); CPX-0075 (Panduit Base-24 module).

b. Leviton

The Leviton accused products are marketed under the names "OPT-X UHDX Enclosures" and "HDX Enterprise Cassettes." The accused Leviton enclosures are all Base-12 chassis, available in three sizes (1U, 2U, and 4U). The accused Leviton modules are available in two configurations (Base-12 and Base-24). Both the Base-12 and the Base-24 modules are used with the Leviton Base-12 chassis. *See* CX-0001C (Prucnal WS) Q/A 98; CPX-0057 (Leviton Base-12 1U chassis); CPX-0060 (Leviton Base-12 module); CPX-0061 (Leviton Base-24 module).

c. Siemon

The Siemon accused products are marketed under the name "LightStack Ultra High-Density Fiber Plug and Play system." The accused Siemon chassis fall into two categories (Base-8 and Base-12) and are available in three sizes (1U, 2U, and 4U). The accused Siemon modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 106; CPX-0076 (Siemon Base-8 1U chassis); CPX-0077 (Siemon Base-12 1U chassis); CPX-0078 (pre-Aug. 2019 version of Siemon Base-12 1U chassis); CPX-0079 (Siemon Base-8 module); CPX-0080 (Siemon Base-12 module).

d. FS

The FS accused products are marketed under the names "FHX Series" and "FHX-FCP/FHX-C Series" and include both chassis and modules. The accused FS chassis fall into two categories (Base-8 and Base-12) and are available in just one size (1U). The accused FS modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 117; CPX-0053 (FS Base-8 1U chassis); CPX-0054 (FS Base-12 1U chassis); CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module).

49

2. Importation (All Asserted Patents)

Section 337 is a trade statute enacted to regulate international commerce. *Suprema, Inc. v. International Trade Comm'n*, 796 F.3d 1338, 1344 (Fed. Cir. 2015). In an investigation predicated on allegations of patent infringement, the statute prohibits "[t]he importation into the United States, the sale for importation, or the sale within the United States after importation . . . of articles that . . . infringe[.]" 19 U.S.C. § 1337(a)(1)(B). "A complainant need only prove importation of a single accused product to satisfy the importation element." *Certain Electronic Nicotine Delivery Systems and Components Thereof*, Inv. No. 337-TA-1139, Order No. 35 at 6-11 (Aug. 5, 2019) (reviewed on other grounds, *see* Comm'n Notice (Sept. 4, 2019)); *Certain Trolley Wheel Assemblies*, Inv. No. 337-TA-161, USITC Pub. No. 1605, Comm'n Op. at 7-8 (Nov. 1984).

Importation - Leviton

Leviton argues that it has not imported any accused product. *See* Resps. Br. at 16-26; Leviton Response to Complaint. Ex. A (EDIS Doc. ID No. 711309).

Leviton argues, *inter alia*:

1. Leviton Does Not Import the Leviton Accused Combinations

Leviton does not import, sell for importation, or sell after importation the allegedly infringing combinations of a Leviton Enclosure with Leviton Accused Modules. The importation requirement requires importation of "articles that infringe." 19 U.S.C. § 1337(a)(1)(B). Complainant's only infringement allegations are directed to the *combination* of a Leviton Enclosure with Leviton Accused Modules. CX-0001C (Prucnal WS) Q/A 134, 206. Leviton does not import any such combination. RX-0005C (Kim WS) Q/A 35, 36; Prucnal Tr. 306:18–22, 308:10–14; Schoettelkotte Tr. 128:11–15. Complainant did not respond to Leviton's Motion for Summary Determination as to the accused

combinations, or as to the Leviton Accused Modules discussed below, or address them in its prehearing brief and thus waives any argument of violation, importation, or remedy based on such combinations or Leviton Accused Modules.

2. Leviton Does Not Import the Leviton Accused Modules

Leviton does not import, sell for importation, or sell after importation any of the Leviton Accused Modules. Complainant identifies 97 Leviton Accused Modules as "accused products." CX-0001C (Prucnal WS) Q/A 100–101. Leviton manufactures the Leviton Accused Modules in its manufacturing plant in Bloomingdale, Illinois. RX-0005C (Kim WS) Q/A 34; RDX-0019C.0005; RDX-0005C; RDX-0008C.198. At the same plant in Bloomingdale, Leviton manufactures nearly 100 varieties of non-accused, non-infringing cassettes, adapter plates, and splice modules that can be used in the Leviton Enclosures. RX-0005C (Kim WS) Q/A 23-27, 36; RX-0008C (Lebby RWS) Q/A 49-65, 203-210. Complainant does not allege that the Leviton Accused Modules are imported or directly or indirectly infringe. Prucnal Tr. 306:5-8.

3. Leviton Does Not Import the Leviton Enclosures

Leviton does not import, sell for importation, or sell after importation the Leviton Enclosures. "Articles that infringe" can include articles that indirectly infringe. *Suprema*, 796 F.3d 1338. Here, at most, only the Leviton Enclosures are alleged to indirectly infringe. But they are not (and were not) imported. Leviton manufactures the Leviton Enclosures in its manufacturing plant in Bothell, Washington. RX-0005C (Kim WS) Q/A 34-36, 48, 49; RX-0008C (Lebby RWS) Q/A 325-333; RX-0286C–0288C (Enclosure Assembly Instructions); RX-1269C (Tray Assembly Instructions); CX-0054C (Bills of Materials); RDX-0005C.

Resps. Br. at 16-17 (footnotes omitted).

Thus, Leviton argues that neither the chassis nor the modules, nor any

combination of the two, are ever imported into the United States. See Resps. Br. at 18-

26. For the reasons discussed below, the importation requirement of section 337 is met

with respect to the Leviton accused products.

All of the patent claims asserted against Leviton in this investigation disclose a

combination of a "chassis" and one or more removable "modules." The Leviton accused

Case: 22-1228 Document: 29 VERSO 242 Filed: 04/25/2022 Confidential Material Omitted on this Page

products are marketed under the name OPT-X UHDX Enclosures (chassis) and HDX Enterprise Cassettes (modules). CX-0001C (Pruenal WS) Q/A 98. Leviton manufactures all of its HDX Enterprise Cassettes in Bloomingdale, Illinois. JX-0013C (Byquist Dep. Tr.) at 113-114. Leviton assembles the OPT-X UHDX Enclosures in Bothell, Washington. *Id.* at 56.

Although the final assembly of Leviton's chassis has always occurred in Bothell, Washington, the evidence indicates that until recently, most manufacturing activities occurred in Mexico.¹² Approximately one-sixth of the number of components that Leviton uses to assemble the OPT-X UHDX enclosures in the United States are either

, and until recently both were

manufactured in and imported from Leviton facilities in Mexico. See CX-0054C

(Leviton 1U enclosure bill of materials); JX-0013C (Byquist Dep. Tr.) at 118; Kim Tr.

487-489. For example,

. JX-0013C (Byquist Dep.

¹² Shortly before the evidentiary hearing, Leviton's Mr. Kim amended his direct formerly imported from Mexico are now testimony to state that manufactured and sourced in the United States. See RX-0005.1C (Errata to Kim WS). Voluntary cessation of importation, however, does not deprive the Commission of jurisdiction or prevent the Commission from imposing a remedy. Certain Road Milling Machines and Components Thereof, Inv. No. 337-TA-1067, Comm'n Op. at 22-23 (Aug. 7, 2020) ("Under Commission precedent, 'the fact that respondents allege to have discontinued importation does not preclude a finding that section 337 has been violated, nor does it preclude the imposition of a remedy."") (quoting Certain Hardware Logic Emulation Systems and Components Thereof, Inv. No. 337-TA-383, Initial Det., 1997 WL 665006 at *8 (July 31, 1997)); see also Intel Corp. v. International Trade Comm'n, 946 F.2d 821, 830 n.14 (Fed. Cir. 1991) ("[M]ere voluntary cessation of allegedly illegal conduct does not moot a case; if it did, the courts would be compelled to leave '[t]he defendant ... free to return to his old ways.") (quoting United States v. Concentrated Phosphate Export Ass'n, Inc., 393 U.S. 199, 203 (1968)).

Case: 22-1228 Document: 29 VE Rage: 243 Filed: 04/25/2022 Confidential Material Omitted on this Page

Tr.) at 130-138; CX-0059C (Leviton UHD-W2 1RU sub drawing). These imported components represented over percent of the value of Leviton's chassis, in terms of materials costs. Kim Tr. 529-533. When the cost of labor in Mexico is added, the percentage rises to percent. *See* CX-0054C (Leviton 1U enclosure bill of materials); JX-0013C (Byquist Dep. Tr.) at 141-144.

The amount of manufacturing activity that took place in Mexico rather than in Bothell, Washington was significant enough that until recently Mexico was identified as the country of origin for the fully assembled chassis, which were shipped to Leviton customers in boxes labeled "Made in Mexico." *See* CX-0055 (packaging labels for Leviton 1U and 4U chassis); JX-0013C (Byquist Dep. Tr.) at 50-51; Kim Tr. 534. Moreover, for the fully assembled into Leviton's accused chassis. *See* JX-0013C (Byquist Dep. Tr.) at 116-120 (contrasting for the Leviton's accused chassis. *See* JX-0013C (Byquist Dep. Tr.) at 116-120 (contrasting for the bills of materials); *see also, e.g.*, CX-0060C (Leviton 001-5R1UD-S12 assembly instructions) (depicting component parts), CX-0054C (Leviton 1U enclosure bill of materials).

Due to its final assembly operations in Bothell, Washington, Leviton argues that its chassis have always been manufactured in the United States, and that therefore there has been no importation within the meaning of section 337. This is incorrect. Leviton's accused chassis were actually "manufactured" in Mexico, with the exception of certain minor and insignificant assembly steps performed after importation. Kim Tr. 504-505

"). There was a sufficient nexus between

Case: 22-1228 Document: 29 VERSON 244 Filed: 04/25/2022 Confidential Material Omitted on this Page

and the "articles that infringe" sold after importation to conclude that the importation requirement has been satisfied.¹³

Early Commission precedent established that there must be a nexus between the importation (in this case, of the manufactured in Mexico) and the alleged unfair acts (for example, inducing or contributing to direct infringement by Leviton customers). See Certain Cardiac Pacemakers and Components Thereof, Inv. No. 337-TA-162, 1984 WL 273827, Order No. 37 (Mar. 21, 1984) (granting summary det. of no violation). In Cardiac Pacemakers, the presiding administrative law judge found that no unfair acts had been committed within the meaning of section 337 because the accused respondent imported only two minor components of the accused products, "interchangeable, staple items that are used in several non-infringing applications[,]" and did not infringe the patent directly, contributorily, or by inducement. *Cardiac* Pacemakers, Order No. 37, 1984 WL 273827 at *1-*2. He concluded that "[n]o nexus can be established between the importation and the alleged infringement; consequently, the Commission cannot find a violation of the statute and lacks jurisdiction to issue a remedy." Id. at *2; see also Dynamic Random Access Memories, Components Thereof and Products Containing Same, Inv. No. 337-TA-242, USITC Pub. 2034, Comm'n Op. at 90-92 (Nov. 1987) (determining not to exclude "upstream" products (*i.e.*, components of an infringing device) because there had been no allegation or showing of indirect

¹³ The term "articles that . . . infringe" in 19 U.S.C. § 1337(a)(1)(B) includes not only articles that directly infringe a patent at or after the time of importation, but also articles used to induce infringement or to contributorily infringe. *Suprema*, 796 F.3d at 1348-52; *see also Comcast Corp. v. International Trade Comm'n*, 951 F.3d 1301, 1308 (Fed. Cir. 2020); *Certain Blood Cholesterol Testing Strips and Associated Systems Containing the Same*, Inv. No. 337-TA-1116, Comm'n Op. at 27-29 (May 1, 2020).

Case: 22-1228 Document: 29 VE Rage: 245 Filed: 04/25/2022 Confidential Material Omitted on this Page

infringement). Conversely, in ruling on a request for temporary relief in *Certain Fluidized Supporting Apparatus*, the presiding administrative law judge stated that "there is a sufficient link between the alleged unfair acts and the assembled article if the importation of components of the article is an important step in the production and sale of the article." Certain Fluidized Supporting Apparatus and Components Thereof, Inv. Nos. 337-TA-182/188, Initial Det., 1984 WL 273788 at *55 (June 16, 1984). The administrative law judge concluded that jurisdiction existed in that investigation because the "imported components are essential and even indispensable" to the infringing beds.¹⁴ *Id.*

More recent precedent confirms that importation of articles that do not infringe as of the time of importation may nevertheless form the basis of a violation of section 337. *Suprema*, 796 F.3d at 1348-52. Thus, for example, in *Blood Cholesterol Testing Strips*, imported test strips and meters were found to be "articles that infringe" where post-importation use of the strips and meters according to their directions infringed the asserted method claims and the imported articles had no substantial noninfringing uses. *Certain Blood Cholesterol Testing Strips and Associated Systems Containing the Same*, Inv. No. 337-TA-1116, Comm'n Op. at 27-29 (May 1, 2020); *see also Certain Beverage Dispensing Systems*, Inv. No. 337-TA-1130, Comm'n Op. at 11, 13-14 (Mar. 11, 2020) (violation found where all components of infringing system were imported, there were no

¹⁴ The Commission reversed the administrative law judge's determination on temporary relief on the grounds that the complainant would be unable to make a showing of a domestic industry, noting that it "neither approve[d] nor disapprove[d] the other findings of the ALJ." *Certain Fluidized Supporting Apparatus and Components Thereof*, Inv. Nos. 337-TA-182/188, USITC Pub. 1667, Comm'n Op. at 25-28 (Oct. 1984).

Case: 22-1228 Document: 29VERSO: 246 Filed: 04/25/2022 Confidential Material Omitted on this Page

noninfringing uses for any imported component, and the imported components satisfied all limitations of the asserted apparatus claims).

While *Blood Cholesterol Testing Strips* involved a respondent's own direct infringement through post-importation use rather than indirect infringement via post-importation use by others, the Commission indicated that its analysis and findings in that investigation "should not be read to limit 'articles that infringe' to only analogous situations." *Blood Cholesterol Testing Strips*, Comm'n Op. at 32. "In any future investigation in which the Commission is presented with this issue, the Commission will consider and fully assess its controlling statute, Congressional intent, the applicable precedent from the Commission's reviewing courts, and the relevant facts."¹⁵ *Id.* at 32-33.

Leviton is accused of inducing infringement and/or contributorily infringing through importation of the through that had no substantial uses other than

Blood Cholesterol Testing Strips, Comm'n Op. at 33 n.26. Commissioner Schmidtlein similarly noted:

In any future investigation in which the Commission is presented with the issue of post-importation direct infringement by the respondent as the basis for the 337 violation, she believes it is appropriate to consider the extent, if any, to which the accused products are modified or combined with other non-accused articles after importation in order to satisfy all of the elements of the asserted claim.

Id. at 33 n.27.

¹⁵ Chair Kearns, for example, stated as follows:

Commissioner Kearns notes that, in any future investigation in which the Commission is presented with this issue (including in the context of imported components accused of infringing an apparatus claim), he is likely to consider such factors as the nature of the imported items and what additional activity occurs in the United States, including any combinations or modifications that are made with respect to the imported articles after importation, all in light of the limitations of the asserted claims.

Case: 22-1228 Document: 29 VERSON 247 Filed: 04/25/2022 Confidential Material Omitted on this Page

to be assembled into complete chassis. Those chassis, labeled "Made in Mexico," were provided to customers who then used them, at least some of the time, in combinations that allegedly infringe the patents asserted in this investigation. **Control** that Leviton formerly imported from Mexico were not "off-the-shelf" products – they had no use other than to be combined to form an accused Leviton chassis. Thus, they were not the sort of minor components that were at issue in *Cardiac Pacemakers*. Moreover, inasmuch as all of the asserted claims of the patents asserted against Leviton claim a

chassis, the "imported components are essential and even indispensable" to the alleged infringement. *Fluidized Supporting Apparatus*, Initial Det. at *55. In other words,

were "integral part[s]" of the chassis as sold to Leviton customers, *see id.*, and the sale of the chassis was a direct step in the ultimate alleged infringement. Accordingly, there was a sufficient nexus between **and the** alleged infringement such that the products are within the Commission's jurisdiction.

Importation - Panduit and Siemon

Respondents Panduit and Siemon admittedly import accused modules, while domestically manufacturing the chassis used in the combinations of chassis and modules alleged to infringe the asserted '320, '153, and '456 patents. CX-2044C (J. Stip. of Corning and Panduit re Importation) at 1 (showing importation of modules only); JX-0028C (Wagner Dep. Tr.) at 42-43, 79, 81-82, JX-0029C (Wiltjer Dep. Tr.) at 64-65; Siemon Response to Complaint Ex. A (EDIS Doc. ID No. 709242); RX-1266C (Veatch WS) Q/A 18. Yet, these respondents argue that complainant has not shown that they have imported "articles that . . . infringe" and that therefore jurisdiction under section 337 has not been established. Resps. Br. at 10.

57

Panduit and Siemon argue that the fact that they import only one of the two components that make up the accused combinations of chassis and modules divests the Commission of jurisdiction (due to failure to satisfy the importation requirement) because there is an insufficient nexus between the imported articles and the unfair methods of competition. *See* Resps. Br. at 10-15. Panduit makes this argument even though it previously stipulated that its importation of modules is sufficient to satisfy the importation requirement of section 337. *See* CX-2044C (J. Stip. of Corning and Panduit re Importation) at 2 ("For the purposes of this Investigation only, Respondent will not dispute that the importation requirement of 19 U.S.C.A. § 1337(a)(1)(B) is satisfied as to Respondent with respect to the [module] products listed in Exhibit A."). Citing pre-*Suprema* case law, Panduit and Siemon argue that complainant has not shown a nexus between their importation activity and the alleged unfair acts. *See* Resps. Br. at 10.

The argument that Panduit and Siemon make is unavailing under current Commission precedent. The question of what relationship must exist between an importation and alleged infringement is now governed by the Federal Circuit's en banc opinion in *Suprema*, which confirmed that the importation of articles that do not infringe as of the time of importation may nevertheless form the basis of a violation of section 337. *Suprema*, 796 F.3d at 1348-52. The court held that it was an appropriate exercise of the Commission's discretion to find that a violation of section 337 may be based on indirect infringement of a method claim:

It is true that the direct infringement required for inducement . . . will typically not have taken place at the time of the importation that induces it. Yet we cannot conclude that Congress unambiguously excluded such induced infringement on the basis of the panel's reasoning.

58

Id. at 1347-48. As the court explained,

[r]eading the statute unambiguously to require that infringement occur at the time of importation would have produced absurd results under the pre-1994 version of § 271(a).... At that time (before 1994), § 271(a) did not define importing a patented invention (or the offer to sell a patented invention) an infringing act. Section 271(a) only covered making, using, and selling, and those actions had to occur in the United States. 35 U.S.C. § 271(a) (1988). At least for ordinary importations involving goods that enter the United States for a later use or sale, none of the activities encompassed by the former § 271(a) would have occurred in the United States at the time of importation. If Congress meant to forbid the Commission from looking past the time of importation in defining Section 337's reach, Section 337 would not have reached even garden-variety direct infringement. Even if Section 337(a)(l)(B)'s clause covering post-importation sales allowed assessment of infringement after importation, Section 337 would not have covered the ordinary case of post-importation use without post-importation sales. We cannot attribute that result to Congress.

Id. at 1348. The court concluded, "We hold that the Commission's interpretation that the phrase 'articles that infringe' covers goods that were used by an importer to directly infringe post-importation as a result of the seller's inducement is reasonable." *Id.* at 1352-53. Under *Suprema*, therefore, the statutory phrase "articles that . . . infringe" covers chassis and module combinations that, after importation of the modules, were used by Panduit's and Siemon's customers to directly infringe as a result of Panduit's and Siemon's inducement.

As discussed above, the Commission recently applied *Suprema* in *Blood Cholesterol Testing Strips*, in which imported test strips and meters were found to be "articles that infringe" where post-importation use of the articles according to the directions provided infringed the asserted method claims, and the imported articles had no substantial noninfringing uses. The Commission Opinion further explained that "[i]n any future investigation in which the Commission is presented with this issue, the

Case: 22-1228 Document: 29 VE Rade: 250 Filed: 04/25/2022 Confidential Material Omitted on this Page

Commission will consider and fully assess its controlling statute, Congressional intent, the applicable precedent from the Commission's reviewing courts, and the relevant facts." *Blood Cholesterol Testing Strips*, Comm'n Op. at 32-33.

The relevant factors identified in *Blood Cholesterol Testing Strips* all favor a determination that Panduit and Siemon have committed an unfair act within the meaning of section 337. The evidence shows that Panduit and Siemon import modules that they then induce others to use in a manner that infringes the '320, '153, and '456 patents. The nature of the imported modules is that they are one of just two custom components that together make up infringing combinations of chassis and modules. They are not off-the-shelf staple items – their sole use is to be combined with chassis in order to house and connect fiber optic cables. While there are some combinations that do not infringe the asserted patents,¹⁶ the relevant point is that there are also combinations that do infringe, and that the imported modules are specifically designed to be used in such combinations.¹⁷ Once the modules arrive in the United States, the only remaining

¹⁶ Panduit's accused modules can be used with Panduit products other than the Panduit accused chassis, such as Panduit's HD Flex Zero RU Bracket and Cassette Holders, which are not accused of infringement. *See* RX-1672C (Kuffel WS) Q/A 48-52; RX-0006C (Min RWS) Q/A 251; RX-0146 (HD Flex Ordering Guide). Panduit has also developed adapters to allow its accused modules to be used with unaccused alternative systems such as the SFQ and Opticom systems. *See* RX-1672C (Kuffel WS) Q/A 50-52. Siemon's accused modules can be used in a floor mounted enclosure that cannot be mounted to a rack and therefore does not infringe any of the '320, '153, and '456 patents. *See* RX-1266C (Veatch WS) Q/A 21. However, as discussed *infra*, the modules are intended to be used, and are in fact used, in infringing assemblies.

¹⁷ There is record evidence of this. *See* JX-0029C (Wiltjer Dep. Tr.) at 121 (explaining Panduit customer support for using accused combination); CX-0145C (Panduit HD Flex Project Charter) (setting out as the purpose of Panduit's HD Flex products the combination of the HD Flex Modules in the HD Flex Chassis); *and* CX-0180C (Siemon LightStack specifications (Nov. 2019)) at 1-2; CX-0181C (Siemon LightStack 8 specifications (Nov. 2019)) at 1-2 (both promoting accused combinations and showing

activity needed to form the infringing combination is to insert the modules into the chassis. The accused modules are not modified in any way before installation. No further manufacturing or component assembly is needed. In fact, given the limitations of the asserted claims, it is possible to form an infringing apparatus without even attaching fiber optic cables to the combination of chassis and modules. *See* JX-0004 ('320 Patent) at 19:51-67; JX-0007 ('153 Patent) at 16:51-20:30; JX-0010 ('456 Patent) at 21:43-24:43 (asserted claims). Under the framework set forth in *Blood Cholesterol Testing Strips*, Panduit's and Siemon's import activity is sufficiently tied to the alleged infringement to qualify as an unfair act under 19 U.S.C. § 1337(a)(1)(B).

Importation - FS and Wirewerks

FS admitted in confidential exhibits attached to their responses to the complaint that they have imported accused products. *See* FS Response to Complaint Ex. A (EDIS Doc. ID No. 707984). Wirewerks agrees that it has imported accused products. *See* Resps. Br. at 16.

3. Direct Infringement

As noted, Corning asserts independent claim 1 and dependent claim 3.

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Panduit, Leviton, Siemon, and FS accused combinations practice each element of asserted claims of the '320 patent, either literally or under the doctrine of equivalents. However, it has not been shown that Panduit, Siemon, and FS accused

users how to install modules in chassis to reach 144 connections per 1U); CX-0179C (Siemon Plug and Play presentation) at 1, 3-4, and 10 (promoting accused combination); CX-0173C (Siemon 4U presentation) (showing design of modules to be combined with chassis).



combinations directly infringe the asserted claims inasmuch as they do not sell their accused chassis and modules in combination. Inasmuch as Leviton is the only respondent shown to sell accused chassis and modules in an infringing combination, only Leviton directly infringes the asserted claims. Indirect infringement is discussed, *infra*.

Asserted claims 1 and 3 read as follows:

- 1. A fiber optic apparatus, comprising:
- a chassis; and
- a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per *U space*, *based on using at least one simplex fiber optic component or at least one duplex fiber optic component*.
- **3**. The fiber optic apparatus of claim **1**, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per *U space*.

JX-0004 ('320 Patent) at 19:52-67 (emphasis added).

a. Issues Common to Multiple Respondents

i. "configured to support"

Asserted claims 1 and 3 do not require a chassis loaded with enough modules to make 98 or 144 connections at the time of infringement. The claim language requires only "the fiber optic connection equipment configured to support a fiber optic connection density of at least [98 or 144] fiber optic connections per U space."

The phrase "the fiber optic connection equipment" refers back to the previous element, which requires "a fiber optic connection equipment provided in the chassis."

Case: 22-1228 Document: 29 VERSON 253 Filed: 04/25/2022 Confidential Material Omitted on this Page

This limitation is met, therefore, when a single accused module is inserted into the chassis. *See* CX-0001C (Prucnal WS) Q/A 149, 151, 153, 155. That is consistent with the use of the singular "a fiber optic connection equipment."

The claim requires that the equipment provided in the chassis is "configured to support" a fiber optic connection density. Therefore, the claim does not require that the equipment reach a particular density — only that it be configured to support such a density.

A person of ordinary skill in the art would understand that the invention in the '320 patent is a system that is designed to permit a maximum of 98 or 144 connections in a 1U space, but that it does not require that maximum density to be used from the outset or at any particular point in time. To the contrary, the type of fiber optic equipment to which the invention of the '320 patent is directed "is customized based on the application and connection bandwidth needs. . . . When additional bandwidth is needed or desired, additional fiber optic equipment can be employed or scaled in the data center to increase optical fiber port count." JX-0004 ('320 Patent) at 1:52-53, 61-63. In other words, as inventors Harley Staber and Brian Rhoney have explained, the patented system is modular and scalable — it is designed to allow customers to add connections as demand warrants. CX-0006C (Staber WS) Q/A 12; CX-0007C (Rhoney WS) Q/A 9, 24.

Consistent with this, the '320 patent specification repeatedly uses the term "configured to support" to refer to the design of the fiber optic equipment, not to particular uses. For example, it states that "the chassis may be configured to support a fiber connection density of at least ninety-eight (98), at least one hundred twenty (120) per U-space, or at least one hundred forty-four (144) fiber optic connections per U space



based on using at least one simplex or duplex fiber optic component." JX-0004 ('320

Patent) at 2:11-15. This describes three distinct embodiments based on the number of

components that each module accommodates:

The fiber optic equipment trays 20 in this embodiment [Figure 1] support up to four (4) of the fiber optic modules 22 in approximately the width of a 1-U space, and three (3) fiber optic equipment trays 20 in the height of a 1-U space for a total of twelve (12) fiber optic modules 22 in a 1-U space. Thus, for example, if six (6) duplex fiber optic components were disposed in each of the twelve (12) fiber optic modules 22 installed in fiber optic equipment trays 20 of the chassis 12 as illustrated in FIG.1, a total of one hundred forty-four (144) fiber optic connections, or seventy-two (72) duplex channels (i.e., transmit and receive channels), would be supported by the chassis 12 in a 1-U space. If five (5) duplex fiber optic adapters are disposed in each of the twelve (12) fiber optic modules 22 installed in fiber optic equipment trays 20 of the chassis 12, a total of one hundred twenty (2) fiber optic connections, or sixty (60) duplex channels, would be supported by the chassis 12 in a 1-U space. The chassis 12 also supports at least ninety-eight (98) fiber optic components in a 1-U space where in at least one of the fiber optic components is a simplex or duplex fiber optic component."

JX-0004 ('320 Patent) at 5:33-52. As the specification later summarizes, "[w]hen this fiber optic module 22 form factor is combined with the ability to support up to twelve (12) fiber optic modules 22 in a 1-U space, as described by the exemplary chassis 12 example above, a higher fiber optic connection density is supported and possible." *Id.* at 8:46-51; *see also id.* at 10:25-45.

Thus, the patent shows that the claimed fiber optic equipment is configured to support a certain number of connections based on how the chassis, trays, and modules are designed, not based on how many of a particular module are inserted at any point in time. Whether a product satisfies only claim 1 (which requires 98 connections per U space) or both claim 1 and claim 3 (which requires 144 connections per U space), depends on the design of the product (such as the density of the modules), not on how many modules are

inserted at any given time, as respondents incorrectly suggest.

The specification also repeatedly uses the phrase "configured to support" to describe the fiber optic equipment's design, not its use at any given point in time. For example, and as shown above, it states that "the chassis may be configured to support a fiber connection density of at least" 98, 120, or 144 fiber optic connections per U space based on using at least one simplex or duplex fiber optic component, depending on how many adapters is contained in each module. Id. at 2:11-15. The abstract similarly states: "At least one of the one or more of the U space fiber optic equipment units may be configured to support particular fiber optic connection densities and bandwidth in a given 1-U space." Id. at Abstract. As also shown above, the specification equates "fiber optic connection density" that is "supported" with a density that is "possible." Id. at 8:50-51. Further, the specification uses the term "configured to support" in the same manner to refer to LC fiber optic adapters, which it describes as "configured to receive and support connections with duplex LC fiber optic connections," id., at 8:64-9:1. Here, too, the specification uses the term "configured to support" to describe a design with a "possible" use, not to describe whether that possible use is employed at any particular time.

In a case cited by respondents (Resps. Br. at 38), *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1348-49 (Fed. Cir. 2012), the court interpreted the phrase "adapted to" in the limitation "said arms and said pair of magnetic members adapted to extend across respective side portions of a primary spectacle frame." The court recognized that "the phrase 'adapted to' is frequently used to mean 'made to,' 'designed to,' or 'configured to,' but it can also be used in a broader sense to mean 'capable of' or 'suitable for.'" *Id.* at 1349. Based on the intrinsic evidence before it, the court adopted

Case: 22-1228 Document: 29 VERSON 256 Filed: 04/25/2022 Confidential Material Omitted on this Page

the "narrower definition." *Id.* The court's analysis thus equated "configured to" with "designed to" (the "narrower reading"). Its reasoning shows that the interpretation of the claim language depends on the intrinsic evidence.

In re Giannelli, 739 F.3d 1375 (Fed. Cir. 2014), which respondents also cite (Resps. Br. at 39), similarly links the phrase "configured to" to the design of a product, not its actual use. That case involved a patent on an exercise machine "adapted" to be used with a "pulling" motion; the PTAB had found it obvious to modify a prior art machine adapted to be used with a "pushing motion." *Id.* at 1379. Quoting *Aspex Eyewear*, the court explained that the phrase "adapted to' is frequently used to mean 'made to,' 'designed to,' or 'configured to,'" *id.*; construed the patent before it to have that meaning; and distinguished the prior art machine because "it is not obvious to modify a machine with handles designed to be pushed to one with handles adapted to be pulled." *Id.* at 1380 (observing that using a pulling motion with the prior art machine was "contraindicated"). Here, there is ample evidence that the accused products are "designed to" support 98 or 144 connections per U space; no evidence that such usage is "contraindicated."

Simplex and Duplex Fiber Optic Components

Claims 1 and 3 further require that the fiber optic connection equipment provided in the chassis — the modules — be configured to support 98 or 144 connections per U space "based on using at least one simplex fiber optic component or at least one duplex fiber optic component." The administrative law judge determined that the claim term "based on using at least one simplex fiber optic component or at least one duplex fiber

66

optic component" should be construed to mean "based on using at least one fiber optic connector comprising either one or two strands of fiber, or at least one fiber optic adapter that receives such a connector." Thus, under this claim construction, a "fiber optic component" may be either a fiber optic adapter or a fiber optic connector. *See* JX-0004 ('320 Patent) at 5:18-19. Indeed, respondents' experts recognize that usage. *See*, *e.g.*, RX-0006C (Min RWS) Q/A 55 ("A simplex component (connector or adapter) supports communication through a single optical fiber."); RX-0001C (Blumenthal WS) Q/A 45 ("[A] person of ordinary skill in the art would understand that a 'duplex' component (connector or adapter) would support no more than a two-fiber connection.").

Each of respondents' accused modules except for Panduit's contains quad LC adapters. Respondents claim that the quad LC adapters in their accused modules are not a simplex or duplex component, but are instead a "multiple fiber" component. RX-0006C (Min RWS) Q/A 54. Yet, the record shows otherwise. First, the evidence shows clearly that a person of ordinary skill would consider a quad LC adapter to be a pair of duplex adapters, or a set of four simplex adapters, side by side. *See* Prucnal Tr. 391 ("[T]he quad adapter is just two duplex adapters next to each other."). Second, it is undisputed that quad LC adapters receive only simplex LC and duplex LC connectors. Thus, the density provided by these adapters is based on using simplex or duplex components, regardless of whether the adapters themselves are construed as simplex or duplex.

Quad LC Adapters

In the claim construction section of the related '456 patent, the administrative law judge has determined that (1) the claim term "simplex [LC] fiber optic adapter" should be

Case: 22-1228 Document: 29 VERSON 258 Filed: 04/25/2022 Confidential Material Omitted on this Page

construed to mean "fiber optic adapter that supports a simplex [LC] connector"; and (2) the claim term "duplex [LC] fiber optic adapter" should be construed to mean "fiber optic adapter that supports a duplex [LC] connector."

As discussed in the claim construction section, a person of ordinary skill would understand that quad LC adapters are also duplex LC and simplex LC adapters because they receive duplex LC and simplex LC connectors to form duplex and simplex connections. First, quad LC adapters meet the definition of duplex LC adapters in the '320 specification: "adapters that are configured to receive and support connections with duplex LC fiber optic connectors." JX-0004 ('320 patent) at 8:67-9:1. As Dr. Min conceded at the hearing, "the only type of connectors that a quad LC adapter could accept are simplex LC connectors and duplex LC connectors." Min Tr. 825.

Second, as discussed in the claim construction section, quad LC adapters meet the definition of duplex LC adapters in the TIA-568-C standard: "mechanical device designed to align and join two duplex optical fiber connectors (plugs) to form an optical duplex connection." CX-0922C (TIA-568-C.0); *see* Prucnal Tr. 387, 389 (explaining why respondents' quad LC adapters meet the standard).

Third, as discussed in the claim construction section, quad LC adapters conform to the LC standard (FOCIS-10), and are therefore — by definition — simplex LC and duplex LC adapters. CX-0195 (FOCIS-10A) at §§ 1.1, 1.2 (explaining that FOCIS-10 defines only simplex and duplex LC adapters); Min Tr. 828 ("[T]he LC standard that you're talking about, the FOCIS 10, only describes simplex and the duplex adapters."). A person of ordinary skill would understand that any adapter called an LC adapter is one that conforms to the LC standard, and would further understand that all adapters that

68
conform to the LC standard are either a simplex LC adapter or a duplex LC adapter, or both. A person of ordinary skill would therefore consider that a quad LC adapter as either four simplex LC adapters, or two duplex LC adapters, or even a combination of two simplex and one duplex adapter(s); but not some other variant, because no other recognized variant exists.

Fourth, as discussed in the claim construction section, Leviton's patent (Wang '903) and the Smrha '684 patent respondents assert as prior art both recognize quad LC adapters as two duplex LC adapters arranged side by side. CX-0159 (Wang '903) at 14:60-62 (a "quad fiber optic adapter . . . may be characterized as including two duplex fiber optic adapters . . . arranged side-by-side"); CX-0032 (Smrha '684) at 3:38-45 (describing a quad LC adapter as "four adapters 46 (two adapter pairs)"); *id.* 4:20-22.

Fifth, as discussed in the claim construction section, respondents' documents indicate that respondents' quad LC adapters comply with the FOCIS-10 standard and have "[s]tandard [i]nterfaces," meaning that they contain simplex and duplex adapter interfaces. CX-0160C (11-19 Siemon LightStack 8 Spec.) at 3; *see* RX-0291C (LC Adapter Drawings) at 1.

ii. Doctrine of Equivalents (quad LC adapters)

While it is not the usual practice to discuss infringement under the doctrine of equivalents before discussing all the merits of literal infringement, this issue is common to multiple respondents, and thus it is appropriate to do so here. For the reasons set forth below, and as Dr. Prucnal has shown, respondents' accused modules with quad LC adapters infringe under the doctrine of equivalents because any differences between the

69

Case: 22-1228 Document: 29 VERSON Filed: 04/25/2022 Confidential Material Omitted on this Page

claimed limitations and the accused devices are insubstantial. The accused devices perform substantially the same function as modules with duplex LC adapters, in substantially the same way, to achieve substantially the same result. *See* CX-0001C (Prucnal WS) Q/A 190-193.

In the context of the asserted claims and asserted patents, a person of ordinary skill would consider any differences between quad LC adapters and duplex LC adapters "insubstantial." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 35-36 (1997); *see Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1043 (Fed. Cir. 1993) (assessing substantiality of difference from the perspective of one of ordinary skill). Respondents' quad LC adapters perform substantially the same function as duplex LC adapters. Indeed, they perform an identical function, which is to receive simplex or duplex LC connectors to make simplex or duplex LC connections. *See* CX-0001C (Prucnal WS) Q/A 191; RX-0006C (Min RWS) Q/A 55, 69; RX-0008C (Lebby RWS) Q/A 83, 223; RX-0001C (Blumenthal WS) Q/A 53; JX-0016C (Kim Dep. Tr.) 188-189; and JX-0018C (Maynard Dep. Tr.) 182. The sole function of any LC adapter is to receive and support an LC connector. Thus, the fact that quad LC adapters conform to the LC standard is itself proof that they perform the identical function to duplex LC adapters.

Respondents' experts argue that "[a] quad adapter, as its name indicates, supports four fiber optic connections in a single housing," which is "twice as many communication channels of the same form as a duplex adapter," RX-0006C (Min RWS) Q/A 64; *see* RX-0008C (Lebby RWS) Q/A 216, 220-223; and that, because a quad adapter receives four fibers instead of two, it can support four channels of

70

Case: 22-1228 Document: 29 VERSO 261 Filed: 04/25/2022 Confidential Material Omitted on this Page

communications, whereas "[s]implex and duplex adapters cannot support that same level of communication," RX-0008C (Lebby RWS) Q/A 222. However, this "quads go to four" argument fails as a matter of law. As the Federal Circuit has held:

infringement under the doctrine of equivalents is not precluded merely because the accused device performs functions *in addition to* those performed by the claimed device. . . . It is the limitations and functions of the invention described in the claims, not the elements or functions of the accused device, which establish the reference point for the doctrine of equivalents analysis.

Insta-Foam Prods., Inc. v. Universal Foam Sys., Inc., 906 F.2d 698, 702 (1990)

(emphasis added). That is, merely pointing to an additional function that quad adapters could theoretically perform does not matter if they perform the claimed function in the same way as duplex adapters.

Here, the relevant claim limitation recites "fiber optic connection equipment" the accused modules — "configured to support a fiber optic connection density" of 98 or 144 fiber optic connections per U space "based on using at least one simplex fiber optic component or at least one duplex fiber optic component." JX-0004 ('320 Patent) at 19:55-59, 19:65-66. Accordingly, equivalence turns on whether respondents' accused modules are configured to achieve a fiber optic connection density of 144 connections per U space using an equivalent type of simplex or duplex connector or adapter as a module containing a duplex adapter. It is undisputed that respondents' accused products that use quad LC adapters receive the same type of connectors as similar products with duplex LC adapters and achieve exactly the same density (144 connections per U space) using those adapters.

Respondents' experts also concede another point that supports a finding of

71

Case: 22-1228 Document: 29 VERSON 262 Filed: 04/25/2022 Confidential Material Omitted on this Page

equivalence: quad LC adapters were known at the time of the patents. Each of respondents' technical experts shows examples of contemporaneous documents with quad LC adapters. *See* RX-0001C (Blumenthal WS) Q/A 55, 129-136, 145; RX-0006C (Min RWS) Q/A 57; RX-0008C (Lebby RWS) Q/A 167-178, 235. It is well settled that interchangeability weighs in favor of finding infringement under the doctrine of equivalents. *See, e.g., Warner-Jenkinson Co.*, 520 U.S. at 36 ("The known interchangeability of substitutes for an element of a patent is one of the express objective factors . . . as bearing upon whether the accused device is substantially the same as the patented invention."); *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950); *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1261 (Fed. Cir. 1989).

The evidence shows not merely that quad LC adapters were available at the time of the invention, but that respondents considered them interchangeable with duplex LC adapters when designing their accused products. For example, whereas four of the five respondents chose to use quad LC adapters, the fifth, Panduit, chose duplex LC adapters instead, as did Corning. *See* CX-0147 (Panduit HD Flex Cassettes Spec.) at 1; CX-0666 (EDGE Brochure) at 8; CX-0667 (EDGE8 Brochure) at 6. Respondent FS makes modules for its accused chassis that not only use quad LC adapters, but also duplex LC adapters. CX-0423C (FS FHX MTP-12 Cassettes Prod. Spec.) at 1 (FS product specification showing another FS Accused Module with duplex adapters); JX-0031C (Zhang Dep. Tr.) 150:21-151:1 (confirming this FS module has duplex adapters). Some respondents' experts and engineers have testified, moreover, that respondents used quad LC adapters rather than duplex LC adapters because quad adapters cost less. *See* RX-

72

0006C (Min RWS) Q/A 55; JX-0016C (Kim Dep. Tr.) 194-195. This further indicates that such adapters are functionally interchangeable, and that respondents' choice between them was not driven by functional considerations.

Respondents' experts opine that quad LC adapters allow for "connection flexibility" by allowing a duplex LC connector to be inserted into any of the four "adjacent ports" of a quad LC adapter, including the two center ports, which they claim would not be possible with two duplex adapters "because each of those adapters would be separated by a housing wall." RX-0008C (Lebby RWS) Q/A 222; RX-0006C (Min RWS) Q/A 65. However, neither Dr. Lebby nor Dr. Min provides any evidentiary support for this opinion. Mr. Kim testified that he had no knowledge of any such use occurring in the real world. *See* Kim Tr. 834-837.

As Dr. Prucnal explained, though it is theoretically possible to insert a duplex LC connector into the middle two ports of a quad LC adapter, it would violate basic principles of how these products were designed and are used. Prucnal Tr. 321.¹⁸ Respondents' quad LC adapters label each pair of ports "A/B," as specified in the FOCIS 10 standard. *E.g.*, CX-1851 at 11; CX-1853 at 11, 30. This is done to maintain proper polarity. Prucnal Tr. 296. If a duplex LC connector were inserted into the middle two ports, it would upset this standardized polarity scheme. *See* Prucnal Tr. 322. There is significant evidence that they should not be used in this way. *See*, *e.g.*, JX-0016C (Kim Dep. Tr.) 193 (the A/B labeling is "referred to as a receive and send"), 217:18-218:10

¹⁸ Inserting a duplex adapter into the middle two ports also would reduce the utility of the quad adapter. As Dr. Min admitted on cross examination, if a duplex LC connector is inserted into the middle two ports of a quad LC adapter, the outer ports could be used only for simplex connectors, whereas using the proper ports (1/2 or 3/4) leaves the other two ports for either simplex or duplex connectors. Min Tr. 834.

Case: 22-1228 Document: 29 VERSON 264 Filed: 04/25/2022 Confidential Material Omitted on this Page

("polarity means that [on] one end you have a receive that's going out of A, and the other end you need to have a send that is A"); CX-0159 (Wang '903) at 13 (explaining that "polarity designators . . . ensure that the . . . transmit signal (Tx) at one end of the cable matches the corresponding receiver (Rx) at the other end of the cable").

Respondents' experts also opine that the "smaller form factor" of a quad LC adapter distinguishes it functionally from a duplex LC adapter. *See* RX-0008C (Lebby RWS) Q/A 77, 231; RX-0006C (Min RWS) Q/A 65. Although quad LC adapters are a few millimeters narrower than two duplex LC adapters arranged side-by-side, this difference is irrelevant to the "function" of such adapters — to receive LC connectors. Nor does this slightly smaller form factor enable respondents' accused modules with quad LC adapters to achieve greater fiber connection density than do Corning's or Panduit's modules. To the contrary, they achieve identical density of 144 LC connections per U space.

Respondents' quad LC adapters perform the function of receiving LC connections in substantially the same way as duplex LC adapters. All of the domestic industry and accused modules use these adapters to provide 12 LC connections in a Base-12 Module, 8 LC connections in a Base-8 Module, and 24 LC connections in a Base-24 Module. All make duplex LC connections by receiving duplex connectors in the front. Further, on the interior of the module, all modules have individual fibers corresponding to each individual port of their LC adapters, individually numbered to correspond to the fibers to which these individual fibers connect in the multi-fiber MPO/MTP adapter on the rear of the module.

For example, the Leviton Representative Base-12 Module (on the left) with quad

74



LC adapters and the Panduit Representative Base-12 Module (on the right) with duplex LC adapters both have 12 individual fibers on the interior of the module that are numbered and correspond to specific fibers in the 12-fiber MTP adapters on the rear of the module, which is key to tracking and managing these connections. *See* CX-1851 (Leviton Photos Ex. H) at 14; CX-1849 (Panduit Photos Ex. F) at 23; CX-1631 (Panduit HD FLEX MPO Cassette Customer Drawing) at 1.



Dr. Min states that quad LC adapters do "not operate in substantially the same way as the claimed simplex or duplex fiber optic adapter primarily due to the differences in function." RX-0006C (Min RWS) Q/A 66. Dr. Lebby restates his opinion: "Leviton's quad adapters achieve their various functions by packing into a single form factor an adapter including four equally spaced ports, with each port designed to mate a single ferrule with another single ferrule." RX-0008C (Lebby RWS) Q/A 226. Neither Dr. Min nor Dr. Lebby addresses the fact that the form factor of the quad LC adapter does not affect how it forms LC connections or increase how many connections respondents' accused modules provide.

Respondents' quad adapters achieve the same result as duplex LC adapters. Both establish LC duplex connections, which fiber harnesses then route to rear MPO or MTP adapters. CX-0001C (Prucnal WS) Q/A 191-94. Both provide the same number of LC connections per module — 12 in a Base-12 Module, 8 in a Base-8 Module, and 24 in a Base-24 Module. Both are configured to support exactly 144 LC connections in a 1U space.

Dr. Min opines that quad LC adapters have a "smaller form factor," and therefore achieve "substantially different results." However, his only support is to repeat the irrelevant fact that quad LC adapters support "twice the number of available fiber connections" as a duplex LC adapter. *See* RX-0006C (Min RWS) Q/A 67.

Dr. Lebby claims that Leviton was able to achieve a different result with quad LC adapters than it could have with duplex LC adapters — that "space savings associated with quad adapters allowed Leviton to include the front latch alongside the adapters, which ensures easy two-finger access to insert and remove Leviton cassettes, adapter plates, and splice modules." RX-0008C (Lebby RWS) Q/A 232. However, this is not a different result in terms of the claims of the '320 patent — it is the same result. *See* CX-0001C (Prucnal WS) Q/A 194.

b. Direct Infringement - Panduit

Panduit's HD FLEX Fiber product line consists of: (1) Base-8, Base-12, and Base-24 chassis, each available in 1U, 2U, and 4U sizes; and (2) Base-8, Base-12, and Base-24 modules. As shown in CX-1849 (Panduit photos) at 2, 22, and 74-75, Panduit's Base-12 chassis accept up to twelve Base-12 modules per U space, with six duplex

76



adapters per module.¹⁹ Its Base-8 chassis accept up to six Base-8 modules per U space, with four duplex adapters per module. *Id.* at 24, 44, 69-70. Its Base-24 chassis accept two Base-24 modules per U space, with twelve duplex adapters per module. *Id.* at 46, 67, 79-80. Thus, in each case there are 144 fiber optic connections per U space. *See* CX-0001C (Prucnal WS) Q/A 85; CPX-0062 through CPX-0075 (Panduit chassis and modules).



CX-1849 (Panduit photos) at 2, 22 (depicting Base-12 products CPX-0063; CPX-0074)

Asserted claims 1 and 3 read as follows:

- 1. A fiber optic apparatus, comprising:
- a chassis; and
- a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per *U space, based on using at least one simplex fiber optic component or at least one duplex fiber optic component.*
- **3**. The fiber optic apparatus of claim **1**, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per *U space*.

¹⁹ Panduit accused modules use two-fiber duplex adapters rather than quad adapters. *See*, *e.g.*, CPX-0074.

JX-0004 ('320 Patent) at 19:52-67 (emphasis added).

Dr. Prucnal testified that when combined, these Panduit accused products satisfy each element of claims 1 and 3 of the '320 patent. *See* CX-0001C (Prucnal WS) Q/A 133, 140, 148-49, 167-71; *see also* Staff Br. 69-71; Compl. Br. 73-75. The evidence supports Dr. Prucnal's testimony.

Respondents argue that Panduit accused products do not infringe based on the same "configured to support" argument discussed above in the common issues section.

See Resps. Br. at 54-55. That discussion need not be repeated here.

Respondents argue:

Complainant also argues that, if Complainant needs to show a specific connection density, either Panduit's marketing materials or testing of its products establishes infringement because they show a fully-loaded chassis. CPHB at 69-70. Complainant's allegations are conclusory at best and are insufficient to establish infringement. See, e.g., Kim v. ConAgra Foods, Inc., 465 F.3d 1312, 1319-20 (Fed. Cir. 2006); Certain Audiovisual Components and Products Containing the Same, Inv. No. 337-TA-837, Comm'n Op. at 20 (Mar. 26, 2014). While Complainant points to a Panduit brochure and deposition testimony discussing testing (CPHB at 69-70), neither the documents nor testimony identify the products that are pictured or that were tested. And for the testing, Mr. Wiltjer did not identify how the testing was done, what modules or chassis were used, or what connection density was achieved. See JX-0029C (Wiltjer Dep.) at 39:8-40:22, 42:7-12, 42:21-43:3. In fact, Mr. Wiltjer stated he did not know part numbers and did not know which products Panduit had tested. Id. Moreover, Complainant's own employee, Mr. Hicks, testified that "someone is probably going to get fired" if they build a data center at 100% capacity. Hicks Tr. 106:7-17. Complainant has no evidence of specific instances of direct infringement.

Resps. Br. at 55-56 (footnote omitted).

There was hearing testimony by AFL's Mr. Polidan that such fully loaded Panduit enclosures actually do exist. Polidan Tr. 193-194 ("Q. [H]ave you seen enclosures fully filled with cassettes of any of the other respondents' products here? A. Yes. Q. Which

Case: 22-1228 Document: 29 VERSO Filed: 04/25/2022 Confidential Material Omitted on this Page

ones? A. I've seen Panduit's cassettes fully loaded. I've seen Corning's cassettes fully loaded, and obviously ours."). More importantly, Panduit's accused products are "configured to support" 144 duplex connections whether or not all 144 connections are ever installed or used, and therefore read on the asserted claims. The accused combinations of Panduit products therefore infringe claims 1 and 3 of the '320 patent.

A difference between Leviton and Panduit is that while Leviton sells chassis and modules in combination, Panduit modules are sold separately from the chassis, with instructions provided to customers regarding installation of cassettes into compatible enclosures. *See* RX-0006C (Min RWS) Q/A 82; RX-0147 (HD Flex Fiber Cassette Enclosures Instructions FLEX1U and FLEX4U) at PANDUIT-ITC0001751 ("Cassette Installation (sold separately)"); RX-0148 (HD Flex Fiber Cassette Enclosures Instructions) at PANDUIT-ITC0001763 ("Cassette Installation (sold separately)"). Thus, it is customers, rather than Panduit, who assemble the chassis and modules into infringing combinations. Panduit therefore does not directly infringe the asserted claims of the '320 patent.

As discussed below in the Indirect Infringement section, however, Panduit indirectly infringes the asserted claims through its interactions with its customers.

c. Direct Infringement - Leviton

A difference between Panduit and Leviton is that while Panduit modules are sold separately from the chassis, Leviton sells chassis and modules in combination.

Leviton's accused products consist of Base-12 OPT-X UHDX chassis in 1U, 2U, and 4U sizes, as well as Base-12 and Base-24 HDX Enterprise modules. As shown in CX-1851 (Leviton photos) at 3, 23, and 25, each Leviton accused chassis accepts up to

79



twelve Base-12 modules per 1U space. Each module has three quad adapters on its front side, for a total of twelve fiber optic connections per module. The entire assembly thus supports up to 144 fiber optic connections per 1U space. The Base-24 configuration also supports up to 144 connections per 1U space. *See* CX-0001C (Prucnal WS) Q/A 98; CPX-0057 (Leviton Base-12 1U chassis); CPX-0060 (Leviton Base-12 module); CPX-0061 (Leviton Base-24 module). *See* Staff Br. at 66-67.



CX-1851 (Leviton photos) at 3, 13 (depicting CPX-0057; CPX-0060)

Asserted claims 1 and 3 read as follows:

- 1. A fiber optic apparatus, comprising:
- a chassis; and
- a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per *U space*, *based on using at least one simplex fiber optic component or at least one duplex fiber optic component*.
- 3. The fiber optic apparatus of claim 1, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per U space.

JX-0004 ('320 Patent) at 19:52-67 (emphasis added).

Dr. Prucnal testified that when combined, these Leviton accused products satisfy

Case: 22-1228 Document: 29VERSO: 271 Filed: 04/25/2022 Confidential Material Omitted on this Page

each element of claims 1 and 3 of the '320 patent. *See* CX-0001C (Prucnal WS) Q/A 134, 141, 150-51, 172-76; *see also* Staff Br. 66-69; Compl. Br. 80-85. The evidence supports Dr. Prucnal's testimony.

Respondents argue that Leviton accused products do not infringe based on the same "configured to support" and "simplex" or "duplex" components arguments discussed above in the common issues section. *See* Resps. Br. at 59-60, 61-65. That discussion need not be repeated here.

Respondents also argue, "Complainant failed to prove any specific instance of Leviton making, using, or selling a Leviton Enclosure loaded with at least nine (9) Base-12 modules or at least five (5) Base-24 modules per 1RU (claim 1), let alone fully loaded with Leviton accused modules (required by claim 3)." Resps. Br. at 60.²⁰

The asserted claims of the '320 patent call for a combination of a chassis and fiber optic connection equipment including at least one module that has a simplex or duplex fiber optic component. *See* JX-0004 ('320 Patent) at 19:51-59. Leviton sells such chassis and modules in combination. *See* CX-0152 (Leviton OPT-X enclosure product

²⁰ It is noted that the accused chassis can also support other combinations of chassis and modules, some of which would be noninfringing. In Leviton's case, the accused chassis can also be used with products, such as adapter plates, that are not accused. *See* Resps. Br. at 56; RX-0008C (Lebby RWS) Q/A 210. Respondents argue that there are numerous substantial uses for the Leviton UHDX Enclosures that do not infringe claims 1 or 3 of the '320 patent. *Id.* The concept of "substantial noninfringing uses," however, is only relevant to contributory infringement. *See* 35 U.S.C. § 271(c). In the context of direct infringement, "[i]t is well settled that an accused device that 'sometimes, but not always, embodies a claim[] nonetheless infringes." *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1333 (Fed. Cir. 2013) (quoting *Bell Commc 'ns Research, Inc. v. Vitalink Commc 'ns Corp.*, 55 F.3d 615, 622-23 (Fed. Cir. 1995)); *see also Wisconsin Alumni Research Found. v. Apple Inc.*, 905 F.3d 1341, 1349 (Fed. Cir. 2018) (finding insufficient evidence that accused product sometimes infringed). Indirect infringement is discussed, *infra*.

Case: 22-1228 Document: 29 VE Rage: 272 Filed: 04/25/2022 Confidential Material Omitted on this Page

specifications) ("Enclosures shall be pre-configured or ma[d]e to order with respective adapter plates and MTP cassettes, for easy ordering with one part number."); CX-0150 (Leviton *Fiber Systems* product literature) at 12-15 (Ordering Guide: "(1) Select Enclosures & Panels . . . (2) Select Enclosure Accessories . . . (3) Select Adapter Plates OR Select MTP Cassettes . . .(4) Select Splice Trays/Modules . . . (5) Select Connectors").

There is evidence that Leviton has at least advertised such combinations, and there is no reason to believe that no Leviton customer has ever responded to those advertisements by purchasing a preloaded chassis. Prucnal Tr. 306-307 ("I've seen Leviton marketing material with preloaded chassis. And I don't know if that means offering to sell legally, but I have seen them configured that way.").

Moreover, there is sufficient circumstantial evidence that Leviton, and at least some of its customers, have fully loaded at least one accused chassis with accused modules.

First, Leviton developed its accused products specifically to meet consumer demand for 144 LC connections per 1U space, as opposed to the lower density its products already supported. *See* CX-0001C (Prucnal WS), Q605, 619; CX-2060C (Prucnal RWS) Q/A 304-317. Leviton's **10** to obtain approval to develop what became the accused products lists as the **10** to obtain approval to develop what an equivalent Ultra High Density solution to Corning's EDGE, Systimax's '360', and Ortronics' OptiMo enclosures for Data Center market." CX-0083C (6/16/15 Leviton Email) at 128; CX-0078C (6/21/11 Leviton Email) at 2; *see* JX-0016C (Kim Dep. Tr.) 43; *id.* 51-52. Leviton recognized this market as the

82

CX-0083C (6/16/15 Leviton Email) at 128. It acknowledged that, without a "solution" that could offer 144 connections per 1U, it had "lost" "[m]ultiple large project opportunities." *Id.* It also recognized customers' "need for higher density in one rack unit" as a result of "[r]ack space for structured connectivity due to more and more active equipments [e.g., switches and routers] being installed." *Id.*

Shortly before it released its accused chassis, Leviton developed a

for Leviton's new Ultra High Density Enclosure System.

CX-0083C (6/16/15 Leviton Email) at 77. That statement described "144-F [fibers] per RU" as Leviton's **second state of the state of the**

Case: 22-1228 Document: 29 VE Rego: 274 Filed: 04/25/2022 Confidential Material Omitted on this Page



The same document included an "Enclosure Density Comparison" of Leviton's products offering 72, 96, and 144 connections to quantify space and cost savings from the new "144-F" product — assuming that the new product is fully loaded. *See* CX-0083C (6/16/15 Leviton Email) at 81.

Similarly, Leviton's for its accused Ultra High Density Enclosure analyzed compared to competing products such as EDGE. *See id.* at 138-39. That analysis explicitly stated each chassis would be "fully loaded." CX-0083C (6/16/15 Leviton Email) at 139; *see also id.* at 144 (summary of "[c]ustomer [r]equirements" stating that "most enclosures are typically fully loaded"). Similarly, Leviton's made to help its salespeople sell products, include an for a "Fully Loaded 1RU enclosure." *Id.* at 126; Kim Tr.

517-518 (confirming that CX-0083C (6/16/15 Leviton Email) at 126 "lists the price of a

84

fully loaded 1RU enclosure").

Second, Leviton markets its accused products to emphasize its ability to provide 144 connections per 1RU and benefits of using this higher density. After Leviton introduced its accused chassis, it created product literature stating that the new system offers "144 LC Fibers (1 RU)," describing this as "[u]ltra high density to help meet increasing network demands in data centers." CX-0150 (Leviton Fiber Systems Prod. Literature) at 3-4. The same literature promotes the "maximum capacity" of the Leviton accused chassis and shows that it is reached when filled with 12 Leviton accused modules. *Id.* A presentation that Leviton made to a customer likewise emphasizes "144 fibers per RU," and contrasts it with Leviton's 72 and 96 fiber products. CX-1602C (Leviton HDX Cassette Presentation) at 3.

Third, the record demonstrates that Leviton itself has fully loaded its accused chassis with accused modules. For example, **Second Second Seco**





Mr. Kim's testimony also indicates that Leviton loads chassis. When asked whether "customers at Leviton sometimes order the UHDX enclosure filled with cassettes", Mr. Kim responded that "we have had customer order HDX enclosure with cassettes — cassettes inserted into the enclosure." JX-0016C (Kim Dep. Tr.) 140.

Leviton also created videos further showing that it fully loads chassis and encourages customers to do so. *See* CDX-0014 (Opt-X UHDX Fiber Enclosure System Video) at 0:14-0:33, 0:52-1:06, 1:34-2:18 (formerly CPX-0024); CPX-0025 (How to Install the Opt-X UHDX Enclosure Video) at 0:28-1:02. Although Leviton objected to the admission of CPX-0024 at the hearing, the administrative law judge ruled that it would be received "as a demonstrative exhibit to help illustrate Dr. Prucnal's direct

Case: 22-1228 Document: 29 VERSO 277 Filed: 04/25/2022 Confidential Material Omitted on this Page

testimony." Tr. 896. In that testimony, Dr. Prucnal identified CPX-0024 as an "example[]" of one of "Respondents' own marketing materials and videos," some of which "show the chassis fully loaded with modules." CX-0001C (Prucnal WS) Q/A 67-68. His review of those materials — among many others listed in his witness statement — supports his opinion that "Respondents go through a lot of effort to feature this density in their marketing and their documents and their manuals that all describe, very importantly and very prominently, that having this 144-connection density is an important part of the product." Prucnal Tr. 405.

It is also probable that before releasing and selling their products, Leviton confirmed that its accused modules worked properly with its accused chassis by filling the accused chassis with accused modules. Indeed, Leviton's documents show such testing occurred. A 2014 internal presentation included pictures of a loaded prototype and comments on evaluations of and CX-0082C (4/4/14 Leviton Email) at 9; see id. at 8-11 (discussing findings that trays that trays were that and that). It is not reasonable that from Leviton's engineers assessed the of its trays without ever fully loading them with modules.

Accordingly, the accused combinations of Leviton products directly infringe asserted claims 1 and 3 of the '320 patent.

d. Direct Infringement - Siemon

The Siemon LightStack Ultra High-Density Fiber Plug and Play system consists of Base-8 and Base-12 chassis in 1U, 2U, and 4U sizes, as well as modules in Base-8 and

87



Base-12 configurations. As shown in CX-1853 (Siemon photos) at 2 and 13, Siemon's Base-12 chassis accept up to twelve Base-12 modules per U space, with three quad adapters per module. Its Base-8 chassis accept up to six Base-8 modules per U space, with two quad adapters per module. *Id.* at 19, 26. Thus, in each case there are 144 fiber optic connections per U space. *See* CX-0001C (Prucnal WS) Q/A 106; CPX-0076 through CPX-0080 (Siemon accused products).



CX-1853 (Siemon photos) at 2, 13 (depicting Base-12 products CPX-0077; CPX-0080)

Asserted claims 1 and 3 read as follows:

- 1. A fiber optic apparatus, comprising:
- a chassis; and
- a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per *U space, based on using at least one simplex fiber optic component or at least one duplex fiber optic component.*
- **3**. The fiber optic apparatus of claim **1**, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per *U space*.

JX-0004 ('320 Patent) at 19:52-67 (emphasis added).

Case: 22-1228 Document: 29 VERSON 279 Filed: 04/25/2022 Confidential Material Omitted on this Page

Dr. Prucnal testified that when combined, these Siemon accused products satisfy each element of claims 1 and 3 of the '320 patent. *See* CX-0001C (Prucnal WS) Q/A 135, 142, 151-53, 177-80; *see also* Staff Br. 71-73; Compl. Br. 89-90. The evidence supports Dr. Prucnal's testimony.

Respondents argue that Siemon accused products do not infringe based on the same "configured to support" and "simplex" or "duplex" components arguments discussed above in the common issues section. *See* Resps. Br. at 71-72. That discussion need not be repeated here.

As discussed above, it is the combination of chassis and modules that infringes the asserted claims of the '320 patent, not the separate components. Siemon's Mr. Veatch testified that Siemon has never sold LightStack enclosures pre-loaded with LightStack modules. RX-1266C (Veatch WS) Q/A 22-23 ("[T]hey are sold in separate packaging, and are shipped to the end customer from different facilities. Enclosures are shipped directly from Siemon's facility in Connecticut, while the modules are shipped directly from Siemon's partner in Mexico or Siemon's facility in China."). Thus, it is customers, rather than Siemon, who assemble the LightStack chassis and modules into infringing combinations. Accordingly, Siemon does not directly infringe the asserted claims of the '320 patent.

As discussed in the Indirect Infringement section below, however, Siemon indirectly infringes the asserted claims.

e. Direct Infringement - FS

FS's accused FHX Series and FHX-FCP/ FHX-C Series chassis and modules consist of a 1U chassis that in the Base-12 configuration accepts three rows of four

89



modules each, for a total of up to twelve modules per 1U space. Each Base-12 module has three quad adapters on its front side, for a total of twelve fiber optic connections per module. The entire assembly thus supports up to 144 fiber optic connections per 1U space. The Base-8 configuration also supports up to 144 connections per 1U space. *See* CX-0001C (Pruenal WS) Q/A 117; CPX-0053 (FS Base-8 1U chassis); CPX-0054 (FS Base-12 1U chassis); CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module).



CX-1855 (FS photos) at 2, 15 (depicting CPX-0054; CPX-0056)

Asserted claims 1 and 3 read as follows:

1. A fiber optic apparatus, comprising:

a chassis; and

- a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per *U space*, *based on using at least one simplex fiber optic component or at least one duplex fiber optic component*.
- 3. The fiber optic apparatus of claim 1, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per U space.

JX-0004 ('320 Patent) at 19:51-67 (emphasis added).

Dr. Prucnal testified that when combined, these FS accused products satisfy each

element of claims 1 and 3 of the '320 patent. See CX-0001C (Prucnal WS) Q/A 136,

143, 154-55, 181-85; see also Staff Br. 62-66; Compl. Br. 93-95. The evidence supports

Dr. Prucnal's testimony. However, respondents argue:

Turning now to the "simplex" and "duplex" limitations of the asserted claims, the General Manager of FS testified that the base-8 and base-12 modules accused of infringement in this Investigation have only ever contained quad adapters. RX-0010 (Zhang WS) Q/A 8-14. Given the presence of these quad adapters, for the reasons given with regard to the other respondents, the accused FS modules do not satisfy the "simplex"/"duplex" limitations of the asserted claims of the '320 patent, either literally or under the doctrine of equivalents. RX-0006C (Min RWS) Q/A 50-76. The accused FS modules, therefore, do not directly infringe the asserted claims of the '320 patent, even if there were a cognizable act of infringement on the part of FS. *Id.* Q/A 50.

Resps. Br. at 76.

This argument was addressed above in the common issues section.

In short, in the claim construction section above, the administrative law judge construed the claim term "based on using at least one simplex fiber optic component or at least one duplex fiber optic component" should be construed to mean "based on using at least one fiber optic connector comprising either one or two strands of fiber, or at least one fiber optic adapter that receives such a connector."

The quad adapters in the FS accused products are duplex fiber optic components under the proper claim construction of the claim term "based on using at least one simplex fiber optic component or at least one duplex fiber optic component," and thus satisfy the final limitation of claim 1 of the '320 patent.

* * *

Nonetheless, as discussed below, FS does not directly infringe the asserted claims

91

of the '320 patent. The asserted claims of the '320 patent call for a combination of a chassis and fiber optic connection equipment including at least one module that has a simplex or duplex fiber optic component. *See* JX-0004 ('320 Patent) at 19:51-59 (claiming "[a] fiber optic apparatus comprising: a chassis; and a fiber optic connection equipment provided in the chassis"). It is the combination of chassis and module that infringes, not the separate components. FS's Mr. Zhang testified that FS's FHX products were "sold in separate packaging" and that FS has never sold chassis pre-loaded with modules. RX-0010 (Zhang WS) Q/A 27-28. Thus, it is customers, rather than FS, who would assemble the FHX chassis and modules into infringing combinations. Accordingly, FS does not directly infringe the asserted claims of the '320 patent. As discussed in the indirect infringement section below, however, FS indirectly infringes the asserted claims through its interactions with its customers.

4. Indirect Infringement

As noted, Corning asserts claims 1 and 3 of the '320 patent. Those claims read as follows:

1. A fiber optic *apparatus*, comprising:

a chassis; and

- a *fiber optic connection equipment* provided in the chassis; the fiber optic connection equipment configured to support a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space, based on using at least one simplex fiber optic component or at least one duplex fiber optic component.
- 3. The fiber optic apparatus of claim 1, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least

Case: 22-1228 Document: 29 VERSO 283 Filed: 04/25/2022 Confidential Material Omitted on this Page

one hundred forty-four (144) fiber optic connections per U space.

JX-0004 ('320 Patent) at 19:51-67 (emphasis added).

Thus, the asserted claims of the '320 patent (as well as the '153, and '456 patents discussed, *infra*) disclose an apparatus consisting of two principal parts: a chassis and one or more fiber optic modules. Of the respondents accused of infringement, only Leviton sells its accused chassis and modules in combination. Panduit, Siemon, and FS each package and sell their accused chassis separately from their accused modules. Inasmuch as only a combination of chassis and modules can infringe the '320 patent, these three respondents have not been shown to directly infringe the '320 patent. Nonetheless, for the reasons discussed below, the record evidence demonstrates that Panduit, Siemon, and FS, as well as Leviton, indirectly infringe the asserted claims of the '320 patent by actively inducing the direct infringement of that patent by their customers.

a. Induced Infringement

Corning argues that Panduit, Leviton, Siemon, and FS induce others to infringe asserted claims 1 and 3 of the '320 patent. *See* Compl. Br. at 76-78, 85-88, 90-92, 95-97. The Staff agrees. *See* Staff Br. at 73-77.

Section 271(b) of the Patent Act provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b).

Induced infringement requires proof of two types of knowledge by the alleged inducer: knowledge of the patent in question and knowledge that the induced acts infringe the patent. *Commil*, 135 S. Ct. at 1926; *see also Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 766 (2011); *Microsoft*, 755 F.3d at 904 (to prove induced

93

infringement, patentee must show that accused inducer took an affirmative act to encourage infringement with knowledge that the induced acts constitute patent infringement). Induced infringement requires a finding that the infringer possessed a specific intent to encourage another's infringement. *i4i*, 598 F.3d at 851.

i. Direct Infringement by Others

At the evidentiary hearing, Corning's witnesses testified that it was "common" for customers to "fully load EDGE chassis with EDGE modules," CX-0004C (Hicks WS) Q/A 25; that Corning "markets EDGE as enabling 144 single-fiber connections per 1U space precisely because data centers typically want to make as many connections as possible," *id.*; that Corning's "competitors do the same thing," *id.*; and that "[c]ustomers with large data centers typically have bay after bay, row after row, of fiber optic connection equipment, which is why high-density equipment is so important," CX-0006C (Staber WS) Q/A 12; *see also* Prucnal Tr. 405 (explaining the needs of large data centers, and adding: "The notion that the chassis wouldn't be fully populated when there's so many fibers that have to be broken out is kind of ridiculous. Maybe not all of them are fully — are full, but certainly many of them, if not most of them, are full."). Steve Polidan of former respondent AFL confirmed that, based on his 21 years of experience, he has seen chassis "completely loaded," and that he has personally seen AFL, Panduit, and Corning EDGE chassis fully loaded at customer sites. Polidan Tr. 192-194.

As shown for each respondent below, respondents' own documents provide circumstantial evidence that each respondent's accused chassis have been (a) loaded with at least one corresponding accused module, by respondents' customers; and (b) have been fully loaded to achieve their maximum density of 144 fiber optic connections per U

94

space. See Vita-Mix Corp. v. Basic Holding, Inc., 581 F.3d 1317, 1326 (Fed. Cir. 2009)
("Direct infringement can be proven by circumstantial evidence."); Martek Biosciences
Corp. v. Nutrinova, Inc., 579 F.3d 1363, 1372 (Fed. Cir. 2009) ("A patentee
may prove infringement by 'any method of analysis that is probative of the fact
of infringement,' and circumstantial evidence may be sufficient." (quoting Forest Labs.,
Inc. v. Abbott Labs., 239 F.3d 1305, 1312 (Fed. Cir. 2001))); Alco Standard Corp. v.
Tenn. Valley Auth., 808 F.2d 1490, 1503 (Fed. Cir. 1986) ("Although the evidence of
infringement is circumstantial, that does not make it any less credible or persuasive.").
That evidence includes specifications, instruction manuals, videos, and similar materials
showing the accused chassis fully loaded and indicating that this is a way in which they

Each respondent's documents also show that they tout density, and its benefits, in their marketing to customers. This significant — and consistent — evidence of how respondents market the accused products is also strong circumstantial evidence that at least some customers have fully loaded chassis. *See Bayer Healthcare, LLC v. Zoetis Inc.*, No. 12 C 00630, 2016 WL 4179087 at *29 (N.D. Ill. Aug. 8, 2016) ("Pfizer's marketing and advertising materials . . . also provide circumstantial evidence of direct infringement."). Respondents would not emphasize the benefits of fully loading in their marketing materials unless they had determined it was a feature customers wanted. In similar circumstances, courts have found "that where an alleged infringer designs a product for use in an infringing way . . . there is sufficient evidence for a jury to find direct infringement." *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1365 (Fed. Cir. 2012); *see Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1318 (Fed. Cir. 2009)

95

Case: 22-1228 Document: 29 VERSON 286 Filed: 04/25/2022 Confidential Material Omitted on this Page

(concluding that circumstantial evidence was sufficient to find direct infringement where the expert testified that "[i]t's hard to imagine that we're the only two people in the world that ever used it'" and "Microsoft . . . designed the accused products to practice the claimed invention" (alterations in original)).

Respondents, by contrast, did not offer evidence suggesting that the products they specifically designed to provide greater density of 144 connections per 1U (and that they market for that purpose) were never used by customers in that manner. None of respondents' witnesses has claimed that they or their customers have not in fact combined, or have not in fact fully loaded, their accused chassis with their respective accused modules. *See Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1363 (Fed. Cir. 2006) (finding infringement where defendant offered no evidence that it "or any end-user ignored the instructions" teaching an infringing configuration or acted "contrary to the instructions so as to form a non-infringing configuration"). Instead, respondents' witnesses have either (somewhat implausibly) testified that they are unaware of how their customers use their products, or have wholly failed to provide testimony on this issue.

Respondents' experts, moreover, formed their opinions that respondents did not infringe without considering the evidence. Dr. Min, the noninfringement expert for Panduit, Siemon, and FS, admitted that he formed his opinion without reviewing respondent documents that Corning and Dr. Prucnal cited, Min Tr. 802-806, that he never asked respondents whether they or their customers fully loaded their accused chassis with accused modules, *id.* 806:6-807:4, and that he was not providing an opinion that there was no evidence to show that Siemon's and FS's chassis had been fully loaded,

96

Case: 22-1228 Document: 29 VERSON 287 Filed: 04/25/2022 Confidential Material Omitted on this Page

id. 798-800. Mr. Veatch of Siemon provided no testimony on this issue, while Mr. Zhang of FS confirmed that certain exhibits show FS chassis fully loaded with FS modules. Zhang Tr. 586-587, 589-590, 592-593, 594.

Dr. Lebby likewise did not consider relevant evidence. His list of materials considered shows that he never addressed the extensive documentation that Corning and Dr. Prucnal presented. *See* RX-0008C (Lebby RWS) Q/A 26-28 (listing materials considered). Dr. Lebby testified that he spoke to only one Leviton employee, Frank Kim, *id.* Q/A 26, but Mr. Kim testified that he is "not aware of how a customer uses our existing product in their arrangement from the patch cord out, from the cassette on the front side." JX-0016C (Kim Dep. Tr.) 193.

ii. Induced Infringement - Panduit

As discussed below, the evidence shows that Panduit induces others to infringe asserted claims 1 and 3 of the '320 patent. *See* Compl. Br. at 76-78; Staff Br. at 73-77.

Direct Infringement

As discussed above, Panduit's customers directly infringe the asserted patents. Panduit sells the accused products to customers in the United States. *See, e.g.*, CX-0146 (6/19/20 Panduit Email) (describing and showing photographs of a customer's use of Panduit accused modules with Panduit accused chassis).

Knowledge

Panduit knew of each asserted patent when it was first issued, as it concedes. CX-0361C (Panduit June 4, 2020 Rog Responses) at 140 (Interrog. No. 82); *see also, e.g.*, Kuffel Tr. 624 (testifying that he knew of certain Corning patents at least as of 2010).

97

Inducing Acts

Panduit actively induced the infringement of the asserted patents by encouraging, teaching, and aiding third parties to use their accused products in an infringing device. Panduit's user instructions inform customers how to combine the accused modules and chassis in a way that infringes the asserted patents. *See, e.g.*, CX-1623 (Panduit FLEX1U, FLEX4U Installation Instructions); CX-1705 (Panduit FLEX1U, FLEX2U, & FLEX4U Installation Instructions). Panduit's promotional materials and sales efforts also encouraged users to use the accused combinations to infringe. *See, e.g.*, Min Tr. 839-40; CX-0199 (Panduit HD Flex Enclosures Spec.); JX-0029C (Wiltjer Dep. Tr.) 121:7-14; CX-0382 (Panduit HD FLEX Ordering Guide) at 3-6; CX-0146C (6/19/19 Panduit Email); CX-0145C (Panduit HD Flex Project Charter); CX-1708 (Panduit HD Flex Fiber Enclosure Spec.); CX-0147 (Panduit HD Flex Cassettes Spec.).

Dr. Prucnal testified during the hearing that customers learn to assemble the chassis and modules in infringing combinations from respondents' product literature and instructions. Prucnal Tr. 370. In addition, Ms. Mulhern conceded that Panduit's documents show, and she had "no reason to doubt" that "Panduit's customers demand a high level of technical support" before and after the sales of accused products. Mulhern Tr. 928; *see also* Mulhern Tr. 956 ("[O]ne of the things we know about this market is that the customers are very sophisticated and require . . . technical support.").

Panduit's documents expressly state that their products support 144 connections, describe the benefits of using this capacity, and inform customers how many cassettes are needed to achieve this density. *See, e.g.*, CX-0621 (Panduit Chassis Spec.) at 3 (stating that enclosures provide a "fiber capacity" of "144" in "1 RU"); CX-1623 (Panduit

98

FLEX1U, FLEX4U Installation Instructions) at 3 (instructing customers to "[p]opulate an entire row" before moving to the next and "[r]epeat [the] process until all desired slots are filled"; "FLEX1U can hold up to 12 cassettes"); *id.* at 4 (illustrating cable routing for a fully populated 1U); CX-1705 (Panduit FLEX1U, FLEX2U, & FLEX4U Installation Instructions) at 8-9 (similar). No more direct instruction than this is required. *See Golden Blount, Inc.*, 438 F.3d at 1363.

iii. Induced Infringement - Leviton

As discussed below, the evidence shows that Leviton induces others to infringe asserted claims 1 and 3 of the '320 patent. *See* Compl. Br. at 85-88; Staff Br. at 73-77.

Direct Infringement

As discussed above, Leviton's customers directly infringe the asserted patents. Leviton sells the accused products to customers in the United States. *See, e.g.*, JX-0016C (Kim Dep. Tr.) 135 (naming customers who have purchased the combination).

Knowledge

Leviton knew of each asserted patent at least as of February 2020, when the complaint was filed.

Circumstantial evidence shows an earlier knowledge. The EDGE products bear labels indicating patent protection and directing users to Corning's website, which contains virtual patent marking — including all four asserted patents — regarding the EDGE products. *See, e.g.*, CPX-0043 (EDGE Base-12 Module). Further, as discussed in the Validity (Secondary Considerations) section, *infra*, Leviton's documents and

testimony show that it had samples of Corning's products.²¹ See Suprema, Inc. v. Int'l Trade Comm'n, 626 F. App'x 273, 281 (Fed. Cir. 2015) (attributing knowledge to infringer who was "well-aware of competitor products," the inventor's "prominence" in the market, and of a related patent); SynQor, Inc. v. Artesyn Techs., Inc., 709 F.3d 1365, 1380 (Fed. Cir. 2013) (sufficient knowledge for indirect infringement when defendants acquired product samples and datasheets marked with earlier patents to which asserted patents claimed priority).

Indeed, Leviton was aware of the "proprietary" nature of EDGE's patented features by no later than 2013. *See* CX-0081C (Leviton email dated Apr. 17, 2013) at LEVITONITC1194_00003163.006.

Inducing Acts

Leviton actively induced the infringement of the asserted patents by encouraging, teaching, or otherwise aiding third parties to use its accused products in combination. Leviton's user instructions inform customers how to combine the accused modules and chassis to infringe the asserted patents. *See, e.g.*, Min Tr. 839-840 (testifying that respondents advertise that their accused products can be combined); Prucnal Tr. 368-69 (testifying that Leviton ordering guide CX-0150 (Leviton Fiber Systems Prod. Literature) instructs customers to purchase accused chassis preassembled with accused modules); CX-0087C (Leviton Enclosure Instructions). Leviton has instructed its users to infringe, promoted the infringing combination to its users, and actively encouraged infringing sales. *See, e.g.*, CX-0093 (Leviton HDX MTP Cassette Spec.) (promoting fully loading

²¹ In developing the Leviton accused products, Mr. Kim admitted that Leviton had obtained copies of the EDGE products and analyzed them. Kim Tr. 481; JX-0016C (Kim Dep. Tr.) 35-37; CX-2060C (Prucnal RWS) Q/A 310.

Case: 22-1228 Document: 29 VERSON 291 Filed: 04/25/2022 Confidential Material Omitted on this Page

accused modules "for 144 LC fibers per RU"); CX-0086C (3/20/20 Leviton Email) (showing accused combination); CX-0083C (6/16/15 Leviton Email) at 136 (same); *id.* at 54 (marketing strategy to promote sales of accused combination); *id.* at 60 (website portal for purchasing accused combination); *id.* at 61 (listing customers Leviton encouraged to purchase accused combination); JX-0016C (Kim Dep. Tr.) 69-70 (accused chassis and modules developed for use together); *id.* at 140 (customers have ordered cassettes installed in enclosures); *id.* at 99-100, 146-147.

In addition, Dr. Prucnal testified that customers learn how to assemble the chassis and modules in infringing combinations from respondents' product literature and instructions, Prucnal Tr. 370; and Ms. Mulhern testified that customers in the relevant market require technical support, *see* Mulhern Tr. 956, supporting an inference that Leviton provided such support to its customers. *See also, e.g.*, RX-0198 (Leviton Support Catalog) at 2 (advertising data center support); RX-0212 (Leviton Catalog) at 6, 10-11 (promising customers that Leviton backs up its products ongoing support).

Respondents argue that Leviton merely describes the capabilities of the Leviton UHDX Enclosures including that they are compatible not only with Leviton accused modules, but also with other non-accused cassettes and modules. *See* Resps. Br. at 67-68. Leviton's attempt to draw a distinction between merely describing the capabilities of its accused products and wrongfully encouraging customers to use those capabilities is not persuasive. Leviton's documents make plain that it is actively promoting the benefits of using its accused products' density capabilities to their fullest, including saving rack space and corresponding expense. *See, e.g.* CX-0093 (Leviton HDX MTP Cassette Spec.).

101

Leviton's claims regarding noninfringing cassettes and modules also are not persuasive. Its expert identifies only one such product with LC adapters on the front and multiple fiber MPO/MTP adapters on the rear, that product is for an unusual case of adapting a base-8 system to a base-12 enclosure. See RX-0008C (Lebby RWS) Q/A 207. Thus, none of the products are designed for the customer application that was the primary driver in developing and marketing the Leviton accused products — the need for 144 fiber optic simplex or duplex connections in a single U space (discussed in the Validity (Secondary Considerations) section, *infra*). In light of the sufficient evidence that Leviton makes infringing chassis and infringing modules and induces its customers to use them in infringing combinations, the fact that it also makes noninfringing modules and cassettes is irrelevant. See Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp., 55 F.3d 615, 622-23 (Fed. Cir. 1995) ("[A]n accused product that sometimes, but not always, embodies a claimed method nonetheless infringes."); Toshiba Corp., 681 F.3d at 1364 (Fed. Cir. 2012) ("The existence of a substantial non-infringing use does not preclude a finding of inducement.").

iv. Induced Infringement - Siemon

As discussed below, the evidence shows that Siemon induces others to infringe asserted claims 1 and 3 of the '320 patent. *See* Compl. Br. at 90-92; Staff Br. at 73-77.

Direct Infringement

As discussed above, Siemon's customers directly infringe the asserted patents. Siemon sells the accused products to customers in the United States. *See, e.g.*, CX-0222C (Siemon Stage 2 Presentation) (describing a design of the accused combination).

102

Knowledge

Siemon knew of each asserted patent at least as of February 2020, when the complaint was filed. Siemon admitted knowledge of the the '320 patent by October 30, 2019. CX-0324C (Siemon Resp. to Corning 1st Interrogs.) at No. 70. Siemon likely had even earlier knowledge of all the asserted patents: As discussed with respect to Leviton, Corning labels its EDGE products with references to patents and directions to a website listing patents covering EDGE. Further, as discussed in the Validity (Secondary Considerations) section, *infra*, Siemon's documents and testimony show that it was aware of Corning's protection of its intellectual property, had samples of Corning's products, and possibly copied EDGE, all of which — as discussed with respect to Leviton — are evidence of knowledge of the asserted patents. JX-0019C (Nagel Dep. Tr.) 36 (admitting that Siemon was aware of Corning's patent protection on its products). Siemon also modified its products in mid-2019 in view of Corning's patents covering EDGE. *Id.* at 112, 112-113, 123-124.

Inducing Acts

Siemon actively induced the infringement of the asserted patents by encouraging, teaching, or otherwise aiding third parties to use its accused products in combination. Siemon's user instructions inform customers how to combine the accused modules and chassis to infringe the asserted patents. *See, e.g.*, Min Tr. 839-40 (testifying that respondents advertise that their accused products can be combined); CX-1791C (2/17 Siemon LightStack 4U Install Instructions). Siemon has instructed its users to infringe, promoted the infringing combination to its users, and actively encouraged infringing sales. *See, e.g.*, CX-0180C (11/19 Siemon LightStack Spec.) at 1-2 (promoting accused

103

Case: 22-1228 Document: 29VER306: 294 Filed: 04/25/2022 Confidential Material Omitted on this Page

combination and showing users how to install modules in chassis to reach 144 connections per 1U); CX-0181C (11/19 Siemon LightStack 8 Spec.) at 1-2 (same for base-8 combination); CX-0179C (Siemon Plug and Play Presentation) at 1, 3-4, and 10 (promoting accused combination); CX-0173C (Siemon 4U Presentation) (same); JX-0018C (Maynard Dep. Tr.) 213 (Siemon shows customers how to install modules in chassis); 239-240.

In addition, Dr. Prucnal testified that customers learn how to assemble the chassis and modules in infringing combinations from respondents' product literature and instructions, Prucnal Tr. 370; and Ms. Mulhern testified that customers in the relevant market require technical support, *see* Mulhern Tr. 956, supporting an inference that Siemon in fact provided such support to its customers. *See also* CX-2071C (12-18-18 Siemon Email) at 12 (advertising onsite support).

Siemon argues that "[a]ll of the advertising and product sheets produced in this case show the availability of non-accused Adapter Plates in addition to the Accused Modules as potential uses for the Accused Enclosures... and none of these documents indicate a preference or direction to fill the Enclosures with LightStack Modules versus Adapter Plates." As discussed above, Siemon's documents specifically direct customers to load the accused chassis with accused modules. Any promotion of noninfringing uses does not expunge promotion of infringing uses — particularly where, as here, those infringing uses involve common applications in data centers.

v. Induced Infringement - FS

As discussed below, the evidence shows that FS induces others to infringe asserted claims 1 and 3 of the '320 patent. *See* Compl. Br. at 95-97; Staff Br. at 73-77.

104
Direct Infringement

As discussed above, FS's customers directly infringe the asserted patents. FS sells the accused products to customers in the United States. *See, e.g.*, Zhang Tr. 580, 588; CX-0428C (FS Sales and Inventory Data) (listing U.S. sales of accused products); JX-0031C (Zhang Dep. Tr.) 115-116.

Knowledge

FS knew of each asserted patent at least as of February 2020, when the complaint was filed. As shown with respect to Leviton, Corning labels its EDGE products with references to patents and directions to a website listing patents covering EDGE. Further, FS possibly copied EDGE, which is evidence of knowledge of the asserted patents. For example, FS advertised its accused products as a substitute for EDGE. *See* CX-0397 (FS Tweet).

Inducing Acts

FS actively induced the infringement of the asserted patents by encouraging, teaching, or otherwise inducing third parties to use its accused products in combination. FS's user instructions inform customers how to combine the accused modules and chassis to infringe the asserted patents. *See, e.g.*, CX-0392C (FS FHX Ultra Fiber Enclosure Spec.). FS has instructed its users to infringe, promoted the infringing combination to its users, and actively encouraged infringing sales. *See, e.g.*, Min Tr. 839-40 (testifying that respondents advertise that their accused products can be combined); CX-0391 (FS FHX Enclosure Article) (promoting use of the accused combination); CX-0392C (FS FHX Ultra Fiber Enclosure Spec.) (same); CX-0397 (FS Tweet) (same); CX-0419C (FS FHX Ultra Enclosure for MTP-8 Cassette Prod. Spec.); CX-0420C (FS FHX-1UFCP Ultra

105

Case: 22-1228 Document: 29VERSON 296 Filed: 04/25/2022 Confidential Material Omitted on this Page

Fiber Enclosure Prod. Spec.); CX-0421C (FS FHX MTP-12 Cassettes Spec.); CX-0422C (FS FHX MPO-LC Cassettes); CX-0423C (FS FHX MTP-12 Cassettes Prod. Spec.); CX-0424C (FS FHX MTP-8 Cassettes Spec.); CX-0425C (FS FHX MPO-8 Cassettes); CX-0426C (FS FHX Conversion Cassette Spec.).

In addition, Dr. Prucnal testified that customers learn how to assemble the chassis and modules in infringing combinations from respondents' product literature and instructions, Prucnal Tr. 370; and Ms. Mulhern testified that customers in the relevant market require technical support, *see* Mulhern Tr. 956, supporting an inference that FS in fact provided such support to its customers.

Since receiving Corning's complaint, FS has maintained an inventory of nearly 3,000 accused modules at its Delaware warehouse. JX-0031C (Zhang Dep. Tr.) 163-166; CX-0428C (FS Sales and Inventory Data). Thousands of accused cassettes and their corresponding chassis are in circulation in the United States. Even after FS admitted it knew of the patents, it continued to encourage the infringing combination, as shown by FS's online resources captured in July 2020. *See, e.g.,* CX-1515 (FS Ultra High Density Solution) (advertising the infringing combination with the accused products); CX-1520 (FS Microsoft Webpage) at 2 (promoting use of accused combination); CX-2059 (FS FHX Ultra HD User Guide); CX-2059 (FS FHX Ultra HD User Guide). Even Mr. Zhang's claim that FS has not sold infringing products "since May" fails to show there were no sales in March or April. *See* RX-0010 (Zhang WS) Q/A 31.

At least some of these online resources are hosted with United States entities; all are aimed at a United States audience, including the United States customers to whom FS has sold thousands of accused products. *See Transocean Offshore Deepwater Drilling*,

106

Inc. v. Maersk Contractors USA, Inc., 617 F.3d 1296, 1309 (Fed. Cir. 2010 (holding that an offer to sell under § 271(a) occurs at the "location of the future sale that would occur pursuant to the offer"). There is also evidence that FS effectively operates the FS website that advertises and offers to sell the accused products, *see* JX-0031C (Zhang Dep. Tr.) 111 (admitting that FS itself changed the product offerings on the website); and that in any event the various FS affiliates operate as one. For example, Wei Xiang is the CEO of FS Ltd, FS, FS's five sister companies around the world, the FS affiliate that allegedly owns and operates the FS website, and oversees various affiliated companies. *See* CX-0391 (FS FHX Enclosure Article); JX-0030C (Xiang Dep. Tr.) 17-23. Mr. Zhang's testimony to the contrary is not persuasive. Zhang Tr. 582 (initially denying that he communicated with Mr. Xiang about the website, then admitting that he testified to the contrary).

The FS website does not inform customers which company supplies the products they purchase, and customers were not informed of the distinction between the affiliated companies that worked side-by-side. JX-0031C (Zhang Dep. Tr.) 74-75, 172-173. FS and its affiliates are not merely silent about their corporate distinctions, but actively obscure them. *See, e.g.*, CX-0405 (FS Opens New Warehouse) (announcing that the new operations in Delaware of FS Inc. was the second "FS" branch in the United States). Under these circumstances, FS is liable for its affiliates' conduct. *See Certain Neodymium-Iron-Boron Magnets, Magnet Alloys, and Articles Containing Same*, Inv. No. 337-TA-372, Initial Determination, at 33-34, 81 (Dec. 11, 1995) (finding that two respondents were alter egos and finding violations by both, despite only one having sold the accused products).

107

b. Contributory Infringement

i. Contributory Infringement -Panduit, Leviton, and Siemon

Corning argues that Panduit, Leviton, and Siemon contributorily infringe asserted claims 1 and 3 of the '320 patent. *See* Compl. Br. at 78-80, 88-89, 92-93.

Section 271(c) of the Patent Act provides: "Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer." 35 U.S.C. § 271(c).

Thus, to establish contributory infringement, the complainant must show that: (1) direct infringement exists; (2) the accused infringer had knowledge of the patent; (3) the component provided to the direct infringer has no substantial noninfringing uses; and (4); the component is a material part of the invention. 35 U.S.C. § 271(c); *Fujitsu Ltd. v. Netgear Inc.*, 620 F.3d 1321, 1326 (Fed. Cir. 2010). "[N]on-infringing uses are substantial when they are not unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental." *Vita-Mix Corp. v. Basic Holding, Inc.*, 581 F.3d 1317, 1327 (Fed. Cir. 2009). "[C]ontributory infringement requires knowledge of the patent in suit and knowledge of patent infringement." *Commil*, 135 S. Ct. at 1926.

Panduit, Leviton, and Siemon argue that they do not contributorily infringe because their accused chassis and modules have substantial noninfringing uses. There is

108

evidence to support these assertions.

First, Panduit's accused modules can be used with Panduit products other than the Panduit accused chassis, such as the unaccused HD Flex Zero RU Bracket and Cassette Holders. *See* Staff Br. at 78; Resps. Br. at 58; RX-1672C (Kuffel WS) Q/A 48-52; *see also* RX-0006C (Min RWS) Q/A 251; RX-0146 (HD Flex Ordering Guide). Panduit has also developed adapters to allow its accused modules to be used with unaccused alternative systems such as the SFQ and Opticom systems. RX-1672C (Kuffel WS) Q/A 50-52.

Second, Leviton's accused UHDX Enclosures can be used with at least 64 varieties of other cassettes, 21 varieties of adapter plates, and 12 varieties of splice modules, none of which are accused of infringement. *See* Staff Br. at 78; Resps. Br. at 69; RX-0005C (Kim WS) Q/A 23-27; RX-0008C (Lebby RWS) Q/A 203-10. Complainant's expert, Dr. Prucnal, conceded at the hearing that the combination of a Leviton UHDX Enclosure with these other cassettes, adapter plates, and splice modules would be a substantial non-infringing use. Prucnal Tr. 338-339.

Third, the trays in each of the Siemon accused chassis can be filled with one or more adapter plates instead of the accused modules. *See* Staff Br. at 78-79; Resps. Br. at 73; RX-1266C (Veatch WS) Q/A 20; RX-0086C (Siemon presentation, "LightStack, Ultra High Density Plug and Play System"); RX-0006C (Min RWS) Q/A 253, 259. Moreover, Siemon's accused modules can be used in a floor mounted enclosure that cannot be mounted to a rack and therefore does not infringe any of the '320, '153, and '456 patents. RX-1266C (Veatch WS) Q/A 21.

109



Accordingly, the evidence does not establish contributory infringement by

Panduit, Leviton, or Siemon.

ii. Contributory Infringement - FS

Corning argues that FS contributorily infringe asserted claims 1 and 3 of the '320

patent. Concerning FS, Corning argues:

As shown above, FS.com's customers directly infringe the Asserted Patents; FS.com knew of the Asserted Patents; each FS.com Accused Chassis and Module is material to the infringing combination; and each FS.com Accused Product was specially designed for that use. Respondents concede that there are no substantial non-infringing uses. RPreHB at 79; *see also* Min Tr. 841-42.

See Compl. Br. at 98.

Respondents argue:

As noted above, unlike direct infringement, indirect infringement has a knowledge component. FS had no knowledge of the patents asserted by Corning in this Investigation prior to receiving the subject Complaint. RX-0010 (Zhang WS) Q/A 20-21. Upon receipt of that Complaint, FS discontinued the sale of the accused products. *Id.* Q/A 17-19. Thus, to the extent that sales of the accused FS products could have led to a direct infringement by FS customers "when at least one module is inserted into the tray," providing the requisite underlying direct infringement, no such predicate sales occurred with the knowledge requisite for indirect infringement, and Corning provides no evidence thereof. CX-0001C (Prucnal WS) Q/A155.

Otherwise, to the extent Complainant somehow maintains that the FS.com website provides evidence of indirect infringement, as noted above, FS does not own or operate that website. In any event, Mr. Zhang testified that FS intended that any content regarding its accused FHX products be removed from the FS.com website once FS.com, Inc. received the Complaint in this Investigation. Zhang Tr. at 597:14-19. The only "evidence" Complainant offered to counter that testimony included a screenshot purporting to be from the FS.com website downloaded on July 7, 2020 - a document (and especially a date) that Mr. Zhang, when asked, could not authenticate. Zhang Tr. at 584:11-16.

Complainant also showed Mr. Zhang a Youtube video screen shot

110

bearing a date of July 2, 2020. Zhang Tr. at 587:3-10. As with the FS.com website page, Complainant failed to authenticate the date affixed on the screen shot through Mr. Zhang. *See id.* (Mr. Zhang simply acknowledging that the date appeared on the document shown to him). At no point did Complainant offer up a witness with the knowledge to do so to lay a proper foundation for these documents, and particularly the date thereon. As the Administrative Law Judge noted, "I have yet to tell someone that their paralegal can make documents by downloading things off the Internet such as the original contract to the sale of the Brooklyn Bridge." Judge Shaw Tr. 895:16-19.

Resps. Br. at 76-77.

The Staff argues:

FS did not present any evidence of substantial noninfringing uses, relying instead on its argument that it cannot indirectly infringe because it did not make any sales of accused products after learning of the accused patents. *See* RX-0010 (Zhang WS) Q/A 17-21. FS's chassis and modules, however, work in basically the same way as those of the other Respondents. Moreover, as discussed above, there is evidence that FS has at least continued to induce infringement by customers who had previously purchased FS accused products. In the Staff's view, therefore, FS has been shown to indirectly infringe even without proof of contributory infringement.

See Staff Br. at 78 n.22.

In view of the authentication issues involving Internet video screenshots, Corning

has not established contributory infringement by FS.

C. Domestic Industry (Technical Prong)

As discussed below, the evidence shows that the Corning domestic industry

products are covered by claims 1 and 3 of the '320 patent.

Asserted claims 1 and 3 read as follows:

1. A fiber optic apparatus, comprising:

a chassis; and

a fiber optic connection equipment provided in the chassis; the fiber optic connection equipment

111

configured to support a *fiber optic connection density* of at least ninety-eight (98) fiber optic connections per U space, based on using at least one simplex fiber optic component or at least one duplex fiber optic component.

3. The fiber optic apparatus of claim 1, wherein the fiber optic connection equipment is configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per U space.

JX-0004 ('320 Patent) at 19:52-67 (emphasis added).

The Corning EDGE Solutions product line includes Base-8 and Base-12 chassis in 1U, 2U, 4U, and 5U sizes, as well as modules in Base-8 and Base-12 configurations. *Id.* Q/A 31-36; CX-0002C (Ralph WS) Q/A 36. As shown in CX-1869 (Corning EDGE photos) at 2 and 42, Corning's Base-12 chassis accept up to twelve Base-12 modules per U space, with six standard duplex adapters per module. Its Base-8 chassis accept up to six Base-8 modules per U space, with four standard duplex adapters per module. *Id.* at 17, 48. Thus, in each case there are 144 fiber optic connections per U space. *See* CX-0002C (Ralph WS) Q/A 68; CPX-0040 through CPX-0045 (Corning EDGE products).





CX-1869 (Corning EDGE photos) at 2, 42 (depicting Base-12 products CPX-0041; CPX-0043)

112

The EDGE DI Chassis with EDGE DI modules practice claims 1 and 3 of the '320 patent. These claims are directed to a fiber optic apparatus comprising a chassis, with fiber optic connection equipment provided in the chassis, configured to support at least 98 or 144 connections per U space based on using simplex or duplex fiber optic components. Complainant's technical prong expert Dr. Ralph testified that the EDGE DI Chassis is a chassis, designed to be equipped with EDGE DI modules. *See* CX-0002C (Ralph WS) Q/A 55-59; CPX-0040 (EDGE Base-8 Chassis); CPX-0041 (EDGE Base-12 Chassis); CPX-0042 (EDGE Base-8 Module); CPX-0043 (EDGE Base-12 Module); CX-1869 (Corning Photos Ex. D) at 2, 17. An EDGE DI Chassis equipped with at least one EDGE DI Module is fiber optic connection equipment provided in the chassis configured to support 144 connections per U space based on using duplex LC components, and so practices claims 1 and 3. *See* CX-0002C (Ralph WS) Q/A 67-70; Ralph Tr. 224:16-20, 226:15-20.

Respondents argue:

Complainant failed to prove any combination of an EDGE chassis and modules that practices claims 1 or 3 of the '320 Patent. RX-0008C (Lebby RWS) Q/A 343-360. An EDGE Base-12 Chassis must be loaded with at least nine (9) EDGE Base-12 Modules per 1RU, and an EDGE Base-8 Chassis must be loaded with at least thirteen (13) EDGE Base-8 Modules, to be "configured to support . . . at least ninety-eight (98) fiber optic connections" per 1RU, as required by claim 1. RX-0008C (Lebby RWS) Q/A 347-349; Ralph Tr. 224:24-225:2, 225:14-20; see Section V.C. An EDGE Base-12 Chassis must be fully loaded with Base-12 Modules, and an EDGE Base-8 Chassis must be fully loaded with EDGE Base-8 Modules, to be "configured to support . . . at least one hundred forty-four (144) fiber optic connections" per 1RU, as required by claim 3. RX-0008C (Lebby RWS) Q/A 347-349; Ralph Tr. 225:3-9, 225:21-25; see Section V.C. Complainant did not even bother to cross-examine Respondents' expert Dr. Lebby – leaving his domestic industry opinions unchallenged.

Resps. Br. at 257-58 (footnote omitted).

First, Corning's witnesses testified that EDGE DI Chassis are full loaded with EDGE DI modules in some cases. For example, Mr. Hicks testified that it "is common" for customers to fully load EDGE chassis with EDGE modules, and that he has seen data center customers fully load an EDGE chassis to reach 144 LC connections in a 1U. CX-0004C (Hicks WS) Q/A 25 & 26. Mr. Hicks further explained at the hearing that he had personally seen a fully loaded EDGE chassis at a JP Morgan Chase data center in Delaware. Hicks Tr. 108-109. Similarly, Mr. Staber testified that he himself had fully loaded EDGE DI Chassis with EDGE DI modules, explaining: "[w]hen we developed EDGE, we did rigorous testing where we fully populated the chassis with modules making 144 connections, and we brought in our field engineering services group to run tests on these products." CX-0006C (Staber WS) Q/A 6. Mr. Hicks further testified:

Customers are often purchasing many chassis at once, and you would do that only if you plan to fill at least some of them. You also would purchase a 2U or 4U chassis only if you wanted more connections than a 1U. We market EDGE as enabling 144 single-fiber connections per 1U space precisely because data centers typically want to make as many connections as possible. Our competitors do the same thing. It is ... usually the first and most prominent feature that is advertised.

CX-0004C (Hicks WS) Q/A 25. Mr. Rhoney testified that "customers use the modularity of EDGE to scale up to a full chassis capacity over time." CX-0007C (Rhoney WS) Q/A

27. Respondents declined to cross-examine any of those witnesses.

Second, Corning's marketing materials show EDGE DI modules in an EDGE DI Chassis. *See* CX-0002C (Ralph WS) Q/A 42; Ralph Tr. 246:12-248:17; CX-0666 (EDGE Brochure); CX-0667 (EDGE8 Brochure); CPX-0013 (Pretium EDGE Solutions Video); CPX-0012 (EDGE Jumper Management Video); CPX-0011 (EDGE8 Housing

Features and Benefits Video).

Third, as with the accused products, the EDGE DI modules were designed to be used with the EDGE DI Chassis to achieve 144 connections per 1U space, and are marketed for that use. Mr. Hicks testified that Corning provides instructions and manuals informing customers how to use the EDGE DI Products, including how to fully load the chassis with modules. Hicks Tr. 105-106. Examples of such marketing materials include: CX-0666 (EDGE Brochure) at 8; CX-0667 (EDGE8 Brochure) at 6; CX-0652 (Corning EDGE-01U-SP Specs.) at 2; CX-0654 (Corning EDGE8-01U-SP Specs.) at 2; CX-0658 (Corning ECM-UM08-05-E6Q-ULL Specs.) at 2; CX-0653 (Corning EDGE-04U Specs.) at 3; CX-0655 (Corning EDGE8-04U Specs.) at 1.

Fourth, the documents and testimony of respondents and former respondent AFL further confirm that EDGE DI Chassis have been fully loaded with EDGE DI modules. Mr. Polidan of AFL testified that he had personally seen EDGE chassis "fully loaded" at customer sites. Polidan Tr. 193:20-194:2. Panduit's internal documents show — and its witness confirmed — that when Panduit itself purchased and analyzed the Corning EDGE DI Chassis, it fully loaded the chassis with modules. CX-0112C (Panduit Competitive Product Evaluation-3) at 15; Kuffel Tr. 632. Leviton's documents also show each size of the EDGE chassis (1, 2, and 4U) "fully patched" — that is, fully loaded. CX-0083C (6/16/15 Leviton Email) at 140.

Thus, even if Corning never directly practiced its own '320 patent, it would nevertheless satisfy the technical prong of the domestic industry requirement because its customers practice the patent. As noted, Corning advertises that EDGE chassis and modules are designed to work together and instructs its customers on how to do so. In

115

the process, Corning knowingly encourages its customers to practice the '320 patent by using its EDGE chassis and modules in combination. As Mr. Hicks testified, the customers follow Corning's instructions, thereby directly practicing claims 1 and 3 of the '320 patent. CX-0004C (Hicks WS) Q/A 25-26. This is sufficient to constitute inducement under 35 U.S.C. § 271(b).²²

Corning therefore has satisfied the technical prong of the domestic industry

requirement with respect to the '320 patent.

D. Validity of the '320 Patent

Respondents argue:

- (1) the Panduit FCE1 Enclosure equipped with Panduit FAP Panels and Panduit FCX-24-10 Cassettes anticipates claims 1 and 3;
- (2) Vazquez anticipates claims 1 and 3 under pre-AIA 35 U.S.C. §102(e);
- (3) asserted claims 1 and 3 are rendered obvious by the Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes;
- (4) asserted claims 1 and 3 are rendered obvious by a combination of Panduit products (the Panduit FMT2 enclosure and the Panduit FEAT104LC93 patch panel with duplex adapters);
- (5) asserted claims 1 and 3 are rendered obvious by the combination of U.S. Patent No. 8,179,684 ("Smrha '684") (RX-0458), and a prior art product by AFL Future Access 1RU;
- (6) asserted claims 1 and 3 are invalid because they are not enabled; and

²² The technical prong may be satisfied through inducement. *Certain Endoscopic Probes for Use in Argon Plasma Coagulation Systems*, Inv. No. 337-TA-569, Initial Det. at 81 (Jan. 16, 2008) (*aff'd*, Comm'n Notice (Mar. 17, 2008) ("The standard for determining whether the complainant practices at least one claim of the asserted patent is the same as that for infringement. That is, the complainant must show that the domestic industry *either directly or indirectly* infringes at least one claim of the asserted patent.") (emphasis added); *Alloc, Inc. v. International Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003) ("The test for satisfying the 'technical prong' of the industry requirement is essentially same as that for infringement[.]").

Case: 22-1228 Document: 29 VE Rage: 307 Filed: 04/25/2022 Confidential Material Omitted on this Page

(7) the claim term "U space" renders claims 1 and 3 indefinite.

See Resps. Br. at 77-130.

Complainant and the Staff disagree. See Compl. Br. at 139-61, 218-26, 228-30; Staff Br. at 85-115.

For the reasons set forth below, respondents have not shown by clear and convincing evidence that the asserted claims 1 and 2 of the '320 patent are invalid under any theory.

1. Applicable Law

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Nevertheless, each claim of a patent is presumed to be valid, even if it depends from a claim found to be invalid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986).

A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by "clear and convincing" evidence of invalidity. *Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995).

a. Anticipation

Anticipation under 35 U.S.C. § 102 is a question of fact. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007). Section 102 provides that, depending on the circumstances, a claimed invention may be anticipated by variety of prior art, including publications, earlier-sold products, and patents. *See* 35 U.S.C. § 102 (*e.g.*, section 102(b) provides that one is not entitled to a patent if the claimed invention "was patented or described in a printed publication in this or a foreign country or in

117

public use or on sale in this country, more than one year prior to the date of the

application for patent in the United States").

The general law of anticipation may be summarized, as follows:

A reference is anticipatory under § 102(b) when it satisfies particular requirements. First, the reference must disclose each and every element of the claimed invention, whether it does so explicitly or inherently. Eli Lilly & Co. v. Zenith Goldline Pharms., Inc., 471 F.3d 1369, 1375 (Fed.Cir.2006). While those elements must be "arranged or combined in the same way as in the claim," Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1370 (Fed.Cir.2008), the reference need not satisfy an ipsissimis verbis test, In re Bond, 910 F.2d 831, 832-33 (Fed.Cir.1990). Second, the reference must "enable one of ordinary skill in the art to make the invention without undue experimentation." Impax Labs., Inc. v. Aventis Pharms. Inc., 545 F.3d 1312, 1314 (Fed.Cir.2008); see In re LeGrice, 49 C.C.P.A. 1124, 301 F.2d 929, 940-44 (1962). As long as the reference discloses all of the claim limitations and enables the "subject matter that falls within the scope of the claims at issue," the reference anticipates -- no "actual creation or reduction to practice" is required. Schering Corp. v. Geneva Pharms., Inc., 339 F.3d 1373, 1380-81 (Fed.Cir.2003); see In re Donohue, 766 F.2d 531, 533 (Fed.Cir.1985). This is so despite the fact that the description provided in the anticipating reference might not otherwise entitle its author to a patent. See Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1562 (Fed.Cir.1991) (discussing the "distinction between a written description adequate to support a claim under § 112 and a written description sufficient to anticipate its subject matter under § 102(b)").

In re Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

b. Obviousness

Under section 103 of the Patent Act, a patent claim is invalid "if the differences

between the subject matter sought to be patented and the prior art are such that the subject

matter as a whole would have been obvious at the time the invention was made to a

person having ordinary skill in the art to which said subject matter pertains."²³ 35 U.S.C.

²³ The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v.*

§ 103. While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on "underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

The objective evidence, also known as "secondary considerations," includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). "[E]vidence arising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as commercial success, will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR*, 550 U.S. at 426 (commercial success did not alter conclusion of obviousness).

"One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 550 U.S. at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id*.

Specific teachings, suggestions, or motivations to combine prior art may provide helpful insights into the state of the art at the time of the alleged invention. *Id.* at 420.

Dennison Mfg. Co., 810 F.2d 1561, 1568 (Fed. Cir. 1987).

Nevertheless, "an obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way." *Id.* "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* A "person of ordinary skill is also a person of ordinary creativity." *Id.* at 421.

Nevertheless, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more than yield a predictable result; combining elements that work together in an unexpected and fruitful manner would not have been obvious).²⁴

2. Anticipation

a. Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes

Respondents argue that the Panduit FCE1 Enclosure equipped with Panduit FAP

²⁴ Further, "when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

Panels and Panduit FCX-24-10 Cassettes anticipates claims 1 and 3 of the '320 patent. It

is argued, *inter alia*:

There is no dispute that the Panduit FCE1 Enclosure, FCX-24-10 Cassette, and FAP Panels are all prior art to claims 1 and 3 of the '320 Patent. RX-0617C (Panduit Product Launch Dates); RX-1672C (Kuffel WS) Q/A 58. The Panduit FCE1 Enclosure was on sale no later than March 28, 2005. RX-0617C (Panduit Product Launch Dates); RX-1672C (Kuffel WS) Q/A 58. The Panduit FCX-24-10 Cassette was on sale no later than March 10, 2005. And the Panduit FAP Panel was on sale no later than November 17, 2006. RX-0617C (Panduit Product Launch Dates); RX-1672C (Kuffel WS) Q/A 58. The Panduit FCE1 Enclosure equipped with Panduit FAP Panels and Panduit FCX-24-10 Cassettes anticipates and renders obvious claims 1 and 3. *See* §§ VII.C.1.a, VII.C.1.b, *infra*.

The Panduit FCE1 Enclosure equipped with Panduit FAP Panels and Panduit FCX-24-10 Cassettes anticipates claims 1 and 3. RX-0495 (2005 Panduit Product Catalog) at p. C2.22, C.22.31; *see also* RX-0001C (Blumenthal WS) Q/A 263-277.

Complainant argues that a combination of three "separate" products cannot form a basis for anticipation. CPHB at 142. But, the Panduit FCE1 Enclosure's only function is to accommodate the Panduit FAP Panels and FCX-24-10 Cassettes, and thus the Panduit FCE1 Enclosure equipped with Panduit FAP Panels and Panduit FCX-24-10 Cassettes should be considered as a single "device." See also RX-0495 (2005 Panduit Product Catalog) at p. C2.22; RX-1672C (Kuffel WS) Q/A 53-58. Therefore, the Panduit FCE1 Enclosure equipped with Panduit FAP Panels and Panduit FCX-24-10 Cassettes is a proper anticipatory product. Zenith Elecs. Corp. v. PDI Commc 'n Sys., Inc., 522 F.3d 1348, 1357-59 (Fed. Cir. 2008) (analyzing TV and speaker that were designed to work together as one anticipating system); Radware, Ltd. v. F5 Networks, Inc., No. 5:13-CV-02024-RMW, 2016 WL 861065, at *1 (N.D. Cal. Mar. 5, 2016) ("Radware argues that the 3DNS product and the BIG-IP product cannot be used to anticipate Radware's claims because in 1998, the two were separate products, and anticipation must be based on a single reference. . . . F5 does not dispute that anticipation must be based on a single reference, but F5 argues that the 3DNS / BIG-IP system is, in fact, a single reference. . . . The court finds that the proffered system may constitute a single reference for anticipation purposes. Radware's own technical expert testified that 'two modules that may be next to each other or within the same box' could satisfy the language of Radware's claims. . . . The court understands the proffered 3DNS / BIG-IP system to be what

Case: 22-1228 Document: 29 VERSON 312 Filed: 04/25/2022 Confidential Material Omitted on this Page

Dr. Rubin described: *two hardware modules mounted on the same rack connected by a high-speed data connection*. Accordingly, Radware's motion to exclude the system as consisting of more than a single reference is denied.") (emphasis added).

See Resps. Br. at 87-89.

The prior art reference asserted is a combination of a Panduit chassis (the FCE1

enclosure) and two types of Panduit modules (FAP panels and FCX-24-10 cassettes).

Each of the three components qualifies as prior art to the asserted claims of the

'320 patent.²⁵ The FCE1 Enclosure is depicted in Panduit's 2005 Product Catalog under

the heading "OptiCom[®] QuickNet[™] Rack Mount Fiber Enclosure" with part number

FCE1. RX-0495 (2005 Panduit Product Catalog) at page C2.22. The catalog indicates

that the enclosure is a 1U chassis that "[h]olds up to 4 cassettes, FAP or FMP adapter

panels." Id.; CX-1863 (Prucnal Inspection Photos Ex. 2).

²⁵ The Panduit FCE1 enclosure was on sale no later than March 28, 2005; the FCX-24-10 cassette was on sale no later than March 10, 2005; and the FAP panel was on sale no later than November 17, 2006. *See* RX-1672C (Kuffel WS) Q/A 58; RX-0617C (Panduit product launch dates).

Case: 22-1228 Document: 29 VERSO 313 Filed: 04/25/2022 Confidential Material Omitted on this Page



RX-0495 (2005 Panduit Product Catalog) at C2.22

The first type of Panduit module in the asserted product combination is an "FAP" panel, meaning an adapter panel with Panduit part number FAP6WBLMTP that contains six 12-fiber multi-fiber ("MPO") adapters on the front side of the panel. RX-0001C (Blumenthal WS) Q/A 246-47, 250 (physical sample of discontinued FAP panel unavailable), 252. The second module type is the Panduit QuickNet cassette, Panduit part number FCX-24-10, which contains twelve LC duplex adapters on the front side connected to two MTP adapters on the rear side. *Id.* Q/A 246-47, 253.

Respondents argue that as long as at least one multi-fiber FAP panel is included, an FCE1 chassis filled with any combination of FAP panels and/or QuickNet cassettes would support more than 144 fiber optic connections per U space, and therefore would anticipate claims 1 and 3 of the '320 patent. *See* Resps. Br. at 88-92; RX-0001C

123

(Blumenthal WS) Q/A 262-77.

Dr. Blumenthal's opinion has two fundamental shortcomings. First, he relies on a combination of multiple references, and a combination cannot anticipate. *See Studiengesellschaft Kohle, m.b.H. v. Dart Indus., Inc.*, 726 F.2d 724, 726-27 (Fed. Cir. 1984) ("It is hornbook law that anticipation must be found in a single reference, device, or process."). The FCE1 enclosure, QuickNet Cassettes, and MPO panels were sold separately as distinct products. *See* CX-0021 (Panduit Pan Net Brochure) at 3. Dr. Blumenthal provides no basis for his claim that these three separate Panduit devices qualify as a single anticipating reference. *See* RX-0001C (Blumenthal WS) Q/A 243. No evidence has been adduced that these three devices are somehow components of a single device, let alone one in existence before the priority date of the '320 patent. Indeed, Dr. Blumenthal cites no evidence that this combination of devices was ever assembled in the configuration that he proposes prior to the '320 patent's priority date. *See* CX-2060C (Prucnal RWS) Q/A 354. Nor have Panduit's fact witnesses provided such evidence. *Id.* Q/A 357.

Second, asserted claims 1 and 3 recite a "fiber optic connection density of at least [98 or 144] connections per U space, based on using at least one simplex fiber optic component or at least one duplex fiber optic component." A proper reading of this claim, in light of the specification and the prosecution history, is that the entire density of 98 or 144 connections must be achieved using simplex or duplex components. Of the products in Dr. Blumenthal's combination, only the QuickNet Cassettes had simplex/duplex LC adapters on the front. *See* CX-2060C (Prucnal RWS) Q/A 348; CX-0021 (Panduit Pan Net Brochure) at 5. The MPO panels had multi-fiber MPO adapters on the front, *see* CX-

124

2060C (Prucnal RWS) Q/A 350; CX-1774 (2007 Pan Net Catalog) at 2, and any combination of those products with LC components falls outside the scope of the '320 patent claims. Equipment with multiple fiber components neither comprises nor is capable of receiving a simplex or duplex component, and therefore cannot be configured to a support a connection density based on at least one such simplex or duplex component. *See* CX-2060C (Prucnal RWS) Q/A 359.

That the physical combination of simplex/duplex components and multiple fiber components is technically possible is irrelevant because the patent (as confirmed by the prosecution history) teaches the use of only simplex/duplex components to achieve the claimed density. See Giannelli, 739 F.3d at 1380 ("physical capability alone does not render obvious that which is contraindicated"). The '320 patent discloses embodiments that involve either the use of simplex/duplex (LC) components, or the use of multiple fiber (MPO) components, but never both. The '320 patent does not include a single embodiment or any suggestion of using both simplex/duplex (LC) and multiple fiber (MPO) components together on the front side of fiber optic connection equipment. To the contrary, the patent distinguishes between these two approaches. Some embodiments, such as those in the claims, are configured to support a connection density of 98 or 144 connections per U space using LC connections. Other embodiments are configured to support a much higher connection density of 434 or 576 connections per U space using exclusively MPO connections. See JX-0004 ('320 patent) at 2:7-20. Indeed, the '320 patent provides a specific table showing the "max" fiber density in terms of either "Duplexed LC" or MPO connections, not both:

125

Connector Type	Max Fibers per 1 RU	Max Fibers per 4 RU	Number of Connectors per 1 RU Space	Number of Connectors per 4 RU Space	Bandwidth per 1 U using 10 Gigabit Transceivers (duplex)	Bandwidth per 1 U using 40 Gigabit Transceivers (duplex)	Bandwidth per 1 U using 100 Gigabit Transceivers (duplex)
Duplexed	144	576	72	288	1,440 Gigabits/s.	960 Gigabits/s.	1,200 Gigabits/s.
12-F MPO 24-F MPO	576 1,152	2,304 4,608	48 48	192 192	5,760 Gigabits/s. 11,520 Gigabits/s.	3,840 Gigabits/s. 7,680 Gigabits/s.	4,800 Gigabits/s. 9,600 Gigabits/s.

JX-0004 ('320 Patent) at 19:1.

The prosecution history confirms that a combination of simplex/duplex and multifiber components does not practice the claims of the '320 patent. As discussed in detail in the Claim Construction section (Section V.A.4), infra, Corning's original application proposed additional claims for high-density configurations using multiple fiber (MPO) components, but the examiner determined these were a "patently distinct species" from the claims based on using "simplex or duplex type fiber connectors" "that were "not obvious variants of each other." See JX-0005 ('320 Prosecution History) at 4922. Corning elected to proceed with only the claims directed to simplex/duplex, and not multiple fiber, components. JX-0005 ('320 Prosecution History) at 5302. Respondents themselves have embraced this view. See CX-1987C (Leviton 6/12/20 Interrogatory Responses) at 26 ("Corning previously disclaimed the use of multiple fiber components during prosecution of the patent."); CX-2019 (Siemon 6/12/20 Interrogatory Responses) at 117; RX-0008C (Lebby RWS) Q/A 158 (describing Corning's election "a clear and unmistakable representation that the" asserted claims "did not include, and in fact excluded, multiple fiber components"). Accordingly, Dr. Blumenthal's hypothetical combination, if it had been made, would not have practiced, and thus cannot anticipate the asserted claims.

Accordingly, respondents have not shown by clear and convincing evidence that

126



the combination of a Panduit FCE1 enclosure with Panduit FAP panels and FCX-24-10 cassettes anticipates asserted claims 1 and 3 of the '320 patent.

b. Vazquez '918

Respondents argue that U.S. Patent No. 8,861,918 to Vazquez (CX-1762 and RX-

0459 ("Vazquez '918")) anticipates claims 1 and 3 of the '320 patent. See Resps. Br.

111-120. Corning and the Staff disagree. See Compl. Br. at 146-48; Staff Br. at 95-98.

Vazquez '918 was filed on July 31, 2008 and claims priority to U.S. Provisional

App. No.60/967,798, filed on Sept. 7, 2007. See RX-0001C (Blumenthal WS) Q/A 332-

35. The application leading to Vazquez '918 was published on March 12, 2009, and the

patent issued on October 14, 2014.

The date of invention for the '320 patent is deemed to be August 29, 2008, the

filing date of U.S. Provisional App. No. 61/190,538. See JX-0004 ('320 Patent). Thus,

Vazquez '918 qualifies as prior art under pre-AIA 35 U.S.C. § 102(e), which provides

that an invention is patentable unless:

(e) the invention was described in . . . (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language[.]

35 U.S.C. § 102(e)(2).

As an initial matter, respondents' argument that Vazquez anticipates claims 1 and 3 of the '320 patent contradicts the explicit disclosures of Vazquez '918. The only disclosure in Vazquez '918 of connection density refers to Figure 1, which it describes as

127

Case: 22-1228 Document: 29 VERSON 318 Filed: 04/25/2022 Confidential Material Omitted on this Page

"configured with forty eight (48) LC duplex fiber optic adapters 22 for supporting connections to *96 optical fibers*." CX-1762 (Vazquez '918) at 5:55-58 (emphasis added). There is no disclosure in the text of the specification of any embodiment with more than 96 fiber connections.

Respondents' expert opined that the embodiment shown in Figure 14 of Vazquez '918 includes 75 duplex adapters, for a total of 150 fiber optic connections. *See* RX-0001C (Blumenthal WS) Q/A 339. His testimony, however, was based solely on a visual inspection of the drawing in Figure 14, as the specification's description of that figure is silent regarding the number of connections included. As Dr. Prucnal testified, "for Dr. Blumenthal's argument to be true, it would have to be the case that the patentees, focused as they were on the need for high-density fiber optic connections, nonetheless disclosed a configuration that offers 1.5 times as many connections as its own Figure 1, but declined to identify this density breakthrough." CX-2060C (Prucnal RWS) Q/A 452. He also testified, "[a] person of ordinary skill in the art would take the patentee at his word as to what his patent discloses, not assume that it actually discloses a more advanced configuration than described." *Id*.

Respondents' argument relies on the premise that the Vazquez '918 inventors, focused on the need for high-density fiber optic connections, implicitly disclosed configurations far denser than 96 (nearly 1.5 times as many), but declined to claim or even identify this breakthrough. Vazquez '918 is a Corning patent. Respondents' suggestion that Corning set out to create EDGE and simply missed the density already disclosed in its own patent is not credible.

Moreover, even if Dr. Blumenthal were correct that Figure 14 of Vazquez '918

128

Case: 22-1228 Document: 29 VERSO 319 Filed: 04/25/2022 Confidential Material Omitted on this Page

discloses 150 connections, respondents have failed to establish that the connections in

Figure 14 fit within a 1U space, as required by the asserted claims of the '320 patent.

Dr. Prucnal testified that "[t]here is not enough information in the patent to support Dr. Blumenthal's assumption." *Id.* Q/A 456. He further testified that although

Figure 1 may be designed for a 1U space,

the only evidence on which Dr. Blumenthal's conclusion rests – the drawings in the Figures – suggest that Figures 1 and Figure 14 disclose different sized panels. As shown in CDX-0005C (Prucnal Rebuttal) at 256, Figure 1 shows a panel with two rows of adapters and little space between the adapters and between the adapters and the top and bottom edges. Figure 14, by contrast, shows three rows of adapters, and more space between those adapters than in Figure 1. Both of these Figures cannot be accurate and also both show LC duplex adapters in a 1U space, and there is accordingly no basis to rely on the drawings themselves for these critical variables.

Id. Thus, neither the text nor the drawings of Vazquez '918 support respondents' argument that Figure 14 depicts fiber optic equipment with a connection density of 150 fiber optic connections per 1U space. Vazquez '918 simply shows that the disclosed inventions are designed to work within a structure of standard U-sized spaces. *See* CX-2060C (Prucnal RWS) Q/A 445, 452.

Additionally, the PTAB has rejected the argument that Vazquez '918 anticipates the '320 patent. In its October 2016 petition for *inter partes* review of the '320 patent, Panduit relied on Vazquez '918 as the first of three primary references, and the only one asserted as anticipatory. *See* CX-2063 ('320 IPR Petition).²⁶ The PTAB rejected

²⁶ The evidence shows that this was the second time the Patent Office considered Vazquez as potential prior art to the '320 patent. In its application for what became the '320 patent, Corning identified the application that would become Vazquez '918, which is a Corning patent. US 2009/0067800 A1 ("Vazquez Application"); JX-0004 ('320 patent) at 7. The Examiner did not challenge the '320 patent application based on the

Panduit's petition as to Vazquez and declined to institute an IPR on those grounds. *Panduit Corp. v. Corning Optical Comm., LLC,* No. IPR2017-00009 at 12 (P.T.A.B. Apr. 17, 2018). In the rejection, the PTAB identified the same failure to disclose a 1U space discussed above, concluding that "the disclosure in Vazquez stating that the shelves are 1-U sized and have the standard 1.75 inch U height, is not a teaching that housing 30 is likewise 1-U sized." *Id.* at 12. Without such critical information, the PTAB concluded, it is improper to conclude that "a person of skill in the art would have understood Vazquez's disclosure of 1-U sized shelfs to be the same" as the '320 patent's claimed disclosure of 98 or 144 connections "per U-spacing using duplex components." *Id.* Indeed, Panduit's argument for anticipation by Vazquez '918 — the same argument respondents raise here — did not meet the PTAB's threshold requirement of showing a likelihood that Panduit could succeed.

Accordingly, respondents have not proven by clear and convincing evidence that Vazquez '918 anticipates any asserted claim of the '320 patent.

Whether Respondents Are Estopped

Complainant argues:

In addition, the estoppel effects of the PTAB's decision bars not only Panduit, but also the other respondents from challenging claims 1 and 3 of the '320 patent using Vazquez. See 35 U.S.C. § 315(e)(2) ("The petitioner in an *inter partes* review . . . or the real party in interest or privy of the petitioner, may not assert . . . in a proceeding before the International Trade Commission under section 337 . . . that the claim is invalid on any ground that the petitioner raised or reasonably could have raised during that *inter partes* review."). The other respondents are "real part[ies] in interest or priv[ies]" to Panduit regarding assertion of Vazquez '918 as prior art: Respondents present only one expert witness, Dr.

Vazquez Application. See generally JX-0005 ('320 Prosecution History).

Blumenthal, on the topic of invalidity; Dr. Blumenthal's witness statement makes clear that he has been retained by and is submitting testimony on behalf of respondents Panduit, Leviton, AFL, FS.com, Wirewerks, and Siemon regarding invalidity, RX-0001C (Blumenthal WS) Q/A 2; and not only is the testimony on behalf of all respondents, but it is being led by Panduit, who filed Dr. Blumenthal's witness statements. Allowing Panduit to advance the exact same invalidity ground in this Investigation as it raised in the IPR proceeding — which was already decided by the PTAB and the Federal Circuit — through its privies would cut directly against the purpose of the IPR estoppel rule.

Compl. Br. at 148-49.

Respondents argue, inter alia:

Complainant incorrectly argues Respondents cannot challenge the validity of '320 Patent claims 1 and 3 over Vazquez due to IPR estoppel. CPHB at 159-60. The ALJ provisionally denied Complainant's Motion *in Limine* that exclude these arguments. *See* Order No. 24 at 2 ("Complainant's Motion in Limine No. 2, entitled 'Preclusion of Respondents' Vazquez Invalidity Ground Based on IPR Estoppel' (Motion Docket No. 1194-44), is denied. Complainant is not precluded from arguing IPR estoppel in this investigation. *It has not, however, been shown that estoppel should be applied at this time, as a threshold matter*.") (emphasis added). *See also* Complainant's Motion *in Limine* #2: Preclusion of Respondents' Vazquez Invalidity Ground Based on IPR Estoppel (Mtn. Dkt. No. 1194-0044) (Oct. 2, 2020); Respondents' Opposition to Complainant's Motion in Limine No. 2 (Oct. 9, 2020). Complainant's argument should similarly be denied post-hearing.

Complainant argues that (1) IPR estoppel applies to Panduit because Panduit filed an IPR on the '320 Patent ("the Panduit IPR"); (2) Panduit is barred from raising anticipation based on Vazquez '918 because it was "a ground that the petitioner raised" in the Panduit IPR; and (3) IPR estoppel applies to the other Respondents because they are real-parties-ininterest or privies to Panduit. CPHB at 159-60. All of these arguments lack merit.

Respondents are not estopped from arguing the '320 Patent is invalid over Vazquez '918 because (1) the Vazquez '918 ground was not instituted in the Panduit IPR and (2) the non-Panduit Respondents were not privies of Panduit in the Panduit IPR. As the ALJ correctly recognized in Order No. 24, denying Complainant's Motion *in Limine* No. 2 which raised these exact arguments, estoppel should not be applied. Order No. 24 at 2 (Oct. 16, 2020).

While Panduit's IPR Petition included Vazquez '918 as one of many proposed invalidity grounds, the PTAB did not institute on this ground. *See* CX-1736 ('320 FWD) at 7 (showing that the Vazquez 918 Ground was not instituted). Based on the Federal Circuit precedent when the Final Written Decision on the '320 Patent issued, estoppel only applied to grounds that were raised or reasonably could have been raised. *Shaw Indus. Grp. v. Automated Creel Sys.*, 817 F.3d 1293, 1300 (Fed. Cir. 2016) ("*Shaw*"). Where a ground was not instituted, however, the Federal Circuit held that the petitioner did not raise, nor reasonably could it have raised, that non-instituted ground during the IPR. *Id.* As Vazquez '918 was not instituted, estoppel does not apply.

Even if Panduit were estopped, the other Respondents are not. For IPR estoppel to preclude the non-Panduit Respondents from arguing the Vazquez '918 invalidity ground in this Investigation, the non-Panduit Respondents must be "real part[ies] in interest or *priv[ies]* of the petitioner." 35 U.S.C. § 315(e)(2) (emphasis added). Of import to this analysis is whether the nonparty is a privy *during the IPR*, not during subsequent district court or ITC litigation. *See Wi-Fi One, LLC v. Broadcom Corp.*, 887 F.3d 1329, 1340 (Fed. Cir. 2018); *Evolutionary Intelligence, LLC v. Sprint Nextel Corp.*, No. C-13-4513-RMW, 2014 WL 819277, at *5-6 (N.D. Cal. Feb. 28, 2014); *Finjan, Inc. v. Cisco Sys.*, No. 17-cv-00072-BLF, 2020 WL 532991, at *3 (N.D. Cal. Feb. 3, 2020). Thus, what matters is not whether they are coordinating with Panduit in this Investigation, but whether they were involved in the prior Panduit IPR. They were not, and thus estoppel does not apply.

Resps. Br. at 112-14.

The Staff argues, "even if Corning were subject to IPR estoppel, the Staff is not

subject to estoppel under 35 U.S.C. § 315(e)(2)." Staff Br. at 60 n.14.

The administrative law judge agrees with the Staff's position. Inasmuch as complainant is no longer asserting any claim of the '206 patent that contains this claim term, the history of the '206 patent is only of marginal interest here. *See* Staff Br. at 60 n.14. Additionally, it has not been shown that non-Panduit respondents are real parties in interest or privies of Panduit. *See* Resps. Br. at 113-14. Thus, respondents are not estopped from arguing that Vazquez '918 anticipates the asserted claims of the '320

132



patent.

3. Obviousness

a. Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes

Respondents argue that asserted claims 1 and 3 are rendered obvious by the

Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes.

See Resps. Br. at 92-95. Corning and the Staff disagree. See Compl. Br. 149-51; Staff

Br. 98-100.

Respondents argue, inter alia:

To the extent the Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes is not considered a single device, it nonetheless renders obvious claims 1 and 3. As discussed in Section VI.C.1.a, *supra*, incorporated herein by reference, the Panduit FCE1 Enclosure equipped with the Panduit FAP Panels and the Panduit FCX-24-10 Cassettes discloses all elements of claims 1 and 3.

Furthermore, a POSITA would have been motivated to do this and would have reasonably expected to achieve the desired result, *i.e.*, highdensity and versatile fiber optic connection equipment offering both MTP and LC connections on the front of the fiber optic connection equipment by using the Panduit FCE1 Enclosure with the Panduit QuickNet Cassettes (FCX-24-10), and the Panduit MPO/MTP Fiber Adapter Panels, which (FAP6WBLMTP) were all sold by the same company (Panduit), during the same time period, for the same applications (*e.g.*, data centers, telecommunications rooms, 19" and 23" racks and cabinets), as part of the same family of products compatible with one another. RX-0001C (Blumenthal WS) Q/A 260; RX-1672C (Kuffel WS) Q/A 56, 58; RX-0495 (2005 Panduit Product Catalog) at pp. C2.22, C.2.31.

Not only were the Panduit FCE1 Enclosure, the Panduit FAP Panels, and the Panduit FCX-24-10 Cassettes all part of the same line of products, but the FCE1 Enclosure was in fact designed and advertised as an enclosure that can be used with both the Panduit FAP Panels and Panduit FCX-24-10 Cassettes. The literature for these products explains that the Panduit FAP Panels and Panduit FCX-24-10 Cassettes were designed to be used with the FCE1 Enclosure. RX-0495 (2005 Panduit

Case: 22-1228 Document: 29 VE Rege: 324 Filed: 04/25/2022 Confidential Material Omitted on this Page

Product Catalog) at pp. C2.22, C.2.31; *see also* RX-0001C (Blumenthal WS) Q/A 260.

Resps. Br. at 92-93.

For the reasons discussed below, respondents have not proven by clear and convincing evidence that claims 1 and 3 of the '320 patent are rendered obvious by Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes.

These products do not achieve, or disclose how to achieve, 144 connections in a 1U space based on using simplex or duplex components. Respondents have not shown how a person of skill in the art would have been motivated to combine the three separate Panduit devices. *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1359 (Fed. Cir. 2017) (obviousness requires " a known reason a skilled artisan would have been motivated to combine elements to arrive at a claimed combination."). The MPO panels and QuickNet cassettes have fundamentally different architectures — the front side of the MPO panels house multiple fiber adapters, while the QuickNet Cassettes house simplex/duplex LC adapters.

Dr. Blumenthal opines that a person of ordinary skill would have been motivated to combine these different species of adapters to create "fiber optic connection equipment offering *both MTP and LC connections* on the front of the fiber optic connection equipment." RX-0001C (Blumenthal WS) Q/A 260 (emphasis added). The record shows that a person of ordinary skill would have had no reason to combine — and likely would have avoided combining — simplex/duplex and multi-fiber components on the front side of a rack-mounted fiber optic enclosure. *See* CX-2060C (Prucnal RWS) Q/A 367-88.

First, Dr. Blumenthal does not identify any application in a data center that would

134

involve the use of both LC and MTP connectors on the front of the same chassis. *See* CX-2060C (Prucnal RWS) Q/A 354. As Dr. Blumenthal testified at the hearing, although Panduit's engineers are persons skilled in the art, there is no record evidence that any Panduit engineer ever combined these Panduit products in the manner he proposes. Blumenthal Tr. 672, 674-675, 679-680. Dr. Blumenthal likewise conceded that the only Panduit document he relies on — an excerpt from a 2005 product catalog (RX-0495 (Panduit 2005 Catalog)) — does not depict mixing and matching of simplex/duplex and multiple fiber components. Blumenthal Tr. 772-773; *see also* CX-2060C (Prucnal RWS) Q/A 372; CDX-0005C (Prucnal Rebuttal Demonstratives) at 220. Nor is there any evidence that any other respondent created or marketed such a combination. Blumenthal Tr. 679-680 (Panduit); 746 (Siemon); 748 (Leviton); CX-2060C (Prucnal RWS) Q/A 282 (AFL).

Indeed, the rest of the record — including respondents' own documents — shows affirmatively that a person of ordinary skill would have lacked a motivation to mix and match as Dr. Blumenthal suggests. All parties in this investigation advertise the density of their products in terms of either LC connections or multiple fiber connections, but not a combination of the two. *See* CX-2060C (Prucnal RWS) Q/A 369 (Corning); CX-0007C (Rhoney WS) Q/A 27 (Corning); CX-2060C (Prucnal RWS) Q/A 380-386 (FS, Leviton, Panduit, Siemon); CDX-0005C (Prucnal Rebuttal Demonstratives) at 221-236 (same). As Dr. Prucnal explains, the consistent and uniform way in which Corning and respondents describe the fiber optic densities of their products with separate categories — modules using LC-duplex connectors in one category and models using MPO or other multiple fiber components in another category — shows that customers of these products

135

Case: 22-1228 Document: 29 VERSON 326 Filed: 04/25/2022 Confidential Material Omitted on this Page

use the products for either LC connections or MPO connections on the front side of a chassis, but not for a mix of both types of connections. *See* CX-2060C (Prucnal RWS) Q/A 380-387.

Second, the development of respondents' accused products confirms that a person of ordinary skill would not have been motivated to mix simplex or duplex and multiple fiber components on the front side of the same enclosure. *See* Compl. Br. at 199-207. Dr. Prucnal described in depth how respondents designed their accused products to match EDGE's 144 LC connections in a 1U space despite already having products that supported up to 72 or 96 LC connections in a 1U space, as well as other MPO/MTP products. If a fiber optic enclosure relying on a mixture of simplex or duplex and multiple fiber components was practical to meet the needs of data center customers, there would have been no need for respondents to spend years developing new products. *See* CX-2060C (Prucnal RWS) Q/A 378.

Third, the development of EDGE further confirms that a person of ordinary skill would not have been motivated to mix and match simplex or duplex and multiple fiber components. Like respondents, Corning had a preexisting Plug and Play system that offered some cassettes with LC components, and others with multiple fiber components, but that achieved only up to 72 LC connections per 1U space. *Id.* Q/A 259. Despite the theoretical ability to mix these connectors and increase density, Corning's engineers — like respondents' — knew that customers want products that maximize density using only simplex/duplex LC duplex connections, and therefore spent millions of dollars and years of engineering to develop EDGE. *See* CX-2060C (Prucnal RWS) Q/A 374; CX-0007C (Rhoney WS) Q/A 27; CX-0006C (Staber WS) Q/A 9, 12.

136



Accordingly, respondents have not proven by clear and convincing evidence that claims 1 and 3 of the '320 patent are rendered obvious by Panduit FCE1 Enclosure using Panduit FAP Panels and Panduit FCX-24-10 Cassettes.

b. Panduit FMT2 Enclosure using the FEAT104LC93 Patch Panel including Duplex Adapters

Respondents argue that a combination of Panduit products (the Panduit FMT2

enclosure and the Panduit FEAT104LC93 patch panel with duplex adapters) renders

obvious asserted claims of the '320 patent. Corning and the Staff disagree. See Compl.

Br. at 151-55; Staff Br. at 95-111.

Respondents argue, inter alia:

A POSITA would have been motivated to use the Panduit FMT2 Enclosure with the Panduit FEAT104LC9 Panel housing the Panduit RFADJLCZBU adapters. RX-0001C (Blumenthal WS) Q/A 291. A POSITA would have had a reasonable expectation of success and would have reasonably expected to achieve a desired result provided by the highdensity and versatile fiber optic connection equipment. Id. at 292. Also, the Panduit FMT2 Enclosure, Panduit FEAT104LC93 patch panel, and Panduit Duplex LC Adapters (e.g., Panduit Part No. RFADJLCZAQ, RFADJLCZBU) were all sold by the same company (Panduit), during the same time period, for the same applications (e.g., data centers, telecommunications rooms, 19" and 23" racks and cabinets). RX-1672C (Kuffel WS) Q/A 66, 71, 72. In fact, the Panduit FEAT104LC93 Patch Panel came equipped with the Panduit Duplex LC Adapters RFADJLCZBU. RX-1672C (Kuffel WS) Q/A 71, 72. Yet, Complainant argues that the Panduit FEAT Panel has not been shown used with or designed to be used with FTM2 Enclosure ("the bodily incorporation argument"). CPHB at 151. Complainant is wrong.

First, this argument is contrary to the well-established case law that the prior art inventions need not be physically combinable to render a claim obvious. *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016). "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . but rather whether a skilled artisan would have been motivated to combine the

137

teachings of the prior art references to achieve the claimed invention." *Id.* (internal quotation marks and citations omitted); *Panduit Corp. v. Corning Optical Commc 'ns LLC*, Case IPR2016-01703, Paper No. 38 (PTAB Feb. 27, 2018), *aff'd by Corning Optical Commc 'ns LLC v. Panduit Corp.*, 774 Fed. Appx. 681 (2019). Therefore, Complainant's arguments focused on actual physical compatibility of the products are irrelevant because the inquiry is whether a POSITA would have been motivated to use a 2RU patch panel, such as the Panduit FEAT Patch Panel, with a 2RU enclosure, such as the Panduit FMT2 Enclosure that was designed to accommodate 2RU patch panels, and not whether the two products are physically combinable. *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (*en banc*) ("Etter's assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.").

Second, the products are compatible with each other, and a POSITA would be motivated to use the standardized 2RU Panduit enclosure with the standardized 2RU Panduit Patch Panel. RX-0495 (2005 Panduit Product Catalog) at p. C2.23; RPX-0022; RX-1672C (Kuffel WS) Q/A 65-73; RX-0001C (Blumenthal WS) Q/A 278, 283-285; Blumentahl Tr. at 686:11-18.

Resps. Br. at 97-98.

Each of these components (the Panduit FMT2 enclosure, the Panduit

FEAT104LC93 patch panel, and duplex adapters) qualifies as prior art. The Panduit

FMT2 enclosure was on sale no later than December 31, 2005; the FEAT104LC9 patch

panel was on sale no later than April 16, 2007; and the RFADJLCZBU and

RFADJLCZAQ LC duplex adapters used in that patch panel were on sale no later than

December 31, 2005. *See* RX-1672C (Kuffel WS) Q/A 72; RX-0617C (Panduit product launch dates).

According to Panduit's 2005 catalog, the FMT2 fiber optic enclosure was a 2U

enclosure that "mount[ed] to any standard EIA 19 rack or cabinet." RX-0495 (Panduit

2005 product catalog) at C2.23. It was designed to "mount behind Panduit modular patch

Case: 22-1228 Document: 29 VERSO 329 Filed: 04/25/2022 Confidential Material Omitted on this Page

panels such as CFAPPBL2." Id.; see also CX-0021 (Panduit Pan Net Brochure) at 4;

CPX-0084 (FMT2 enclosure).

PANDUIT®	PAN-NE	T [®] NETWORK SOLUTIONS		and the second
OPTICOM [®] Trays • Removable top cover provide slack storage storage in rear • Mounts to any standard EIA 1	s access to connecti of tray 19" rack or cabinet	ons and • Includes fiber optic cable routing kits (gror saddle clips, spools, strain relief and ID/ca various cable management solutions	nmets, cable lution labels	e ties,) for Std.
	Part Number	Part Description	Rack Spaces/	Pkg. Qty.
	FMT1	Mounts behind PANDUIT modular patch panels such as CFAPPBL1, 1.77*H x 17.0*W X 11.2*D	1	1
	FMT2	Mounts behind PANDU/T modular patch panels such as CFAPPBL2, 3.4"H x 17.0"W x 11.2"D	2	1
FMT2	^ One rack space = All product color is	1.75" (44.45 mm). Diack.	-	

RX-0495 (2005 Panduit Product Catalog) at C2.23: FMT2 Enclosure

Modular patch panels were frameworks for holding fiber optic adapters and were designed to attach to the front of an enclosure such as the FMT2. The Panduit Product Catalog identifies modular patch panel CFAPPBL2 as a panel designed to attach to the FMT2. RX-0495 (Panduit 2005 product catalog) at C2.23.

Respondents, however, rely instead on a different modular patch panel not identified in the product catalog, the FEAT104LC93. RX-0001C (Blumenthal WS) Q/A 285. The FEAT104LC93 was a 2U patch panel that held up to 104 LC duplex adapters in a 2U space, arranged in four rows of 26 adapters per row. *Id.* Q/A 286; CPX-0085 (FEAT104LC9 patch panel); CPX-0082 (Panduit duplex LC adapters). This would translate to 52 duplex adapters per 1U space with two connections each, for a maximum total of 104 fiber optic connections per 1U space. This would be more than the 98



connections claimed in claim 1, but less than the 144 connections claimed in claim 3 of the '320 Patent. The FEAT104LC93 panels were sold with LC duplex adapters installed, specifically Panduit's RFADJLCZBU LC adapters. RX-0001C (Blumenthal WS) Q/A 287-88; RX-1672C (Kuffel WS) Q/A 66.



RX-0573C (FEAT104LC9 patch panel) at 2

For the reasons discussed below, respondents have not shown by clear and convincing evidence that claims 1 and 3 are rendered obvious by the Panduit FMT2 enclosure using the FEAT104LC93 patch panel including duplex adapters.

140
Case: 22-1228 Document: 29 VE Report 331 Filed: 04/25/2022 Confidential Material Omitted on this Page

With regard to claim 1, there is no evidence of any motivation to combine these two Panduit products. Even if there were, the resulting combination would not satisfy each limitation of claim 1 because the "fiber optic connection equipment" would not be "provided in the chassis." CX-2060C (Prucnal RWS) Q/A 422; *see* JX-0004 ('320 Patent) at 19:54. With regard to claim 3, the alleged combination would not read on the asserted claim for the additional reasons that it would not be "configured to support a fiber optic connection density of at least one hundred forty-four (144) fiber optic connections per U space." JX-0004 at 19:64-67.

Respondents' obviousness argument is unpersuasive because there is not a clear and convincing evidence that one of ordinary skill in 2008 would have been motivated to combine the FMT2 enclosure with the FEAT104LC93 patch panel. Dr. Blumenthal testified that a person of ordinary skill in the art would have been motivated to do this and would have reasonably expected to achieve the desired result, *i.e.*, high-density and versatile fiber optic connection equipment, because the products were all sold by the same company during the same time period, "for the same applications (*e.g.*, data centers, telecommunications rooms, 19" and 23" racks and cabinets), as part of the same family of products compatible with one another." RX-0001C (Blumenthal WS) Q/A 292. Noting that the FMT2 enclosure is a standardized 2RU size and that the FEAT104LC9 panel is a standardized 2RU size fiber panel designed to be used with a 2U enclosure, he concluded, without supporting evidence, that one of ordinary skill would necessarily have been motivated to use the two products together. *Id.* Q/A 293. This analysis assumes that the two products are, in fact, compatible with one another.

Respondents have not shown that a person skilled in the art would have, or even

141

Case: 22-1228 Document: 29 VERSON 332 Filed: 04/25/2022 Confidential Material Omitted on this Page

could have, used the FEAT Panel with the FMT2 enclosure. As Dr. Prucnal testified, "Panduit's own documents do not advertise the FMT2 and FEAT Panel together, but instead teach away from this combination, by marketing the FMT2 as compatible with other panels." CX-2060C (Prucnal RWS) Q/A 411.

Panduit's Chief Engineer Mr. Kuffel testified about the features of the FMT2 enclosure and the FEAT panel, but did not testify at any point that they were either compatible in theory or combined in practice. See RX-1672C (Kuffel WS) Q/A 59-72. At the hearing, Mr. Kuffel conceded that the products were not designed to be used together, and could not have been used together as sold. See Kuffel Tr. 640-641. Even if a person of ordinary skill obtained both products, the fact that they were plainly not meant to work together would discourage such a person from pursuing the combination. Indeed, Mr. Kuffel testified that a person of ordinary skill would have needed to grind off the mounting hardware from the FMT2 enclosure or drill corresponding holes in the FEAT panel. Id. at 651-652. At the hearing, Dr. Blumenthal agreed that modifications were required for real-life use. See Blumenthal Tr. 686. He gave no opinion what such a modification would entail, why a person of ordinary skill would attempt it, or the predictability of the combination post-modification. He even agreed that he "th[ought]" Panduit's engineers "would not combine" those products when developing a high-density fiber optic enclosure to compete with EDGE. Id. at 688.

Without the support of either documentary evidence or testimony from a Panduit witness, Dr. Blumenthal's opinion that it would have been obvious to combine the two products does not rise to the level of clear and convincing evidence.

Moreover, Panduit's advertisements made clear that the FMT2 chassis and FEAT

142

panel were not meant to be used together. The product specification sheet for the FMT2 enclosure states that the FMT2 is designed to be used with a different patch panel, the CFAPPBL2. *See* CX-1739C (Panduit OptiCom Panel and Tray Spec.). Mr. Kuffel confirmed that point during his cross examination. Kuffel Tr. 642. Nowhere does the product specification suggest that the FMT2 enclosure is compatible with the FEAT panel or any other panel — it does not even mention patch panels other than those in the CFAPPBL series. *See id.*; CX-2060C (Prucnal RWS) Q/A 402. The product specification also states that the maximum number of fibers it supports in a 2U rack space is 192 (corresponding with the CFAPPBL2 panel), not 208 (the FEAT Panel). CX-2060C (Prucnal RWS) Q/A 402; CDX-0005C (Prucnal Rebuttal Demonstratives) at 242. From those facts, a person of ordinary skill looking for a patch panel to use with the FMT2 enclosure would conclude that the FMT2 enclosure is neither designed for nor compatible with the FEAT panel.

Even if respondents had been able to show a motivation to combine the FMT2 enclosure and the FEAT panel, the resulting combination would not render claim 3 of the '320 patent obvious because it would only support a maximum of 104 fiber optic connections in a 1U space, not the 144 connections required by the claim. *See* RX-0573C (FEAT104LC9 patch panel) at 2 (showing 208 connections in a 2U space); RX-0001C (Blumenthal WS) Q/A 286. To create a combination that would read on the additional limitation of dependent claim 3, Dr. Blumenthal had to devise a hypothetical new patch panel, one that was never manufactured by Panduit, that contains 288 connections in a 2U space.²⁷

While acknowledging that the actual FEAT104LC93 panel "provides a fiber optic connection density of 208 in two rack units, which is 104 'per U space[,]'" Dr. Blumenthal opined that "using the hole size of the FOCIS 10 Manual RX-0464 (TIA/EIA FOCIS 10 Standard) and hole spacing of Dayton-Rodgers Specification RX-0929 (Dayton-Rodgers Specification)," "[i]t would have been obvious for a person of ordinary skill in the art to modify Panduit FEAT104LC9 patch panel to hold for example 72 duplex LC adapters" per U space, thereby providing 144 connections per U space. RX-0001C (Blumenthal WS) Q/A 313-14. He testified that inasmuch as the adapters in the FEAT104LC93 are mounted vertically, a person of ordinary skill in the art would have had to rearrange the adapters horizontally in order to fit 72 adapters per U space. *Id.* Q/A 320.

Specifically, a person of ordinary skill would have used the teaching of [U.S. Patent No. 6,362,422] to decrease the space between adaptor ports. A person of ordinary skill would have used the teaching of the Panduit Opticom connector modules or FAB12WBULCZ adapter panel to rotate the LC adapter position by 90 degrees. And in result, a person of ordinary

²⁷ Panduit identified this absence as a "gap" in its product offerings, even though the products on which Dr. Blumenthal's opinion relies were all available at that time. *Id.* at 700-701. Mr. Kuffel acknowledged as much in his testimony regarding the Panduit project team that would ultimately engage in a multi-year development effort to create a product that matched EDGE. *See, e.g.*, Kuffel Tr. 606-607 (Panduit's 4U enclosure only capable of 288 connection; it was a "problem" that Corning had twice the density) (discussing CX-0102C (Panduit Prod. Charter)); *id.* 617 (as of April 2010, "Panduit's products only supported 48 channels or 96 fibers in a 1U") (discussing CX-0103C (4/19/2010 Panduit Res. Meeting Minutes)). Dr. Blumenthal's theory about the hypothetical motivation of a person of ordinary skill to combine the Panduit prior art leads to the implausible conclusion that Panduit's real-world engineers, individuals of ordinary or greater skill in the art, misunderstood their own products. *See* CX-2060C (Prucnal RWS) Q/A 416, 440.

Case: 22-1228 Document: 29 VE Rade: 335 Filed: 04/25/2022 Confidential Material Omitted on this Page

skill after having decreased the spacing between ports of the Panduit FEAT104LC9 and rotated the LC adapter position by 90 degrees would have had a reasonable expectation of success to increase the number of fibers per U space and bandwidth per U space.

Id. Q/A 322. Dr. Blumenthal presented a complex series of equations demonstrating how to determine the number of duplex adapters that could fit in a 1U space following these modifications, and concluded that the final result would be 150 fiber optic connections per U space, sufficient to read on claim 3 of the '320 Patent. *Id.* Q/A 323-29.

This complicated path to modifying the existing FEAT104LC93 to create a hypothetical new product never contemplated by Panduit is neither "clear" nor "convincing." Moreover, Dr. Blumenthal's reasoning is flawed if for no other reason than the fact that duplex adapters are wider than the holes used to secure them in a metal frame such as a patch panel. CX-2060C (Prucnal RWS) Q/A 426 ("Dr. Blumenthal assumes a hole size of 0.522" wide by 0.384" high, but he does not account for the protrusions and ridges of LC adapters that extend beyond the width of the LC adapter hole size."); RX-0464 (TIA/EIA FOCIS 10 Standard) at RX-0464.0007 (standard applies only to the holes that LC adapters must fit into; "[f]ully dimensioned components are not within the scope or intent of FOCIS 10A."). Dr. Blumenthal's equations, all of which are based on hole width rather than adapter width, are therefore inaccurate indicators of how many adapters could fit on a FEAT104LC93 panel, however reconfigured.²⁸

²⁸ Indeed, the PTAB already rejected Panduit's prior attempt to rely on substantively identical mathematical calculations based on several of these same flaws. In rejecting Panduit's 2016 *inter partes* review challenge, that Panduit initiated, the PTAB found that Panduit had failed to account for the actual size and usage of LC adapters, "such as the overall size and shape of the adapter, its mounting arrangement, or spacing between adapters," as well as the "need[] to provide access to the adapters . . . in an actual system." CX-1736 (320 IPR Final Decision) at 24, 26; *see also* CX-2060C (Prucnal



Accordingly, respondents have not shown by clear and convincing evidence that claims 1 and 3 of the '320 patent are rendered obvious by the Panduit FMT2 enclosure using the FEAT104LC93 patch panel including duplex adapters.

c. Smrha '684 in combination with AFL Future Access

Respondents argue that asserted claims 1 and 3 are rendered obvious by the

combination of U.S. Patent No. 8,179,684 ("Smrha '684") (RX-0458), and a prior art

product by AFL Future Access 1RU. See Resps. Br. at 120-30. Corning and the Staff

disagree. See Compl. Br. at 155-61; Staff Br. at 104-08.

Respondents argue, inter alia:

A POSITA would have been motivated to combine Smrha '684 with Future Access 1 RU. RX-0001C (Blumenthal WS) Q/A 346-349, 356, 387-389. Smrha '684 teaches that there was a known demand for increased density and improvements in access, cable management, and other features for fiber optic panels. For at least these reasons, a POSITA would have readily modified the fiber optic panels of Smrha '684 so as to increase the density of fiber optic connections within a single U space beyond ninety-six by stacking the modules even higher than two as taught by Future Access 1 RU. *Id.* And a POSITA would also have a reasonable expectation of success in doing so. *Id.* Furthermore, both Smrha '684 and Future Access 1 RU relate to fiber optic panels and both have a sliding tray upon which independently slidable modules are supported. *Id.*

Smrha '684 discloses a panel having fiber optic modules stacked two high and providing at least ninety-six connections in the panel. *See* RX-0001C (Blumenthal WS) Q/A 346-349, 356. But Smrha '684 goes further and teaches that other numbers of adapters can be created and that the arrangement, including stacking, of the fiber optic modules can be modified as well. *Id.* Although a POSITA would already understand that Smrha '684's modules could be stacked higher than the two shown in its figures, Future Access 1 RU confirms this by teaching that the modules can be vertically stacked at least three high on a slidable drawer within a panel. Future Access 1RU shows that three modules can be successfully

RWS) Q/A 436-37.

Case: 22-1228 Document: 29 VERSON 337 Filed: 04/25/2022 Confidential Material Omitted on this Page

stacked within a panel and with one RU space. Future Access 1 RU also indicates that three SC adapters can be successfully stacked within a chassis and one RU space as well – even leaving room along the height of the space in the chassis or panel for other components. RX-0001C (Blumenthal WS) Q/A 387-389; RX-0004 Q/A 23-24; RDX-0004.2. And Future Access 1 RU also teaches that this can be done within one RU space or one rack unit. *See* RX-0001C (Blumenthal WS) Q/A 346-349; RX-0525C (Future Access Drawings); RDX-0004C; RDX-0001.110; Nieves Tr. 553:5-13, 557:24-558:17.

Future Access 1 RU included a tray that would slide in and out of its 1 RU panel. *See* RX-0001C (Blumenthal WS) Q/A 355; RX-0525C (Future Access Drawings); RDX-0004C; RDX-0001.110. A POSITA would have readily modified the fiber optic panels of Smrha '684 so as to increase the density of fiber optic connections within a single U space beyond ninety-six by stacking the modules even higher than two as taught by Future Access 1 RU. RX-0001C (Blumenthal WS) Q/A 356-361. A POSITA would have understood that these adapters could be successfully provided in the chassis of Smrha '684 at the claimed densities for at least the reason of Future Access 1 RU. *Id.* Q/A 360; RX-0458 (Smrha '684) at 12:7-13.

Resps. Br. at 122-23.

Future Access 1 RU

Respondents identify a "Future Access 1 RU" product design by AFL as prior art

that discloses three fiber optic modules stacked together, thereby supplying the element

missing from Smrha '684 by demonstrating that it was possible to stack three modules

rather than just two. They offer drawings of a fiber optic panel that was created and

offered for sale to in 2007. RX-0525C (Future Access drawings).

Dr. Blumenthal testified that a version of this product was installed in Gresham, Oregon

in 2007. RX-0001C (Blumenthal WS) Q/A 350. AFL employee Mr. Nieves testified

that :

In response to **RFP** of **2007**, we offered for sale a product having three splitter modules stacked horizontally inside an enclosure or panel that would fit into a 1 RU space, or U space, as is well

147

Case: 22-1228 Document: 29 VERSO 338 Filed: 04/25/2022 Confidential Material Omitted on this Page

known in the industry. The splitter modules, which used the module from our 1x32 splitter module, could be either 1x4 or 1x8 and were mounted in a slidable tray.

RX-0004C (Nieves WS) Q/A 5. He also testified about the installation of a modified

version of the Future Access product at a multi-dwelling unit community in Oregon. Id.

Q/A 25-37. As installed, the product contained only one splitter module, not three,

although Mr. Nieves claimed that there would have been room to install up to two more

splitter modules. Id. Q/A 33; RX-0518 (Oregon installation photos) at AFL-ITC-

00002786. Based on this testimony, Dr. Blumenthal opined that:

Although a POSITA would already understand that Smrha '684's modules could be stacked higher than the two shown in its figures, Future Access 1 RU confirms this by teaching that the modules can be vertically stacked at least three high on a slidable drawer within a panel. And Future Access 1 RU also teaches that this can be done within one RU space or one rack unit.

RX-0001C (Blumenthal WS) Q/A 356. And, although the Future Access 1 RU product

did not contain more than 96 fiber optic connections, Dr. Blumenthal reasoned that

[e]ach horizontal layer of adapters in Smrha '684 provides 48 connections so that two layers provide the 96 connections as I previously mentioned. A third layer would provide a total of 144 connections. A POSITA would have reason to believe that these adapters could be successfully provided in the chassis of Smrha '684 at the claimed densities for at least the reason of Future Access 1 RU.

Id. Q/A 360.

Respondents have not shown by clear and convincing evidence that the AFL

Future Access 1 RU design depicted in RX-0525C is prior art to the '320 patent. The

design drawings themselves are marked as confidential, and therefore are not "printed

publications" that could qualify as prior art. See 35 U.S.C. § 102(b). Respondents assert

that the design shown reflects the product offered for sale to Verizon, but as Dr. Prucnal

148

Case: 22-1228 Document: 29 VE Rade: 339 Filed: 04/25/2022 Confidential Material Omitted on this Page

testified, the documents "do not show a manufactured product, only a conceptual drawing." CX-2060C (Prucnal RWS) Q/A 469. If the Future Access product is prior art at all, the relevant version is the one that was "known or used by others in this country" in 2007, not the concept shown in the confidential drawings. *See* 35 U.S.C. § 102(a).

As Mr. Nieves testified, the version of the product actually installed in 2007 was different from the drawings – it contained only one splitter module, not three. RX-0004C (Nieves WS) Q/A 33; RX-0518 (Oregon installation photos); Nieves Tr. 548-549.

While AFL may have intended to attempt to install a triple stack of modules in the Future Access product at the time of the conceptual drawings, there is no evidence that it ultimately succeeded in doing so before the date of invention for the '320 Patent. *See* CX-2060C (Prucnal RWS) Q/A 470 ("[U]ntil at least a prototype is built, it is not clear that a concept will work as expected; it is therefore not clear whether AFL could have actually built a product based on its conceptual model.").²⁹

<u>Smrha '684</u>

Smrha '684 was filed on October 7, 2008, issued on May 15, 2012, and claims priority to a provisional application filed on October 29, 2007. RX-0458. It is therefore prior art to the '320 Patent. *See* 35 U.S.C. § 102(e)(2).

As an initial matter, respondents fail to show that a person of ordinary skill would

²⁹ See Nieves Tr. 549 ("Q. To your knowledge when was the first publicly available installation of a Future Access RU enclosure that actually had three splitter modules installed in it? When did that take place, if at all? A. I don't know that because the way this product resulted to Verizon was that they would buy the RU panel and then they would purchase the splitter modules individually. So as you can see, they can put up to three. And the density depended upon how many MDU tenants they wanted to turn on with their fiber service. So this was a field trial. So they had one cassette there. And I don't recall if they were going to add the second and the third modules there.").

Case: 22-1228 Document: 29 VERSON 340 Filed: 04/25/2022 Confidential Material Omitted on this Page

have used Smrha '684 as a starting point for solving the problem to which the '320 patent is directed. To the contrary, as Dr. Prucnal has shown, Smrha '684 would be a highly improbable — and ultimately futile — starting point because it does not disclose critical information regarding its dimensions, and because of distinctive architecture that makes it unsuitable to the modifications that would be needed to satisfy the asserted claims. *See* CX-2060C (Prucnal RWS) Q/A 481.

Smrha '684 discloses a fiber optic connection enclosure that may be mounted on a rack. As shown in its Figure 4 below, it discloses a chassis 12 with two horizontal layers of adapter packs 32 that slide on separate mounting guides 30 that in turn are mounted on a single sliding drawer 34. *See id.* Q/A 462, 505. The adapter packs are designed to be installed on the mounting guides 30 when the drawer is in an open position (as shown in Figure 4 below), and then remain installed during use when the drawer 34 is closed. *See id.* Opening the drawer and removing the adapter packs is not done to establish connections since "[o]perative use and access to the adapter packs 32 is instead provided by the sliding movement of the packs 32 relative to, and without, the sliding movement of the drawer 34." CX-0032 (Smrha '684) at 9:43-45. Smrha '684 also states that "each adapter pack 32 contains six blocks 58 having four adapters 46 for a total of 96 frontward connection locations and rearward connection locations 56." CX-0032 (Smrha '684) at 4:20-22.

150

Case: 22-1228 Document: 29 VERSON 341 Filed: 04/25/2022 Confidential Material Omitted on this Page



Smrha '684 does not disclose the dimensions of chassis 12, provide any indication that it is designed for a 1-U sized space, or even indicate it is mountable in standard 19- or 23inch equipment racks (and if so which). *See* CX-2060C (Pruenal RWS) Q/A 463-64, 500. Smrha '684's only reference to a "rack" is: "Because of the access design of the present arrangement, the amount of space utilized on racks and cabinets is minimized." CX-0032 (Smrha '684) at 12:7-13. In any event, a person of ordinary skill could not learn from reading Smrha '684 the most important piece of information for purposes of solving the problem of the '320 patent — the height, in Rack Unit spaces. CDX-0005C (Pruenal Rebuttal Demonstratives) at 259, 464. Indeed, Smrha '684 provides even less indication that it is 1U-sized than Vazquez '918 (which at least mentioned U-sized shelves). Indeed, Dr. Blumenthal conceded at the hearing that Smrha '684 "does not disclose the size of the chassis or the apparatus it discusses," Blumenthal Tr. 732, though he opined it was possible to estimate its size based on the figures.

Motivation to Combine Smrha '684 with AFL Future Access

Given Smrha '684's failure to disclose a U-space or any dimensions, a person of ordinary skill in the art would not only lack motivation to start with Smrha '684 to solve the problem of the '320 patent, but also would lack the motivation to combine Smrha

151

'684 with AFL Future Access.

AFL Future Access was a product line of fiber-optic splitter modules that could be used in various types of enclosures. *See* RX-0001C (Blumenthal WS) Q/A 352. Dr. Blumenthal describes a splitter module as one that "can be used to split the light signal from a single fiber into multiple lights signals [sic]." *Id.* Q/A 353. One of the supposed enclosures for these modules was a 1U chassis. *Id.* Q/A 352. When used together, this 1U chassis could accommodate three Future Access splitter modules stacked vertically on a tray. *Id.* Q/A 355. The chassis also supported separate SC fiber optic adapters, which is another type of standardized simplex/duplex component. *Id.* Q/A 352, 355. Dr. Blumenthal's image of this configuration is shown below. RDX-0001C (Blumenthal Demonstratives) at 110.



As is immediately apparent, AFL Future Access had a fundamentally different architecture than Smrha '684. Other than the fact that they are both fiber optic enclosures that receive fiber optic connections, there are no apparent design similarities. Smrha '684 contains two horizontal stacks of adapter packs that are mounted on a complex framework that allows each pack to move independently in and out of the chassis, while

Case: 22-1228 Document: 29 VERSON 343 Filed: 04/25/2022 Confidential Material Omitted on this Page

AFL Future Access has three vertically stacked modules inserted independently and designed to remain fixed. *See* CX-2060C (Prucnal RWS) Q/A 468, 508. The simplex/duplex adapters in Smrha '684 are located on the movable adapter packs, while in AFL Future Access they are separately mounted and fixed to a separate structure.

Despite these different architectures, Dr. Blumenthal opines that "Future Access 1 RU . . . teach[es] that the modules can be vertically stacked at least three high on a slidable drawer within a panel." RX-0001C (Blumenthal WS) Q/A 356. He further opines that a person of ordinary skill would have been motivated to modify "the fiber optic panels of Smrha '684 so as to increase the density of fiber optic connections within a single U space beyond ninety-six by stacking the modules even higher than two as taught by Future Access 1 RU," because Smrha '684 "teaches that there was a known demand for increased density and improvements in access, cable management, and other features for fiber optic panels." *Id.* Q/A 358.

The suggestion that Future Access teaches that a third row of adapter packs could be added to Smrha '684 simply because Future Access has three vertical rows of adapters or modules contradicts the teachings of both references and flies in the face of the real world evidence. Neither of these references achieved more than 96 fiber connections. That failure alone shows that their creators did not possess the knowledge to achieve the density of EDGE. CX-2060C (Prucnal RWS) 476, 484. Smrha '684 expressly states that "notwithstanding advances made in the art, there is a continuous need for further improvement of high-density termination panels and associated methods." Given this existing motivation, if the inventors of Smrha '684 could have increased density simply by adding a third row of their structure, they would have done so.

153

Case: 22-1228 Document: 29 VERSON 344 Filed: 04/25/2022 Confidential Material Omitted on this Page

Dr. Blumenthal's opinion also ignores the real-world evidence of what AFL did when it sought to match the EDGE features. *See* CX-2060C (Prucnal RWS) Q/A 509. As Dr. Prucnal has shown, when AFL's engineers set out to solve this problem, they did not think to modify Future Access in the ways Dr. Blumenthal suggests (or at all); instead, they started from scratch and built a new system guided by the EDGE design. *See* CX-2060C (Prucnal RWS) Q/A 476. Dr. Blumenthal admitted as much during his cross examination. Blumenthal Tr. 741-742.

Dr. Blumenthal also does not show how a third adapter pack could be added to Smrha '684, whether the framework in Smrha '684 could support such an addition, and whether the result would fit within a 1U space. *See* CX-2060C (Prucnal RWS) Q/A 483, 486-87. He was questioned on these precise points at the hearing, and he did not offer any meaningful analysis. He simply asserted (without explanation) that the hardware within the Smrha'684 chassis "could be reduced and slowed down." Blumenthal Tr. 735. Such conclusory testimony is inadequate as a matter of law. *See ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (rejecting expert invalidity opinion as "conclusory and factually unsupported" where "[t]he expert failed to explain how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate or read on the asserted claims.").

It is not apparent from Dr. Blumenthal's testimony where in Smrha '684 there is room for the additional adapter packs, rails, and hardware needed to support a third row of connections. He first testified that he did not "consider it necessary" to analyze Smrha's figures to ascertain where a third level of adapter packs might fit, Blumenthal

154



Tr. 736-737, even though he purported to determine the size of Smrha'684's enclosure — which he conceded was not disclosed in the patent — only by studying those very same figures. *See id.* at 733-734. Then, confronted with the figures, Dr. Blumenthal offered an explanation for how the figures show there was room for a third layer of adapter packs. Specifically, he opined there was "room for another one of these adapter packs, as depicted in this patent, atop the existing adapter pack where the arrow 28 is pointing" in Figure 3 of the patent. Blumenthal Tr. 738. Figure 3 is shown below.



CX-0032 (Smrha '684) at 5.³⁰

As the above figure makes clear, there is no room in Smrha '684 for a third row of adapter packs. The patentee did not leave a third of the chassis empty, and for good reason. The patent states (as Dr. Blumenthal recognizes) that "[d]emand for greater telecommunications services has promoted the increase in circuit densities of termination panels," and there is "a continuous need for further improvement of high-density

³⁰ In another part of his testimony, Dr. Blumenthal opined that a third row of adapter packs could fit beneath the two adapter packs disclosed by Smrha '684. Blumenthal Tr. 737. That new suggestion is equally unsubstantiated and inconsistent with his expert report, *see id.* at 726, 738, and with his direct witness statement, *see* RX-0001C (Blumenthal WS) Q/A 356 ("Although a POSITA would already understand that Smrha '684's modules could be stacked *higher* than the two shown in its figures, Future Access 1 RU confirms this by teaching that the modules can be vertically stacked at least three high on a slidable drawer within a panel.") (emphasis added).

Case: 22-1228 Document: 29 VE Rage: 346 Filed: 04/25/2022 Confidential Material Omitted on this Page

termination panels and associated methods." *Id.* at 26; RX-0001C (Blumenthal WS) Q/A 347. It would have made no sense for the inventor of Smrha '684 to have recognized a need for greater density and then simply left the chassis only two-thirds full.

* * *

Accordingly, respondents have not proven by clear and convincing evidence that

claims 1 and 3 of the '320 patent are rendered obvious by Smrha '684 in combination

with AFL's Future Access product design.

d. Secondary Considerations (All Patents)³¹

For the reasons discussed below, Corning has adduced evidence of secondary

considerations indicating that the asserted claims of the '320 patent are not obvious. See

Compl. Br. at 207-17; Staff Br. at 108-11.

Respondents disagree. See Resps. Br. at 254-57. Respondents argue, inter alia:

Complainant also claims that there must have been copying because competitors looked at, and analyzed the DI products, relying mainly on a "competitor analysis" of EDGE products performed by Panduit. Kuffel Tr. 605:8-16; Blumenthal Tr. 721:4-7. But this was one of several analyses that Panduit performed on the products of various companies. Kuffel Tr. 653:6-19. Such analyses are to understand the strength of the competition and do not show any copying. Blumenthal Tr. 721:8-14, 721:19-722:1; JX-0033C (Hicks Dep. Tr.) 87-92 (Corning also obtains competitor products for competitive intelligence including teardowns and photographs).

Moreover, Respondents' chassis and modules, including *e.g.*, Leviton Enclosures and Leviton Accused Modules, are substantially different from the DI products and include quad adapters and critical easeof-use functionality that are not found in the DI products. RX-0005C (Kim WS) Q/A 31; RX-0008C (Lebby RWS) Q/A 75, 82-87. *See also supra* Section VI.B.2.a.ii. Complainant does not point to a shred of

³¹ Inasmuch as the four asserted patents are related, the parties did not brief the secondary considerations separately for each patent. *See* Joint Outline at 5-9.

evidence that Leviton copied Corning and there is none.

Complainant also fails to establish that products embodying the alleged inventions of the Asserted Claims have been any more commercially successful than products that do not embody those inventions. RX-0001C (Blumenthal WS) Q/A 370-371, 586-587, 719-720. Complainant also has not established that any alleged success is a direct result of the claimed invention. RX-0009C (Blumenthal RWS) Q/A 23-24. Complainant has not performed any economic analysis of commercial success apart from naked sales numbers. *See Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1151 (Fed. Cir. 1983) (rejecting evidence of alleged commercial success that only reported number of units sold without providing any evidence of market share, growth in market share over time, replacement of earlier units sold by others, and no evidence of a nexus).

Finally, Complainant fails to establish any long-felt but unresolved need for the alleged inventions. RX-0001C (Blumenthal WS) Q/A 372-373, 452-453, 588-589, 721. Complainant also fails to establish any praise or awards, professional skepticism, unexpected results, or teaching away from those alleged inventions. RX-0001C (Blumenthal WS) Q/A 374-376, 454-456, 590-592, 722-724; RX-0009C (Blumenthal RWS) Q/A 15-26.

See Resps. Br. at 256-57.

Overview

The asserted claims manifest the "objective indicia of non-obviousness" that the Federal Circuit has called "often . . . the most probative and cogent evidence in the record." *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016) (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983)). Evidence of this kind helps to "guard against slipping into use of hindsight," *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 36 (1966) (internal quotation marks omitted).

As discussed below, the evidence shows that EDGE's patented features helped it to meet a long-felt need for accessible density, achieve results that its designers did not expect, overcome skepticism and succeed where others had failed, enjoy commercial

157

success, and receive industry praise.

As Dr. Prucnal explains, to apply the traditional objective indicia to EDGE's patented features, it is necessary to tie those features to the benefits that EDGE achieves by practicing the asserted claims, which he groups into the three categories of density, accessibility, and modularity. *See* CX-0001C (Prucnal WS) Q/A 564-565; *see also id.* Q/A 567 (explaining that EDGE achieved those benefits through its "novel design" incorporating "sliding trays and front-and-rear accessible modules").³²

Dr. Prucnal further considered how the asserted claims related to the three major

benefits of EDGE that he had three EDGE's three major benefits, as follows:

- claims 1 and 3 of the '320 patent, and claims 11, 19 and 27 of the '456 patent, read specifically on achieving a certain number of fiber optic connections in a U space, CX-0001C (Prucnal WS) Q/A 570;
- claims 21 and 28 of the '456 patent, and claims 1 and 23 of the '153 patent, read on features that improve accessibility, such as sliding trays holding modules and features that guide tray and module movement *id.* Q/A 571; and
- claims 11 and 27 of the '456 patent, and (formerly asserted) claim 14 of the '206 patent, read on features of modules and features guiding and allowing their installation and movement, which help to protect fibers from damage or excessive bending, *id*. Q/A 572.

All the asserted claims either fit into this categorization or depend from claims that fit

³² Testimony from Corning's fact witnesses supports this identification of density, accessibility, and modularity as the three main benefits achieved by EDGE's innovative design. *See* CX-0004C (Hicks WS) Q/A 12 (Corning "introduced 'evolved density' so data-center operators could make more fiber optic connections in the same space, and in a more accessible way," and that "the EDGE products are "growth enabled" because data-center operators can use a system of modules to increase the number of connections to meet their specific requirements"); *id.* Q/A 55 ("[W]e were the first to provide high density and accessibility in a plug-and-play system."); CX-0006C (Staber WS) Q/A 12 (EDGE "provide[d] greater density for LC-based connections than any system that existed at the time" and was also "designed to be . . . modular"); *id.* Q/A 16 (similar, and also discussing the need for "good finger access").

into this categorization.³³ Accordingly, by showing that EDGE's achievement of unprecedented density, accessibility, and modularity helped it to succeed, Dr. Prucnal's analysis shows that the asserted claims demonstrate objective indicia of non-obviousness.

Long-Felt Need

Patented features' ability to meet a long felt but unsolved need is well-recognized evidence of non-obviousness. Here, the testimony of Corning's witnesses showed that before the invention of EDGE, "Corning's and other competitors' products offered a maximum of 96 LC fiber connections within a standard Rack Unit space, and most products in the marketplace offered only 72." *See* CX-0007C (Rhoney WS) Q/A 11; *see also* CX-0004C (Hicks WS) Q/A 15; CX-0006C (Staber WS) Q/A 16; CX-0001C (Prucnal WS) Q/A 557. Mr. Kuffel further confirmed at the hearing that as of early 2010, "Panduit was supporting 48 channels, 96 fibers . . . in a 1RU." Kuffel Tr. 610-611.

Corning's witnesses also testified that pre-EDGE products had "other shortcomings in terms of providing accessibility (e.g. good finger spacing), modular growth, and in protecting fibers during finger access." CX-0006C (Staber WS) Q/A 16; *see* CX-0007C (Rhoney WS) Q/A 11 (explaining that "customers . . . wanted greater density but also wanted more usability than" offered by "existing solutions in the market," including "better accessibility to connectors"). Respondents' witnesses have similarly testified to "market feedback" demanding the "highest amount of connectors" with "hand accessibility," JX-0018C (Maynard Dep. Tr.) 43-45, and that "more density . .

³³ Dr. Prucnal's categorization refers to claim 1 of the '153 patent, which is no longer asserted; and to claim . However, their patented features are still at issue in claims that remain asserted. For example, the patented features of claim 14 of the '206 patent, *see* CX-0001C (Prucnal WS) Q/A 572, are incorporated in claims 22 and 23, which depend from claim 14.

. save[s] money," but can make it "difficult to have access with your hands to those connections," JX-0016C (Kim Dep. Tr.) 57, 139.

The evidence shows that, beginning in 2007, Corning conducted a lengthy process to identify unmet customer needs through market research and to develop, though brainstorming and design, new products to meet those needs. *See* CX-0006C (Staber WS) Q/A 18-19 (describing Corning's market research "to obtain the 'voice of customer'" and "five-stage development process" for EDGE); CX-0007C (Rhoney WS) Q/A 12 ("many workshop and brainstorming sessions with large groups of engineers from different backgrounds"); CX-0001C (Prucnal WS) Q/A 578-581 (discussing documentation of Corning's efforts to ascertain customers' needs and to develop EDGE to meet those needs). After months of work, Corning's engineers settled on the design concept that became EDGE: unprecedented density of 144 LC connections per U space, employing sliding trays, removable modules, and related features (such as rails, guides, and latches) to enable access, and a modular structure that helped to protect fibers. *Id.* Q/A 586; *see* CX-1459C (Pretium EDGE Presentation) (documenting the process of creating EDGE).

Unexpected Results

Corning set a goal of achieving "at least 96 LC fiber optic connections per U space." CX-0006C (Staber WS) Q/A 17; CX-0822C (NGDC Concept Review) at 11 (listing ">48 ports," or 96 connections using duplex adapters, as the "[t]arget" for a "1U Modular Design"). Ultimately, EDGE exceeded that goal by 50%, achieving 144 LC connections. *See* CX-0006C (Staber WS) Q/A 24 ("[W]e ultimately developed a system that provided 144 connections and blew the competition away.").

160

Case: 22-1228 Document: 29 VE Rage: 351 Filed: 04/25/2022 Confidential Material Omitted on this Page

Similarly, Corning quantified its accessibility goal as a 20% reduction in installation time. *Id.*; *see* CX-0913C (Corning EDGE Review Meeting '148 IPR) at 60 ("target value proposition" including "20% faster network deployment" over "the current [Plug and Play] product solution set"). Ultimately, EDGE nearly doubled that, reducing installation time by 36%. *See* CX-0006C (Staber WS) Q/A 24. Contemporaneous documents confirm that Corning measured a "36% time reduction" and congratulated its designers on "exceeding . . . target values." *See* CX-0915C (Corning EDGE Time/Motion Study '148 IPR) at 14. The installers attributed the "reduce[d] . . . time" to the patented feature of "ability to load the modules from the back of the housing" and praised the "new latching features and back of housing installation." *Id.* at 21.

Skepticism and Prior Failure

CX-0101C (Corning

LANscape Pretium EDGE Solutions Competitive Prod. Info Summary Presentation), at7. Those criticisms targeting EDGE's patented features as unworkable undermine

161

Case: 22-1228 Document: 29 VERSON 352 Filed: 04/25/2022 Confidential Material Omitted on this Page

respondents' present assertions that those features would obviously work. *See* CX-0001C (Prucnal WS) Q/A 600.

Examples of prior failures included some from EDGE's own inventors, who tried "a number of different concepts, many of which didn't end up working." CX-0007C (Rhoney WS) Q/A 13 (failed "concept for modules that moved in a telescoping manner"); CX-0819C (NGDC Weekly Meeting) at 23 (failed designs including the "telescoping modules" and a "rear mounted sliding shelf"). Even after EDGE's launch, several respondents experienced design failures when trying to make competing products. *See, e.g.,* JX-0016C (Kim Dep. Tr.) 51 (Leviton at first "

"); JX-0019C (Nagel

Dep. Tr.) 38 (concept involving backward-sliding trays that "burnt a lot of time" and "really wasn't practical"); *see also* CX-0001C (Prucnal WS) Q/A 604-06.

Commercial Success

When launched, EDGE received an "overwhelmingly positive" response, including "large market adoption quickly." CX-0007C (Rhoney WS) Q/A 15; *see* CX-0006C (Staber WS) Q/A 25 ("Initial demand exceeded our supply, and customers were willing to pay a premium over our next-best selling data center products"). Corning's contemporaneous documents confirm that it charged a "15% price premium" for EDGE over Corning's previous solution and still made unusually strong early sales with rapid growth. *See* CX-0927C (Houghton Award Nominations) at 2; CX-0001C (Prucnal WS) Q/A 610. Today, "EDGE is the leading plug-and-play solution in the United States," allowing Corning to capture "**Constant**" . . . of the data-center market as a whole, and a greater share if you look just at high-density solutions." *See* CX-0004C



(Hicks WS) Q/A 23; Q/A 55 (EDGE has had a "lot of success" because Corning was "the first to provide high density and accessibility in a plug-and-play system"); CX-1000C (Corning Chassis Sales Data) and CX-0973C (Corning Module and Assembly Sales Data).

Respondents' internal documents also acknowledge that EDGE — and, specifically, EDGE's patented features — succeeded. For example, in 2011,

" CX-0116C (Panduit

Market Spec. Requirements) at 2;

CX-0083C (6/16/15 Leviton Email) at 128;

and in or around 2017, AFL identified a "require[ment]" for "a platform that can effectively compete with benchmarks" including EDGE and Leviton's accused product, because "data center customers demand high density connectivity solutions that offer flexibility in terms of deployment and ease of use," CX-0341C (AFL HD Platform Gate 3) at 2.

Respondents' marketing documents further show that they sell the accused products by advertising the same benefits that EDGE's patented features provide density, accessibility, and modularity. For example, Panduit sells HD Flex by promoting its "higher . . . density," a "fully modular solution," and "access to connections from front or rear," CX-0199 (Panduit HD Flex Enclosures Spec.) at 1; and Siemon sells LightStack by pointing to its "ultra high density 144 fibers per 1U (LC interface)," its "[f]ixed design with sliding trays and innovative features" that offered "High Density AND Unmatched



Accessibility," and its "[r]ear module insertion and removal," CX-0179C (Siemon Plug and Play Presentation) at 5.

Industry Praise

EDGE has also received significant praise for its benefits of density, accessibility, and modularity. Corning's customers praised EDGE, *see* CX-0001C (Prucnal WS) Q/A 623 (citing examples), and Corning won awards for EDGE in 2013, 2014, 2016, CX-0006C (Staber WS) Q/A 26 (explaining that these awards recognized "the accessible density and other features achieved by the EDGE system").

Respondents' internal documents also recognized EDGE's competitive strength. One Panduit employee,

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	CX-0143C (5/29	0/15 Panduit Email) at 1; see id. at 9
(describing	ε	and
		. Panduit
	CX-01.	31C (6/19/13 Panduit Email) at 34; see
CX-0114C () at 21 (describing the
	, including that it (1) is	(2) uses (3)
		(4) has
	and (5)	
). Siemon similarly	v credited EDGE, compared to

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	Case: 22-1228	Document: 129 VE	Confidentia	Filed: 04/25/2022 Il Material Omitted on this	s Page
. .	" produc	ts, with "		22 Co	
	"	and "	"; aı	nd observed that EDGE's	
"					
		" CX-0164C (Siemo	on NPD PRS)	at 21.	

Copying

Respondents argue, "Complainant does not point to a shred of evidence that

Leviton copied Corning and there is none." Resps. Br. at 257.

The Staff argues:

Finally, Complainant asserts that Respondents attempted to counteract EDGE's success by copying EDGE's patented features. *See* CX-0001C Q/A 628. Dr. Prucnal cited numerous examples of Respondents engaging in competitive analyses of Corning's EDGE products, as well as monitoring of Corning's patents covering EDGE. *Id.* Q/A 625-26, 631-35. However, competitive benchmarking and attempts to ensure that a product design does not infringe another's patents do not necessarily constitute "copying." In the Staff's view, this final secondary consideration is, at best, a neutral factor in assessing nonobviousness. All other objective indicia, however, tend to weigh against a finding that any of the asserted patent claims are invalid for obviousness.

See Staff Br. at 110-11.

Corning argues that there is "ample evidence that competitors copied EDGE."

Compl. Br. at 214. In support, Corning cites Mr. Hicks' testimony:

[Respondents'] products look just like EDGE. Among other things, they have chassis that fit in the U space with sliding trays and modules. When we launched EDGE, it was a unique solution with completely different features from anything else on the market. But, after EDGE launched, competitors introduced products that look the same with almost identical features to EDGE.

CX-0004C (Hicks WS) Q/A 62.



Compl. Br. at 215.

As the Staff noted, however, "competitive benchmarking and attempts to ensure

that a product design does not infringe another's patents do not necessarily constitute

'copying." The administrative law judge agrees. On the whole, this secondary

consideration is a neutral factor in assessing nonobviousness.

EDGE's Patented Features

Respondents dispute the link between EDGE's success and its patented features.

For example, respondents argue, inter alia:

Complainant also has not established that any DI product or accused product is coextensive with the any specific alleged invention claimed in any claim of any Asserted Patent and cannot, therefore, rely on a rebuttable presumption of nexus. In fact, Complainant contends that the DI products and accused products have succeeded based only on a combination of features, including connection density, accessibility, and modularity that are not all addressed by any single claim of any specific

Asserted Patent. For example, the DI products and accused products include numerous significant features that are not claimed in: (1) the '320 Patent, including *e.g.*, fiber optic equipment tray(s), fiber optic modules, fiber optic module guides, a fiber optic cable management clips, and rearremovable functionality for the modules, RX-0001C (Blumenthal WS) Q/A 368-369; (2) the '456 Patent, including e.g., a fiber optic connection density of at least 144 fiber optic connections per 1RU (claims 11-16, 21), fiber optic cable management clips, and rear-removable functionality for the modules, id. Q/A 448-449; (3) the '153 Patent, including e.g., fiber optic connection density of 98 or 144 connections per 1RU space, id. Q/A 584-585; and (4) the '206 Patent, including e.g., fiber optic equipment tray(s), fiber optic connection density of 98 or 144 fiber optic connections per 1RU space, and a fiber optic cable management clips, id. Q/A 717-718. Moreover, Complainant contends that the DI products and accused products embody different alleged inventions claimed in different Asserted Patents that claim *different* alleged inventions. That by itself, precludes Complainant from relying on a rebuttable presumption of nexus. See Fox Factory, Inc. v. SRAM, LLC, 944 F.3d 1366, 1373-74 (Fed. Cir. 2019), cert. denied, No. 20-158, 2020 WL 5883383 (U.S. Oct. 5, 2020).³⁴

See Resps. Br. at 254-55.

In general, Corning may establish a "prima facie case of nexus" between a successful product and the claims of an asserted patent by showing "that [the product] practices the . . . patent" and that the "product was commercially successful," *Crocs*, 598 F.3d at 1310-11, or manifests other indicia of non-obviousness. Once a prima facie case is established, it then becomes respondents' burden by "presenting evidence that shows the proffered objective evidence was 'due to extraneous factors other than the patented invention.'" *WBIP*, 829 F.3d at 1329 (quoting *Demaco*, 851 F.2d at 1393); *see also Demaco*, 851 F.2d at 1394 ("A patentee is not required to prove as part of its prima facie

³⁴ The PTAB rejected similar nexus arguments in its Final Written Decision finding claims 1-20 of a patent related to the '320, '456, and '153 Patents. RX-1393 (Final Written Decision of IPR of '148 Patent). For example, the PTAB determined that there was not sufficient evidence to show that the Corning EDGE product and alleged copy (Panduit product) are coextensive with any patent claim and that Corning arguments on commercial success, long-felt need, recognition of a problem, and failure of others actually relate to *another* patent. *Id.* at RX-1393.0035-38.

Case: 22-1228 Document: 29 VERSON 358 Filed: 04/25/2022 Confidential Material Omitted on this Page

case that the commercial success of the patented invention is *not* due to factors other than the patented invention.").

Corning has shown as part of its affirmative domestic industry case, relying on the opinion of Dr. Ralph, that the EDGE products practice the asserted patents. Those patents describe preferred embodiments that match EDGE, and include figures that depict EDGE's modules and chassis. In addition, much of the evidence supporting Corning's showing of objective indicia points specifically to EDGE's characteristics of density, accessibility, and modularity, which are benefits derived from EDGE's patented features. *See* CX-0001C (Prucnal WS) Q/A 564-72. Thus, Corning has made a prima facie case tying EDGE's success and other indicia of non-obviousness to claimed features.

Dr. Blumenthal has offered an opinion that objective indicia are not present, but in that opinion he does not cite or discuss the evidence that Corning has put forward, even though much of it was cited in Corning's contention interrogatories, which he purportedly reviewed in preparing his opinion. *See* RX-0001C (Blumenthal WS) Q/A 368-377, 448-457, 584-593, 717-725; *but see* Blumenthal Tr. 714-715 (equivocating on whether he "actually looked at" the evidence cited by Dr. Prucnal). Instead, for each asserted patent, Dr. Blumenthal cites the claims of each other asserted patent and asserts that Corning has not shown that particular indicia are attributable to one patent rather than the others. *See id.* Q/A 369, 449, 585, 718. This approach would make it impossible to use indicia where a product embodies the claims of multiple patents, and that is not the law. Instead, in cases "[w]here a product embodies claims from two patents," it is sufficient for the patentee to show that "the claims of both patents generally cover the same invention." *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1377 (Fed.

168

Case: 22-1228 Document: 29 VERSON 359 Filed: 04/25/2022 Confidential Material Omitted on this Page

Cir. 2019) (citing *WIBP* and similar cases), *cert. denied*, No. 20-158 (Oct. 5, 2020). Here, the asserted claims "generally cover" EDGE, and so its success is evidence in favor of each.

In his testimony, Dr. Blumenthal also opined that some features of EDGE were disclosed in other patents invalidated in previous *inter partes* review proceedings (and not asserted here), and that EDGE's success might be attributable to those features. Furthermore, those previous patents, like the asserted patents, "generally cover[ed]" EDGE, *Fox Factory*, 944 F.3d at 1377, so they do not defeat a presumption of nexus to the asserted patents. Moreover, the previously invalidated patents were broader because they did not claim the density of the asserted claims of the '320 and '456 patents or other features found in the '153 and '206 patents. The Patent Office upheld the '320 patent against Panduit's *inter partes* challenge and declined to review the '206 patent (as discussed in the Validity sections for the '320 and '206 patents).

* * *

Accordingly, Corning has adduced evidence of secondary considerations indicating that the asserted claims of the '320 patent are not obvious.

4. Enablement

Respondents argue that asserted claims 1 and 3 are invalid because they are not enabled. *See* Resps. Br. at 77-85. Corning and the Staff disagree. *See* Compl. Br. at 218-26; Staff Br. at 111-15.

Respondents argue, inter alia:

Claims 1 and 3 of the '320 Patent are invalid because they are not enabled. RX-0001C (Blumenthal WS) Q/A 206-214. The enablement

169

requirement "prevents both inadequate disclosure of an invention and overbroad claiming that might otherwise attempt to cover more than was actually invented." *MagSil Corp. v. Hitachi Global Storage Techs., Inc.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012). Thus, a patentee invites additional scrutiny when it chooses to use open-ended claim language, *e.g.*, limitations claiming "at least" some threshold quantity but lacking any express upper bound. Complainant chose to use exactly that formulation for the alleged inventions claimed in claims 1 and 3 of the '320 Patent.

Claim 1 requires that "the fiber optic connection equipment is configured to support a fiber optic connection density of *at least ninetyeight (98) fiber optic connections per U space*, based on using at least one simplex fiber optic component or at least one duplex fiber optic component." JX-0004 ('320 Patent) at 19:54-59 (emphasis added). Claim 3 requires that "the fiber optic connection equipment is configured to support a fiber optic connection density of *at least one hundred fortyfour (144) fiber optic connections per U space*," based on using at least one simplex fiber optic component or at least one duplex fiber optic component. *Id.* at 19:64-67 (emphasis added). There is no dispute that claims 1 and 3 are open-ended because they include an expressly stated lower bound but do not include an expressly stated upper bound. RX-0001C (Blumenthal WS) Q/A 207; CX-2060C (Prucnal RWS) Q/A 177; CPHB at 222; SPHB at 110.

Accordingly, claims 1 and 3 are valid if and only if (1) they have an inherent upper limit and (2) the specification enables a POSITA to approach that limit. *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1376-77 (Fed. Cir. 2007). Claims 1 and 3 do not satisfy that standard and are therefore invalid.

Resps. Br. at 77-78.

For the reasons discussed below, respondents have not proven by clear and

convincing evidence that claims 1 and 3 of the '320 patent do not satisfy the enablement

requirement of 35 U.S.C. § 112.

Respondents fail to show that any asserted claims are invalid for lack of

enablement. Under former 35 U.S.C. § 112 ¶ 1 (2006) (now § 112(a)), a patent must

describe the invention "in such full, clear, concise, and exact terms as to enable any

person skilled in the art to which it pertains . . . to make and use the same." This requires

170

"teach[ing] those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation." *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 959 F.3d 1091, 1100 (Fed. Cir. 2020) (quoting *ALZA Corp. v. Andrx Pharm., LLC*, 603 F.3d 935, 940 (Fed. Cir. 2010)). As with other challenges to patent validity, respondents bear the burden to show lack of enablement by clear and convincing evidence. *See Cephalon, Inc. v. Watson Pharm., Inc.*, 707 F.3d 1330, 1336 (Fed. Cir. 2013).

Respondents' enablement challenges in this case almost entirely concern claim limitations that feature open-ended ranges, such as the limitation of '320 claims 1 and 3 that recite "fiber optic connection density of at least 98" or "at least 144 fiber optic connections per U space." JX-0004 ('320 Patent) at Claims 1, 3. These ranges are openended because the claim terms express a lower limit but no upper limit. An enablement challenge to a claim containing a range of this kind is governed by *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361 (Fed. Cir. 2007):

[O]pen-ended claims are not inherently improper; as for all claims their appropriateness depends on the particular facts of the invention, the disclosure, and the prior art. They may be supported if there is an inherent, albeit not precisely known, upper limit and the specification enables one of skill in the art to approach that limit.

Id. at 1376-77. Accordingly, respondents must show either that there is no inherent upper limit on the claims they challenge, or that the specification does not teach a person of skill to approach that limit without undue experimentation. Further, as the Federal Circuit's decision in *McRO* makes clear, an enablement challenge requires "specific identification of products or processes that were or may be within the scope of the claims

and were allegedly not enabled." 959 F.3d at 1101; *see id.* at 1104. Respondents have not made the showing required.

"a fiber optic connection density of at least 98" or "at least 144 fiber optic connections per U space" ('320 patent, claims 1, 3)

Existence of an Inherent Upper Limit

The evidence shows an inherent upper limit on fiber optic connection density per U space based on using simplex or duplex components. The existence of such a limit is, in a sense, trivial: a U space is a finite amount of space, and each fiber takes up space, so only a finite number of fibers can be connected in a U space. *See* CX-2060C (Prucnal RWS) at, *e.g.*, Q/A 188, 223-224. However, as a person of ordinary skill would know, there are more pressing constraints on the number of connections per U space than fiber size. Those constraints include the size of fiber optic connectors, adapters, and cables, *see id.* Q/A 188-197; the need for technicians to access fiber optic connections to install, use, and maintain fiber optic connection equipment, *see id.* Q/A 198-204; and the need to protect fibers and ensure an appropriate bend radius, *see id.* Q/A 205-211.

First, as to the physical size of the equipment, a person of ordinary skill would recognize from the '320 patent and from general background knowledge, that the '320 patent claims recite physical structure that takes up space. *See* JX-0004 ('320 Patent) at Claims 1, 3 ("fiber optic connection equipment provided in [a] chassis"; "at least one simplex or duplex fiber optic component"). The '320 patent specification explains that "increasing the number of optical fiber ports can require more equipment rack space in a data center," *id.* at 1:64-65, and discusses in detail the limits imposed by space constraints, *see id.* at 2:10-25, 4:36-42, 5:38-67, 8:38-51, 10:25-46, 11:42-12:4, 12:40-

172

13:21, 14:5-34, 15:29-56, 16:58-17:19, 19-20 (table). Indeed, a primary focus of the specification is to disclose the physical constraints on making fiber optic connections in a U space and the techniques that push as close as possible to those inherent limits.
Witnesses from both Corning and respondents agreed that there is a limit on the number of connections that can fit into a U or 4U space using simplex and duplex LC components. JX-0034C (Rhoney Dep. Tr.) 180:16-20; JX-0017C (Kuffel Dep. Tr.) 138-139; Kuffel Tr. 613-614, 617-618.

Second, the need for technician access to the equipment imposes a further limit on "what a person skilled in the art would understand to be workable," *Ralston Purina Inc.*, 772 F.2d 1570, 1576 (Fed. Cir. 1985). The '320 patent specification refers to operations expressly performed by hand, *see* JX-0004 ('320 Patent) at 6:54-57 (disclosing a "lever [that] can easily be squeezed into [a] finger hook . . . by a thumb and finger"), alongside many other "pulling," "pushing" and "releasing" operations that, in context, a person of skill would understand to be manual. *See id.* at 6:5-8, 6:13-18, 6:18-20, 6:29-30, 6:39-41, 6:41-44, 6:51-54, 6:67-7:3, 7:24-29; CX-2060C (Prucnal RWS) Q/A 200; *see also* Prucnal Tr. 974:5-7 ("[I]t's not just density, but also accessibility, for example, that would determine what's achieved."); *id.* at 988:13-14 (whether "densities are usable[]... would take into account finger access").

Dr. Blumenthal also recognizes the importance of accessibility, RX-0009C (Blumenthal RWS) Q/A 366, as do other witnesses. As Mr. Rhoney explained, "[j]ust having density is not going to cut it," and some of Corning's attempted designs that preceded EDGE "ultimately did not succeed because we ignored some of the other attributes like modularity and accessibility." JX-0034C (Rhoney Dep. Tr.) 177; see

173

Case: 22-1228 Document: 29 VERSON 364 Filed: 04/25/2022 Confidential Material Omitted on this Page

Hicks Tr. 104 (describing EDGE's "sliding trays" that create "the ability to get access to the . . . modules" as a "key value proposition of the EDGE solution").

Third, the need to protect fibers and ensure an appropriate bend radius is also discussed in the '320 patent specification, *see* JX-0004 ('320 Patent) at 9:59-63, 19:36-40; was discussed by Dr. Prucnal at the hearing, *see* Prucnal Tr. 1040 (explaining that "[f]iber optics requires avoiding breakage, having not too sharp a bend radius or losing a lot of light"); and was discussed by a number of other witnesses. *See* JX-0016C (Kim Dep. Tr.) 56-57; JX-0017C (Kuffel Dep. Tr.) at 68-69, 109; Kuffel Tr. 630

see also id. at 635 (

The existence of a limit on the number of fiber optic connections per U space, from the perspective of a person of skill, is further shown by one respondent's own attempts, and the attempt of respondents' expert, to calculate such a limit. As Dr. Prucnal explains, See CX-2060C (Prucnal RWS) Q/A 192 (discussing, e.g., CX-0103C (); see Kuffel Tr. 613-614. Panduit again attempted to calculate such a limit in its unsuccessful *inter partes* review challenge to the '320 patent. See CX-2060C

(Prucnal RWS) Q/A 435 (discussing CX-1736 (320 IPR Final Decision)). Dr.

Blumenthal himself attempted to calculate such a limit in his analysis here. *See id*. Q/A 184; RX-0001C (Blumenthal WS) Q/A 314.

That uncertainty goes to whether the

Case: 22-1228 Document: 29 VE Rade: 365 Filed: 04/25/2022 Confidential Material Omitted on this Page

limit is "precisely known," which it "need not be." *Andersen Corp.*, 474 F.3d at 1376-77. Panduit's and Dr. Blumenthal's calculations establish at a minimum that persons of ordinary skill agree some inherent limit exists, even if such persons may disagree about exactly what the limit is.

Ability To Approach the Inherent Upper Limit

Respondents bear the burden to show that the challenged claims are not enabled, and they must show that the specification does not "enable[] one of skill in the art to approach" the inherent upper limit, *Andersen Corp.*, 474 F.3d at 1366. To make that showing, respondents must come forward with clear and convincing evidence of "specific . . . products or processes that were or may be within the scope of the claims and were allegedly not enabled." *McRO*, 959 F.3d at 1101. They have failed to produce that necessary proof.

Corning (although it does not carry the burden) has presented evidence that the teachings of the '320 patent, embodied in the EDGE products and respondents' infringing products, enable a person of skill to approach the inherent upper limit on fiber optic connection density in a U space using simplex or duplex connections. That includes Dr. Prucnal's testimony explaining that:

- although there is substantial market pressure to achieve greater accessible density, there is no evidence of any marketed product exceeding EDGE's density since the time of EDGE's invention in August 2008, *see id.* CX-2060C (Prucnal RWS) Q/A 214;
- Respondents reviewed EDGE while designing their accused products and converged on similar designs that match, but do not exceed, its density, even where

see id. Q/A 215 (quoting CX-0103C (4/19/2010));

175



• EDGE's inventor Brian Rhoney testified that, in his opinion, EDGE comes "'really close to that theoretical limit with LC connectivity of 144 fiber connections in a 1U space," *id.* Q/A 217 (quoting JX-0034C (Rhoney Dep. Tr.) 181).

Based on those facts, Dr. Prucnal gives a persuasive opinion that "the disclosures of the '320 patent enable a person of ordinary skill to approach the inherent upper limit on the open-ended range claimed by claims 1 and 3." CX-2060C (Prucnal RWS) Q/A 212; *see* Kuffel Tr. 617-618

Dr. Blumenthal opines that "[s]ince the alleged inventions of the '456 Patent, adapters with smaller footprints allowing for much greater densities [than LC adapters] have been developed and used in fiber optic equipment." RX-0001C (Blumenthal WS) Q/A 209. He opines that such "later-developed adapters were not known, and the densities achievable with those later-developed adapters could not be reached, as of the time of the alleged inventions of the '320 Patent." *Id.* The only specific example to which he points is the Mini-Duplex Connector ("MDC") and its associated adapters. *See id.* Q/A 203-205, 212-215; RX-0073 ("unveil[ing]" of MDC in February 2019). Respondents' arguments relying on MDC connectors and adapters fail for three reasons.

First, the state of the art for enablement purposes is assessed as of the priority date of the patent — here, August 2008 — and no later. The governing rule was set forth by Judge Markey in *In re Hogan*, 559 F.2d 595, 605 (C.C.P.A. 1977):
Case: 22-1228 Document: 29 VERSON 367 Filed: 04/25/2022 Confidential Material Omitted on this Page

[I]f appellants' 1953 application provided sufficient enablement, considering all available evidence (whenever that evidence became available) of the 1953 state of the art, i.e., of the condition of knowledge about all art-related facts existing in 1953, then the fact of that enablement was established for all time and a later change in the state of the art cannot change it.

Id. at 605; *see Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1254 (Fed. Cir. 2004); *see also Amgen Inc. v. Sanofi*, 872 F.3d 1367, 1374-75 (Fed. Cir. 2017). Indeed, Dr. Blumenthal conceded under examination by the Staff that he "didn't know that something could become unenabled" based on events that occurred after the priority date. Blumenthal Tr. 763-764. Yet, relying on his testimony, respondents criticize Corning because its specifications did not mention later-developed adapters "not known" at the time of the specification. *E.g.*, RX-0001C (Blumenthal WS) Q/A 209. That is the exact use of post-priority evidence — criticism of an inventor for failing to do the "impossible," *Chiron*, 363 F.3d at 1254 — that *Hogan* prohibits.

Respondents argued that *MagSil Corp. v. Hitachi Global Storage Techs.*, 687 F.3d 1377 (Fed. Cir. 2012), allowed the use of post-priority evidence to show lack of enablement. *See* Resps. Br. 83-84. To the contrary, *MagSil* acknowledged that "[t]he enablement determination proceeds as of the effective filing date of the patent." 687 F.3d at 1380. In that case, moreover, the claims covered certain changes in electrical resistance of "'at least 10%,'" *id.* at 1381; and as of the priority date, the specification taught "a maximum change in resistance of only 11.8%," *id.* at 1382; but during prosecution, the inventors recognized an "upper limit" of a "100% resistive change," *id.*, far beyond what the specification taught. The Federal Circuit also referred to even higher changes (exceeding 600%) achieved years later, which the patent-holder sought to claim,

177

Case: 22-1228 Document: 29 VERSON 368 Filed: 04/25/2022 Confidential Material Omitted on this Page

and criticized that as overreaching. *See id.* at 1384. However, *MagSil* did not consider whether — and certainly did not hold that — if the patent had taught how to approach the known upper limit on resistance changes as of its priority date, it would have become invalid when later advances made greater changes feasible, as respondents suggest here.

Second, even if later-invented adapters were relevant evidence about enablement (which they are not), respondents have failed to show that the patent does not enable their use. As *McRO* explains, a genuine enablement challenge

routinely involve[s] concrete identification of at least some embodiment or embodiments asserted not to be enabled — including what particular products or processes are or may be within the claim, so that breadth is shown concretely and not just as an abstract possibility, and how much experimentation a skilled artisan would have to undertake to make and use those products or processes.

959 F.3d at 1100 (citing *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988)). Here, Dr. Blumenthal gives no opinion on "how much experimentation a skilled artisan would have to undertake to make," *id.*, a version of EDGE that would use later-adopted adapters. He opines that inasmuch as such adapters were not disclosed in the specification, it necessarily does not disclose their making and use. Those conclusory statements do not meet respondents' burden.

More generally, the '320 patent does not claim particular adapters, but specifies the use of simplex and duplex components. It teaches and claims certain aspects of a system that achieves unprecedented density combined with accessibility and fiber protection. *See* CX-0001C (Prucnal WS) Q/A 50-57. Dr. Blumenthal does not opine, and respondents have not shown any evidence, that it would require undue

Case: 22-1228 Document: 29 VERSON 369 Filed: 04/25/2022 Confidential Material Omitted on this Page

experimentation to adapt the system taught in the specifications of the asserted patents to use MDC adapters instead of the LC and MPO adapters expressly disclosed.

Third, and similarly, respondents have not proposed any "concrete identification," *McRO*, 959 F.3d at 1100, of a product that is not enabled because it uses later-invented adapters. The accused products do not — they use LC adapters to achieve exactly the 144 connections per U space that the '320 patent specification teaches. Dr. Blumenthal opines that "the use of MDC adapters would allow a person of ordinary skill in the art to achieve up to 432 fiber optic connections per 1RU space using simplex or duplex adapters," RX-0001C (Blumenthal WS) at, *e.g.*, Q/A 203, 212, but gives no opinion at all about how much experimentation would be required to achieve a 432-fiber result, and whether such experimentation would be "undue" under the multi-part standard of *Wands*. Mere "conclusory statements' regarding the amount of experimentation necessary" are insufficient to carry the "burden of establishing lack of enablement by clear and convincing evidence," *Takeda Pharm. Co. v. Zydus Pharms. Am., Inc.*, 743 F.3d 1359, 1369 (Fed. Cir. 2014). Here, respondents fail to present even a conclusory opinion applying the appropriate legal standard.

* * *

Accordingly, respondents have not proven by clear and convincing evidence that claims 1 and 3 of the '320 patent fail to satisfy the enablement requirement of 35 U.S.C. § 112.

5. Indefiniteness ("U space")

Respondents argue that the claim term "U space" renders claims 1 and 3

179

indefinite. See Resps. Br. at 85-87. Corning and the Staff disagree. See Compl. Br. at

228-30; Staff Br. at 55.

Respondents argue, inter alia:

The term "U space" renders claims 1 and 3 of the '320 Patent and claims 11, 12, 14, 15, 16, 19 and 21 of the '456 Patent indefinite under any construction. *See* RX-0001C (Blumenthal WS) Q/A 215-230. The term "*per*" in the claims 1 and 3 of the '320 Patent, and claims 11 and 19 of the '456 Patent, introduces ambiguity that renders these claims indefinite because a POSITA would not be able to determine the claim scope. *Id*; *see also* RDX-0001.73-74.

The specification discusses fiber optic connection density "*in* a 1-U space." JX-0004 ('320 Patent) at 10:28-46; JX-0010 ('456 Patent) at 10:49-62; *see also* RDX-0001.75. Yet, claims 1 and 3 of the '320 Patent, and claims 11 and 19 of the '456 Patent recite fiber optic connection density "*per* U space." JX-0004 ('320 Patent) at Claims 1-3; JX-0010 ('456 Patent) at Claims 11, 19; *see also* RDX-0001.73-74.

For example, claim 3 of the '320 Patent recites "one hundred fortyfour (144) fiber optic connections *per U space*." A POSITA be unable to determine whether the claim would include a density of 432 connections (3X144) in situations where there is not 144 connections *in any given 1-U space* would fall within the claim scope. *See* RX-0001C (Blumenthal WS) Q/A 227-230; *see also* RDX-0001.76. The example in RDX-0001.76 is 3-U high, with 8 rows and 27 duplex adapters per row, resulting in 432 connections, but no single U-space contains 144 connections:



The different meaning of the two terms – "in" and "per" – is irreconcilable. RX-0001C (Blumenthal WS) Q/A 227-230. The 432 connections in RDX-0001.76 in a 3-U height could imply that there are

144 connections *per* U space; however, that contradicts the specification, which refers to connections *in* a "given 1-U space," implying that all 144 connections fit within a given 1-U space. Even if we assumed "*per*" means "*in*" (it does not), the example in RDX-0001.76 would not satisfy claim 3 because Row 3 and Row 6 adapters are not within any given 1-U space. *See* RX-0001C (Blumenthal WS) Q/A 227-230.

Thus, a POSITA would not be able to determine with reasonable certainty what the word "per" means. *Id.* A POSITA would have no way to determine whether "per" required each and every U space to have 144 connections and, therefore, would not be able to determine the scope of claim 3 with reasonable certainty. The same is true for claim 1 of the '320 Patent and claims 11, 12, 14, 16, 19, and 21 of the '456 Patent.

See Resps. Br. at 85-86.

For the reasons discussed below, respondents have not proven by clear and convincing evidence that the claim term "U space" (claimed in asserted claims 1 and 3 of the '320 patent and in asserted claims 11, 19, and 27 of the '456 patent) is indefinite under 35 U.S.C. § 112.

Respondents argue that the use of the term "per" in the phrase "per U space" renders the term indefinite — even though they did not seek construction of the term "per" in the parties' Joint Claim Construction Statement.

Respondents' argument rests on a contrast between the phrase "per U space" (which appears in the claims) and the phrase "in a U space" (which appears in the specification). *See* RX-0001C (Blumenthal WS) Q/A 225. They argue that the phrase "in a U space" means that the claimed density of connections must fit in a single U space, but that the phrase "per U space" permits an average to be calculated for a multiple Uspace embodiment. *Id.* Q/A 229. They postulate a hypothetical device that achieves a density of (for example) 432 connections across 3 U spaces, but less than 144 connections in any single U space, because some adapters fall on dividing lines between

181

U spaces. Id. Q/A 228.

The word "per" is not indefinite in context, and a person of skill would be reasonably certain that respondents' hypothetical device does not infringe the '320 or '456 patents. As Dr. Prucnal explains, the word "per" does not have a specific technical meaning in the field of fiber optics, so a person of ordinary skill would understand it to have its ordinary, non-technical meaning, which is "'with respect to every member of a specified group' or 'for each.'" CX-2060C (Prucnal RWS) Q/A 242-245 (quoting CX-1535 (Webster's Third) at 7). In some contexts, such as "average income per capita," the word "per" can mean an average. In other contexts, such as a direction to take medicine "twice per day," the word can mean a minimum (or maximum) for each element of a group. *Id.* Q/A 246.

Here, the claims and specification show that the second meaning (a minimum, not an average) is intended. In the '320 and '456 patent claims, the word "per" is used as part of the phrases "at least 98 . . . per U space" and "at least 144 . . . per U space." When "at least" is combined with "per," it indicates that a minimum (rather than an average) is being stated. Dr. Prucnal gives an illustration based on a study showing that in 2015 American households had, on average, 2.3 televisions. *See id.* Q/A 247 (discussing CX-1534 (EIA Today in Energy). Based on this study, he explains, it would be correct to say that Americans had 2.3 televisions "per" household — the average but not correct to say that Americans had "at least" 2.3 televisions "per" household, because most households had only 1 or 2 televisions. *See id.* That reading of the limitation "at least . . . per" is reinforced by the specification. As both experts agree, *compare* RX-0001C (Blumenthal WS) Q/A 225 *with* CX-2060C (Prucnal RWS) Q/A

182

Case: 22-1228 Document: 29 VERSON 373 Filed: 04/25/2022 Confidential Material Omitted on this Page

248, the '320 and '456 patent specifications consistently describe the number of connections achieved "in a U space," which indicates that the number must be achieved for each U space the device takes up.

Thus, applying the phrase "at least . . . per" to respondents' hypothetical product, a person of skill would say with reasonable certainty that it does not have "at least" 144 connections "per" U space. By assumption, some U spaces do not have 144 connections.

* * *

Accordingly, respondents have not shown by clear and convincing evidence that the claim term "U space" (claimed in asserted claims 1 and 3 of the '320 patent and in asserted claims 11, 19, and 27 of the '456 patent) is indefinite under 35 U.S.C. § 112.

V. U.S. Patent No. 10,444,456

U.S. Patent No. 10,444,456, entitled "High Density and Bandwidth Fiber Optic Apparatuses and Related Equipment and Methods," was filed on April 5, 2019 and issued on October 15, 2019. JX-0010 ('456 Patent). The '456 patent is assigned to Corning. JX-0012 ('456 Patent Assignment Record). The '456 patent is related to and shares a specification with the '320 and '153 patents. The '456 patent states, "The technology of the disclosure relates to fiber optic connection density and bandwidth provided in fiber optic apparatuses and equipment." JX-0010 at 1:33-35. The '456 patent has a total of 30 claims, of which Corning asserts independent claims 11 and 27 and dependent claims 12, 14-16, 19, 21, and 28. *See* Compl. Br. at 8.

As discussed below, the evidence shows that (1) the asserted claims of the '456 patent are infringed by the accused products; (2) complainant has satisfied the technical

183

Case: 22-1228 Document: 29 VERSON 374 Filed: 04/25/2022 Confidential Material Omitted on this Page

prong of the domestic industry requirement; and (3) the asserted claims are not invalid.

The asserted claims of the '456 patent (and the claims from which they depend)

read:

- **11**. A fiber optic apparatus, comprising:
- a chassis configured to be disposed in an equipment rack, the chassis comprising front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a plurality of fiber optic equipment trays supported by the chassis and extendable relative to the chassis in the longitudinal direction; and
- a plurality of fiber optic modules configured to be installed in the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules comprises a front side, a rear side, an internal chamber, a plurality of first fiber optic adapters disposed through the front side, at least one second fiber optic adapter disposed through the rear side, and a plurality of optical fibers disposed within the internal chamber and extending from the at least one second fiber optic adapter to the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules;
- wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to support a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space of the chassis, based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters; and.
- wherein a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches.

12. The fiber optic apparatus of claim 11, wherein the plurality of first fiber optic adapters is disposed through at least eighty-five percent (85%) of a width of the front side of at least one fiber optic module of the plurality of fiber optic modules.

14. The fiber optic apparatus of claim 11, wherein for each fiber optic module of the plurality of fiber optic modules, each fiber optic adapter of the plurality of first fiber optic adapters comprises a simplex LC fiber optic adapter or a duplex LC fiber optic adapter, and wherein the at least one second fiber optic adapter comprises at least one multi-fiber push-on (MPO) fiber optic adapter.

15. The fiber optic apparatus of claim 11, wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive a single row of multiple fiber optic modules of the plurality of fiber optic modules.

16. The fiber optic apparatus of claim 11, wherein each fiber optic module of the plurality of fiber optic modules is configured to be locked into place in a fiber optic equipment tray of the plurality of fiber optic equipment trays.

18.^[35] The fiber optic apparatus of claim **11**, wherein the plurality of fiber optic equipment trays comprises three fiber optic equipment trays per U space of the chassis.

19. The fiber optic apparatus of claim **18**, wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to support a fiber optic connection density of one hundred forty-four (144) fiber optic connections per U space of the chassis, based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters.

20.^[36] The fiber optic apparatus of claim **11**, wherein:

each fiber optic equipment tray of the plurality of fiber optic equipment trays comprises first, second, and third module guide members extending upward from a bottom of the fiber optic equipment tray; and

³⁵ Claim 18 is not asserted.

³⁶ Claim 20 is not asserted.

each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive a first fiber optic module of the plurality of fiber optic modules between the first and second module guide members, and the fiber optic equipment tray is configured to receive a second fiber optic module of the plurality of fiber optic modules between the second and third module guide members.

21. The fiber optic apparatus of claim **20**, wherein for each fiber optic equipment tray of the plurality of fiber optic equipment trays, each module guide member of the first, second, and third module guide members comprises a locking feature configured to cooperate with a fiber optic module of the first or second fiber optic modules to prevent movement of the fiber optic module relative to the fiber optic equipment tray.

27. A fiber optic apparatus, comprising:

- a chassis configured to be disposed in an equipment rack, the chassis comprising front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a plurality of fiber optic equipment trays supported by the chassis and extendable relative to the chassis in the longitudinal direction; and
- a plurality of fiber optic modules configured to be installed in the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules comprises a front side, a rear side, an internal chamber, a plurality of first fiber optic adapters disposed through the front side, at least one second fiber optic adapter disposed through the rear side, and a plurality of optical fibers disposed within the internal chamber and extending from the at least one second fiber optic adapter to the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules;

wherein the chassis defines a 4-U space, in which a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches; and

wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to support a fiber optic connection density of five hundred seventy-six (576) fiber optic connections in the 4-U space of the chassis, based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters.

28. The fiber optic apparatus of claim **27**, wherein the plurality of first fiber optic adapters is disposed through at least eighty-five percent (85%) of a width of the front side of at least one fiber optic module of the plurality of fiber optic modules.

JX-0010 ('456 Patent) at 21:43-24:43.

A. Claim Construction

1. A Person of Ordinary Skill in the Art

As noted in the '320 patent section of this initial determination, the administrative law judge finds that a person of ordinary skill in the art with respect to the four asserted patents is a person who has at least a bachelor's degree in mechanical engineering, materials science, or a related field, and at least two years of experience in fiber optic equipment.

2. "fiber optic connection density"

Pursuant to Ground Rule 6.d, the parties filed a joint claim construction chart on June 1, 2020. *See* Joint Chart. As shown in that chart, the parties have agreed on the construction of the following claim term that appears in certain asserted claims of the '456 patent. Below is a chart showing the parties' proposed claim construction.

Case: 22-1228 Document: 29 VERSON 378 Filed: 04/25/2022 Confidential Material Omitted on this Page

Claim Term	Asserted Claims	Agreed-Upon Construction		
"fiber optic connection density"	·456: 11, 19, 27	"number of fiber optic connections that can be made to the front side of the fiber optic equipment"		

See Joint Chart at 3-4; Resps. Br. at 53; Staff Br. at 46-47.

The claim term "fiber optic connection density" appears in asserted claims 11, 19, and 27 of the '456 patent. The parties have agreed to construe that claim term as "number of fiber optic connections that can be made to the front side of the fiber optic equipment." *See* Joint Chart; Resps. Br at 53; Staff Br at 46-47.

Accordingly, as argued by the parties, the administrative law judge adopts the joint proposed claim construction and has determined that the claim term "fiber optic connection density" should be construed to mean "number of fiber optic connections that can be made to the front side of the fiber optic equipment."

3. "U space"

The claim term "U space" appears in asserted claims 1 and 3 of the '320 patent and in asserted claims 11, 19, and 27 of the related '456 patent. Below is a chart showing the parties' proposed claim constructions.

Complainant and the Staff	Respondents
Plain and ordinary meaning, an example of which is "a rack unit, which is a standardized measurement of 1.75 inches (44.45mm) in height within a standardized 19-inch rack or 23-inch rack.	'320 patent: § 112 (indefinite); if not indefinite, then "space comprising a height of 1.75 inches and width of 19 or 23 inches."
	'456 patent: "space comprising a height of 1.75 inches and width of 19 or 23 inches";

Case: 22-1228 Document: 29 VE Rage: 379 Filed: 04/25/2022

ntial Material Omitted on this Page

otherwise §112 (ind	efinite)

See Staff Br. at 54-55 (citing Joint Chart at 5); Compl. Br. at 44-46; Resps. Br. at 45-47.

For the reasons discussed in the claim construction section of the '320 patent, the administrative law judge has determined that the claim term "U space" that appears in the asserted claims of the '456 patent should be given its "plain and ordinary meaning, an example of which is a rack unit, which is a standardized measurement of 1.75 inches (44.45mm) in height within a standardized 19-inch rack or 23-inch rack."

4. "simplex [LC] fiber optic adapter" and "duplex [LC] fiber optic adapter"

The claim terms "simplex [LC] fiber optic adapter(s)" and "duplex [LC] fiber optic adapter(s)" appear in asserted claims 11, 14, 19, and 27 of the '456 patent. Below is a chart showing the parties' proposed claim constructions.

Complainant	Respondents	Staff		
"A fiber optic adapter that supports a simplex [LC] connector"	"device that receives [LC] connectors to support no more than a single-fiber connection"	"fiber optic component that receives a connector [of intermateability standard type LC] in a single-fiber connection"		
"A fiber optic adapter that supports a duplex [LC] connector"	"device that receives [LC] connectors to support no more than a two-fiber connection"	"fiber optic component that receives a connector [of intermateability standard type LC] in a one- or two- fiber connection"		

See Joint Chart at 2; Compl. Br. at 31-42; Resps. Br. at 26-32; Staff Br. at 56-57.

For the reasons discussed below, the administrative law judge has determined that (1) the claim term "simplex [LC] fiber optic adapter" should be construed to mean "fiber optic adapter that supports a simplex [LC] connector"; and (2) the claim term "duplex

189

[LC] fiber optic adapter" should be construed to mean "fiber optic adapter that supports a duplex [LC] connector."

Complainant's proposed construction is consistent with the Staff's proposal to construe the phrases as a "fiber optic component that receives a connector in a single-fiber connection" and a "fiber optic component that receives a connector in a one- or two-fiber connection." *Id.* There is no material difference between the two proposed constructions. When an adapter receives a simplex connector, it forms a one-fiber connection; and when an adapter receives a duplex connector, it forms a two-fiber connection. The Staff's construction adds the additional fact that a duplex adapter can receive a simplex as well as a duplex connector.

The claims of the '456 patent focus on the type of connectors that an adapter can receive and the corresponding connections that it forms, rather than on the number of connectors it can receive and the connections it cannot form. Claims 11, 19, and 27 refer to simplex and duplex adapters in specifying a particular "fiber optic connection density," which the parties agree means the "number of fiber optic connections that can be made to the front side of the fiber optic equipment." Joint Chart at 3-4. In determining that number, a person of ordinary skill would be concerned with how many fiber connectors could be inserted on the front side, not whether those connectors were received by duplex adapters standing alone or combined in a single block to form a quad adapter. As discussed below, such a person would understand that a quad adapter is identical to a pair of duplex adapters in the context of fiber optic connection density.

Respondents argue that the claims distinguish between "simplex" and "duplex" adapters:

190

The claims also distinguish between "simplex" and "duplex" adapters despite that both can support a simplex connector. *Id.* at claims 11, 14, 19, 27, 28; Prucnal Tr. 290:11-14, 290:19-21; Ralph Tr. 209:11-17. The difference between "simplex" and "duplex" adapters is the maximum number of fiber connections that they support, *i.e.*, the maximum number of fibers that they can connect. RX-0008 (Lebby RWS) Q/A 148. Respondent's construction captures this distinction by specifying that a "simplex" adapter supports "no more than a *single-fiber* connection." By contrast, Complainant's constructions render superfluous the reference to "duplex" adapter that supports a simplex and "duplex" adapters are "a fiber optic adapter that supports a simplex connector." *See Akzo Nobel Coatings, Inc. v. Dow Chemical Co.*, 811 F.3d 1334, 1340 (Fed. Cir. 2016).

Resps. Br. at 27-28.

The claims refer to simplex and duplex adapters separately, but do not distinguish them. Nor would such a distinction make sense because, as a person of ordinary skill would know, a duplex adapter is two simplex adapters side-by-side. CX-0001C (Prucnal WS) Q/A 166. That a simplex adapter supports one simplex connector and a duplex adapter supports two simplex connectors (either individually or joined in a duplex connector) is of no consequence, because it does not affect density. That both simplex and duplex adapters are "a fiber optic adapter that supports a simplex connector" does not "render superfluous the reference to 'duplex fiber optic adapters" in the claims as argued by respondents, but instead reflects the well understood overlap between a simplex and duplex adapter.

Moreover, the '456 specification defines a duplex adapter in terms of the type of connectors that adapter can receive and the connections made with those connectors. *See* CX-2060C (Prucnal RWS) Q/A 45; CX-0001C (Prucnal WS) Q/A 26-27. The specification defines duplex LC fiber optic adapters as adapters that are "configured to

191

receive and support connections with duplex LC fiber optic connectors." JX-0010 ('456 Patent) at 9:19-22; *see* 9:63-10:10 (similar); 5:58-67, 10:52-11:4, 14:36-64, 15:61-16:22, 17:25-53. The specification further notes that duplex LC adapters "support single or duplex fiber connections and connectors." *Id.* at 9:67-10:1. A one-fiber or simplex connection generally permits communication in one direction at a time, and so may be used either to send or receive information. A two-fiber or duplex connection permits communication in two directions at the same time, and can be used to send and to receive information simultaneously. *See, e.g.*, CX-0001C (Prucnal WS) Q/A 26, 164, 175, 178, 183; CX-2060C (Prucnal RWS) Q/A 33, 45.

The specification also contrasts duplex adapters with a "multi-fiber MPO fiber optic adapter," which it defines as an adapter "equipped to establish connections to multiple optical fibers (e.g., either twelve (12) or twenty-four (24) optical fibers)." JX-0010 ('456 Patent) at 9:29-31. This is another example of the specification defining a fiber optic adapter based on the type of connector it receives and corresponding connections it can form, rather than on the number of fibers it receives. As a person of ordinary skill in the art would understand, an MPO adapter would support either 12 or 24 fibers depending solely on the type of MPO connector that was used — the MPO adapter is identical regardless of the number of fibers used in the connector. *See* CX-0001C (Prucnal WS) Q/A 318; CX-0683 (FOCIS-5).

The specification also distinguishes simplex and duplex components from multiple fiber components based on density. A table in the specification shows that the "max fibers per 1RU" is 144 using "duplexed LC" compared to 576 using "12-[fiber] MPO" and 1,152 using "24-[fiber] MPO." JX-0010 ('456 Patent) at 19-20 table. The

192

Case: 22-1228 Document: 29 VERSON 383 Filed: 04/25/2022 Confidential Material Omitted on this Page

same table shows that the number of "connectors per 1RU" is 72 with duplexed LC and 48 with either 12 or 24 fiber MPO, demonstrating the centrality of connector types in understanding the distinction between adapter types and the density achievable by each respective type.

Additionally, the prosecution history shows that simplex and duplex fiber optic adapters are defined by the type of connectors they receive. As noted above, during prosecution of the '320 patent, Corning originally asserted two sets of claims. One set claimed densities based on simplex or duplex components, and the second claimed much higher densities based on multifiber components. *See* JX-0005 ('320 Prosecution History) at 6-7 (former claims 13 and 26). The examiner issued a Restriction Requirement finding that the Application

contains claims directed to the following *patentably distinct species*: A) high density fiber optic connection apparatus or method based on *simplex or duplex type fiber connectors*; and B) high density fiber optic connection apparatus or method based on *multiple fiber or MPO connectors*.

JX-0005 ('320 Prosecution History) at 4922 (emphasis added). These "species are independent and distinct *because they involve different types of fiber connectors*" that "are not obvious variants of each other." *Id.* (emphasis added). Such "different types of optical fiber connectors . . . conventionally have different structures and are not likely to be covered within common prior art references." *Id.* Thus, the examiner distinguished between the species based on the "types of fiber connectors" these different species of fiber optic components use.

Responding to the Restriction Requirement, Corning elected Species A (simplex/duplex), and reserved the right to pursue claims directed to Species B (multiple

193

Case: 22-1228 Document: 29 VERSON 384 Filed: 04/25/2022 Confidential Material Omitted on this Page

fiber). Corning accordingly withdrew claims that recited the use of multiple fiber components. *Id.* at 5302. Those withdrawn claims recited much higher densities, which would indicate to a person of ordinary skill that the reference to "multiple fiber" adapters and components referred to the use of that term in the art as involving connectors with multiple fibers (typically 12 or more) in a single ferrule. *See* JX-0005 ('320 Prosecution History) at 6-7 (former claims 13 and 26); CX-0001C (Prucnal WS) Q/A 34.

Respondents argue that "Complainant disclaimed any interpretation of 'simplex' or 'duplex' adapter that would encompass adapters that received connectors to support more than a two-fiber connection, *i.e.*, that connect more than two optical fibers." *See* Resps. Br. at 30.

Corning surrendered claims reciting multiple-fiber adapters or components. Yet, respondents are incorrect, however, that such terms would be understood as "more than two-fiber adapters or components," a term that has no significance in the art. Resps. Br. at 30. As the examiner's Restriction Requirement, the withdrawn claims, and the specification make plain, multiple fiber adapters and components are distinguished based on the type of connectors that are used, which involve multiple fibers in a single ferrule. *See* Prucnal Tr. 394-395; CX-0001C (Prucnal WS) Q/A 34, 318.

Industry standards and other extrinsic evidence support Corning's and the Staff's constructions, as discussed below.

Industry Standards

Industry standards can assist a finder of fact to assess how a person of ordinary skill in the art would assess disputed claim terms. *See Vizio, Inc. v. Int'l Trade Comm'n*, 605 F.3d 1330, 1337 (Fed. Cir. 2010) ("Moreover, we agree with the Commission that

194

Case: 22-1228 Document: 29 VERSON 385 Filed: 04/25/2022 Confidential Material Omitted on this Page

the fact that the MPEG–2 standard was the standard used for digital television broadcasts in the United States at the time of the filing of the patent itself suggests that one of ordinary skill in the art would understand the disputed claim terms of the ' 074 patent to refer to the MPEG–2 standard."). Here, there are two relevant industry standards.

First, TIA-568-C, Generic Telecommunications Cabling for Customer Premises, is a general industry standard for fiber optic connection equipment. Its glossary defines a duplex fiber optic adapter as a "mechanical device designed to align and join two duplex optical fiber connectors (plugs) to form an optical duplex connection." CX-0922C (TIA-568-C.0) at 16. It defines a duplex connector, in turn, as a "remateable device that terminates two fibers and mates with a duplex receptacle." Id. at 17. The TIA-568-C standard also defines a multiple fiber adapter (or "array" adapter) as a "mechanical device designed to align and join two array optical fiber connectors (plugs) to form an optical array connection"; and an "array" connector — which, the standard itself states, can also be called a "multi-fiber connector" — as a "single ferrule connector that contains multiple optical fibers arranged in a row or in rows and columns." Id. at 16. Thus, for both duplex adapters and multiple fiber adapters, the TIA-568-C standard defines these adapters solely in terms of the types of connectors they receive. See CX-0001C (Prucnal WS) Q/A 30; 164-66; 186; Prucnal Tr. 386-389 (discussing TIA 568-C). Thus, it is undisputed that respondents' quad LC adapters meet this industry standard definition of a duplex LC adapter.

Second, the industry standard that governs the particular type of simplex/duplex adapter at issue supports Corning's and Staff's proposed construction. The TIA standard known as FOCIS 10 defines standardized LC connectors and adapters. *See* CX-0195

195

Case: 22-1228 Document: 29 VERSON 386 Filed: 04/25/2022 Confidential Material Omitted on this Page

(FOCIS-10A). To designate an adapter or connector as "LC" is to say that it complies with the FOCIS 10 standard. *Id.* at 7. FOCIS 10 defines only simplex and duplex connectors and adapters. *Id.* at 9; CX-0001C (Prucnal WS) Q/A 191. Further, it shows that a duplex adapter is merely two simplex adapters arranged side by side. *Compare* CX-0195 (FOCIS-10A) at 15, 17 (figures "2.2.1a" and "2.2.1b" define "[s]implex . . . adapter interface[s]") *with id.* at 19 ("[e]ach of the units in the duplex adapter shall comply with all of the dimensions of figure 2.2.1a or 2.2.1b"); Prucnal Tr. 392. This contradicts respondents' claim that an adapter cannot simultaneously be both duplex and simplex.

FOCIS 10 does not define any "quad" LC adapter. *See* CX-0001C (Prucnal WS) Q/A 191. Thus, if a quad adapter qualifies as an LC adapter — as respondents' quad adapters do — it can do so only by meeting the specification for a simplex LC adapter (as a set of four such adapters), a duplex LC adapter (as a set of two), or both. Just as a duplex LC adapter is also two simplex LC adapters, a quad adapter is merely two duplex LC adapters or four simplex LC adapters. *See* CX-0001C (Prucnal WS) Q/A 176, 186; Prucnal Tr. 391:6-19, 392:21-393:8.

There is a difference between a quad LC adapter and a duplex LC adapter in terms of the plastic housing. A quad LC adapter consists of two duplex LC adapters in a single molding. However, that is irrelevant to whether a person of ordinary skill would consider a quad LC adapter distinct from a simplex or duplex LC adapter. FOCIS 10 states that "fully dimensioned components are not within [its] scope or intent" CX-0195 (FOCIS-10A) at 7, meaning that the plastic housing surrounding a simplex or duplex adapter is irrelevant to whether it is a simplex or duplex adapter under the LC standard.

196



See CX-0001C (Prucnal WS) Q/A 176, 186; Prucnal Tr. 391:4-5 ("[T]he connector

dimensions are what's important, not the plastic.").

Product Catalogs

Respondents argue:

The extrinsic evidence supports Respondents' proposed construction. *See* RX-0008C (Lebby RWS) Q/A 165-178; RX-0001C (Blumenthal WS) Q/A 128-136. For example, Alliance Fiber Optics Products (AFOP), a Corning affiliate, created and distributed technical drawings for "duplex" and "quad" adapters:



Both adapters received and supported simplex and duplex connectors. But AFOP identified the adapter that supported up to a *two-fiber* connection a "*Duplex* Adapter," and identified the adapter that supported up to a *four-fiber* connection a "*Quad* Adapter." *See also* RX-0005C (Kim WS) Q/A 31-33; RPX-0029 (AFOP Duplex Adapter); RPX-0030 (AFOP Quad Adapter).

Resps. Br. at 30-31.

The product catalogs show both duplex LC and quad LC adapters, but the fact

that these are distinct things in terms of their plastic housing is irrelevant to whether a

quad LC adapter is also a simplex and duplex LC adapter. These catalogs do not

Case: 22-1228 Document: 29 VERSON 388 Filed: 04/25/2022 Confidential Material Omitted on this Page

"describe" these adapters in any way; they merely display them. Nowhere do these catalogs call quad adapters "multi-fiber" or "multiple fiber." A number of them specifically describe quad adapters as "LC," which supports Corning's position *See* CX-2060C (Prucnal RWS) Q/A 69-75 (discussing respondents' catalogs).

Indeed, one catalog that respondents cite — RX-0325 (Tyco Fiber Optic Products) — shows the opposite of what they claim. It contains separate sections for "Single Fiber/Duplex Products" and "Multi-Fiber Products." *Id.* at 0001. The listing for quad adapters that respondents cite is contained in the section for single fiber/duplex products, not the section for multiple fiber products. *See id.* at 44. This is a clear example of how a person of ordinary skill would recognize quad LC adapters as simplex/ duplex, not multiple fiber, components.

Other Patents

Other patents in the field of art provide additional support for Corning's and Staff's proposed constructions. *See Foster v. Hallco Mfg. Co., Inc.*, 119 F.3d 16, 1997 WL 419391, at *6 (Fed. Cir. 1997) (accepting other patents as extrinsic evidence of claim meaning).

First, U.S. Patent No. 10,502,903 to Wang et al. is a Leviton patent for a fiber optic adapter. CX-0159 (Wang '903). The patent describes embodiments using both duplex LC adapters and quad LC adapters. Wth respect to the quad adapter embodiment, it explains that a "quad fiber optic adapter may be characterized as *including two duplex fiber optic adapters 402A and 402B arranged side-by-side*." CX-0159 (Wang '903) at 14:58-67 (emphasis added); *see* CX-0001C (Prucnal WS) Q/A 61.

Second, U.S. Patent No. 8,179,684 to Smrha — which respondents assert as prior

198

Case: 22-1228 Document: 29 VERSON 389 Filed: 04/25/2022 Confidential Material Omitted on this Page

art against the '320 and '456 patents — likewise describes a quad adapter as two duplex adapters and four simplex adapters. *See* CX-0032 (Smrha '684). Smrha '684 describes modules (called adapter packs) that have six quad adapters (called adapter blocks) in a row. It states that "each adapter block 58 include[es] four adapters 46 (two adapter pairs)." *Id.* at 3:44-45.

Respondents' Documents

Respondents' documents further confirm that a person of ordinary skill would view quad adapters as simplex or duplex adapters. First,

RX-0291C (Leviton Adapter Multimode LC Spec.) at 1

Second, Leviton's specification sheet for its accused modules contains a section entitled "Standards Compliance" that indicates that Leviton's quad LC adapters comply with "ANSI/TIA-604-10 (LC) for connector intermateability" — that is, FOCIS 10. CX-0093 (Leviton HDX MTP Cassette Spec.) at 1.

Third, Siemon's product for its accused chassis describes the quad LC adapters in the accused modules as having "standard interfaces," which a person of ordinary skill in the art would understand as a the duplex and simplex LC interfaces in the FOCIS 10 standard. CX-0180C (11/19 Siemon LightStack Spec.) at 3. CX-0160C (11/19 Siemon LightStack 8 Spec.) is a product specification for one of the Siemon Accused Modules



(the LightStack 8) that contains two quad LC adapters. The document describes these adapters as "4 duplex LCs."

5. "internal chamber"

The claim term "internal chamber" appears in asserted claim 11 of the '456

patent. Below is a chart showing the parties' proposed claim constructions.

Complainant and the Staff	Respondents		
"the enclosed space between the main body and the	"an area between a front side		
cover of a fiber optic module, bounded by the front	and a rear side of the fiber optic		
and rear sides of the main body"	module"		

Joint Chart at 6; Compl. Br. at 46-47; Resps. Br. at 47-50; Staff Br. at 57-58.

For the reasons discussed below, the administrative law judge has determined that the claim term "internal chamber" should be construed to mean "the enclosed space between the main body and the cover of a fiber optic module, bounded by the front and rear sides of the main body."

The dispute with regard to this term is whether the internal chamber is required to have a cover. Respondents argue that "a POSITA would not have understood that the 'internal chamber' is enclosed or that it is enclosed by a cover." Resps. Br. at 50. Complainant and the Staff take the position that the specification defines the boundaries of the "internal chamber" with reference to a cover, and that it is therefore enclosed. *See* Compl. Br. at 46-47; Staff Br. at 57-58; CX-0001C (Prucnal WS) Q/A 238. The specification provides:

The fiber optic module 22 is comprised of a main body 90 receiving a cover 92. An internal chamber 94 (FIG. 11) disposed inside the main body 90 and the cover 92 and is configured to receive or retain optical fibers or a fiber optic cable harness, as will be described in more detail below. The

Case: 22-1228 Document: 29 VERSON 391 Filed: 04/25/2022 Confidential Material Omitted on this Page

main body **90** is disposed between a front side **96** and a rear side **98** of the main body **90**.

JX-0010 ('456 Patent) at 9:11-13, fig. 11.

It further states that "FIG. 11 illustrates the fiber optic module 22 in an exploded view with the cover 92 of the fiber optic module 22 removed to illustrate the internal chamber 94 and other internal components of the fiber optic module 22." *Id.* at 9:44-47. In other words, the internal chamber 94 is bounded by the front and rear sides of the main body 90, by the floor of the main body 90 below, and by the cover 92 above. Complainant's expert Dr. Prucnal testified that this construction comports with the understanding of one of ordinary skill in the art, who would know that "a module is intended to house fiber optic cables, and that because it is critical to protect those cables from the elements and any disruption, the module would contain a covered internal chamber in which to house the cables." CX-0001C (Prucnal WS) Q/A 238.

The enclosure requirement follows from the ordinary meaning of the claims and is confirmed by the specification. In ordinary non-technical usage, the word "chamber" means "an enclosed or compartmented space designed for some specialized purpose." CX-2060C (Prucnal RWS) Q/A 167 (quoting CX-1535 (Webster's Third) at 6)). The claims of the related '206 patent are consistent with and reinforce that ordinary meaning, by referring to a "main body defining an internal chamber" and a "plurality of optical fibers disclosed in the internal chamber." JX-0001 ('206 Patent) at, *e.g.*, claim 14.

Both the '206 and '456 specifications repeatedly state (and show in figures) that the internal chamber has a cover. *See* JX-0001 ('206 Patent) at 2:65-67, 8:20-26, 8:58-9:9, 9:33-43, 9:52-63 & Figs. 10A-11, 14-17, 19, 20, 22, 23; JX-0010 ('456 Patent) at

201

9:5-19, 9:44-62 & Figs. 10A-11, 14-17, 19, 20, 22, 23. The specifications further explain that it is important to protect fibers and to maintain an appropriate bend radius, which are the functions that an enclosure serves. *See, e.g.*, JX-0001 ('206 Patent) at 9:24-32; *see also* JX-0010 ('456 Patent) at 10:12-19 (similar).

6. "width of the front side of [the] fiber optic module"

The claim term "width of the front side of [the] fiber optic module" appears in asserted dependent claims 12 and 28 of the '456 patent. The parties' proposed constructions are:

Complainant	Respondents	Staff		
"the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions that are used to insert the module into the chassis or remove it from the chassis."	"width of the front side of the fiber optic module including areas dedicated to latches, sidewalls, flanges, and other nonadapter functions"Otherwise indefinite.	"the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions, <i>e.g.</i> , the dimension identified as "W ₂ " in Figure 13 of the '456 and '206 Patents"		

See Joint Chart at 4; Compl. Br. at 47-50; Resps. Br. at 41-45; Staff Br. at 58-62.

For the reasons discussed below, the administrative law judge has determined that the claim term "width of the front side of [the] fiber optic module" should be construed to mean "the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions that are used to insert the module into the chassis or remove it from the chassis."

The phrase "width of the front side" should be construed as Corning proposes: to mean "the width of the side of the module that when inserted faces the front of the

202

chassis, excluding any module rail guides or protrusions that are used to insert the module into the chassis or remove it from the chassis." Joint Chart at 4.

Corning's and the Staff's proposed constructions are similar. Their proposals exclude "any module rail guides or protrusions." The Staff proposes adding a reference to "the dimension identified as 'W₂' in Figure 13 of the '456 and '206 Patents." These two proposals are not materially different. Respondents' proposal, however, would not exclude rails or rail guides and would add the phrase "including areas dedicated to latches, sidewalls, flanges, and other nonadapter functions." *Id.* That proposal is incorrect, especially as respondents' experts apply it to include rails. *See, e.g.,* RX-0001C (Blumenthal WS) Q/A 153-155.

The '456 patent specification "acts as a dictionary," *Phillips*, 415 F.3d at 1321 (internal quotation marks omitted), by defining the "width of the front side" to exclude rails and similar protrusions from the module sides. That specification, referring to Figure 13, JX-0010 ('456 Patent) at 10:20, discloses the "width W₁ of the front opening 126," *id.* at 10:25-26, comparing it to two other defined widths: "width W₂ of the front side 96 of the main body 90 of the fiber optic module 22," *id.* at 10:35-36; and "[w]idth W₃, the overall width of the fiber optic module 22," *id.* at 10:39-40. The variables W₁, W₂, and W₃ and numbered items 22, 90, 96, and 126 each correspond to notations in Figure 13. *See* CX-2060C (Prucnal RWS) Q/A 124; CDX-0005C (Prucnal Rebuttal Demonstratives) at 24.³⁷ The specification also discloses "module rails 28A, 28B disposed on each side 102A, 102B of the fiber optic module 22." *Id.* at 9:34-35. Figure

³⁷ Dr. Prucnal's witness statement and demonstrative discuss the '206 specification, noting that the '456 specification contains "essentially the same" language and figures. *See* CX-2060C (Prucnal RWS) Q/A 124-127, 136-38.

Case: 22-1228 Document: 29 VERSON 394 Filed: 04/25/2022 Confidential Material Omitted on this Page

13 shows that the module rails 28A and 28B are included in W_3 (the "overall width of the fiber optic module") but not in W_2 (the "width of the front side"). JX-0010 ('456 Patent) at Fig. 13; *see* CDX-0005C (Prucnal Rebuttal Demonstratives) at 24.

The function of measuring the width of the front side further supports excluding rails. *See Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1368 (Fed. Cir. 2008) (in construing claim "we ask what function" a limitation "plays in the operation of the claimed apparatus"). The parties agree that "fiber optic connection density," which the '456 patent seeks to maximize, means the "number of fiber optic connections that can be made to the front side of the fiber optic equipment," Joint Chart at 3. With that goal in mind, it follows to distinguish the "width of the front side," which is W₂, and which includes only those parts of the module that take up precious space on the front side, from the "overall width of the fiber optic module," which is W₃, and which includes parts of the module is installed, the rails are part of W₃ but not part of W₂ because, when the module is installed, the rails fit into rail guides in the trays and take up no additional space on the front side. *See* JX-0010 ('456 Patent) at 6:20-23, 9:34-35; *id.* at Fig. 5; CX-2060C (Prucnal RWS) Q/A 132-38.

The different embodiment depicted in Figures 16 to 18 does not suggest otherwise. That embodiment is an "alternate fiber optic module" that is "designed to fit across two sets of module rail guides." JX-0010 ('456 Patent) at 13:50-56. According to the specification, the alternate module has "widths W₁ and W₂" that "are the same as in the fiber optic module 22 illustrated in FIG. 13." *Id.* at 14:42-43. There is no discussion of a width W₃, and Figure 18 also appears to define W₂ differently than Figure 13, by including the module rails. A person of ordinary skill would rely on the more detailed

204

Case: 22-1228 Document: 29 VERSON 395 Filed: 04/25/2022 Confidential Material Omitted on this Page

definition and description provided for Figure 13 and would interpret Figure 18 as incorporating that earlier disclosure rather than changing or conflicting with it. *See* CX-2060C (Prucnal RWS) Q/A 126-27.

Respondents rely on statements from the prosecution history of the '206 patent, and Panduit's unsuccessful *inter partes* review of that patent, to argue that Figure 18, rather than Figure 13, should control. *See* Resps. Br. at 43-45. However, the doctrine of prosecution disclaimer, on which respondents rely, requires a "clear and unmistakable disavowal" of claim scope, *Schindler Elevator Corp. v. Otis Elevator Co.*, 593 F.3d 1275, 1285 (Fed. Cir. 2010), and none is present here. During prosecution, the examiner cited a piece of prior art ("Rapp '274") that had two large flanges and a latch on its front side. The flanges and the latch, unlike module rails 28A and 28B from the specification, took up substantial space on the front side of the module. *See* CX-2060C (Prucnal RWS) Q/A 130-31 (discussing CDX-0005C, at 28). Corning cited Figure 18 to distinguish Rapp '274, but could have just as well cited Figure 13 — the flanges and latch of Rapp '274 would have been part of width W₂ using either description. *See id.* Q/A 132. Neither the examiner nor Corning mentioned rails or suggested that the flanges or latch of Rapp '274 resembled rails. None of this amounts to a clear and unmistakable disclaimer.

The *inter partes* review proceedings on which respondents rely (*see* Resps. Br. at 43-45) similarly do not support their position. Corning's briefing in the '206 IPR stated explicitly that "the overall width of the module, W₃, can be larger than the width of just the front side of the module because, as shown in [Figure 13], structure like side rails can protrude out from the sides of the modules"; and that "[b]ecause these rails are not part of the 'front side' of the module body, the '206 patent does not include them in the 'width of

205

Case: 22-1228 Document: 29 VERSON 396 Filed: 04/25/2022 Confidential Material Omitted on this Page

the front side.'" RX-0512 ('206 IPR Prelim. Resp.) at 26. Corning also distinguished Rapp '274 on the basis that Rapp's flanges and latch are part of its front side, *see id.* at 11, 17, 31, 33 — but, for the reasons already given, that distinction was fully consistent with Corning's claim construction position regarding rails, which it advanced in the same brief. *See* CX-2060C (Prucnal RWS) Q/A 133-35.

Respondents' argument concerning indefiniteness is discussed in the Validity section, *infra*.

B. Infringement Analysis of the '456 Patent

As noted, Corning asserts independent claims 11 and 27 and dependent claims 12, 14-16, 19, 21, and 28. For the reasons discussed below, Corning has shown by a preponderance of the evidence that respondent's accused products infringe independent claims 11 and 27, and dependent claims 12, 14-16, 19, 21, and 28, of the '456 patent.

1. Accused Products

The accused products consist of chassis, modules, and combinations thereof. There are three categories of accused products, Base-8, Base-12, and Base-24, which are defined by the number of fiber connections available per module. First, a Base-8 module supports eight fiber connections, and a Base-8 chassis supports eighteen Base-8 modules per 1U space. *See* CX-0001C (Prucnal WS) Q/A 63. Second, a Base-12 module supports twelve fiber connections, and a Base-12 chassis supports twelve Base-12 modules per 1U space. *Id.* Finally, a Base-24 module supports twenty-four fiber connections, and a Base-24 chassis supports six Base-24 modules per 1U space. *Id.* In each case, there are a

Case: 22-1228 Document: 29 VERSON 397 Filed: 04/25/2022 Confidential Material Omitted on this Page

total of 144 connections available in a 1U space; the difference in the three categories is in the number of modules needed to fill that space.

Within each category, there are three chassis sizes: 1U, 2U, and 4U, which refer to the chassis height. *Id.* Apart from the total height, these types are materially the same for each respondent. *Id.* That is, the fiber optic connection density for a 1U chassis from a given respondent is the same as the density for a 2U or 4U chassis from that respondent. *Id.* Q/A 64. Complainant argues that therefore "for each Respondent, and within each fiber connectivity configuration (Base-12, Base-8, and Base-24), a 1U chassis is representative of a 2U chassis and a 4U chassis for purposes of the asserted patents." *Id.*; *see also* CX-2042 (Compl. & Siemon Stip. Re Representative Accused Prods.) (stipulating that within each of the three categories, Siemon's 1U chassis is representative of its 2U and 4U chassis for purposes of the asserted patents).

Complainant has offered a complete list of representative accused products for each respondent, along with the group of accused products represented by each such product, through the testimony of Dr. Prucnal. *See* CX-0001C (Prucnal WS) Q/A 62; CDX-0013 (Prucnal list of accused products).

Not all respondents market all types of accused products. The following describes the accused products allegedly imported and/or sold in the United States by each respondent:

207

Case: 22-1228 Document: 29 VE Rage: 398 Filed: 04/25/2022 Confidential Material Omitted on this Page

	Brand	Chassis			Module		
Respondent		Base-8	Base-12	Base-24	Base- 8	Base- 12	Base- 24
FS	FHX	1U	1U		Х	Х	
Leviton	OPT-X		1U/2U/4U			Х	Х
Panduit	HD FLEX	1U/2U/4U	1U/2U/4U	1U/2U/4U	Х	Х	Х
Siemon	LightStack	1U/2U/4U	1U/2U/4U		X	X	

Summary of Accused Products

See Staff Br. at 20.

a. Panduit

The Panduit accused products are marketed as "HD FLEX Fiber" enclosures and cassettes. The accused Panduit chassis fall into three categories (Base-8, Base-12, and Base-24), and are available in three sizes (1U, 2U, and 4U). The accused Panduit modules are available in three configurations (Base-8, Base-12, and Base-24). *See* CX-0001C (Prucnal WS) Q/A 85; CPX-0062 (Panduit Base-8 1U chassis); CPX-0063 (Panduit Base-12 1U chassis); CPX-0065 (Panduit Base-24 1U chassis); CPX-0073 (Panduit Base-8 module); CPX-0074 (Panduit Base-12 module); CPX-0075 (Panduit Base-24 module).

b. Leviton

The Leviton accused products are marketed under the names "OPT-X UHDX Enclosures" and "HDX Enterprise Cassettes." The accused Leviton enclosures are all Base-12 chassis, available in three sizes (1U, 2U, and 4U). The accused Leviton modules are available in two configurations (Base-12 and Base-24). Both the Base-12 and the

208

Case: 22-1228 Document: 29 VERSON 399 Filed: 04/25/2022 Confidential Material Omitted on this Page

Base-24 modules are used with the Leviton Base-12 chassis. *See* CX-0001C (Prucnal WS) Q/A 98; CPX-0057 (Leviton Base-12 1U chassis); CPX-0060 (Leviton Base-12 module); CPX-0061 (Leviton Base-24 module).

c. Siemon

The Siemon accused products are marketed under the name "LightStack Ultra High-Density Fiber Plug and Play system." The accused Siemon chassis fall into two categories (Base-8 and Base-12) and are available in three sizes (1U, 2U, and 4U). The accused Siemon modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 106; CPX-0076 (Siemon Base-8 1U chassis); CPX-0077 (Siemon Base-12 1U chassis); CPX-0078 (pre-Aug. 2019 version of Siemon Base-12 1U chassis); CPX-0079 (Siemon Base-8 module); CPX-0080 (Siemon Base-12 module).

d. FS

The FS accused products are marketed under the names "FHX Series" and "FHX-FCP/FHX-C Series" and include both chassis and modules. The accused FS chassis fall into two categories (Base-8 and Base-12) and are available in just one size (1U). The accused FS modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 117; CPX-0053 (FS Base-8 1U chassis); CPX-0054 (FS Base-12 1U chassis); CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module).

2. Direct and Indirect Infringement

As noted, Corning asserts independent claims 11 and 27 and dependent claims 12, 14-16, 19, 21, and 28 of the '456 patent. Asserted claims 11-12, 14-16, 19, and 21 of the '456 patent are asserted against FS. These claims and claims 27 and 28 are asserted against Panduit and Siemon. Leviton is accused of infringing claims 11, 14-16, 19,

209

and 27. See Compl. Br. at 98-109; CX-0001C (Prucnal) Q/A 196.

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Panduit, Leviton, Siemon, and FS accused combinations practice each element of asserted claims of the '456 patent. However, it has not been shown that Panduit, Siemon, and FS accused combinations directly infringe the asserted claims inasmuch as they do not sell their accused chassis and modules in combination. Inasmuch as Leviton is the only respondent shown to sell accused chassis and modules in an infringing combination, only Leviton directly infringes the asserted claims. Indirect infringement is discussed, *infra*.

a. Issues Common to Multiple Respondents

Asserted claims 11 and 27 of the '456 patent read:

11. A fiber optic apparatus, comprising:

- a chassis configured to be disposed in an equipment rack, the chassis comprising front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a *plurality of fiber optic equipment trays* supported by the chassis and extendable relative to the chassis in the longitudinal direction; and
- a *plurality of fiber optic modules* configured to be installed in the *plurality of fiber optic equipment trays*, wherein each fiber optic module of the *plurality of fiber optic modules* comprises a front side, a rear side, an internal chamber, a plurality of first fiber optic adapters disposed through the front side, at least one second fiber optic adapter disposed through the rear side, and a plurality of optical fibers disposed within the internal chamber and

210

extending from the at least one second fiber optic adapter to the plurality of first fiber optic adapters;

- wherein each fiber optic equipment tray of the *plurality of fiber optic equipment trays* is configured to receive multiple fiber optic modules of the *plurality of fiber optic modules*;
- wherein the *plurality of fiber optic equipment trays* and the *plurality of fiber optic modules* are configured to support a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space of the chassis, *based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters*; and

wherein a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches.

14. The fiber optic apparatus of claim 11, wherein for each fiber optic module of the plurality of fiber optic modules, each fiber optic adapter of the plurality of first fiber optic adapters comprises *a simplex LC fiber optic adapter or a duplex LC fiber optic adapter*, and wherein the at least one second fiber optic adapter comprises at least one multi-fiber push-on (MPO) fiber optic adapter.

19. The fiber optic apparatus of claim 18, wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to support a *fiber optic connection density* of one hundred forty-four (144) fiber optic connections per U space of the chassis, based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters.

27. A fiber optic apparatus, comprising:

a chassis configured to be disposed in an equipment rack, the chassis comprising front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;

- a *plurality of fiber optic equipment trays* supported by the chassis and extendable relative to the chassis in the longitudinal direction; and
- a *plurality of fiber optic modules* configured to be installed in the *plurality of fiber optic equipment trays*, wherein each fiber optic module of the *plurality of fiber optic modules* comprises a front side, a rear side, an internal chamber, a plurality of first fiber optic adapters disposed through the front side, at least one second fiber optic adapter disposed through the rear side, and a plurality of optical fibers disposed within the internal chamber and extending from the at least one second fiber optic adapter to the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the *plurality of fiber optic equipment trays* is configured to receive multiple fiber optic modules of the *plurality of fiber optic modules*;
- wherein the chassis defines a 4-U space, in which a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches; and
- wherein the *plurality of fiber optic equipment trays* and the *plurality of fiber optic modules* are configured to support a fiber optic connection density of five hundred seventy-six (576) fiber optic connections in the 4-U space of the chassis, *based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters*.

JX-0010 ('456 Patent) (emphasis added).

Although the '456 patent claims the same density as the '320 patent, the claim

language differs in two main respects.

First, whereas the '320 patent recites a "fiber optic connection density of at least

[98 or 144] fiber optic connections per U space of the chassis, based on using at least one

simplex fiber optic component or at least one duplex fiber optic component," the '456

patent recites density "based on using a simplex fiber optic adapter or a duplex fiber optic

212
Case: 22-1228 Document: 29 VERSON 403 Filed: 04/25/2022 Confidential Material Omitted on this Page

adapter as each fiber optic adapter of the plurality of first fiber optic adapters" on the front of the module. JX-0010 ('456 Patent), Claims 11, 27. Dependent claim 14 further specifies that such adapters are "a simplex LC fiber optic adapter or a duplex LC fiber optic adapter." *Id.*, Claim 14.

Second, whereas the '320 patent required only "a fiber optic connection equipment" — that is a single module — in the chassis "configured to support" the claimed densities, the '456 patent claims require a "plurality of fiber optic modules configured to support" the claimed density of at least 98 fiber optic connections. Like claim 3 of the '320 patent, claim 19 of the '456 patent recites a density of 144 fiber optic connections per U space — but it recites exactly that number, not "at least" 144 as in claim 3 of the '320 patent.

i. Respondents' Quad LC Adapters

Given that the asserted claims of the '456 patent recite a density based on the use of a simplex or duplex fiber optic adapter, as opposed to a simplex or duplex fiber optic component (which may be either an adapter or connector), respondents' accused modules with quad LC adapters do not infringe these claims based solely on the fact that these adapters receive simplex or duplex LC connectors, as is the case with claims 1 and 3 of the '320 patent. That is, however, irrelevant. In the Claim Construction section above, the administrative law judge determined that (1) the claim term "simplex [LC] fiber optic adapter" should be construed to mean "fiber optic adapter that supports a simplex [LC] connector"; and (2) the claim term "duplex [LC] fiber optic adapter" should be construed to mean "fiber optic adapter that supports a duplex [LC] connector."

In the Claim Construction section, after discussing the claim language and the

213

specification, the administrative law judge stated the following concerning the industry

standard, *inter alia*:

First, TIA-568-C, Generic Telecommunications Cabling for Customer Premises, is a general industry standard for fiber optic connection equipment. Its glossary defines a duplex fiber optic adapter as a "mechanical device designed to align and join two duplex optical fiber connectors (plugs) to form an optical duplex connection." CX-0922C (TIA-568-C.0) at 16. It defines a duplex connector, in turn, as a "remateable device that terminates two fibers and mates with a duplex receptacle." Id. at 17. The TIA-568-C standard also defines a multiple fiber adapter (or "array" adapter) as a "mechanical device designed to align and join two array optical fiber connectors (plugs) to form an optical array connection"; and an "array" connector - which, the standard itself states, can also be called a "multi-fiber connector" — as a "single ferrule connector that contains multiple optical fibers arranged in a row or in rows and columns." Id. at 16. Thus, for both duplex adapters and multiple fiber adapters, the TIA-568-C standard defines these adapters solely in terms of the types of connectors they receive. CX-0001C (Prucnal WS) Q/A 30; 164-66; 186; Prucnal Tr. 386:14-389:20 (discussing TIA 568-C). Thus, it is undisputed that respondents' quad LC adapters meet this industry standard definition of a duplex LC adapter.

Second, the industry standard that governs the particular type of simplex/duplex adapter at issue supports Corning's and Staff's proposed construction. The TIA standard known as FOCIS 10 defines standardized LC connectors and adapters. *See* CX-0195 (FOCIS-10A). To designate an adapter or connector as "LC" is to say that it complies with the FOCIS 10 standard. *Id.* at 7. FOCIS 10 defines only simplex and duplex connectors and adapters. *Id.* at 9; CX-0001C (Prucnal WS) Q/A 191. Further, it shows that a duplex adapter is merely two simplex adapters arranged side by side. *Compare* CX-0195 (FOCIS-10A) at 15, 17 (figures "2.2.1a" and "2.2.1b" define "[s]implex . . . adapter interface[s]") *with id.* at 19 ("[e]ach of the units in the duplex adapter shall comply with all of the dimensions of figure 2.2.1a or 2.2.1b"); Prucnal Tr. 392:6-20. This contradicts respondents' claim that an adapter cannot simultaneously be both duplex and simplex.

FOCIS 10 does not define any "quad" LC adapter. CX-0001C (Prucnal WS) Q/A 191. Thus, if a quad adapter qualifies as an LC adapter — as respondents' quad adapters do — it can do so only by meeting the specification for a simplex LC adapter (as a set of four such adapters), a duplex LC adapter (as a set of two), or both. Just as a duplex LC adapter is also two simplex LC adapters, a quad adapter is merely two duplex LC

Case: 22-1228 Document: 29 VERSO 405 Filed: 04/25/2022 Confidential Material Omitted on this Page

adapters or four simplex LC adapters. CX-0001C (Prucnal WS) Q/A 176, 186; Prucnal Tr. 391:6-19, 392:21-393:8.

See Section V.A.4, supra.

Thus, respondents' quad LC adapters are themselves properly understood as simplex or duplex LC adapters.

ii. Accused Chassis with Accused Modules

As noted above, the claims of the '456 patent require a "plurality of fiber optic modules" — together with a "plurality of fiber optic equipment trays" — "configured to support" the claimed fiber optic connection densities. Thus, the claims require at least two accused modules in an accused chassis. Respondents argue, as they did with respect to the '320 patent, that "configured to support" requires a mostly or fully loaded chassis. For the same reasons discussed with respect to the '320 patent, that is incorrect.

b. Direct and Indirect Infringement - Panduit

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Panduit's accused combinations practice each element of asserted claims 11, 12, 14-16, 19, 21, 27, and 28 of the '456 patent. *See* Compl. Br. at 100-05; CX-0001C (Prucnal WS) Q/A 200-03, 205, 209-10, 214-16, 226, 229-30, 237-40, 247-52, 271, 273, 277-81, 284-85, 292, 294, 298-307, 316-19, 322-23, 330-31, 334-35, 342-43, 347-48, 357-59, 363-65, 375-77, 382-85, 394-98, 401-02, 407, 410-11, 416-19. However, it has not been shown that those accused combinations directly infringe the asserted claims inasmuch as Panduit does not sell its accused chassis and modules in combination.

Direct Infringement

Independent Claim 11

The only dispute with respect to claim 11 involves respondents' argument that this claim requires evidence of a fully loaded chassis. *See* Resps. Br. at 130-36. This is the same argument Panduit made with respect to the '320 patent and found to be incorrect.

Dependent Claim 12

Claim 12 recites: "The fiber optic apparatus of claim 11, wherein the plurality of first fiber optic adapters is disposed through at least eighty-five percent (85%) of a width of the front side of at least one fiber optic module of the plurality of fiber optic modules."

The administrative law judge determined that the claim term "width of the front side of [the] fiber optic module" should be construed to mean "the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions that are used to insert the module into the chassis or remove it from the chassis."

Dr. Prucnal's analysis of the accused modules used Panduit's detailed technical measurements of these modules, which he confirmed by taking his own measurements. He found that the Panduit Base-12 Module has six spaces on the face of the module for inserting six LC duplex adapters; that each of these spaces measures 13.08 mm; and that, collectively, these six spaces occupy a width of 78.48 mm. *See* CX-0001C (Prucnal WS) Q/A 306; CX-1679C (Panduit HDFE MPO Cassette Base Drawing). He also found that the front side of the Panduit Base-12 module is 88.00 mm excluding side protrusions and 93.22 mm including side protrusions. *See* CX-0001C (Prucnal WS) Q/A 306. He thus

216

Case: 22-1228 Document: 29 VERSO 407 Filed: 04/25/2022 Confidential Material Omitted on this Page

found that Panduit's adapters take up 89% of the front side of the module excluding protrusions (correct construction) and 84% of the front side of the module including protrusions (respondents' proposed construction).

Dr. Prucnal found that the Panduit Base-8 Module has three spaces on the front side of the module for inserting four duplex LC adapters that total 51.46 mm. *See* CX-0001C (Prucnal WS) Q/A 307; CX-1735C (Panduit LC - MPO Cassette Drawing). He further found that, according to Panduit's documents, the front side is 55.38 mm excluding side protrusions and 60.50 mm including side protrusions. *See* CX-0001C (Prucnal WS) Q/A 307; CX-1735C (Panduit LC - MPO Cassette Drawing). He thus found that, using Panduit's own documents, the adapters take up 92.9% of the front side of the module excluding protrusions (correct construction) and 85% of the front side of the module including protrusions (respondents' proposed construction). *See* CX-0001C (Prucnal WS) Q/A 307.³⁸

Respondents argue that Dr. Min found that the Panduit Base-12 Module does not infringe claim 12 when "excluding protrusions," Resps. Br. at 133-34, but that is incorrect. Dr. Min found no infringement when including protrusions in the measurement of the front side (respondents' proposed construction), but offered no

³⁸ Dr. Prucnal acknowledged that using his own measurements (as opposed to Panduit's), the adapters take up only 84.6% of the front side under Respondents' proposed constructions, but he explained that Panduit's measurements are more likely to be reliable and should therefore be preferred. CX-0001C (Prucnal WS) Q/A 307. Regardless, 84.6% rounds to 85%. See Viskase Corp. v. Am. Nat'l. Can Co., 261 F.3d 1316, 1320 (Fed. Cir. 2001) (observing the "standard scientific convention" of rounding "when a number has not been carried to the next mathematically significant figure"); Noven Pharms., Inc. v. Actavis Labs. UT, Inc., C.A. No. 15-249-LPS, 2016 WL 3625541, at *3, 5 (D. Del. July 5, 2016) (construing the term "15 mg/cm²" as having a "plain and ordinary meaning . . . of greater than or equal to 14.5 mg/cm² and less than 15.5 mg/cm²").

Case: 22-1228 Document: 29 VERSON 408 Filed: 04/25/2022 Confidential Material Omitted on this Page

opinion under the correct construction that exclude protrusions. *See* RX-0006C (Min RWS) Q/A 165. Respondents appear to concede this. *See* Resps. Br. at 133 ("Under at least Respondents' construction, Complainant will be unable to establish that Panduit's Accused Products infringe claims 12 and 28").

Respondents argue the Panduit Base-8 Module does not infringe "excluding protrusions," Resps. Br. at 134, but that is again incorrect. The percentage they cite (84.6%) relies on Dr. Prucnal's measurements including side protrusions (respondents' construction), as both Dr. Prucnal's and Dr. Min's testimony make clear. *See* CX-0001C (Prucnal WS) Q/A 307; RX-0006C (Min RWS) Q/A 166. Dr. Prucnal's testimony shows that Panduit's modules infringe under the correct claim construction because the adapters take up 92.4% of the front side, *see* CX-0001C (Prucnal WS) Q/A 307. Dr. Min gives no contrary opinion.

Dependent Claims 14-16, 19, and 21

Dependent claims 14-16, 19, and 21, all of which depend from claim 11, require modules with an LC-to-MPO connection (claim 14), horizontal rows of modules (claim 15), and modules that can be locked in place (claims 16 and 21). *See* JX-0010 ('456 Patent) at 22:21-36, 22:63-23:3. Claim 19 requires 144 connections per U space. *Id.* at 22:42-49. Respondents do not dispute that all of the Panduit accused combinations satisfy the additional limitations of claims 14-16 for the reasons set forth in Dr. Prucnal's testimony. *See* CX-0001C (Prucnal WS) Q/A 322-23, 334-35, 347-48. Thus, inasmuch as the Panduit accused combinations are found to infringe claim 11, then they infringe claims 14-16 as well.

Respondents dispute that Panduit's accused products infringe claim 19 on the

218

same grounds as they dispute infringement of claim 11 and found to be incorrect. See

Resps. Br. at 131-32. Panduit also infringes claim 21, which recites:

The fiber optic apparatus of claim 20, wherein for each fiber optic equipment tray of the plurality of fiber optic equipment trays, each module guide member of the first, second, and third module guide members comprises a locking feature configured to cooperate with a fiber optic module of the first or second fiber optic modules to prevent movement of the fiber optic module relative to the fiber optic equipment tray.

As the '456 specification indicates, a person of ordinary skill would understand that the plain meaning of a module guide member is a component of the fiber equipment tray that establishes individual openings into which fiber optic modules may be inserted. *See* JX-0010 ('456 Patent) at 6:20-42, 14:31-35, 15:46-60; CX-0001C (Prucnal WS) Q/A 376.

Dr. Prucnal demonstrated that each tray in the Panduit Base-12, Base-8, and Base-24 Chassis has five, seven, and four module guide members, respectively. *See* CX-0001C (Prucnal WS) Q/A 383. In each Chassis, these module guide members are molded plastic components that are integrated with the tray and extend upward from the bottom of the tray toward the top of the chassis. *See* CX-0001C (Prucnal WS) Q/A 383; CX-0382 (Panduit HD FLEX Ordering Guide) at 3; CX-1705 (Panduit FLEX1U, FLEX2U, & FLEX4U Installation Instructions); JX-0017C (Kuffel Dep. Tr.) 428-434. The guide members on the trays form four, six, and two channels, respectively, into which Panduit Base-12, Base-8, and Base-24 Modules may be inserted.

Dr. Prucnal also explained in detail how each representative Panduit module is configured to be locked into place in a fiber optic equipment tray, based on Panduit's documents and witness testimony, as well as Dr. Prucnal's own examination of the accused products. *See* CX-0001C (Prucnal WS) Q/A 348; CX-1623 (Panduit FLEX1U,

219

Case: 22-1228 Document: 29 VERSON 410 Filed: 04/25/2022 Confidential Material Omitted on this Page

FLEX4U Installation Instructions); CX-1705 (Panduit FLEX1U, FLEX2U, & FLEX4U Installation Instructions); JX-0017C (Kuffel Dep. Tr.) 238-241, 354-355, 431-434; *see* CX-1849 (Panduit Photos Ex. F) at 22, 44, 67.

Dr. Min's contrary opinions are unpersuasive. He opines first that "[w]ith respect to the front portion of the tray, Dr. Prucnal does not identify what the specific 'locking feature' is in the module guides." RX-0006 (Min RWS) Q/A 177. This is an improper attempt to import a limitation into the claim. Claim 21 does not require a locking feature in the front portion of the tray — the claim requires "a locking feature configured to cooperate with a fiber optic module of the first or second fiber optic modules to prevent movement of the fiber optic module relative to the fiber optic equipment tray," but does not specify where on the module guide that locking feature must be located. The specification, moreover, contains embodiments of a locking feature on the rear of the module guides. *See* JX-0010 ('456 Patent) at 6:64-7:7.

Dr. Min opines that, although Dr. Prucnal "asserts that the combination of the rear stop and metal spring clip limits the movement of the cassette," Dr. Prucnal does not "explain how the combination of the rear stop and the metal spring clip satisfy the 'a locking feature' requirement of claim 21." RX-0006C (Min RWS) Q/A 177. Dr. Min later appears to opine that "multiple components" cannot be "the single 'locking feature." *Id.* Q/A 179. A person of ordinary skill would not understand "a feature" to be limited to a single component, and Dr. Min provides no evidence to suggest otherwise. *See IGT v. Glob. Gaming Tech., Inc.*, No. CV-S-94-601-HDM (LRL), 1997 WL 361610, at *2 (D. Nev. Feb. 18, 1997) ("a single claim element in a patent may be found by combining multiple components in the accused device"), *aff 'd in part, vacated in part*, 194 F.3d

220

1339 (Fed. Cir. 1999).

Independent Claim 27 and Dependent Claim 28

Respondents dispute that Panduit's accused products infringe claim 27 on the same grounds as they dispute infringement of claim 11. *See* Resps. Br. at 131-32. Respondents dispute that Panduit's accused products infringe claim 28 on the same grounds as they dispute infringement of claim 12, *id.* at 133-34, and found to be incorrect.

* * *

Corning has shown by a preponderance of the evidence that Panduit's accused combinations practice each element of asserted claims of the '456 patent. However, it has not been shown that those accused combinations directly infringe the asserted claims inasmuch as Panduit does not sell its accused chassis and modules in combination.

Indirect Infringement

For the same reasons discussed in the Indirect Infringement section of the '320 patent, Panduit indirectly infringes the asserted claims of the '456 patent.

c. Direct and Indirect Infringement - Leviton

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Leviton's accused combinations practice each element of asserted claims 11, 14-16, 19, and 27 of the '456 patent. *See* Compl. Br. at 105-06; CX-0001C (Prucnal WS) Q/A 200-03, 206, 209-10, 217-19, 226, 231-32, 237-40, 253-58, 271, 274, 277-81, 286-87, 292, 295, 298-303, 316-19, 324-25, 330-31, 336-37, 342-43, 349-50, 357-59, 366-68, 394-98, 403-04, 407, and 412-13.

221

Direct Infringement

Independent Claim 11

Leviton's only dispute with respect to claim 11 involves respondents' argument that this claim requires evidence of a fully loaded chassis and that Leviton's quad LC adapters are not simplex or duplex adapters. These are the same arguments made with respect to the '320 patent, and found to be incorrect.

Dependent Claims 14-16, and 19

The remaining dependent claims asserted against Leviton, all of which depend from claim 11, require modules with an LC-to-MPO connection (claim 14), horizontal rows of modules (claim 15), modules that can be locked in place (claim 16), and 144 connections per U space (claim 19). *See* JX-0010 ('456 Patent) at 22:21-36, 22:42-49, 22:63-23:3. Respondents do not dispute that the Leviton accused products satisfy the additional limitations of claims 14-16, for the reasons set forth in Dr. Prucnal's testimony. *See* CX-0001C (Prucnal WS) Q/A 324-25, 336-37, 349-50. Thus, inasmuch as the Leviton accused combinations are found to infringe claim 11, then they infringe claims 14-16 as well.

Independent Claim 27

Respondents dispute that the Leviton accused products practice this claim on the same grounds as they dispute infringement of claim 11. Thus, inasmuch as the Leviton accused combinations are found to infringe claim 11, then they infringe claims 14-16 as well.

* * *

Accordingly, the accused combinations of Leviton products directly infringe the asserted claims of the '456 patent.

Indirect Infringement

For the same reasons discussed in the Indirect Infringement section of the '320 patent, Leviton indirectly infringes the asserted claims of the '456 patent.

d. Direct and Indirect Infringement - Siemon

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Siemon's accused combinations practice each element of the asserted claims 11, 12, 14-16, 19, 21, 27, and 28 of the '456 patent. *See* Compl. Br. at 106-08; CX-0001C (Prucnal WS) Q/A 200-03, 207, 209-10, 220-22, 226, 233-34, 237-40, 259-64, 271, 275, 277-81, 288-89, 292, 296, 298-303, 308-11, 326-27, 338-39, 351-54, 369-71, 375-77, 386-89, 394-98, 405-06, 407, 414-18, 420. However, it has not been shown that Siemon's accused combinations directly infringe the asserted claims inasmuch as Siemon does not sell its accused chassis and modules.

Direct Infringement

Independent Claim 11

Siemon's only dispute with respect to claim 11 involves respondents' argument that this claim requires evidence of a fully loaded chassis and that Siemon's quad LC adapters are not simplex or duplex adapters. These are the same arguments made with respect to the '320 patent, and found to be incorrect.

Dependent Claim 12

For the Siemon Base-12 Module, Dr. Prucnal's detailed analysis found that it has three spaces on the face of the module for inserting three quad LC adapters; that each of

223

Case: 22-1228 Document: 29 VERSON 14 Filed: 04/25/2022 Confidential Material Omitted on this Page

these spaces measures 26.00 mm according to Siemon's documents; and that, collectively, these three spaces occupy a width of 72.00 mm. *See* CX-0001C (Prucnal WS) Q/A 310; CX-0183C (Siemon Cassette Base 12 Drawing). He also found that, according to Siemon's documents, the front side of the Siemon Base-12 module is 91.24 mm excluding side protrusions and 94.04 mm including side protrusions. *See* CX-0001C (Prucnal WS) Q/A 310. He thus found that the adapters in Siemon's Base-12 module take up 85.5% of the front side of the module excluding protrusions and 82.9% of the front side of the module including protrusions, and therefore infringe under at least Staff's proposed construction. *See* CX-0001C (Prucnal WS) Q/A 310.

For the Siemon Base-8 Module, Dr. Prucnal found that it has two spaces on the face of the module for inserting two quad LC adapters, and that each of these spaces measures 26.03 mm according to Siemon's documents, for a total of 52.06 mm. *See* CX-0001C (Prucnal WS) Q/A 311; CX-1790C (Siemon Cassette Base 8 Drawing). He further found that Siemon's documents showed the front side of the Representative Siemon Base-8 Module is 58.78 mm excluding side protrusions and 62.00 mm including side protrusions. *See* CX-0001C (Prucnal WS) Q/A 311. He thus found that using Siemon's documents, the adapters take up 88.5% of the front side of the module excluding protrusions and 84% of the front side of the module including protrusions, and therefore infringe under at least Staff's proposed construction.

Respondents argue that Siemon does not infringe "because the front openings on Siemon's Fiber Optic Modules do not constitute 85% of the width of the front side of the module." *See* Resps. Br. at 144. However, claim 12 does not recite a "front opening" (a claim limitation used in the "206 patent). It instead recites that "the plurality of first

224

Case: 22-1228 Document: 29 VERSON 415 Filed: 04/25/2022 Confidential Material Omitted on this Page

fiber optic adapters is disposed through at least eighty-five percent (85%) of a width of the front side." Siemon provides no basis to conflate the space through which the adapters are disposed with a front opening, nor any supporting expert opinion. Dr. Min does not dispute Dr. Prucnal's measurements.

Dependent Claims 14-16, 19, and 21

Dependent claims 14-16, 19, and 21 require modules with an LC-to-MPO connection (claim 14), horizontal rows of modules (claim 15), and modules that can be locked in place (claims 16 and 21). *See* JX-0010 ('456 Patent) at 22:21-36, 22:63-23:3. Claim 19 requires 144 connections per U space. *Id.* at 22:42-49. Respondents do not dispute that all of the Siemon accused combinations satisfy the additional limitations of these claims for the reasons that Dr. Prucnal set forth in his testimony. *See* CX-0001C (Prucnal WS) Q/A 326-27, 338-39, 351-54, 369-71, 386-89. Thus, inasmuch as the Siemon accused combinations are found to infringe claim 11, then they infringe claims 14-16, 19, and 21 as well.

Independent Claim 27 and Dependent Claim 28

Respondents concede that the Siemon accused products practice the limitations of claim 27 and 12, except for the same arguments regarding the density limitations they make with respect to claims 11 and 12, respectively, and found to be incorrect.

* * *

Corning has shown by a preponderance of the evidence that Siemon's accused combinations practice each element of asserted claims of the '456 patent. However, it has not been shown that those accused combinations directly infringe the asserted claims

225

inasmuch as Siemon does not sell its accused chassis and modules in combination.

Indirect Infringement

For the same reasons discussed in the Indirect Infringement section of the '320 patent, Siemon indirectly infringes the asserted claims of the '456 patent.

e. Direct and Indirect Infringement - FS

For the reasons discussed below, Corning has shown by a preponderance of the evidence that FS's accused combinations practice each element of asserted claims 11, 12, 14-16, 19, 21, 27, and 28 of the '456 patent. *See* Compl. Br. at 108-09; CX-0001C (Prucnal WS) Q/A 200-03, 208-10, 222-226, 235-40, 265-71, 276-81, 290-92, 297-303, 312-19, 328-31, 340-43, 355-59, 372-77, 390-93. However, it has not been shown that FS's accused combinations directly infringe the asserted claims inasmuch as FS does not sell its accused chassis and modules in combination.

Direct Infringement

FS and its customers directly infringe claims 11, 12, 14-16, 19, and 21 of the '456 Patent through the FS accused products.

Independent Claim 11

FS's only dispute with respect to claim 11 concerns respondents' argument that this claim requires evidence of a fully loaded chassis and that FS quad LC adapters are not simplex or duplex adapters. *See* Resps. Br. at 148-50. These are the same arguments made with respect to the '320 patent, and fail for the same reasons described above.

Dependent Claim 12, 14-16, 19, and 21

The remaining dependent claims asserted against FS, all of which depend from claim 11, require modules with an LC-to-MPO connection (claim 14), horizontal rows of

Case: 22-1228 Document: 29 VE Rage: 417 Filed: 04/25/2022 Confidential Material Omitted on this Page

modules (claim 15), and modules that can be locked in place (claims 16 and 21). *See* JX-0010 ('456 Patent) at 22:21-36, 22:63-23:3. Claim 19 requires 144 connections per U space. *Id.* at 22:42-49. Respondents do not dispute that all of the FS accused products satisfy each of these additional limitations for the reasons set forth in Dr. Prucnal's testimony. *See* CX-0001C (Prucnal WS) Q/A 328-29, 340-41, 355-56, 372-74, 390-93. Thus, inasmuch as the the FS accused combinations are found to infringe claim 11, then they infringe claims 14-16, 19, and 21 as well.

* * *

Corning has shown by a preponderance of the evidence that FS's accused combinations practice each element of asserted claims of the '456 patent. However, it has not been shown that those accused combinations directly infringe the asserted claims inasmuch as FS does not sell its accused chassis and modules in combination.

Indirect Infringement

For the same reasons discussed in the Indirect Infringement section of the '320 patent, FS indirectly infringes the asserted claims of the '456 patent.

C. Domestic Industry (Technical Prong)

Corning and the Staff argue that the evidence shows that the Corning domestic industry products are covered by asserted claims of the '456 patent. *See* Compl. Br. at 233-34; Staff Br. at 161-62. Respondents argue, "Complainant failed to prove any combination of an EDGE chassis and modules that practice claims 11, 12, 14-16, 19, 21, 27, or 28 of the '456 Patent." *See* Resps. Br. at 259-61.

As discussed below, the evidence shows that the Corning domestic industry

227

Case: 22-1228 Document: 29 VERSON 418 Filed: 04/25/2022 Confidential Material Omitted on this Page

products are covered by asserted independent claims 11 and 27 and dependent claims 12, 14-16, 19, 21, and 28 of the '456 patent.

The EDGE DI Chassis together with the EDGE DI Modules practice asserted claims 11, 12, 14-16, 19, 21, 27, 28 of the '456 patent. Claim 11 requires a fiber optic apparatus comprising a chassis with a plurality of extendable equipment trays, a plurality of modules with fiber optic adapters on the front and rear, and requires that the equipment trays be configured to receive multiple modules, and that the connection equipment be configured to support a density of at least 98 connections per U space based on using simplex or duplex adapters. JX-0010 ('456 Patent), Claim 11. Dr. Ralph's testimony shows that the EDGE DI Chassis, using at least two EDGE DI Modules (a plurality of modules), satisfies the structural features and density required by claim 11. *See* CX-0002C (Ralph WS) Q/A 73-96; CX-1869 (Corning Photos Ex. D) at 2, 9, 17, 24, 42-43, 45-51; CPX-0040 (EDGE Base-8 Chassis); CPX-0041 (EDGE Base-12 Chassis); CPX-0042 (EDGE Base-8 Module); CPX-0043 (EDGE Base-12 Module).

Respondents make only one argument against the technical prong for the '456 patent, and it is identical to their argument for the '320 patent: that Corning has failed to show specific instances of EDGE DI Chassis fully loaded with EDGE DI Modules. *See* Resps. Br. at 259-61. For the same reasons discussed above with respect to the '320 patent, this argument is rejected.

Respondents do not separately dispute that the EDGE DI Chassis with EDGE DI Modules satisfies the additional asserted claims of the '456 patent.

As Dr. Ralph testified, the EDGE products satisfy the additional claims for the reasons described below.

228

Case: 22-1228 Document: 29 VE Rage: 419 Filed: 04/25/2022 Confidential Material Omitted on this Page

- <u>Claim 12</u>: The EDGE DI Modules have adapters disposed through at least 85% of the width of the front side of the module. CX-0002C (Ralph WS) Q/A 97-102.
- Claim 14: The EDGE DI Modules have duplex LC adapters on the front side and MTP adapters on the rear side. CX-0002C (Ralph WS) Q/A 103-104.
- <u>Claim 15</u>: Each tray in the EDGE DI Chassis is configured to receive a single row of multiple EDGE DI Modules. CX-0002C (Ralph WS) Q/A 105-107.
- Claim 16: Each EDGE DI Module is configured to be locked into place in the trays of the EDGE DI Chassis. CX-0002C (Ralph WS) Q/A 108-109.
- <u>Claim 19</u>: The EDGE DI Chassis has three trays that accept EDGE DI Modules and are configured to support 144 fiber optic connections per U space based on using simplex or duplex fiber optic adapters. CX-0002C (Ralph WS) Q/A110-113.
- <u>Claim 21:</u> The EDGE DI Chassis has module guide members with locking features configured to receive EDGE DI Modules. CX-0002C (Ralph WS) Q/A 114-117.
- <u>Claims 27:</u> The 4U EDGE DI Chassis is configured the same way as the EDGE DI Chassis but has 12 equipment trays and is configured to support 576 fiber optic connections per U space based on using simplex or duplex adapters. CX-0002C (Ralph WS) Q/A 118-135; *see also* CPX-0044 (EDGE Base-8 4U Chassis); CPX-0045 (EDGE Base-12 4U Chassis).
- Claim 28: For the same reasons as in claim 12, the EDGE DI Modules when used with the EDGE 4U DI Chassis have adapters disposed through at least 85% of the width of the front side of the module. CX-0002C (Ralph WS) Q/A 136-137.

Accordingly, Corning has satisfied the technical prong of the domestic industry

requirement with respect to the '456 patent.

D. Validity of the '456 Patent

As noted, Corning asserts independent claims 11 and 27 and dependent claims 12,

14-16, 19, 21, and 28 of the '456 patent.

229



Respondents argue that the following 11 different combinations render obvious all

asserted claims of the '456 patent:

- asserted claim 11 is obvious over Smrha '684 (RX-0458) in view of Niazi '209 (RX-0442) and AFL Future Access 1RU (RX-0525C (Future Access drawings));
- 2. asserted claim 12 is obvious in view of Smrha '684 in view of Niazi '209, and AFL Future Access 1RU;
- 3. asserted claim 12 is obvious in view of Smrha '684 in view of Niazi '209, AFL Future Access 1RU, and Panduit SFQ Cassette;
- 4. asserted claim 14 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- 5. asserted claim 15 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 16 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 19 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 21 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 28 is obvious in view of Smrha '684 in view of Niazi, Future Access 1 RU, Verdiell (RX-0462 (U.S. Patent No. 7,452,236 to Verdiell)) and Panduit SFQ cassette (CPX-0083) (see RX-0574C (Panduit SFQ Cassette drawing); RX-0576C (Panduit Quick Net Catalog (SFQ Series)));
- 10. asserted claim 27 is obvious over Smrha '684 in view of Niazi, Future Access 1RU, and Verdiell; and
- 11. asserted claim 28 is obvious in view of Smrha '684 in view of Niazi, Future Access 1 RU, and Verdiell.

Additionally, respondents argue:

- 12. asserted claim 11 of the '456 patent is invalid because the full scope of the claims is not enabled;
- 13. the claim term "U space" renders asserted claims 11, 12, 14, 15, 16, 19 and 21 indefinite; and
- 14. the claim term "width of the front side of [the] fiber optic module" is indefinite, rendering asserted claims 12 and 28 invalid.

See Resps. Br. at 150-85.

Corning and the Staff disagree. See Compl. Br. at 161-73, 226-30; Staff Br. at

162-72.

For the reasons discussed below, respondents have not shown by clear and

convincing evidence that the asserted independent claims 11 and 27 and dependent

claims 12, 14-16, 19, 21, and 28 of the '456 patent are invalid.

1. Obviousness

Respondents argue that the following 11 different combinations render obvious all

asserted claims of the '456 patent:

- asserted claim 11 is obvious over Smrha '684 (RX-0458) in view of Niazi '209 (RX-0442) and AFL Future Access 1RU (RX-0525C (Future Access drawings));
- 2. asserted claim 12 is obvious in view of Smrha '684 in view of Niazi '209, and AFL Future Access 1RU;
- 3. asserted claim 12 is obvious in view of Smrha '684 in view of Niazi '209, AFL Future Access 1RU, and Panduit SFQ Cassette;
- 4. asserted claim 14 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 15 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 16 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 19 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 21 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU;
- asserted claim 28 is obvious in view of Smrha '684 in view of Niazi, Future Access 1 RU, Verdiell (RX-0462 (U.S. Patent No. 7,452,236 to Verdiell)) and Panduit SFQ cassette (CPX-0083) (see RX-0574C (Panduit SFQ Cassette drawing); RX-0576C (Panduit Quick Net Catalog (SFQ Series)));
- 10. asserted claim 27 is obvious over Smrha '684 in view of Niazi,

Case: 22-1228 Document: 29 VERSO 422 Filed: 04/25/2022 Confidential Material Omitted on this Page

Future Access 1RU, and Verdiell; and

11. asserted claim 28 is obvious in view of Smrha '684 in view of Niazi, Future Access 1 RU, and Verdiell.

See Resps. Br. at 170-85.

Corning and the Staff disagree. See Compl. Br. at 161-73; Staff Br. at 162-73.

For the reasons discussed below, respondents have not shown by clear and convincing evidence that the 11 different combinations render obvious all asserted claims of the '456 patent.

Respondents argue that Smrha '684, in combination with AFL Future Access and Niazi '209, renders asserted claims 11, 14, 15, 16, 19, 20, and 21 of the '456 patent obvious. They further argue that these combinations, together with Panduit SFQ cassette, render claim 12 obvious; that these combinations, together with Verdiell '236, render claims 27 and 28 obvious; and that these combinations, together with Verdiell '236 and the Panduit SFQ cassette, render claim 28 obvious.

As discussed below, respondents have failed to demonstrate that a person of ordinary skill would have been motivated to combine these references, or that doing so would have yielded predictable results. They also lack clear and convincing evidence that these references, even if combined, would disclose the limitations of the '456 patent asserted claims.

a. Smrha '684 as the starting point

Respondents have failed to show that a person of ordinary skill would have been motivated to solve the problem of the '456 patent — accessible, practicable high density in a fiber optic enclosure for a data center environment — by combining Smrha '684 with

232

Case: 22-1228 Document: 29 VERSON 423 Filed: 04/25/2022 Confidential Material Omitted on this Page

the other references on which respondents rely. As discussed extensively for the '320 patent in the Validity section above, a person of ordinary skill would not have used Smrha '684 as a starting point for solving the problem solved by the '456 patent because it fails to provide the critical dimensions — fiber connections in a 1-U space — necessary to make modifications that would predictably increase density. *See* CX-2060C (Prucnal RWS) Q/A 481.

To show obviousness, Smrha '684 is a poor starting point not merely for the specific density recited in the '456 patent, but also for the modularity at the heart of the claimed design to achieve that density. As discussed above with respect to the '320 patent, the adapters in Smrha '684 are not contained in removable modules, but in fixed adapter packs, such that 48 duplex adapters (providing 96 connections) are installed at all times. A person of ordinary skill looking to solve the problem of a high-density, modular system would not start with a non-modular system, which would make development unpredictable. Indeed, before EDGE, the prior art taught away from independently removable modules because excessive movement could damage the fibers, especially in a dense system. *See* CX-2060C (Prucnal RWS) Q/A 267; CX-0006C (Staber WS) Q/A 25. A person of ordinary skill would not have converted a non-modular fiber enclosure like Smrha '684 to a modular one in the pursuit of greater density.

Dr. Blumenthal opines that a person of ordinary skill would be motivated to start with Smrha '684 because it describes a "continuous need for further improvement of high-density termination panels and associated methods." *See* CX-0032 (Smrha '684) at 1:28-30; RX-0001C (Blumenthal WS) Q/A 387, 399, 404, and 436. The specific problem solved by the '456 patent is accessible, modular, and scalable density, not

233

Case: 22-1228 Document: 29 VERSO 424 Filed: 04/25/2022 Confidential Material Omitted on this Page

simply forcing more connections into a box. *See TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (holding that an expert must "explain why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does*") (emphasis added).

b. Smrha '684 with AFL Future Access

As discussed above for the '320 patent, a person of ordinary skill would lack the motivation to combine Smrha '684 with AFL Future Access. These references have fundamentally different and incompatible architectures that make any supposed teachings of AFL Future Access inapplicable to Smrha '684. Like Smrha '684 itself, AFL Future Access does not disclose a modular system with removable modules, does not disclose modules with simplex/duplex adapters, and specifically discloses connections fixed in the enclosure.

c. Smrha '684 with Niazi '209

As discussed below, respondents have not shown that a person of ordinary skill would have been motivated to combine Smrha '684 with Niazi '209. The examiner reviewed Niazi '209 before issuing the '456 patent. *See* JX-0011 ('456 Prosecution History) at 11379. Dr. Blumenthal nonetheless opines that after modifying Smrha '684 in view of AFL Future Access to add a third row of adapters packs, a person of ordinary skill would further redesign this system in view of Niazi '209 to place each row of adapter packs onto its own separate, extendable tray. *See* RX-0001C (Blumenthal WS) Q/A 403-404. As there is no motivation for the first step, there also is no motivation for the second.

Case: 22-1228 Document: 29 VERSO 425 Filed: 04/25/2022 Confidential Material Omitted on this Page

First, Niazi '209 is not analogous art to the '456 patent. It is neither from the same "field of endeavor" nor "reasonably pertinent to the particular problem" of the '456 patent, which is creating fiber optic equipment with high density, accessibility, modularity, and scalability. *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011) (quoting *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)). As Dr. Blumenthal concedes, Niazi '209 is a patent application disclosing a computer chassis for housing modules of a computer system. *See* CX-2060C (Prucnal RWS) Q/A 510 and 512. A person of ordinary skill would not be motivated to combine a system for computer motherboard storage with a system for fiber optic equipment. They are separate fields. *See id*.

Dr. Blumenthal explained that Niazi '209 describes computer equipment for use "in the data center environment." *See* Blumenthal Tr. 782. Data centers include a wide range of equipment that spans many different fields of art. *See* CX-2060C (Prucnal RWS) Q/A 512. A person of ordinary skill would not find a motherboard storage system to be reasonably pertinent to building high-density fiber optic equipment that is accessible, modular, and scalable. That is particularly true because high-density fiber optic connection equipment must support many precise connections of fragile fibers. *Id.*; Prucnal Tr. 1040 (explaining that architecture for computer motherboards is "electronic technology highly optimized for slim profile, very robust in terms of the temperature, mechanical vibration, and the ability to even lay things right on top of each other" while "[f]iber optic packaging is very special" due to the fragility of the fibers and the risk of attenuation).

Second, the architectures of Niazi '209 and Smrha '684 are incompatible. Niazi '209 discloses a system for storing computer motherboards on stacked trays with separate

235

drawers for other components. *See* CX-2060C (Pruenal RWS) Q/A 510-11; Pruenal Tr. 1040-1042. Smrha '684 shows a chassis with two horizontal layers of adapter packs that slide on a mounting framework that sits on a bottom drawer. *See* CX-2060C (Pruenal RWS) Q/A 510. The drawer in Smrha '684, which Dr. Blumenthal identifies as the claimed tray, collectively pulls out all the adapter packs to facilitate installation; the sliding adapter pack assembly, by contrast, enables separate rows and columns of adapters to be accessed individually, when accessing those adapters. *See* CX-0032 (Smrha '684) at 3:28-32 and Figs. 2 & 3; CX-2060C (Pruenal RWS) Q/A 515. Additional drawers would simply take up space in which adapter packs could be disposed, or in which space for finger access could be provided, without providing any density advantage. *Id.*

Third, Smrha '684 teaches away from the multi-drawer system of Niazi '209. In Smrha '684, the purpose of having one drawer is to facilitate access to all of the adapter packs at the same time during installation, and the purpose of the sliding adapter pack assembly is to facilitate access to individual adapter packs. *See* CX-2060C (Prucnal RWS) Q/A 515. A system with multiple trays would require users to pull out more drawers for installation than just the one. *Id.* As shown by respondents' development of the accused products, these are complex designs that require considerable engineering, particularly to support both high density and accessibility. *Id.*

d. Analysis of the Asserted Claims

The 11 different combinations argued by respondents are discussed below on a claim by claim basis.



i. Claim 11

Respondents argue that asserted claim 11 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU.

plurality of fiber equipment trays

Respondents have not shown that Smrha '684 in combination with Niazi '209 discloses "a plurality of fiber optic equipment trays supported by the chassis and extendable relative to the chassis in the longitudinal direction." Dr. Blumenthal concedes that Smrha '684 discloses only one tray, not a plurality. *See* RX-0001C (Blumenthal WS) Q/A 418; CX-2060C (Prucnal RWS) Q/A 517. He opines that the computer trays in Niazi '209 supply the teaching to alter the architecture of Smrha '684 to place each row of adapter packs on a separate tray, rather than on a framework attached to a single tray. *See* CX-2060C (Prucnal RWS) Q/A 517. As discussed above, Niazi '209 discloses a different and inconsistent approach to housing equipment that a person of ordinary skill would not seek to incorporate in the Smrha '684 design. *Id.*

fiber optic modules configured to be installed in trays

Smrha '684 in combination with Niazi '209 also does not disclose "a plurality of fiber optic modules configured to be installed in the plurality of fiber optic equipment trays." Smrha '684 discloses a different architecture where the adapter packs are installed into independent mounting structures so that they can be accessed without touching the tray. *See* CX-2060C (Prucnal RWS) Q/A 518; CX-0032 (Smrha '684) at 9:28-45 (stating that the adapter pack movement should not be linked to the movement of the tray). Niazi '209 does not disclose modules in a high-density fiber optic system. *See* CX-2060C (Prucnal RWS) Q/A 518-19. Niazi '209 does not disclose fiber optic

237

Case: 22-1228 Document: 29 VE Rage: 428 Filed: 04/25/2022 Confidential Material Omitted on this Page

equipment trays and instead discloses trays for computer equipment storage. Even if Niazi '209 disclosed the limitations missing from Smrha '684, as discussed above, a person of ordinary skill would not be motivated to solve the problem solved by the '456 patent with these references in the way respondents claim.

density of 98 or 144 fiber connections per 1U

Smrha '684 does not disclose "a fiber optic connection density of at least ninetyeight (98) fiber optic connections per U space of the chassis." As discussed above for the '320 patent, Smrha '684 discloses 96 fiber optic connections but no space within which that number is achieved, and AFL Future Access also does not disclose this density. *See* CX-2060C (Prucnal RWS) Q/A 520.

ii. Claim 12: Module Density

Respondents argue that asserted claim 12 is obvious in view of Smrha '684 in view of Niazi '209, and AFL Future Access 1RU; and asserted claim 12 is obvious in view of Smrha '684 in view of Niazi '209, AFL Future Access 1RU, and Panduit SFQ Cassette.

Claim 12 is directed to the density of the modules in the '456 patent, and recites that "the plurality of first fiber optic adapters is disposed through at least eighty-five percent (85%) of a width of the front side of at least one fiber optic module of the plurality of fiber optic modules." Inasmuch as Smrha '684 does not disclose the modules of the '456 patent, and does not disclose the dimensions of its adapter packs, Dr. Blumenthal relies on the Panduit SFQ Cassette to supply these features. *See* CX-2060C (Prucnal RWS) Q/A 526, 530; RX-0576C (Panduit SFQ Catalog) and RX-0575C

238

(Panduit SFQ Cassette Drawing). However, the Panduit SFQ is not prior art: it was not available until February 2009, whereas the priority date of the '456 patent is August 2008.³⁹

In any event, Dr. Blumenthal has not shown whether, why, or how a person of ordinary skill would have replaced the Smrha '684 adapter packs with this cassette. *See* CX-2060C (Prucnal RWS) Q/A 529. The Panduit SFQ Cassette has a distinctive wedge shape designed to be pulled from the rear of a patch panel, but the adapter packs of Smrha '684 are a framework assembly that slides within mounting guides, contains its own cable routing elements, and teaches away from module removal. *See* CX-2060C (Prucnal RWS) Q/A 529. Each Panduit SFQ Cassette contains 12 adapters — in contrast to 24 adapters in each adapter pack of Smrha '684. *Id.* A person of ordinary skill would have no reason to redesign the adapter packs of Smrha '684 to accommodate the smaller Panduit SFQ Cassettes, which do not comprise framework assemblies but instead have different mounting structures designed to work with a different enclosure system. *Id.*;

³⁹ Respondents argue that claims 12 and 28 are not entitled to the same priority date as the other asserted claims because they are not disclosed in the '538 Application to which the '456 patent claims priority. See Resps. Br. at 171-72. The '538 Application discloses that each shelf fits into the width of a 1U space (which is 19 inches) and has 24 ports, permitting a fiber count as high as 48 per shelf. It includes detailed figures, including Figures 4A, 4B, 5A, and 5B, showing how this is done. See RX-0060 ('538 Application) at 8. This disclosure enables a person of ordinary skill to practice the other asserted claims of the '320, '153, and '456 patents — that is, to make a functioning version of EDGE. The claims disclose making modules in which the front opening takes up at least 85% of the width of the front side, as is the case for EDGE and for each of the accused products. The Staff states that it agrees with Dr. Pruchal that "the later priority date has not been established by clear and convincing evidence" and that "it is not necessary to resolve the issue because there are other reasons to conclude that the combination of the SFQ Cassette with Smrha '684 does not render claim 12 invalid." Staff Br. at 168. The administrative law judge agrees with Corning and the Staff that the later priority date has not been established by clear and convincing evidence. Nonetheless, Panduit SFQ Cassette is discussed on the merits here.

RX-0001C (Blumenthal WS) Q/A 411; RX-1672C (Kuffel WS) Q/A 75.

Further, as Mr. Kuffel testified, the Panduit SFQ Cassette was designed for a system that could support up to only 96 LC connections in a 1U space. *See* RX-1672C (Kuffel WS) Q/A 75. He further conceded that Panduit redesigned their cassettes when developing Panduit's accused product, the HD Flex, because the "geometries" of the SFQ cassettes indicated that Panduit could not achieve a density of 144 connections per U space "using those form factors." Kuffel Tr. 655. Thus, a person in the industry did not believe that the Panduit SFQ Cassette could or would work in a system designed to achieve the density of the '456 patent.

Dr. Blumenthal's testimony also has not shown that the Panduit SFQ Cassette discloses the additional limitation of claim 12. The claim requires calculating the ratio of the spaces through which the front adapters are disposed to the width of the front side of the Panduit SFQ Cassette, which must be greater or equal to 85%. *See* CX-2060C (Prucnal RWS) Q/A 531-32. Instead of comparing the space for adapters with the front side of the cassette, Dr. Blumenthal compares it to the front opening — that is, the space for the adapters plus any unused spaces between those adapters in the opening. *Id.* (discussing RX-0001C (Blumenthal WS) Q/A 434-35) Inasmuch as he measures the wrong thing, Dr. Blumenthal has not shown disclosure of this limitation. *Id.*

Additionally, Dr. Blumenthal's measurements are unreliable. *See* CX-2060C (Prucnal RWS) Q/A 532. Dr. Blumenthal cites "3.883 inches" as the measurement for the space through which the adapters are disposed, but it is not clear how he reaches this number. *Id.* The number he uses for the width of the front opening — "3.951 inches" — is at odds with the number used in his expert report, which was 3.798 inches. *Id.* Thus,

240

Case: 22-1228 Document: 29 VERSO 431 Filed: 04/25/2022 Confidential Material Omitted on this Page

his conclusions cannot be verified due to reliance on ambiguous, multiple measurements.

Id.; see Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc., 853 F.3d 1272, 1284 (Fed. Cir.

2017) (ambiguous references cannot anticipate a claim).

iii. Claim 14

Respondents argue that asserted claim 14 is obvious over Smrha '684 in view of

Niazi '209 and AFL Future Access 1RU.

Claim 14 depends from claim 11. Claim 14 recites:

14. The fiber optic apparatus of claim 11, wherein for each fiber optic module of the plurality of fiber optic modules, each fiber optic adapter of the plurality of first fiber optic adapters comprises a simplex LC fiber optic adapter or a duplex LC fiber optic adapter, and wherein the at least one second fiber optic adapter comprises at least one multi-fiber push-on (MPO) fiber optic adapter.

JX-0010 ('456 Patent), Claim 14.

For claim 14, Dr Prucnal explains, "As I explained earlier, Dr. Blumenthal has failed to demonstrate that Smrha '684 in combination with AFL Future Access and Niazi '209 satisfy Claim 11; this proposed combination fails to satisfy Claim 14 for the same reasons." CX-2060C (Prucnal RWS) Q/A 534. The administrative law judge agrees.

iv. Claim 15: Row of Modules in Each Tray

Respondents argue that asserted claim 15 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU.

Claim 15 depends from claim 11. Claim 15 recites fiber optic trays "configured to receive a single row of multiple fiber optic modules." Dr. Blumenthal opines it would be obvious to modify Smrha '684 to place each row of adapter packs on its own tray, in view of Niazi '209. *See* RX-0001C (Blumenthal WS) Q/A 410. As shown above for

241

claim 11, he has failed to establish any basis for that fundamental redesign of Smrha '684. *See* CX-2060C (Prucnal RWS) Q/A 536-538.

v. Claim 16: Locking Feature

Respondents argue that asserted claim 16 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU.

Claim 16 depends from claim 11. Claim 16 recites fiber optic modules "configured to be locked into place in a fiber optic equipment tray." As shown above, Dr. Blumenthal has not shown that Smrha '684 alone or in combination with Niazi '209 and AFL Future Access discloses a plurality of fiber optic equipment trays or modules configured to be installed in trays. *See* CX-2060C (Prucnal RWS) Q/A 540. Dr. Blumenthal has not shown the claimed locking feature in Smrha '684. As Dr. Prucnal demonstrates, the Smrha '684 adapter packs are not configured to lock into the sliding tray. *Id.* They instead lock into either a rearward or forward slot in mounting guides. The disclosed interaction is thus between the adapter packs and the mounting guides that support them, not between the modules and the tray, as claim 16 requires. *See* CX-2060C (Prucnal RWS) Q/A 540; CX-0032 (Smrha '684) at 3:30-32, 9:43-45, and 10:26-31.

vi. Claim 19: Density

Respondents argue that asserted claim 19 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU.

Claim 19 depends from unasserted claim 18 which depends from claim 11. Claim 19 requires a fiber optic connection density of exactly 144 connections per U space of the chassis, "based on using a simplex fiber optic adapter or a duplex fiber optic adapter as

242

each fiber optic adapter of the plurality of first fiber optic adapters." As shown above, Dr. Blumenthal has not shown that Smrha '684 in view of Niazi '209 or AFL Future Access renders obvious a density of even 98 connections within a U space. It follows that those references do not render obvious the greater density of 144 connections. *See* CX-2060C (Prucnal RWS) Q/A 542, 544-45.

vii. Claim 21: Module Guide

Respondents argue that asserted claim 21 is obvious over Smrha '684 in view of Niazi '209 and AFL Future Access 1RU.

Claim 21 depends from claim 20, which requires fiber optic equipment trays with module guides configured to receive multiple fiber optic modules. As shown above, the drawer in Smrha '684 does not receive fiber optic modules, but instead pulls out stacked mounting guides that support adapter packs at the time of initial installation. *See* CX-2060C (Prucnal RWS) Q/A 546. Neither Niazi '209 nor AFL Future Access discloses a redesign of Smrha '684 to install each layer of adapter packs on a fiber optic equipment tray. *See id.* Claim 21 also requires that each module guide comprise "a locking feature configured to cooperate with a fiber optic module of the first or second fiber optic equipment tray." Dr. Blumenthal opines that Smrha '684 renders this additional limitation obvious. As shown above for claims 11 and 16, he has not shown that Smrha '684 alone or in combination discloses either a plurality of fiber optic equipment trays or a locking feature to prevent movements of the module relative to the tray.

viii. Claim 27

Respondents argue that asserted claim 27 is obvious over Smrha '684 in view of Niazi, Future Access 1RU, and Verdiell.

Claim 27 is similar to claim 11, but requires a chassis configured for a 4-U space, and a proportional increase in density from 144 in a 1U space to 576 in a 4-U space. Thus, respondents have not shown that Smrha '684 alone or in combination satisfies this claim for all the reasons discussed above. To address the 4U limitations, Dr. Blumenthal adds U.S. Patent No. 7,452,236 to Verdiell (RX-0462 (Verdiell '236)), which he opines would suggest to a person of ordinary skill how to expand Smrha '684 for a 4-U space. *See* CX-2060C (Prucnal RWS) Q/A 552 and 555. Verdiell '236 discloses a system for interconnecting "rack-mounted electronic components such as rack mounted computer servers." *See* RX-0462 (Verdiell '236) at 2:17-26; *see also* CX-2060C (Prucnal RWS) Q/A 553. It discloses equipment that spans multiple U spaces in a standard 19-inch rackmount system "spaced apart in 1.75 inch increments referred to as 'units' (sometimes written as 'U')." RX-0462 (Verdiell '236) at 1:29-32; CX-2060C (Prucnal RWS) Q/A 553.

Motivation to combine Smrha '684 with Verdiell '236

Respondents, relying on the testimony of Dr. Blumenthal, provide insufficient evidence to show why a person of ordinary skill would combine Verdiell '236 with Smrha '684, how it could be combined, and whether there would be a reasonable expectation of success. *See* CX-2060C (Prucnal RWS) Q/A 554. Indeed, their purposes and structures are too different to suggest a reason for combination. *Id.* Verdiell '236, like Niazi '209, concerns computer equipment, which is not analogous art to the '456

244

Case: 22-1228 Document: 29 VERSO 435 Filed: 04/25/2022 Confidential Material Omitted on this Page

patent. In any event, as shown above, Smrha '684 does not disclose its dimensions, so a person of ordinary skill would not know how to adapt Smrha '684 to multiple U spaces even after studying Verdiell '236. *See* CX-2060C (Prucnal RWS) Q/A 554; CDX-0005C (Prucnal Rebuttal Demonstratives) at 268.

<u>4-U Space</u>

Respondents do not show that Smrha '684 in combination with any reference discloses a 4-U space. As set forth above, Smrha '684 does not disclose dimensions, much less a 4U space. *See* CX-2060C (Prucnal RWS) Q/A 556. Combining the alleged 4-U disclosure of Verdiell '236 with the dimensionless Smrha '684 would have an unpredictable result. *Id.* Dr. Blumenthal has not shown any reason why the features that disclose more than a 1-U size in those references would apply to Smrha '684, any reason why a person of ordinary skill would choose to combine those features to produce Smrha '684 in a 4-U space, or any reason why such a combination would have a predictable result. *Id.*

First, Dr. Blumenthal relies on Verdiell '236 to provide the 4-U size, but that reference discusses equipment designed for multiple U spaces, which is structurally different and technically easier to design than the structure required by the '456 patent: a chassis that is complete in a 1-U space but can be multiplied to achieve that same structure four times — *i.e.*, akin to four stacked 1-U chassis to make a 4-U chassis. *Id.*

Second, as shown above, Dr. Blumenthal has not shown that a person of ordinary skill would combine Niazi '209 or AFL Future Access with Smrha '684. *See* CX-2060C (Prucnal RWS) Q/A 558. That same analysis applies to the 4-U chassis and its features recited in claim 27. *Id*.

245

Third, Dr. Blumenthal has not shown that, even if Smrha '684 disclosed a device that fits into a 1-U size (which it does not), the architecture in Smrha '684 is scalable to a 4-U size; how that would be accomplished; or what the results (including connection density) would be. *Id.* This is far from obvious, particularly inasmuch as Smrha '684 contains only a single drawer that supports a framework for sliding adapter packs that move within stacked mounting guides. *Id.*

Density

As discussed above, Dr. Blumenthal has not shown that Smrha '684, alone or in combination with Niazi '209 or AFL Future Access, discloses a density of 144 fiber optic connections per U space. *See* CX-2060C (Prucnal RWS) Q/A 559. Inasmuch as claim 27 simply applies that same density to a chassis that is four times taller (4-U instead of 1-U), the same analysis applies here. *Id.* In addition, as discussed above, Dr. Blumenthal has not explained how or why a person of ordinary skill would seek to change the size of Smrha '684, with or without these references, to a 1-U size and multiply its system to fill a 4-U space with at least 576 connections. *Id.*

ix. Claim 28: Module Density

Respondents argue that asserted claim 28 is obvious in view of Smrha '684 in view of Niazi '209, AFL Future Access 1 RU, Verdiell '236; and Smrha '684 in view of Niazi '209, AFL Future Access 1 RU, Verdiell '236 and Panduit SFQ cassette.

Claim 28 depends from claim 27. Smrha '684 in view of Niazi '209, AFL Future Access 1 RU, Verdiell '236 fails to satisfy claim 28 for the same reasons as for claim 27 discussed above.

Additionally, claim 28 mirrors claim 12 except that it applies to the modules for

246

the 4-U chassis of claim 27, rather than the 1-U chassis of claim 11. Dr. Blumenthal's analysis of claim 28 is the same as his analysis of claim 12. *See* CX-2060C (Prucnal RWS) Q/A 562-63 ("Dr. Blumenthal has failed to show that Smrha '684 combined with other references discloses claim 12, and Dr. Blumenthal therefore fails to demonstrate this combination discloses claim 28 for the same reasons.").

2. Enablement

Respondents argue that "Claim 11 of the '456 Patent is invalid because the full scope of the claims is not enabled." *See* Resps. Br. 150-55. Corning and the Staff disagree. *See* Compl. Br. at 226-27; Staff Br. at 171-72.

Respondents argue, inter alia:

Claim 11 of the '456 Patent is invalid because the full scope of the claims is not enabled. RX-0001C (Blumenthal WS) Q/A 195-205. The enablement requirement "prevents both inadequate disclosure of an invention and overbroad claiming that might otherwise attempt to cover more than was actually invented." *MagSil*, 687 F.3d at 1381. Thus, a patentee invites additional scrutiny when it chooses to use open-ended claim language, *e.g.*, limitations claiming "at least" some threshold quantity but lacking any express upper bound. Complainant choose to use exactly that formulation for the alleged invention claimed in claim 11 of the '456 Patent.

Claim 11 requires that "the plurality of fiber optic modules are configured to support a fiber optic connection density of *at least ninetyeight (98) fiber optic connections per U space of the chassis*, based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters." JX-0010 ('456 Patent) at 22:1-7 (emphasis added). There is no dispute that claim 11 is open-ended because it includes an expressly stated lower bound, but does not include an expressly stated upper bound. RX-0001C (Blumenthal WS) Q/A 196; CX-2060C (Prucnal RWS) Q/A 228; Prucnal Tr. 972:10-15; *see also* CPHB at 229.

Accordingly, claim 11 is valid if and only if (1) it has an inherent upper limit and (2) the specification enables a POSITA to approach that limit. *Andersen LLC*, 474 F.3d at 1376-77. Claim 11 does not satisfy that

Case: 22-1228 Document: 29 VERSON 438 Filed: 04/25/2022 Confidential Material Omitted on this Page

standard, and is therefore invalid.

Resps. Br. at 150.

For the reasons discussed below, respondents have not shown by clear and

convincing evidence that claim 11 of the '456 patent does not satisfy the enablement

requirement of 35 U.S.C. § 112.

Claim 11 of the '456 patent, like claims 1 and 3 of the '320 patent, contains an

open-ended range reciting "a fiber optic connection density of at least ninety-eight (98)

fiber optic connections per U space."

Asserted claim 11 of the '456 patent reads:

11. A fiber optic apparatus, comprising:

- a chassis configured to be disposed in an equipment rack, the chassis comprising front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a plurality of fiber optic equipment trays supported by the chassis and extendable relative to the chassis in the longitudinal direction; and
- a plurality of fiber optic modules configured to be installed in the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules comprises a front side, a rear side, an internal chamber, a plurality of first fiber optic adapters disposed through the front side, at least one second fiber optic adapter disposed through the rear side, and a plurality of optical fibers disposed within the internal chamber and extending from the at least one second fiber optic adapter to the plurality of first fiber optic adapters;

wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to

248
receive multiple fiber optic modules of the plurality of fiber optic modules;

wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to support *a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space* of the chassis, based on using a simplex fiber optic adapter or a duplex fiber optic adapter as each fiber optic adapter of the plurality of first fiber optic adapters; and.

wherein a U space comprises a height of 1.75 inches and comprises a width of 19 inches or 23 inches.

JX-0010 ('456 Patent) (emphasis added).

Respondents' enablement challenge to '456 patent claim 11 is substantially

similar to their enablement challenge to '320 patent claims 1 and 3.

Thus, without repeating the entire analysis, certain portions are reproduced below:

Respondents fail to show that any asserted claims are invalid for lack of enablement. Under former 35 U.S.C. § 112 ¶ 1 (2006) (now § 112(a)), a patent must describe the invention "in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same." This requires "teach[ing] those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation." *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 959 F.3d 1091, 1100 (Fed. Cir. 2020) (quoting *ALZA Corp. v. Andrx Pharm., LLC*, 603 F.3d 935, 940 (Fed. Cir. 2010)). As with other challenges to patent validity, respondents bear the burden to show lack of enablement by clear and convincing evidence. *See Cephalon, Inc. v. Watson Pharm., Inc.*, 707 F.3d 1330, 1336 (Fed. Cir. 2013).

Respondents' enablement challenges in this case almost entirely concern claim limitations that feature open-ended ranges, such as the limitation of '320 claims 1 and 3 that recite "fiber optic connection density of at least 98" or "at least 144 fiber optic connections per U space." JX-0004 ('320 Patent) at Claims 1, 3. These ranges are open-ended because the claim terms express a lower limit but no upper limit. An enablement challenge to a claim containing a range of this kind is governed by *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361 (Fed. Cir. 2007):

[O]pen-ended claims are not inherently improper; as for all claims their appropriateness depends on the particular facts of the invention, the disclosure, and the prior art. They may be supported if there is an inherent, albeit not precisely known, upper limit and the specification enables one of skill in the art to approach that limit.

Id. at 1376-77. Accordingly, respondents must show either that there is no inherent upper limit on the claims they challenge, or that the specification does not teach a person of skill to approach that limit without undue experimentation. Further, as the Federal Circuit's decision in *McRO* makes clear, an enablement challenge requires "specific identification of products or processes that were or may be within the scope of the claims and were allegedly not enabled." 959 F.3d at 1101; *see id.* at 1104. Respondents have not made the showing required.

Section IV.D.4, supra.

For the '320 patent, the administrative law judge found existence of an inherent upper limit and ability to approach the inherent upper limit. For the same reasons explained for the '320 patent, the undersigned finds existence of an inherent upper limit and ability to approach the inherent upper limit for claim 11 of the '456 patent. *See id.*

Independent of that analysis, in addition, claim 11 and the specification of the '456 patent contain additional language showing the inherent limits on the number of fiber-optic connections that can be achieved per U space. Claim 11 recites additional structural elements, including "a plurality of fiber optic equipment trays" that are "extendable relative to the chassis in the longitudinal direction"; "a plurality of fiber optic modules configured to be installed in the fiber optic equipment trays"; and the ability to install "multiple fiber optic modules" in each tray. JX-0010 ('456 Patent), Claim 11. A person of ordinary skill would recognize that those elements take up space and can support only a finite number of connections. *See* CX-2060C (Prucnal RWS) Q/A 231.

Case: 22-1228 Document: 29 VE Rage: 441 Filed: 04/25/2022 Confidential Material Omitted on this Page

The specification of the '456 patent also contains statements, like those of the '320 patent, disclosing the limiting effects of physical size, the need for access, and the need to protect fibers by maintaining an appropriate bend radius. *See* JX-0010 ('456 Patent) at 1:66-2:1, 2:16-32, 5:44-6:15, 9:5-31, 10:49-11:16, 12:15-42, 13:4-12, 22:47, 14:36-64, 15:61-16:23, 17:25-53, 19-20 (table) (density); *id.* at 6:43-46, 6:52-56, 6:59-63, 6:65-7:7, 7:17-20, 7:49-52 (access); *id.* at 10:15-19, 19:60-62 (fiber protection).

Moreover, claim 19 of the '456 patent is enabling for the alternative reason that it does not claim a range. *See* 35 U.S.C. § 282(a) (declaring dependent claims presumptively valid even if they depend from invalid independent claims); *Shelcore, Inc. v. Durham Indus., Inc.*, 745 F.2d 621, 624 (Fed. Cir. 1984) (applying presumption). That claim recites "a fiber optic connection density of one hundred forty-four (144) fiber optic connections per U space of the chassis." JX-0010 ('456 Patent) at Claim 19. Respondents have not shown that the '456 specification fails to enable the specific 144fiber embodiment of claim 19.

3. Indefiniteness

a. "width of the front side of [the] fiber optic module" ('456 patent, claims 12, 28)

Respondents argue that asserted dependent claims 12 and 28 of the '456 patent are indefinite under 35 U.S.C. § 112. *See* Resps. Br. 156-57. Corning and the Staff disagree. *See* Compl. Br. at 227-28; Staff Br. at 60-62.

Respondents argue:

The term "width of the front side of [the] fiber optic module" appears in the claims 12 and 28 of the '456 Patent. JX-0010 ('456 Patent). As discussed above in Section V.D, *supra*, Respondents contend that a POSITA would interpret "width of the front side of [the] fiber optic

251

module," as used in claims 12 and 28 of the '456 Patent, to mean "width of the front side of the fiber optic module including areas dedicated to latches, sidewalls, flanges, and other non-adapter functions." RX-0001C (Blumenthal WS) Q/A 233. If that construction is not adopted, then a POSITA would find this claim term to be indefinite, rendering claims 12 and 28 of the '456 Patent invalid. *Id.* This is because a POSITA cannot ascertain with reasonable certainty the scope of the meaning of the term "width of the front side of the fiber optic module" as used in those claims. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

Specifically, a POSITA would review the figures and specification of the '456 Patent and find they provide inconsistent definitions for "W2," the measurement of the width of the front side of the module, making it impossible to determine the proper scope of the claimed meaning of "width of the front side" as used in the '456 Patent. RX-0001C (Blumenthal WS) Q/A 234. As shown in Figure 13 (annotated) of the '456 Patent above, "W2" is the width of the front side 202 of the main body 210 of the module. JX-0010 ('456 Patent) at Fig. 13 10:33-36. The W2 measurement of the front side of the module in Figure 13 omits the module's rails, labeled 28A in this figure. In contrast, Figure 18 of the '456 Patent's measurement of the front side of the module, W2, includes the rails 165A and 165B on the side of the module. JX-0010 ('456 Patent) at 14:65-15:14. It is readily apparent from a comparison of Figures 13 and 18 of the '456 Patent, the measurement protocol for W2 in Figure 18 is inconsistent with Fig. 13. See RX-0001C (Blumenthal WS) Q/A 234; § V.D, supra. The differences in the measurement protocols for the front side of the modules from Figures 13 and 18 are facially irreconcilable, and the asserted claims do not provide any context for which embodiment should be used. *Id.*

Because of these inconsistencies, a POSITA reading claims 12 and 28 in the context of the specification of the '456 Patent would not understand how to determine whether the plurality of first fiber optic adapters is disposed through "at least eighty-five percent (85%) of a width of the front side of at least one fiber optic module," as required by the claims. RX-0001C (Blumenthal WS) Q/A 238. Specifically, as Dr. Blumenthal testified, following the measurement guidelines in Figure 13 will lead to a different result than following the measuring guidelines in Figure 18, so the 85% threshold may be met using one measuring method, but not the other. *Id.* Dr. Blumenthal illustrated this problem with a simple mathematical example. Consider a situation where a plurality of first fiber optic adapters is disposed through a 8.5 cm opening referenced as "WA" and the width of the front side of a fiber optic module as measured according to the method of Figure 13 (omitting the rails) is 10 cm, which is referenced as "W_13", and the width of the front side of a

fiber optic module as measured according to the method of Figure 18 (including the rails) is 12 cm, which is referenced as "W_18". In those examples, the Fig. 13 measurement protocol results in fiber optic adapters disposed through 85% of the width of the front side (WA (8.5 cm)/W_13 (10.0 cm) * 100% = 85%). In contrast, using the Fig. 18 measuring protocol results in fiber optic adapters through 70.08% of the front side (WA (8.5 cm)/W_18 (12 cm) * 100% = 70.08 %). RX-0001C (Blumenthal WS) Q/A 239. Using the Fig. 13 measuring protocol will satisfy the 85% requirement of the claims, but using the Fig. 18 protocol will not. For these reasons, a POSITA would not be able to determine with any certainty whether claims 12 and 28 are infringed, thereby rendering claims 12 and 28 indefinite.

Resps. Br. at 156-57.

For the reasons discussed below, respondents have not shown by clear and convincing evidence that asserted dependent claims 12 and 28 of the '456 patent are indefinite under 35 U.S.C. § 112.

Under former 35 U.S.C. § 112 ¶ 2 (2006) (now § 112(b)), a patent must "conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." This statutory language requires "a patent's claims, viewed in light of the specification and prosecution history, [to] inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig, Instruments, Inc.*, 572 U.S. 898, 910 (2014). "Reasonable certainty" does not require "absolute precision." *Id.* at 910. As with other challenges to patent validity, respondents bear the burden to show indefiniteness by clear and convincing evidence. *See BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365 (Fed. Cir. 2017).

The claim term "width of the front side of [the] fiber optic module" appears in asserted dependent claims 12 and 28 of the '456 patent. The parties' proposed

253

constructions are:

Complainant	Respondents	Staff		
"the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions that are used to insert the module into the chassis or remove it from the chassis."	"width of the front side of the fiber optic module including areas dedicated to latches, sidewalls, flanges, and other nonadapter functions" Otherwise indefinite.	"the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions, <i>e.g.</i> , the dimension identified as "W ₂ " in Figure 13 of the '456 and '206 Patents"		

See Joint Chart at 4; Compl. Br. at 47-50; Resps. Br. at 41-45; Staff Br. at 58-62.

In the Claim Construction section for the '456 patent, the administrative law judge determined that the disputed claim term "width of the front side of [the] fiber optic module" should be construed to mean "the width of the side of the module that when inserted faces the front of the chassis, excluding any module rail guides or protrusions that are used to insert the module into the chassis or remove it from the chassis."

The reasoning is shown below:

The '456 patent specification "acts as a dictionary," *Phillips*, 415 F.3d at 1321 (internal quotation marks omitted), by defining the "width of the front side" to exclude rails and similar protrusions from the module sides. That specification, referring to Figure 13, JX-0010 ('456 Patent) at 10:20, discloses the "width W₁ of the front opening 126," *id.* at 10:25-26, comparing it to two other defined widths: "width W₂ of the front side 96 of the main body 90 of the fiber optic module 22," *id.* at 10:35-36; and "[w]idth W₃, the overall width of the fiber optic module 22," *id.* at 10:39-40. The variables W₁, W₂, and W₃ and numbered items 22, 90, 96, and 126 each correspond to notations in Figure 13. *See* CX-2060C (Prucnal RWS) Q/A 124; CDX-0005C (Prucnal Rebuttal Demonstratives) at 24.⁴⁰ The specification also discloses "module rails 28A, 28B disposed on each

⁴⁰ Dr. Prucnal's witness statement and demonstrative discuss the '206 specification, noting that the '456 specification contains "essentially the same" language and figures. *See* CX-2060C (Prucnal RWS) Q/A 124-127, 136-38.

side 102A, 102B of the fiber optic module 22." *Id.* at 9:34-35. Figure 13 shows that the module rails 28A and 28B are included in W_3 (the "overall width of the fiber optic module") but not in W_2 (the "width of the front side"). JX-0010 ('456 Patent) at Fig. 13; *see* CDX-0005C (Prucnal Rebuttal Demonstratives) at 24.

The function of measuring the width of the front side further supports excluding rails. See Cohesive Techs., Inc. v. Waters Corp., 543 F.3d 1351, 1368 (Fed. Cir. 2008) (in construing claim "we ask what function" a limitation "plays in the operation of the claimed apparatus"). The parties agree that "fiber optic connection density," which the '456 patent seeks to maximize, means the "number of fiber optic connections that can be made to the front side of the fiber optic equipment," Joint Chart at 3. With that goal in mind, it follows to distinguish the "width of the front side," which is W₂, and which includes only those parts of the module that take up precious space on the front side, from the "overall width of the fiber optic module," which is W₃, and which includes parts of the module that do not take up such space. The rails are part of W₃ but not part of W₂ because, when the module is installed, the rails fit into rail guides in the trays and take up no additional space on the front side. See JX-0010 ('456 Patent) at 6:20-23, 9:34-35; *id.* at Fig. 5; CX-2060C (Prucnal RWS) Q/A 132-38.

The different embodiment depicted in Figures 16 to 18 does not suggest otherwise. That embodiment is an "alternate fiber optic module" that is "designed to fit across two sets of module rail guides." JX-0010 ('456 Patent) at 13:50-56. According to the specification, the alternate module has "widths W_1 and W_2 " that "are the same as in the fiber optic module 22 illustrated in FIG. 13." *Id.* at 14:42-43. There is no discussion of a width W_3 , and Figure 18 also appears to define W_2 differently than Figure 13, by including the module rails. A person of ordinary skill would rely on the more detailed definition and description provided for Figure 13 and would interpret Figure 18 as incorporating that earlier disclosure rather than changing or conflicting with it. *See* CX-2060C (Prucnal RWS) Q/A 126-127.

Respondents rely on statements from the prosecution history of the '206 patent, and Panduit's unsuccessful *inter partes* review of that patent, to argue that Figure 18, rather than Figure 13, should control. *See* Resps. Br. at 43-45. However, the doctrine of prosecution disclaimer, on which respondents rely, requires a "clear and unmistakable disavowal" of claim scope, *Schindler Elevator Corp. v. Otis Elevator Co.*, 593 F.3d 1275, 1285 (Fed. Cir. 2010), and none is present here. During prosecution, the examiner cited a piece of prior art ("Rapp '274") that had two large flanges and a latch on its front side. The flanges and the latch, unlike

module rails 28A and 28B from the specification, took up substantial space on the front side of the module. *See* CX-2060C (Prucnal RWS) Q/A 130-31 (discussing CDX-0005C, at 28). Corning cited Figure 18 to distinguish Rapp '274, but could have just as well cited Figure 13 — the flanges and latch of Rapp '274 would have been part of width W_2 using either description. *See id.* Q/A 132. Neither the examiner nor Corning mentioned rails or suggested that the flanges or latch of Rapp '274 resembled rails. None of this amounts to a clear and unmistakable disclaimer.

The *inter partes* review proceedings on which respondents rely (*see* Resps. Br. at 43-45) similarly do not support their position. Corning's briefing in the '206 IPR stated explicitly that "the overall width of the module, W₃, can be larger than the width of just the front side of the module because, as shown in [Figure 13], structure like side rails can protrude out from the sides of the modules"; and that "[b]ecause these rails are not part of the 'front side' of the module body, the '206 patent does not include them in the 'width of the front side.'" RX-0512 ('206 IPR Prelim. Resp.) at 26. Corning also distinguished Rapp '274 on the basis that Rapp's flanges and latch are part of its front side, *see id.* at 11, 17, 31, 33 — but, for the reasons already given, that distinction was fully consistent with Corning's claim construction position regarding rails, which it advanced in the same brief. *See* CX-2060C (Prucnal RWS) Q/A 133-135.

Respondents' argument concerning indefiniteness is discussed in the validity section, *infra*.

Section V.A.6, *supra*.

Thus, the proper construction of the disputed term excludes "any module rail guides or protrusions." A person of ordinary skill would be reasonably certain that (1) the specification's clear reference to Figure 13 in defining the "width of the front side," JX-0010 at 10:25-36; and (2) the distinction drawn in Figure 13 between W1, W2, and W3; combined with (3) the clear statement that the width defined in Figure 18 is "the same as" the width in Figure 13, *id.* at 14:42-43, show that the exclusion of the rails in Figure 13 is the best guide to the meaning of the patent. *See* Section V.A.6, *supra*; CX-2060C (Prucnal RWS) Q/A 124-127.



Even if respondents' competing argument concerning Figure 18 is a "plausible construction" of the patent, that does not show indefiniteness. *Nevro Corp. v. Bos. Sci. Corp.*, 955 F.3d 35, 41 (Fed. Cir. 2020) ("[t]he test is not merely whether a claim is susceptible to differing interpretations" because "[s]uch a test would render nearly every claim term indefinite").

Accordingly, respondents have not shown by clear and convincing evidence that asserted dependent claims 12 and 28 of the '456 patent are indefinite under 35 U.S.C. § 112.

b. "U space" ('320 Patent, Claims 1, 3; '456 Patent, Claims 11, 19)

Respondents argue:

The term "U space" renders claims 11, 12, 14, 15, 16, 19 and 21 of the '456 Patent indefinite irrespective of whether Respondents', Complainant's, or Staff's construction is adopted or whether the term is afforded a plain and ordinary meaning as explained in detail in Section VI.B.2, *supra*, which is incorporated here by reference.

See Resps. Br. at 155-56. Corning and the Staff disagree. See Compl. Br. at 228-30; Staff Br. at 55.

The above is respondents' entire argument on this issue. The administrative law judge found (in the Validity section for the '320 patent) that respondents have not proven by clear and convincing evidence that the claim term 'U space' (claimed in asserted claims 1 and 3 of the '320 patent and in asserted claims 11, 19, and 27 of the '456 patent) is indefinite under 35 U.S.C. § 112." *See* Section IV.D.5, *supra*. The full discussion need not be repeated here. *See id*.

* * *

Accordingly, respondents have not shown by clear and convincing evidence that the asserted independent claims 11 and 27 and dependent claims 12, 14-16, 19, 21, and 28 of the '456 patent are invalid.

VI. U.S. Patent No. 10,120,153

U.S. Patent No. 10,120,153, entitled "Independently Translatable Modules and Fiber Optic Equipment Trays in Fiber Optic Equipment," was filed on January 23, 2017 and issued on November 6, 2018. JX-0007 ('153 Patent). The '153 patent is assigned to Corning. JX-0009 ('153 Patent Assignment Record). The '153 patent is related to, and shares a specification with the '320 and '456 patents. The '153 patent states, "The technology of the disclosure relates to fiber optic modules for fiber optic equipment. The fiber optic modules can be included in fiber optic equipment rack and/or trays." JX-0007 at 2:4-6. The '153 patent has a total of 29 claims of which Corning asserts independent claim 23 and dependent claims 9, 16, and 26. *See* Compl. Br. at 8.

As discussed below, the evidence shows that (1) the asserted claims of the '153 patent are infringed by the accused products; (2) complainant has satisfied the technical prong of the domestic industry requirement; and (3) the asserted claims are not invalid.

A. Claim Construction

1. A Person of Ordinary Skill in the Art

As noted in the '320 patent section of this initial determination, the administrative law judge finds that a person of ordinary skill in the art with respect to the four asserted patents is a person who has at least a bachelor's degree in mechanical engineering, materials science, or a related field, and at least two years of experience in fiber optic

258



equipment.

2. "a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively"

The claim term "a front end with at least one fiber optic routing element that

comprises successive material sections extending frontward, upward, and rearward,

respectively" appears in asserted independent claim 23 of the '153 patent.⁴¹ Below is a

chart showing the parties' proposed claim constructions.

Claim Term	Asserted Claims	Agreed-Upon Construction
"a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively"	ʻ153: 23	"a front end of the fiber optic equipment tray having at least one flange comprising successive sections extending frontward, upward, and rearward that guides optical fibers to either the left or the right"

See Staff Br. at 46-47 (citing Joint Chart at 3-4; RX-0001C (Blumenthal WS) Q/A 109-

10).

Asserted claim 23 reads as follows:

23. A fiber optic apparatus, comprising:

a chassis configured to be disposed in an equipment rack, the chassis comprising opposite front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;

⁴¹ The claim term also appears in independent claim 1 which is not asserted. Asserted claims 9 and 16 depend from claim 1.

a guide system configured to be disposed within the chassis;

- a plurality of fiber optic equipment trays arranged in a stacked configuration and configured to slidably engage within the guide system, wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays comprises *a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively*, to permit optical fibers to be routed to either left or right portions of the plurality of fiber optic equipment trays toward the first and second ends of the chassis; and
- a plurality of fiber optic modules configured to be received by the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules is independently movable in the longitudinal direction relative to each fiber optic equipment tray of the plurality of fiber optic equipment trays;
- wherein each fiber optic module of the plurality of fiber optic modules comprises a front end, a rear end, an interior, a plurality of first fiber optic adapters disposed through the front end, at least one second fiber optic adapter disposed through the rear end, and at least one optical fiber disposed within the interior and establishing at least one optical connection between the at least one second fiber optic adapter and at least one first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein for at least one fiber optic module of the plurality of fiber optic modules, the at least one second fiber optic adapter comprises a higher connection density than each first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules; and
- wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured

to permit the plurality of fiber optic modules to be removable from a front of the plurality of fiber optic equipment trays, and releasably removable from a rear of the plurality of fiber optic equipment trays.

 JX-0007 ('153 Patent) (emphasis added). The parties have agreed to construe the above claim term as "a front end of the fiber optic equipment tray having at least one flange comprising successive sections extending frontward, upward, and rearward that guides optical fibers to either the left or the right." *See* Joint Chart at 2; Compl. Br. at 110; Resps. Br. at 53-54; Staff Br. at 46-47.

Accordingly, as argued by the parties, the administrative law judge adopts the joint proposed claim construction and has determined that the claim term "a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively" should be construed to mean "a front end of the fiber optic equipment tray having at least one flange comprising successive sections extending frontward, upward, upward, and rearward that guides optical fibers to either the left or the right."

The parties' arguments concerning the meaning of a non-claim word "flange" is discussed in the context of infringement and the technical prong of the domestic industry requirement, *infra. See* Compl. Br. at 110; Resps. Br. at 53-54.

B. Infringement Analysis of the '153 Patent

As noted, Corning asserts independent claim 23 and dependent claims 9, 16, and 26. Corning asserts claims 9, 16, 23, and 26 against Panduit and FS, and asserts claims 9 and 23 against Siemon's pre-August 2019 products. For the reasons discussed below, Corning has shown by a preponderance of the evidence that Panduit's, Siemon's, and

261

FS's accused products infringe the '153 patent.

1. Accused Products

The accused products consist of chassis, modules, and combinations thereof. There are three categories of accused products, Base-8, Base-12, and Base-24, which are defined by the number of fiber connections available per module. First, a Base-8 module supports eight fiber connections, and a Base-8 chassis supports eighteen Base-8 modules per 1U space. CX-0001C (Prucnal WS) Q/A 63. Second, a Base-12 module supports twelve fiber connections, and a Base-12 chassis supports twelve Base-12 modules per 1U space. *Id.* Finally, a Base-24 module supports twenty-four fiber connections, and a Base-24 chassis supports six Base-24 modules per 1U space. *Id.* In each case, there are a total of 144 connections available in a 1U space; the difference in the three categories is in the number of modules needed to fill that space.

Within each category, there are three chassis sizes: 1U, 2U, and 4U, which refer to the chassis height. *Id.* Apart from the total height, these types are materially the same for each respondent. *Id.* That is, the fiber optic connection density for a 1U chassis from a given respondent is the same as the density for a 2U or 4U chassis from that respondent. *Id.* Q/A 64. Complainant argues that therefore "for each Respondent, and within each fiber connectivity configuration (Base-12, Base-8, and Base-24), a 1U chassis is representative of a 2U chassis and a 4U chassis for purposes of the asserted patents." *Id.*; *see also* CX-2042 (Compl. & Siemon Stip. Re Representative Accused Prods.) (stipulating that within each of the three categories, Siemon's 1U chassis is representative of its 2U and 4U chassis for purposes of the asserted patents).

Complainant has offered a complete list of representative accused products for

262



each respondent, along with the group of accused products represented by each such product, through the testimony of Dr. Prucnal. CX-0001C (Prucnal WS) Q/A 62; *see* CDX-0013 (Prucnal list of accused products).

Not all respondents market all types of accused products. The following describes the accused products allegedly imported and/or sold in the United States by each respondent:

		Chassis			Module		
Respondent	espondent Brand	Base-8	Base-12	Base-24	Base- 8	Base- 12	Base- 24
FS	FHX	1U	1U		Х	Х	
Panduit	HD FLEX	1U/2U/4U	1U/2U/4U	1U/2U/4U	Х	Х	Х
Siemon	LightStack	1U/2U/4U	1U/2U/4U		X	Х	

Summary of Accused Products

See Staff Br. at 20.

a. Panduit

The Panduit accused products are marketed as "HD FLEX Fiber" enclosures and cassettes. The accused Panduit chassis fall into three categories (Base-8, Base-12, and Base-24), and are available in three sizes (1U, 2U, and 4U). The accused Panduit modules are available in three configurations (Base-8, Base-12, and Base-24). *See* CX-0001C (Prucnal WS) Q/A 85; CPX-0062 (Panduit Base-8 1U chassis); CPX-0063 (Panduit Base-12 1U chassis); CPX-0065 (Panduit Base-24 1U chassis); CPX-0073 (Panduit Base-8 module); CPX-0074 (Panduit Base-12 module); CPX-0075 (Panduit Base-24 module).

b. Siemon

The Siemon accused products are marketed under the name "LightStack Ultra High-Density Fiber Plug and Play system." The accused Siemon chassis fall into two categories (Base-8 and Base-12) and are available in three sizes (1U, 2U, and 4U). The accused Siemon modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 106; CPX-0076 (Siemon Base-8 1U chassis); CPX-0077 (Siemon Base-12 1U chassis); CPX-0078 (pre-Aug. 2019 version of Siemon Base-12 1U chassis); CPX-0079 (Siemon Base-8 module); CPX-0080 (Siemon Base-12 module).

c. FS

The FS accused products are marketed under the names "FHX Series" and "FHX-FCP/FHX-C Series" and include both chassis and modules. The accused FS chassis fall into two categories (Base-8 and Base-12) and are available in just one size (1U). The accused FS modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 117; CPX-0053 (FS Base-8 1U chassis); CPX-0054 (FS Base-12 1U chassis); CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module).

2. Direct and Indirect Infringement

As noted, Corning asserts independent claim 23 and dependent claims 9, 16, and 26. Corning asserts claims 9, 16, 23, and 26 against Panduit and FS, and asserts claims 9 and 23 against Siemon's pre-August 2019 products.

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Panduit, Siemon (pre-August 2019 products), and FS accused combinations practice each element of asserted claims of the '153 patent, either literally or under the doctrine of equivalents. However, it has not been shown that Panduit, Siemon, and FS

accused combinations directly infringe the asserted claims inasmuch as they do not sell their accused chassis and modules in combination. Nonetheless, Corning has shown that those accused combinations indirectly infringe the asserted claims, discussed, *infra*.

The asserted claims of the '153 patent (and the claims from which they depend) read as follows:

1.^[42] A fiber optic apparatus, comprising:

- a chassis configured to be disposed in an equipment rack, the chassis comprising opposite front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a guide system configured to be disposed within the chassis;
- at least one fiber optic equipment tray configured to slidably engage within the guide system, the at least one fiber optic equipment tray comprising a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively, to permit optical fibers to be routed to either left or right portions of the at least one fiber optic equipment tray toward the first and second ends of the chassis; and
- a plurality of fiber optic modules configured to be received by the at least one fiber optic equipment tray, wherein each fiber optic module of the plurality of fiber optic modules is independently movable in the longitudinal direction relative to the at least one fiber optic equipment tray, and wherein each fiber optic module of the plurality of fiber optic modules comprises a front end, a rear end, an interior, a plurality of first fiber optic adapters disposed through the front end, at least one second fiber optic adapter disposed through the rear end,

⁴² Claim 1 is not asserted.

and at least one optical fiber disposed within the interior and establishing at least one optical connection between the at least one second fiber optic adapter and at least one first fiber optic adapter of the plurality of first fiber optic adapters.

6.^[43] The fiber optic apparatus of claim **1**, wherein the at least one fiber optic equipment tray comprises a plurality of fiber optic equipment trays.

9. The fiber optic apparatus of claim 6, wherein:

each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules; and

the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to permit each fiber optic module of the plurality of fiber optic modules to be removable from a front of the plurality of fiber optic equipment trays, and releasably removable from a rear of the plurality of fiber optic equipment trays.

16. The fiber optic apparatus of claim 1, wherein at least one fiber optic module of the plurality of fiber optic modules comprises a locking latch comprising a lateral protrusion configured to prevent the at least one fiber optic module from moving rearward relative to the at least one fiber optic equipment tray, the locking latch being actuatable by a user from a rear of the at least one fiber optic module to enable removal of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module to enable removal of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module formation at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module formation at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a rear of the at least one fiber optic module from a r

23. A fiber optic apparatus, comprising:

a chassis configured to be disposed in an equipment rack, the chassis comprising opposite front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;

⁴³ Claim 6 is not asserted.

a guide system configured to be disposed within the chassis;

- a plurality of fiber optic equipment trays arranged in a stacked configuration and configured to slidably engage within the guide system, wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays comprises a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively, to permit optical fibers to be routed to either left or right portions of the plurality of fiber optic equipment trays toward the first and second ends of the chassis; and
- a plurality of fiber optic modules configured to be received by the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules is independently movable in the longitudinal direction relative to each fiber optic equipment tray of the plurality of fiber optic equipment trays;
- wherein each fiber optic module of the plurality of fiber optic modules comprises a front end, a rear end, an interior, a plurality of first fiber optic adapters disposed through the front end, at least one second fiber optic adapter disposed through the rear end, and at least one optical fiber disposed within the interior and establishing at least one optical connection between the at least one second fiber optic adapter and at least one first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein for at least one fiber optic module of the plurality of fiber optic modules, the at least one second fiber optic adapter comprises a higher connection density than each first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules; and
- wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured

to permit the plurality of fiber optic modules to be removable from a front of the plurality of fiber optic equipment trays, and releasably removable from a rear of the plurality of fiber optic equipment trays.

25. The fiber optic apparatus of claim 23, further comprising a plurality of module guides associated with the plurality of fiber optic equipment trays, wherein the chassis comprises a rear section, and a rear portion of each module guide of the plurality of module guides defines at least one guide channel that is open on a rear end thereof to permit the plurality of fiber optic modules to be inserted into the plurality of module guides from the rear section of the chassis and to be guided toward the front end of the chassis.

26. The fiber optic apparatus of claim **25**, wherein each fiber optic module of the plurality of fiber optic modules comprises a locking latch that is configured to prevent the fiber optic module from moving rearward relative to a fiber optic equipment tray of the plurality of fiber optic equipment trays, and that is actuatable by a user from a rear of the fiber optic module to enable removal of the fiber optic module from the fiber optic equipment tray.

JX-0007 ('153 Patent) at 16:51-20:30.

a. Issues Common to Multiple Respondents

All asserted claims of the '153 patent recite: "a front end with at least one fiber

optic routing element that comprises successive material sections extending frontward,

upward, and rearward, respectively." JX-0007 ('153 Patent), Claims 1 and 23.

Asserted claim 23 reads as follows:

23. A fiber optic apparatus, comprising:

- a chassis configured to be disposed in an equipment rack, the chassis comprising opposite front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a guide system configured to be disposed within the chassis;

- a plurality of fiber optic equipment trays arranged in a stacked configuration and configured to slidably engage within the guide system, wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays comprises *a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively*, to permit optical fibers to be routed to either left or right portions of the plurality of fiber optic equipment trays toward the first and second ends of the chassis; and
- a plurality of fiber optic modules configured to be received by the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules is independently movable in the longitudinal direction relative to each fiber optic equipment tray of the plurality of fiber optic equipment trays;
- wherein each fiber optic module of the plurality of fiber optic modules comprises a front end, a rear end, an interior, a plurality of first fiber optic adapters disposed through the front end, at least one second fiber optic adapter disposed through the rear end, and at least one optical fiber disposed within the interior and establishing at least one optical connection between the at least one second fiber optic adapter and at least one first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein for at least one fiber optic module of the plurality of fiber optic modules, the at least one second fiber optic adapter comprises a higher connection density than each first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules; and
- wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to permit the plurality of fiber optic modules to be removable from a front of the plurality of fiber optic

Case: 22-1228 Document: 29 VERSON 460 Filed: 04/25/2022 Confidential Material Omitted on this Page

equipment trays, and releasably removable from a rear of the plurality of fiber optic equipment trays.

JX-0007 ('153 Patent) (emphasis added).

As discussed in the claim construction section above, the parties have agreed to construe that claim term as "a front end of the fiber optic equipment tray having at least one flange comprising successive sections extending frontward, upward, and rearward that guides optical fibers to either the left or the right." *See* Joint Chart at 2; Compl. Br. at 110; Resps. Br. at 53-54; Staff Br. at 46-47. Indeed, the administrative law judge adopted the joint proposed claim construction and determined that the claim term "a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively" should be construed to mean "a front end of the fiber optic equipment tray having at least one flange comprising successive sections extending frontward, upward, and rearward that guides optical fibers to either the left or the right."

i. Respondents' Fiber Optic Routing Elements

Panduit, Siemon, and FS each designed a slightly different fiber optic routing element, but each is the same across each respondent's accused products. Images of these three fiber routing elements are shown below. Each satisfies the elements of the claims.

Case: 22-1228 Document: 29 VERSO 461 Filed: 04/25/2022 Confidential Material Omitted on this Page



X-1849 (Panduit Photos Ex. F) at 4; CX-1853 (Siemon Photos Ex. J) at 3; CX-1855 (FS Photos Ex. L) at 3

First, each respondent's fiber routing element consists of a molded plastic component that is attached to the front end of the tray through thermal welding, or by permanent snap features. CX-0001C (Prucnal WS) Q/A 442-45. In each case, therefore, the tray comprises the routing element — that is, the fiber routing element is an integrated part of the tray. *Id*.

Second, each respondent's fiber routing element comprises a flange. As Dr. Prucnal explains, a person of ordinary skill would understand that "[a] flange is simply an extension from a main body." *Id.* Q/A 438. Each respondent's fiber routing elements is an extension from the main body of the tray. *Id.* Q/A 442-45.

Third, each respondents' fiber routing elements consist of successive material sections extending frontward, upward, and rearward, respectively, which enables the routing element to hook around the fiber optic cables to hold them in place and facilitate management of the cables at the front of the tray and chassis. *Id*. The material sections comprising this shape are successive in that there is no intermediate material section in the fiber routing element between the elements that extend frontward, upward, and rearward, respectively. *Id*.

271

Fourth, each respondent's fiber routing element guides optical fibers to either the left or the right of the tray or chassis. *Id.* As the specification states, the purpose of the fiber routing element is "to allow optical fibers to be routed therein to either the left or right of the tray to the sides 340, 342 of the chassis." JX-0007 ('153 Patent) at 15:60-62. Respondents' documents show their fiber routing elements being used for this purpose. *See* CX-1622 (Panduit HD Flex Fiber Cabling System Brochure) at 6; CX-0087 (Leviton Enclosure Instructions) at 9; CX-0179C (Siemon Plug and Play Presentation) at 6; CX-0180C (11/19 Siemon LightStack Spec.) at 1; CPX-0021 (FHX Ultra HD Fiber Enclosure User Guide Video) at 1:27; JX-0031C (Zhang Dep. Tr.) 154, 156 (confirming this for the FS accused chassis).

Respondents argue that respondents' accused products do not directly infringe the asserted claims of the '153 patent. It is argued, *inter alia*:

Complainant asserts that Panduit, Siemon, and FS each infringe at least some of the Asserted Claims (claims 9, 16, 23, and 26) of the '153 Patent. Each of these claims, directly or through dependency, recites "a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively." See JX-0007 ('153 Patent), cls. 1, 23; RX-0006C (Min RWS) Q/A 87 (citing RDX-0006C.31-33 (153 Pat. Asserted Claims)). The parties have agreed to a construction for this term as "a front end of the fiber optic equipment tray having at least one flange comprising successive sections extending frontward, upward, and rearward that guides optical fibers to either the left or the right," the parties disagree on what the accused products must have in order to infringe the asserted claims. RX-0006C (Min RWS) Q/A 88-93; CX-0001C (Prucnal WS) Q/A 438.

Respondents' accused products do not infringe the agreed-upon construction for two reasons. First, under the parties' construction, the claim recites a flange that extends from the main body of the tray and comprises successive sections extending frontward, upward and rearward. Min. Tr. 858:11-19; CX-0001C (Prucnal WS) Q/A 438. None of the accused products practice this limitation. Second, Complainant's expert, Dr. Prucnal, asserts that under the agreed-upon construction, the accused

fiber optic routing element must be an integrated component on the front end of the fiber optic equipment tray, which is also not true for any of the accused products.

Resps. Br. at 185.

Respondents argue that respondents' accused products do not include a "flange."

It is argued, *inter alia*:

The parties agree that a "flange" must include *successive* sections extending frontward, upward, and rearward from the tray. *See* RX-0006C (Min RWS) Q/A 89; CX-0001C (Prucnal WS) Q/A 438. Thus, the "fiber optic routing element" must have a specifically-shaped flange extending from the front of the tray, and routing elements that differ in form are excluded.

This is further established by the prosecution history. RPHB at 186-87. Complainant's original claim language did not include the "successive" or "respectively" limitations. JX-0008C ('153 Prosecution History) at 150. Because the claim did not specify any particular, successive order, the Examiner rejected claim 1 as anticipated by U.S. Patent No. 5,511,144 to Hawkins ("Hawkins '144"), which included a "jumper radius control guides 8" that were structures disposed on, and attached to, the *top* of the front portion of the tray. RX-0006C (Min RWS) Q/A 89. To overcome Hawkins '144, Corning added the terms "successive" and "respectively." RPHB at 186-87; JX-0008 ('153 FH) at 138. The experts agree that "successive" means the material sections comprising the fiber optic routing element must proceed in a specific order, with no intervening segments. Min Tr. 858:18-19; CX-0001C (Prucnal WS) Q/A 438. As amended, the flange cannot be on top of the tray, it must extend frontward before extending upward. Min. Tr. 858:11-19.

To support its amendment, Corning cited four figures: Figures 3, 6, 7, and 9. JX-0008 ('153 FH) at 138. As Dr. Prucnal recognized, each figure shows a fiber optic routing element that is a flange that extends from the front of the tray forward, then upward, and then rearward. Prucnal Tr. 360:2-8; 360:23 - 361:1; 361:5 - 362:2; *see also* RX-0006C (Min RWS) Q/A 91; *see also* RDX-006C.38 (Panduit D-Rings). Consistent with the amended claim language, none of these figures show a routing element on top of the tray itself. JX-0007 ('153 Pat.) at Figs. 3, 6, 7, 9; Prucnal Tr. 360:2-8; 360:23 - 361:1; 361:5 - 362:2; RX-0006C (Min RWS) Q/A 92-93. While the '153 Patent includes figures that show "fiber routing guides" 336, like Hawkins '144's jumper radius control guides,

that are disposed on top of the tray itself, Corning did not identify these figures to support its amendment. RX-0006C (Min RWS) Q/A 93; JX-0008 ('153 FH) at 138.

Thus, the claimed "fiber optic routing element" does not encompass all potential cable management elements that can be used to route fiber optic cables. Rather, Corning intentionally limited it, disclaiming routing guides disposed on top of the tray, and sought to claim only fiber optic routing elements that took on a specific shape; extending frontward from the front of the tray and then extending upward and rearward. *See also* CX-0001C (Prucnal WS) Q/A 440 ("during prosecution, Corning distinguished the routing element in the prior art (in particular, the Hawkins reference) based on its 'orientation' or shape, not based on how it was integrated with a tray"). In all of Respondents' accused products, however, the purported fiber optic routing element is disposed on top of the tray and does not extend from the front of the tray in successive segments starting with frontward and continuing upward and rearward.

Resps. Br. at 186-87.

Respondents' arguments rely on improper attempts to import limitations into the claims and the parties' construction — particularly the word "flange," which does not appear in the claims. Corning consented to the use of the term "flange" in the parties' agreed construction based on how that term is used in the patent and the art generally. Respondents, however, have sought to reinterpret that term in ways that significantly change its meaning.

First, Dr. Min opines that respondents' fiber routing elements are not a "flange" because they are not a "part of the tray," but instead are "attached to the front of the tray." RX-0006C (Min RWS) Q/A 88-89, 103, 117, 122. However, there is no requirement in the claims that the flange must be formed as part of the tray rather than as "a separately molded object attached to the tray." *Id.* Q/A 88. It is improper to import such a limitation into the claim, even if all the embodiments in the specification matched

274

Case: 22-1228 Document: 29 VERSON 465 Filed: 04/25/2022 Confidential Material Omitted on this Page

respondents' description. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004). Here, moreover, additional embodiments — indeed, preferred embodiments — show a fiber routing element that is not "part of the tray" but is in fact a "separately molded object attached to the tray." The embodiment in Figure 3, for example, shows a fiber routing element that is comprised of "fiber routing tray 36" that "is attached to the main tray portion 44 via hinge mechanisms in the form of hinges 46A, 46B disposed on each end 48A, 48B of the main tray portion." JX-0007 ('153 Patent) 7:24-29. This embodiment is shown below:



Nor does the use of the term "flange" in the specification support respondents' position. Respondents' experts opine that the terms appears only once in the '153 patent. *See* RX-0006C (Min RWS) Q/A 95 (reading the '153 patent to define "flange" in terms of the U-shaped flange in Figure 33); RX-0008C (Lebby RWS) Q/A 130 (similar). In fact, as Dr. Prucnal explains, it appears twice. Prucnal Tr. 372-73 (explaining that the '153 patent uses the term "flange" to identify two unrelated structures). It first appears in discussing Figure 17, where the term "flange" is used to describe the end of a plunger

275



that is inserted into a hole: "The bracket 160 contains a series of apertures 162 that are adapted to receive flanges 164 from plungers 166." JX-0007 ('153 Patent) at 12:32-34:



The term flange then again appears in Figure 33, which describes a "U-shaped flange" that is formed on the front of module guide tray, which in turn is attached to a fiber optic equipment tray by a hinge. Although this flange is formed as part of the module guide tray, it is clearly a different embodiment from the claimed flange — among other reasons, its U shape is not facing in the claimed direction, but instead has open portion facing upwards rather than rearward as the claims recite. Thus, there is no factual basis for respondents to claim that the Figure 33 embodiment of a flange should be read into the claims.

Respondents' attempt to interpret the term "flange" narrowly is also inconsistent with respondents' own use of that term. Panduit's product specification for its accused chassis, for example, describes as an "integral . . . flange" the mounting brackets that are separate components that can be attached to the chassis (via screws) to mount the chassis it in an equipment rack:



technical information

Mounting:	Integral mounting flange for installation in 19" wide EIA-310 racks
Material:	Steel and plastic

CX-0199 (Panduit HD Flex Enclosures Spec.) at 1. Panduit's description of its own mounting flange as "integral" means that the flange can be attached to the chassis, not that they are part of the structure of the chassis. As Panduit's installation instructions show, these mounting flanges are attached to the side of the chassis via screws, and can be attached in different positions:



CX-1705 (Panduit FLEX1U, FLEX2U, & FLEX4U Installation Instructions) at 2. Thus, Panduit's own use of the term "flange" in the real world conflicts with respondents' position that a "flange" cannot be separately attached. *See* Resps. Br. at 185-87.

Dr. Min also relies on several general-usage dictionaries to support his opinion that "a person of ordinary skill of the art would understand that a 'flange' in the '153 patent is its ordinary meaning of a rib, rim, or other integral projection of an object for strengthening, guiding, or providing a means to connect the object to another object." RX-0006 (Min RWS) Q/A 88. These lay dictionaries are entitled to little weight given the technical nature of the term at issue and the evidence that persons of skill would not

Case: 22-1228 Document: 29 VERSON 468 Filed: 04/25/2022 Confidential Material Omitted on this Page

consider the term "flange" to be limited in the way Dr. Min suggests. *See AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 1247-48 (Fed. Cir. 2001); *Anderson v. Int'l Eng'g & Mfg., Inc.*, 160 F.3d 1345, 1348-49 (Fed. Cir. 1998); *see Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n*, 366 F.3d 1311, 1321 (Fed. Cir. 2004).

Second, Dr. Min opines that respondents' fiber routing elements are not flanges because they "are not made out of the same material of the tray." RX-0006C (Min RWS) Q/A 103-04, 117, 122. There is no requirement in the claims that the fiber routing element be of the same material as the rest of the tray. Nor is this contained in the parties' agreed construction, as Dr. Min conceded on cross examination. Min Tr. 846.

The specification likewise contains no indication that the fiber routing element must be made of the same material as the tray. To the contrary, in describing the Figure 3 embodiment, the specification states that "fiber routing tray 36" that is attached to the main tray "is formed from sheet metal or other material that is bent on top of itself in a Ushape on the front end 60 of the fiber routing tray." JX-0007 ('153 Patent) at 8:12-15 (emphasis added). Thus, the specification simply does not have any disclosure concerning the material of the claimed routing element. As Dr. Prucnal explains, moreover, a person of ordinary skill would know that fiber optic connection equipment for data centers often uses a blend of metal and molded plastic components. CX-0001C (Prucnal WS) Q/A 438, 505.

Third, Dr. Min opines that during prosecution of the '153 patent, "Corning disclaimed cable management structures that are disposed on and attached to the front of the tray and that do not include 'successive material sections extending frontward, upward, and rearward, respectively' (*i.e.*, that are not flanges of the front of the tray

278

itself) in order to secure issuance of the '153 patent." RX-0006C (Min RWS) Q/A 89. Yet, during prosecution, Corning distinguished the routing element in prior art based on its "orientation" or shape, not based on its integration with a tray. Response to Office Action Mailed Apr. 10, 2017, in JX-0008 ('153 Prosecution History) at 143. Thus, the prosecution history is not relevant to how the fiber routing element integrates with the tray or what material comprises it.

Specifically, during prosecution, the examiner cited U.S. Patent No. 5,511,144 ("Hawkins '144") as anticipating the fiber routing guide claimed in the '153. According to the examiner, Hawkins '144 discloses a fiber optic apparatus with chassis, trays, and "at least one fiber routing element (8) that comprises material sections extending frontward, upward and rearward (see Fig. 6) to permit optical fibers to be routed to either left or right portions of the tray towards first and second ends of the chassis." JX-0008 ('153 Prosecution History) at 97; see also id. at 142 (reproducing Hawkins '144 Fig. 6). In response, Corning amended claim 1: "the at least one fiber optic tray comprising a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively, to permit optical fibers to be routed...." JX-0008 ('153 Prosecution History) at 150. Corning then argued that the "jumper radius control guides" in Hawkins '144 did not anticipate the '153 routing guide claims because they "include an upwardly-extending material having an arc-shaped uniform cross-section that curves to one side," and "fail to include 'successive material sections extending frontward, upward, and rearward, respectively." JX-0008 ('153 Prosecution History) at 143.

In subsequent PTO rejections, the examiner did not cite Hawkins '144 for its fiber

279

Case: 22-1228 Document: 29 VERSON 470 Filed: 04/25/2022 Confidential Material Omitted on this Page

routing element, but instead cited U.S. Patent No. 6,944,389 to Giraud, a Corning-owned patent, which provided a circular fiber routing element. JX-0008 ('153 Prosecution History) at 10152. This rejection was later overcome by a terminal disclaimer so that Corning could avoid a double-patenting rejection, but Corning did not concede the propriety of the rejection and so did not speak to the anticipatory nature of Giraud's fiber routing guide. *See id.* at 11383. As a result, the only way Corning narrowed the fiber routing element was by adding the words "successive" and "respectively" and traversing the Hawkins '144 "orientation" or shape as failing to have successive frontward, upward, and rearward sections. That falls short of the "clear and unmistakable disavowal of scope during prosecution," *Purdue Pharma L.P. v. Endo Pharms. Inc.*, 438 F.3d 1123, 1136 (Fed Cir. 2006), required by the doctrine of prosecution history disclaimer.

ii. Doctrine of Equivalents (Fiber Optic Routing Elements)

While it is not the usual practice to discuss infringement under the doctrine of equivalents before discussing all the merits of literal infringement, this issue is common to multiple respondents, and thus it is appropriate to do so here. For the reasons set forth below, and as Dr. Prucnal has shown, the fiber optic routing elements of respondents' accused products (discussed in detail immediately above) infringe under the doctrine of equivalents because any differences between the claimed limitations and the accused devices are insubstantial. The accused devices perform substantially the same function as the patented feature in substantially the same way to achieve substantially the same result. *See* CX-0001 (Prucnal WS) Q/A 503-06.

First, the fiber optic routing elements on the respondents' accused chassis perform

280

Case: 22-1228 Document: 29 VERSON 471 Filed: 04/25/2022 Confidential Material Omitted on this Page

substantially the same function as the claimed fiber optic routing elements. Each manages optical fiber by routing cables to the left or right side of each tray, *see* CX-0001C (Prucnal WS) Q/A 442-45, just like the fiber routing element as described in the specification: "The module guide tray 332 may contain a U-shaped flange 338 to allow optical fibers to be routed therein to either the left or right of the tray to the sides 340, 342 of the chassis 302." *See* JX-0007 ('153 patent) at 15:59-62.

Second, the fiber routing elements in respondents' accused chassis perform this function in substantially the same way as the claimed fiber optic routing elements — through an element with successive sections extending frontward, upward, and rearward. Despite superficial differences, all the elements share the key common design attributes described in the Asserted Claims: successive sections extending frontward, upward, and rearward, creating a shape that hooks around bundles of cables to keep them in place. *See* CX-0001C (Prucnal WS) Q/A 442-45. Although Dr. Min opines that respondents' fiber routing elements are a distinct component from the tray, he did not explain why that matters. A person of ordinary skill would understand that high-density fiber optic connection equipment uses a mix of metal and molded plastic components, which can be attached in various ways. *See* CX-0001C (Prucnal WS) Q/A 438, 505.

Third, the fiber routing elements in respondents' accused chassis achieve the same result as the claimed fiber optic routing elements. All achieve efficient cable management in the front of the chassis. *See* CX-0001C (Prucnal WS) Q/A 442, 444-445. This is the same as the purpose of the fiber routing element described in the '153 patent: "Even with fiber optic equipment tray pull out capabilities, a need still exists to improve access to optical components in a fiber optic equipment tray as well as provide neat

281

routing and organization of jumper connections." JX-0007 ('153 patent) at 2:48-52.

Dr. Min opines that Dr. Prucnal's "same function" showing "oversimplifies the function of the claimed fiber optic routing element, which a POSITA would understand to have at least two additional functions": (1) "protection or shielding for the fiber optic wiring," and (2) "provide increased structural integrity for the cabling in the fiber optic routing tray." RX-0006C (Min RWS) Q/A 98. He opines that respondents' fiber routing elements fail to perform these two additional functions. *Id.* Q/A 108, 109 (Panduit), 116-18 (FS), 125-27 (Siemon). He is misguided on both points.

There is no basis to attribute "protection" or "structural integrity" functions to the claimed fiber routing element. What matters for purposes of the doctrine of equivalents test are the functions recited in the claims. *See Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 559 F.3d 1308, 1312 (Fed. Cir. 2009). Neither of Dr. Min's two functions is recited in the claims or the parties' construction or even described in the specification. To the contrary, Dr. Min infers these functions from the figures of the patent, which he opines show "a lip of sheet metal" that "provides protection or shielding for the fiber optic wiring," and he claims that Figure 3 — which shows a separate fiber routing tray attached to a main tray — indicates that a fiber routing element "provide[s] increased structural integrity for the cabling." RX-0006C (Min RWS) Q/A 98. It is improper to read functions into the claims based on "a few specification statements or figures." *Computer Docking Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1374 (Fed. Cir. 2008).

Moreover, respondents' fiber routing elements do perform both of the asserted additional functions. The whole purpose of these elements is to ensure that the fiber is

282

Case: 22-1228 Document: 29 VERSON 473 Filed: 04/25/2022 Confidential Material Omitted on this Page

not damaged when trays or modules are moved from the chassis. That is protecting the wiring. Further, these elements hold the wiring, and therefore provide increased structural integrity.

With respect to some respondents, Dr. Min opines that fiber routing elements perform additional functions. As to Panduit, he opines that the element "allow[s] the fiber optic wires to be more gradually routed." RX-0006C (Min RWS) Q/A 100. As to Siemon, he opines that it provides a "front grab bar . . . to serve as a handle to allow the tray to be pulled out and pushed in." *Id.* Q/A 125. The fact that these elements provide a function in addition to the claimed element is of no legal consequence in a doctrine of equivalents analysis. *See Insta-Foam Prods.*, 906 F.2d at 702.

Finally, Dr. Min opines that respondents' fiber optic routing elements achieve different results than the claimed elements. However, Dr. Min's opinion relies on unsupported claims about the results achieved by of the '153 patent's fiber routing element, based on inferences from the figures of the patents. RX-0006C (Min RWS) Q/A 114, 125-27. The characteristics of the fiber routing element that Dr. Min purports to extract from the figures are not in the claims or even the specification, and it is improper to import them.

b. Direct and Indirect Infringement - Panduit

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Panduit's accused combinations practice each element of asserted claims 9, 16, 23, and 26 of the '153 patent. *See* Compl. Br. at 120-25; Staff Br. at 122-25,127; CX-0001C (Prucnal WS) Q/A 422-26, 428, 432, 434, 438-40, 442, 448-49, 456, 459-60, 466, 468, 472-73, 475, 477-82, 484, 488, 492, 496, 503-06. However, it has not been shown

283

that Panduit's accused combinations directly infringe the asserted claims inasmuch as Panduit does not sell its accused chassis and modules in combination.

Respondents argue that Corning has not shown that Panduit's accused

combinations infringe the asserted claims of the '153 patent. See Resps. Br. at 185-88,

191-200.

i. Direct Infringement

Unasserted Independent Claim 1

Corning does not assert independent claim 1. Asserted claims 9 and 16 depend

from claim 1. Respondents concede that Panduit's accused products practice these

limitations, except for the fiber optic routing element discussed above in the common

issues section. See Resps. Br. at 185-88.

Respondents argue, inter alia:

The Panduit Accused Products do not include a cable management element that extends frontward from the front of the tray and then upward and rearward. RPHB at 188. Instead, the Panduit Accused enclosures have a plastic molded D-ring component—a separable component from the tray itself-that is disposed on and either snapped into, or screwed into the front of the tray. RX-0006C (Min RWS) Q/A 103-105; RDX-0006C.38 (Panduit D-Rings). These D-ring components do not first extend frontward from the front of the tray. RX-0006C (Min RWS) Q/A 103-105. In fact, they do not extend frontward from the tray at all. Instead, the D-rings sit on top of the tray and are located behind the front lip of the tray. Id. Thus, the Panduit D-rings do not satisfy the requirement that the fiber optic routing element consist of a flange Because the Panduit D-rings do not include the required flange extending from the front of the tray and comprising successive material sections extending frontward, upward, and rearward. As a "fiber optic routing element" is recited in each of the asserted claims, either directly or through dependency, the Panduit Accused Products do not infringe the asserted claims of the '153 Patent. Id. Q/A 105.

See Resps. Br. at 187-88.
Respondents argue, *inter alia*:

The Panduit Accused Products do not include a fiber optic routing element that is an "integrated component on the front end of the fiber tray" because Panduit's D-rings are on rails designed to be easily removed from the tray. RPHB at 188; RX-0006C (Min RWS) Q/A 103-105; *id.* Q/A 33-34; RX-1672C (Kuffel WS) Q/A 35-40; RDX-0010C.2 (Kuffel Demonstratives). For example, the D-ring in the second-generation HD Flex chassis is located on a rail that can be removed via screws or by snapping it out of the tray. RX-1672C (Kuffel WS) Q/A 37-40.

For the rails that can be snapped in and out, the HD Flex Installation Guide (RX-1297) teaches customers how to easily install and remove them. *Id.* Q/A 37. These steps include "[d]epress latch upward from underneath," "[g]rip by finger rail grips," "[p]ush rail to the left," and "[1]ift rail up and away from enclosure." RX-1297.0011 (HD Flex Installation Instructions). The steps are virtually identical to the removal steps that Dr. Prucnal has testified establish that a cable management element is not integral to the tray and is thus not the recited "fiber optic routing element." Specifically, Dr. Prucnal testified that a cable management element is easily removable if you need to "grip the clip, depress the clip, push the clip in the proper orientation, and lift the clip." Prucnal Tr. 996:7-16. But that is the exact situation with the secondgeneration HD Flex products, so these products do not infringe the asserted claims of the '153 Patent.

If more was needed, the D-ring in the Panduit Accused Products is also not an integrated component because it is a different material that is simply disposed on top of the tray. RX-0006C (Min RWS) Q/A 101-105. Again, this is what Corning disclaimed during prosecution and Corning cannot now try to recapture components that were disclaimed. Accordingly, Panduit's accused products do not infringe the asserted claims of the '153 Patent.

See Resps. Br. at 192-93.

This argument was discussed above in the common issues section.

Dependent Claim 9

Respondents concede that Panduit's accused products practice this claim. See

Resps. Br. at 185-88.

Dependent Claim 16

Respondents argue, inter alia:

The Panduit Accused Products do not infringe claims 16 and 26 of the '153 Patent because they do not include a "locking latch." *See* JX-0008 ('153 Patent) cls. 16, 26. Dr. Prucnal's analysis is conclusory and does not specifically allege how the Panduit Accused Products satisfy this limitation. *See* CX-0001C (Prucnal WS) Q/A 499. Instead, Dr. Prucnal cites back to claim 9 without any additional analysis. RX-0006C (Min RWS) Q/A 144. Claim 9 does not recite a locking latch and instead relates to modules being removed from the front and releasably removable from the rear. JX-0008 ('153 Patent) cl. 9. Dr. Prucnal's analysis for claim 9 asserts that "the Combinations of the front and rear stop features [in the Accused Products] capture both the front and rear protrusion rails, holding the module in place." CX-0001C (Prucnal WS) Q/A 460. But Dr. Prucnal never explains how these features satisfy the claimed "locking latch" as recited in claims 16 and 26. RX-0006C (Min RWS) Q/A 146-48.

See Resps. Br. at 194.

Asserted claim 16 reads as follows:

16. The fiber optic apparatus of claim 1, wherein at least one fiber optic module of the plurality of fiber optic modules comprises a *locking latch* comprising a lateral protrusion configured to prevent the at least one fiber optic module from moving rearward relative to the at least one fiber optic equipment tray, the *locking latch* being actuatable by a user from a rear of the at least one fiber optic module to enable removal of the at least one fiber optic equipment tray.

JX-0007 ('153 Patent) (emphasis added).

Asserted claim 26 reads as follows:

26. The fiber optic apparatus of claim 25, wherein each fiber optic module of the plurality of fiber optic modules comprises a *locking latch* that is configured to prevent the fiber optic module from moving rearward relative to a fiber optic equipment tray of the plurality of fiber optic equipment trays, and that is actuatable by a user from a rear of the fiber optic module to enable removal of the fiber optic module from the fiber optic equipment tray.

JX-0007 ('153 Patent) (emphasis added).



Claim 16 requires modules that comprise "a locking latch comprising a lateral protrusion" that prevents the module "from moving rearward" and that can be "actuatable by a user from a rear of" the module to enable module removal from the rear of the tray. Panduit's accused module has a locking latch that holds the module in place to prevent rearward movement and that "is actuatable by a user from the rear of the module" — meaning the user can disengage the latch. CX-0001C (Prucnal WS) Q/A 460; CDX-0001C (Prucnal Direct) at 468-73. The specification shows the claimed locking latch 78 on the module in Figure 4, describing it as follows:

A locking feature in the form of a locking latch 78 and a protrusion 80 (Fig. 4) engage a complementary protrusion in the tray channel 54 The locking latch 78 is disengaged by pushing it inward towards the fiber optic module 22 to release the protrusion 80 from the tray channel 54.

JX-0007 ('153 Patent) 9:5-15. Figure 4 is shown below:



Dr. Prucnal provided extensive analysis and supporting evidence to show that Panduit's accused modules contain a locking latch that satisfies each of these requirements. *See* CX-0001C (Prucnal WS) Q/A 348, 460, 475, 499. Each Panduit accused module has triangle-shaped protrusion rails on the back left and right sides of the module. When these modules are inserted from the rear side of the chassis, the rear



protrusion rails are compressed until they clear a rear stop feature, and snap into place, capturing the rear protrusion rails under the stop. To remove a module from the rear of the tray, tabs on the back of the module are depressed to disengage the stop feature and allow the module to be pulled from the rear. Dr. Prucnal identified these features as the claimed locking latch with a protrusion, as shown below (CDX-0001C, at 468-69):



Dr. Min opines that Dr. Prucnal "fails to establish how the" identified features "satisfy the recited 'locking latch," but does not explain what he believes is missing. RX-0006C (Min RWS) Q/A 147. Dr. Min then opines that "even if" the features Dr. Prucnal identifies "create the claimed 'locking latch' . . . at least when the cassette is installed from the front of the tray, the cassette is held in place by a spring clip located toward the front of the tray, and releasing it does not require a user to actuate anything." *Id.* Q/A 148. The claimed feature is a latch that prevents rearward movement of the module and allows the module to be released from the rear of the chassis. Thus, what happens when the cassette is inserted into the front of the chassis is irrelevant.

Independent Claim 23

Respondents concede that the Panduit accused products practice these claims,

288



except for the fiber optic routing element discussed above. See Resps. Br. at 185-88.

Dependent Claim 26

Respondents argue, inter alia:

The Panduit Accused Products do not infringe claim 26 of the '153 Patent. Claim 26 recites "a rear portion of each module guide of the plurality of module guides defines at least one guide channel that is open on a rear end thereof to permit the plurality of fiber optic modules to be inserted into the plurality of module guides from the rear section of the chassis and to be guide toward the front end of the chassis." JX-0008 ('153 Patent) cl. 26; RX-0006C (Min RWS) Q/A 133-135. The Panduit Accused Chassis do not have a guide channel. RX-0006C (Min RWS) Q/A 133-135. Additionally, any dividers in the tray are not used to guide the Modules from the rear to the front. While they may act like barriers, they do not permit the Modules to be guided to the front of the Accused Chassis. *Id.*; RX-1672 (Kuffel) Q/A 42.

See Resps. Br. at 193-94.

Non-asserted claim 25 and asserted claim 26 read as follows:

25. The fiber optic apparatus of claim 23, further comprising a plurality of module guides associated with the plurality of fiber optic equipment trays, wherein the chassis comprises a rear section, and a rear portion of each module guide of the plurality of module guides *defines at least one guide channel that is open on a rear end thereof to permit the plurality of fiber optic modules to be inserted into the plurality of module guides from the rear section of the chassis and to be guided toward the front end of the chassis.*

26. The fiber optic apparatus of claim 25, wherein each fiber optic module of the plurality of fiber optic modules comprises a *locking latch* that is configured to prevent the fiber optic module from moving rearward relative to a fiber optic equipment tray of the plurality of fiber optic equipment trays, and that is actuatable by a user from a rear of the fiber optic module to enable removal of the fiber optic module from the fiber optic equipment tray.

JX-0007 ('153 Patent) (emphasis added).

Claim 26 recites a locking latch, which Panduit's accused products practice, for

the reasons set forth above with respect to claim 16.

289

Claim 26 depends from claim 25, which recites module guides that "define[s] at least one guide channel that is open on a rear end thereof to permit the plurality of fiber optic modules to be inserted into the plurality of module guides from the rear section of the chassis and to be guided toward the front end of the chassis." JX-0007 ('153 Patent) 20:18-22. The '153 patent explains what it means for the module guides to be open on a rear end as recited in claim 25:

Also as shown in Fig. 3 and as illustrated in more detail in Fig. 4, the module rail guides 50 are configured such that the tray channels 54 are *open on a rear end* 56 of the module rail guides 50. This allows the fiber optic modules 22 to be *rear-installable into the fiber optic equipment trays 20 from the rear section 26 of the chassis 12*.

JX-0007 ('153 Patent) at 7:57-63 (emphasis added). The relevant question with respect to this limitation is whether the accused modules are rear-installable into a fiber optic tray.

Dr. Prucnal has provided extensive analysis and supporting evidence to show that Panduit's accused modules can be inserted into the rear of the fiber optic equipment trays of each of these respondents' accused chassis. Panduit's accused Base-12, Base-8, and Base-24 modules can be inserted into the rear of their accused Base-12, Base-8, and Base-24 chassis, respectively. *See* CX-0001C (Prucnal WS) Q/A 499-500; CDX-0001C (Prucnal Demonstratives) Q/A 580-81. Rear insertion is possible because each pair of laterally spaced module guides in the fiber optic equipment trays creates a guide channel that is open to the rear end of the chassis into which each of the respective modules can be inserted. *See id.* Q/A 500. Further, when these modules are inserted from the rear, they are guided toward the front end of the chassis in the module guides. *See id.* Dr. Prucnal explained that he confirmed this by his use and analysis of the products, and

290

based on respondents' documents and testimony. See id. Q/A 460, 465, 500, 502.

Respondents' expert Dr. Min opines that Panduit's accused products do not infringe this claim because they do not have "at least one guide channel that is open on a rear end." Dr. Min concedes that the accused modules can be inserted into the channels in the module guides from the rear of the chassis. RX-0006C (Min RWS) Q/A at 134-35. He opines that when a Panduit accused module is inserted from the rear "the cassette is not 'guided' in any 'module guides' from the rear to the front of the tray" because "there is space between the cassette and the tray dividers as the cassette is moved within the tray" such that "if the cassette touches a divider on one side of the tray when it is being inserted from the rear of the enclosure, it will not be touching the divider on the other side of the tray." RX-0006C (Min RWS) Q/A 135. To adopt that view would import limitations into the claims, by opining "guiding" a module as permitting no space between the module and the module guide. Furthermore, Dr. Min erroneously relies on testimony from Mr. Kuffel about the relationship between the module and tray dividers when installed from the front, but Claim 26 is directed to rear installation. See RX-0006C (Min RWS) Q/A 135 (citing RX-1672C (Kuffel WS) Q/A 42 (describing insertion of "a Panduit HD Flex cassette into the front of a Panduit HD Flex enclosure")).

Claim 26 contains no "minimum space" requirement, and none is suggested by the specification. When a Panduit accused module is inserted into an enclosure and touches one side of a module rail and not the other, it is because it is being inserted at an angle. If the module is pushed, the divider guide will straighten it out, until it reaches a parallel position between the guides and is locked in place. Mr. Kuffel, confirmed this in his deposition:

291

Case: 22-1228 Document: 29 VERSON 482 Filed: 04/25/2022 Confidential Material Omitted on this Page

THE WITNESS: "[T]he rear of the cassette is dropped into the tray, to the bottom of the tray. It is then pushed back. And it is sort of sloppy. And towards the rear there is a feature that it stops on, relative to one of the dividers. It may be skewed, so it will hit one side and then touch the other. And then at that point you have to — because the cassette is skewed, it is not parallel to the tray. You press it in. . . .

Q: Is there some mechanism that keeps the cassette when it is in the tray from moving from left to right?

A: In the home position there may be, which is the final position. There may be some areas that control the position, in the final position.

See JX-0017C (Kuffel Dep. Tr.) 429-431. Thus, the module guides in the Panduit

accused products ensure that when a module is inserted from the rear, it always stays

within those guides.

ii. Indirect Infringement

The evidence demonstrates that Panduit accused combinations infringe asserted claims 9, 16, 23, and 26 of the '153 patent. Panduit, however, does not sell its products in combinations. In each case, the modules are packaged separately from the chassis. RX-0006C (Min RWS) Q/A 82. Thus, it is customers, rather than Panduit, who assemble the accused chassis and modules into infringing combinations.

Accordingly, Panduit does not directly infringe the asserted claims of the '153 patent. The evidence shows that Panduit indirectly infringe, for the reasons discussed in the Indirect Infringement section of the '320 patent, *supra*.

c. Direct and Indirect Infringement - Siemon

For the reasons discussed below, Corning has shown by a preponderance of the evidence that Siemon's accused combinations (prior to August 2019) practice each element of the asserted claims 9 and 23 of the '153 patent. *See* Compl. Br. at 125-26;

292

Staff Br. at 125-27; CX-0001C (Prucnal WS) Q/A 422-26, 430, 432, 436, 438-40, 444, 452-53, 456, 461-63, 466, 470, 472-73, 477-82, 485, 489, 493-94, and 496, 503-06. However, it has not been shown that those accused combinations directly infringe the asserted claims inasmuch as Siemon does not sell its accused chassis and modules in combination.

Respondents argue that Corning has not shown that Siemon's accused combinations (prior to August 2019) infringe the asserted claims of the '153 patent. *See* Resps. Br. at 185-87, 188-91, 191-92, 193, 194-200.

Although Dr. Min opined that Siemon's prior design is no longer made or sold, and that it was "apparently never imported," RX-0006C (Min WRS) Q/A 119, Siemon's Mr. Veatch contradicted Dr. Min, testifying that in at least the first half of 2019 Siemon did sell its pre-August 2019 design to customers in the United States, Veatch Tr. 463-465.

i. Direct Infringement

Unasserted Independent Claim 1

Respondents concede that the Siemon accused products practice these limitations, except for the fiber optic routing element discussed above. *See* Resps. Br. at 185-87.

Dependent Claim 9

Corning concedes that the currently produced Siemon Accused Chassis does not practice this claim. *See* Compl. Br. at 125-26. However, respondents concede that the pre-August 2019 products did. *See* Resps. Br. at 185-87.

Indeed, Siemon's Mr. Veatch testified that "[o]riginally our enclosures had latches on the front end of the enclosure that allowed modules to be removed from the

293

Case: 22-1228 Document: 29 VERSON 484 Filed: 04/25/2022 Confidential Material Omitted on this Page

front of the enclosure. However, Siemon redesigned the product in August 2019 to remove these front latches. In the redesigned enclosures, modules cannot be removed from the front of the enclosure." *See* RX-1266C (Veatch WS) Q/A 14; *see also* RX-0006C (Min RWS) Q/A 149-51; Veatch Tr. 463.

Independent Claim 23

Respondents concede that the pre-August 2019 Siemon accused products practice these claims, except for the fiber optic routing element discussed above. *See* Resps. Br. at 185-87.

ii. Indirect Infringement

The evidence demonstrates that the Siemon accused combinations (prior to August 2019) infringe claims 9 and 23. Siemon, however, does not sell its products in combinations. In each case, the modules are packaged separately from the chassis. *See* RX-1266C (Veatch WS) Q/A 22-23. Thus, it is customers, rather than Siemon, who assemble the accused chassis and modules into infringing combinations.

Accordingly, Siemon does not directly infringe the asserted claims of the '153 patent. The evidence shows that they indirectly infringe, for the reasons discussed in the Indirect Infringement section of the '320 patent, *supra*.

d. Direct and Indirect Infringement - FS

For the reasons discussed below, Corning has shown by a preponderance of the evidence that FS's accused combinations practice each element of asserted claims 9, 16, 23, and 26 of the '153 patent. *See* Compl. Br. at 126-27; Staff Br. at 115-22, 127; CX-0001C (Prucnal WS) Q/A 422-26, 431-32, 437-40, 445, 454-56, 464-66, 471-73, 476-82,

294

Case: 22-1228 Document: 29 VERSO 485 Filed: 04/25/2022 Confidential Material Omitted on this Page

486, 490, 495-96, 501-02, 503-06. However, it has not been shown that FS's accused combinations directly infringe the asserted claims inasmuch as FS does not sell its accused chassis and modules in combination.

Respondents argue that Corning has not shown that FS's accused combinations infringe the asserted claims of the '153 patent. *See* Resps. Br. at 185-87, 191, 193, 194-200.

i. Direct Infringement

Unasserted Independent Claim 1

Respondents concede that the FS accused products practice this claim, except for

the fiber optic routing element discussed above. See Resps. Br. at 185-87.

Dependent Claims 9 and 16

The evidence shows that the FS accused products infringe asserted dependent

claims 9 and 16. Asserted claim 9 of the '153 patent depends from claim 6, which

depends from unasserted independent claim 1.

Unasserted claim 6 and asserted claim 9 read as follows:

6. The fiber optic apparatus of claim 1, wherein the at least one fiber optic equipment tray comprises a plurality of fiber optic equipment trays.

9. The fiber optic apparatus of claim 6, wherein:

each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules; and

the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to permit each fiber optic module of the plurality of fiber optic modules to be removable from a front of the plurality of fiber optic equipment trays, and

295

releasably removable from a rear of the plurality of fiber optic equipment trays.

Claim 6 adds the limitation that there must be more than one fiber optic equipment tray in the claimed apparatus. JX-0007 ('153 Patent) at 17:32-34. Claim 9 adds two new limitations: (1) each tray must be configured to receive multiple fiber optic modules; and (2) each module must be both removable from the front of a tray and "releasably removable" from the rear of a tray. *Id.* at 17:42-53. There is uncontested evidence that FS accused products satisfy these additional limitations. The FS accused chassis contain three trays per U space, and modules inserted in those chassis can be removed from the front or releasably removed from the rear after disengaging a locking latch. *See* Resps. Br. at 185-87; CPX-0054 (FS Base-12 chassis); CX-1855 (FS photos) at 2; CX-0589 (FHX Module installation instructions) at 2; CX-0001C (Prucnal WS) Q/A 464-65; CDX-0001C (Prucnal demonstratives) at 440-45.

Asserted claim 16 reads as follows:

16. The fiber optic apparatus of claim 1, wherein at least one fiber optic module of the plurality of fiber optic modules comprises a locking latch comprising a lateral protrusion configured to prevent the at least one fiber optic module from moving rearward relative to the at least one fiber optic equipment tray, the locking latch being actuatable by a user from a rear of the at least one fiber optic module to enable removal of the at least one fiber optic module from a rear of the at least one fiber optic mod

JX-0007 ('153 Patent) at 18:31-39.

The evidence that the FS accused modules satisfy this limitation is also uncontested. *See* Resps. Br. at 185-87; CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module); CX-0001C (Prucnal WS) Q/A 476; *see* CDX-0001C (Prucnal demonstratives) at 474-79.

296

Accordingly, the FS accused combinations practice asserted claims 9 and 16.

Independent Claim 23

Respondents concede that the FS accused products practice this claim, except for

the fiber optic routing element discussed above. See Resps. Br. at 185-87.

Dependent Claim 26

Asserted claim 26 depends from claim 25, which depends from independent

claim 23.

Asserted independent claim 23 reads as follows:

- 23. A fiber optic apparatus, comprising:
- a chassis configured to be disposed in an equipment rack, the chassis comprising opposite front and rear ends that are spaced apart from one another in a longitudinal direction, and comprising opposite first and second ends that are spaced apart from one another in a lateral direction that extends crosswise to the longitudinal direction;
- a guide system configured to be disposed within the chassis;
- a plurality of fiber optic equipment trays arranged in a stacked configuration and configured to slidably engage within the guide system, wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays comprises *a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively*, to permit optical fibers to be routed to either left or right portions of the plurality of fiber optic equipment trays toward the first and second ends of the chassis; and
- a plurality of fiber optic modules configured to be received by the plurality of fiber optic equipment trays, wherein each fiber optic module of the plurality of fiber optic modules is independently movable in the longitudinal direction relative to

each fiber optic equipment tray of the plurality of fiber optic equipment trays;

- wherein each fiber optic module of the plurality of fiber optic modules comprises a front end, a rear end, an interior, a plurality of first fiber optic adapters disposed through the front end, at least one second fiber optic adapter disposed through the rear end, and at least one optical fiber disposed within the interior and establishing at least one optical connection between the at least one second fiber optic adapter and at least one first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein for at least one fiber optic module of the plurality of fiber optic modules, the at least one second fiber optic adapter comprises a higher connection density than each first fiber optic adapter of the plurality of first fiber optic adapters;
- wherein each fiber optic equipment tray of the plurality of fiber optic equipment trays is configured to receive multiple fiber optic modules of the plurality of fiber optic modules; and
- wherein the plurality of fiber optic equipment trays and the plurality of fiber optic modules are configured to permit the plurality of fiber optic modules to be removable from a front of the plurality of fiber optic equipment trays, and releasably removable from a rear of the plurality of fiber optic equipment trays.

JX-0007 ('153 Patent) (emphasis added).

Unasserted claim 25 and asserted claim 26 read as follows:

25. The fiber optic apparatus of claim 23, further comprising a plurality of module guides associated with the plurality of fiber optic equipment trays, wherein the chassis comprises a rear section, and a rear portion of each module guide of the plurality of module guides defines at least one guide channel that is open on a rear end thereof to permit the plurality of fiber optic modules to be inserted into the plurality of module guides from the rear section of the chassis and to be guided toward the front end of the chassis.

26. The fiber optic apparatus of claim **25**, wherein each fiber optic module of the plurality of fiber optic modules comprises a locking latch that is configured to prevent the fiber optic module

Case: 22-1228 Document: 29 VERSON 489 Filed: 04/25/2022 Confidential Material Omitted on this Page

from moving rearward relative to a fiber optic equipment tray of the plurality of fiber optic equipment trays, and that is actuatable by a user from a rear of the fiber optic module to enable removal of the fiber optic module from the fiber optic equipment tray.

JX-0007 ('153 Patent).

As shown, claim 26 depends from claim 25, which depends from independent claim 23. Claim 25 adds a plurality of module guides in the fiber optic equipment trays, the guides having an open rear portion that enables users to insert modules into the module guides from the rear of the chassis toward the front end of the chassis. JX-0007 ('153 Patent) at 20:14-22. Claim 26 adds a locking latch on each module configured to prevent the module from moving rearward in a tray and "actuatable by a user from a rear of the fiber optic module" to enable removal of the module from the tray. *Id.* at 20:23-30.

The FS accused chassis have multiple module guides that form channels into which accused modules can be inserted from the rear of the chassis. CX-1855 (FS photos) at 17; CX-0418C (FS FHX Ultra Fiber Enclosure specification) at 3; CX-0419C (FS FHX Ultra Enclosure for MTP-8 Cassette specification) at 3; CX-0001C (Prucnal WS) Q/A 502. As noted above, FS accused modules can be removed from the rear of an accused chassis after disengaging a locking latch on the module. CX-1855 (FS photos) at 17; CX-0589 (FHX Module installation instructions) at 2; CX-0001C (Prucnal WS) Q/A 501; *see* CDX-0001C (Prucnal demonstratives) at 591-96.

Accordingly, the FS accused combinations practice asserted claim 26.

ii. Indirect Infringement

The evidence demonstrates that the FS accused combinations infringe asserted claims 9, 16, 23, and 26 of the '153 patent. FS, however, does not sell its products in

299

Case: 22-1228 Document: 29 VERSON 490 Filed: 04/25/2022 Confidential Material Omitted on this Page

combinations. In each case, the modules are packaged separately from the chassis. *See* RX-0010 (Zhang WS) Q/A 27-28. Thus, it is customers, rather than FS, who assemble the accused chassis and modules into infringing combinations.

Accordingly, FS does not directly infringe the asserted claims of the '153 patent. The evidence shows that FS indirectly infringe, for the reasons discussed in the Indirect Infringement section of the '320 patent, *supra*.

C. Domestic Industry (Technical Prong)

As discussed below, the evidence shows that the Corning domestic industry products are covered by asserted claims 9, 16, 23, 26 of the '153 patent.

The EDGE DI Chassis together with the EDGE DI Modules practice asserted claims 9, 16, 23, 26 of the '153 patent. As discussed throughout the claim construction and infringement sections for the '153 patent above, asserted claim 23 is an independent claim directed to a fiber optic apparatus comprising a chassis, a guide system engaging multiple equipment trays with fiber optic routing elements, a plurality of independently movable modules with higher-density adapters on the rear than on the front, and a tray configuration allowing multiple modules to be removed from the front and rear. *See* JX-0007 ('153 Patent), Claim 23.

Claims 9 and 16 depend from claim 1, and along with claim 26, add a locking latch that enables module removal. *Id.* at Claims 9, 16, 26. Dr. Ralph testified that the EDGE DI Chassis and EDGE DI Modules satisfy these claims with its structure of three trays in the chassis that have fiber routing elements and allow for modules to be latched and removed from the front and rear. *See* CX-0002C (Ralph WS) Q/A 140-164; CX-1869 (Corning Photos Ex. D) at 2-4, 6-40; CPX-0040 (EDGE Base-8 Chassis); CPX-

300

0041 (EDGE Base-12 Chassis); CPX-0042 (EDGE Base-8 Module); CPX-0043 (EDGE

Base-12 Module).

Respondents make the following arguments regarding the '153 patent:

Complainant failed to prove any combination of an EDGE chassis and modules practices claims 9, 16, 23, or 26 of the '153 Patent. RX-0008C (Lebby RWS) Q/A 380-389. The claims of the '153 Patent require, *inter alia*, a combination of a chassis and a "plurality of fiber optic modules." Complainant did not prove any instance of an EDGE Chassis loaded with EDGE modules. RX-0008C (Lebby RWS) Q/A 382-383; Ralph Tr. 212:12-15, 213:24-214:2, 214:18-215:7. Complainant also did not prove that the EDGE Chassis necessarily must be combined with a plurality of EDGE Base-12 or Base-8 Modules. RX-0008C (Lebby RWS) Q/A 384-386, 388-389; RX-1677 (EDGE Catalog); RX-1678 (EDGE8 Catalog); Ralph Tr. 215:16-216:6, 216:17-217:14, 218:2-8. Complainant's failure to prove a practicing combination of an EDGE Chassis loaded with EDGE Modules is fatal to its claim that there is a domestic industry for the '153 Patent. *See Microsoft*, 731 F.3d at 1361.

Complainant also failed to establish that any EDGE Base-12 Combination and EDGE Base-8 Combination include "a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward and rearward, respectively," as required by claims 9, 16, 23, and 26 of the '153 Patent. RX-0008C (Lebby RWS) Q/A 390-393; Lebby Tr. 908:24-909:4. The cable management rings attached to the EDGE Chassis are not the claimed fiber optic routing element because they are not flanges, do not "extend frontward" from the front of the fiber optic equipment tray, and do not comprise successive sections extending "frontward, upward and rearward." RX-0008C (Lebby RWS) Q/A 125-135; RX-0001C (Blumenthal WS) Q/A 526; RX-0006C (Min RWS) Q/A 88-93.

Resps. Br. at 261-62 (footnote omitted).

First, as shown above, respondents make the same "fully loaded" argument as for

the '320 patent, which was thoroughly addressed in that section. Further, the asserted

claims of the '153 patent contain no such requirement, nor any requirement of fiber optic

connection equipment such as modules in the chassis. Dr. Ralph has shown the EDGE

DI Chassis is configured to receive EDGE DI Modules as required by the '153 patent.

See CX-1869 (Corning Photos Ex. D) at 2, 8, 17, 24.44

Second, as shown above, respondents argue that the EDGE DI Chassis does not have "a front end with at least one fiber optic routing element that comprises successive material successions extending frontward, upward, and rearward, respectively." Dr. Ralph, however, demonstrated that the molded plastic cable management clips on the front of the chassis meet this limitation. *See* CDX-0002C (Ralph Direct) (citing CX-1869C at 6, 21); CX-0002C (Ralph WS) Q/A 147.

Respondents argue that the "cable management rings" identified by Dr. Ralph are not fiber optic routing elements because they are not "not the claimed fiber optic routing element because they are not flanges, do not 'extend frontward' from the front of the fiber optic equipment tray, and do not comprise successive sections extending 'frontward, upward and rearward." This argument is not persuasive, and was addressed extensively in the above infringement section, and need not be repeated here.

Accordingly, the evidence shows that the Corning domestic industry products are covered by the asserted claims 9, 16, 23, 26 of the '153 patent.

D. Validity of the '153 Patent

As noted, Corning asserts independent claim 23 and dependent claims 9, 16, and 26 of the '153 patent.

Respondents argue that the following 21 different combinations render obvious unasserted claim 1 and asserted independent claim 23 and dependent claims 9, 16, and 26 of the '153 patent:

⁴⁴ Additionally, there was testimony regarding customers who have combined EDGE chassis with asserted EDGE modules. *See*, *e.g.*, CX-0004C (Hicks WS) Q/A 25-26.



Claim 1:

- (1) Smrha '684 (RX-0458) alone renders unasserted claim 1 obvious;
- (2) Smrha '684 in combination with RX-0442 (U.S. Patent App. Publ. No. 2008/0037209 to Niazi) ("Niazi") renders unasserted claim 1 obvious;
- (3) Smrha '684 in combination with RX-0449 (U.S. Patent No. 6,086,415 to Sanchez) ("Sanchez") renders unasserted claim 1 obvious;
- (4) Smrha '684 in combination with Niazi and Sanchez renders unasserted claim 1 obvious;
- (5) Smrha '684 in combination with RX-0450 (U.S. Patent No. 6,175,079 to Johnston) ("Johnston") render unasserted claim 1 obvious;
- (6) Smrha '684 in combination with Niazi and Johnston renders unasserted claim 1 obvious;

Claim 9:

- (7) asserted claim 9 is obvious over Smrha '684, Niazi, and RX-0446 (U.S. Patent No. 5,613,030 to Hoffer) ("Hoffer")
- (8) asserted claim 9 is obvious over Smrha '684, Niazi, and Hoffer, in further combination with Sanchez;
- (9) asserted claim 9 is obvious over Smrha '684, Niazi, and Hoffer, in further combination with Johnston;

<u>Claim 23</u>:

- (10) asserted claim 23 is obvious over Smrha '684, Niazi, and Hoffer;
- (11) asserted claim 23 is obvious over Smrha '684, Niazi, Hoffer and Sanchez;
- (12) asserted claim 23 is obvious over Smrha '684, Niazi, Hoffer and Johnston;

Claim 16:

- (13) asserted claim 16 is obvious over Smrha '684, Hoffer, and RX-0457 (U.S. Patent No. 7,689,089 to Wagner) ("Wagner");
- (14) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner and Niazi;
- (15) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner and Sanchez;
- (16) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner and Johnston;
- (17) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner, Niazi and Sanchez;
- (18) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner, Niazi and Johnston;

<u>Claim 26</u>:

- (19) asserted claim 26 is obvious over Smrha '684, Niazi, Hoffer, and Wagner;
- (20) asserted claim 26 is obvious over Smrha '684, Niazi, Hoffer, Wagner, and Sanchez; and
- (21) asserted claim 26 is obvious over Smrha '684, Niazi, Hoffer, Wagner, and Johnston.

Resps. Br. at 200-25.

Complainant and the Staff disagree. See Compl. Br. at 173-86; Staff Br. at 130-

46.

For the reasons discussed below, respondents have not shown by clear and

convincing evidence that asserted independent claim 23 and dependent claims 9, 16, and

26 of the '153 patent are invalid.

1. Obviousness

For the reasons discussed below, respondents have not shown by clear and convincing evidence that unasserted claim 1 and asserted independent claim 23 and dependent claims 9, 16, and 26 of the '153 patent are rendered obvious by the 21

304

different combinations proposed by respondents.

As an initial matter, the PTO granted the '153 patent to Corning after reviewing the *inter partes* review proceedings of the related '320 and '206 patents, as well as U.S. Patent Nos. 8,452,148 and 8,184,938. JX-0008 ('153 Prosecution History) at 1726, 8143-45, and 10142-43. The examiner granted the '153 patent over several references on which respondents now rely, including their primary reference (Smrha '684) as well as many of their secondary references. *See* JX-0008 ('153 Prosecution History) at 10162.

Respondents argue that Smrha '684 in combination with Niazi '209 and Hoffer '030 renders obvious claims 9 and 23 — alone or in further combination with Sanchez '415 or Johnston '079; that Smrha '684 in combination with Hoffer '030 and Wagner '089 renders obvious claim 16 — alone or in further combination with Niazi '209 and Sanchez '415 or Johnston '079; that Smrha '684 in combination with Niazi '209 and Hoffer '030 renders claim 23 obvious — alone or in further combination with Sanchez '415 or Johnston '079; and that Smrha '684 in combination with Niazi '209, Hoffer '030, and Wagner '089 renders obvious claim 26 — alone or in further combination with Sanchez '415 or Johnston '079.

At the hearing, Dr. Blumenthal agreed that his obviousness opinion required one of ordinary skill to seek out, to find, and combine features from this list of five or six references in order to capture all of the features of the EDGE system claimed by the '153 patent. *See* Blumenthal Tr. 777-779. Even if he were correct that a person of ordinary skill would have found all of these references and their component features, combining them to create a new device with a new architecture is not indicative of obviousness. Rather, making of such combinations to create a new device would be similar to an

305

invention. *See KSR*, 550 U.S. at 418-19 ("[I]nventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known."); *Smiths Indus. Med. Sys. v. Vital Signs, Inc.*, 183 F.3d 1347, 1356 (Fed. Cir. 1999) ("[T]here is no basis for concluding that an invention would have been obvious solely because it is a combination of elements that were known in the art at the time of the invention.").

As discussed below, respondents have not shown motivations to combine the different combinations of prior art.

a. Motivation to combine Smrha '684 with Niazi '209, Hoffer '030, Wagner '089, Sanchez '415, or Johnston '079

As discussed below, respondents have not shown that a person of ordinary skill would solve the problem of the '153 patent — density with accessibility, modularity, and scalability in a fiber optic data center environment — by combining Smrha '684 and the other references on which respondents rely.

i. Smrha '684 with Niazi '209

As shown above for the '456 patent, a person of ordinary skill would not be motivated to combine Smrha '684 with Niazi '209, which is outside the field of fiber optics and has a different and incompatible architecture. *See* CX-2060C (Prucnal RWS) Q/A 566-67.

ii. Smrha '684 with Hoffer '030

The PTO reviewed U.S. Patent No. 5,613,030 to Hoffer, CX-1752 (Hoffer '030), before issuing the '153 patent. *See* JX-0008 ('153 Prosecution History) at 3146; CX-

306

Case: 22-1228 Document: 29 VERSON 497 Filed: 04/25/2022 Confidential Material Omitted on this Page

2060C (Prucnal RWS) Q/A 568. Hoffer '030 discloses an enclosure that holds fiber optic "cards" in a "card-receiving region." *See* CX-2060C (Prucnal RWS) Q/A 568; CX-1752 (Hoffer '030).

Dr. Blumenthal opines that a person of ordinary skill would combine Smrha '684 with Hoffer '030 to allow greater access to modules — the adapter packs in Smrha '684 — because Hoffer '030 discloses a system that locks cards in place and allows release of those locks to permit controlled removal from the rear of a structure. *See* RX-0001C (Blumenthal WS) Q/A 556; CX-2060C (Prucnal RWS) Q/A 570. He has not shown how or why this combination would be made, and overlooks that it is contrary to the disclosures of Smrha '684. *See* CX-2060C (Prucnal RWS) Q/A 571.

First, as Dr. Prucnal explains, combining Hoffer '030 with Smrha '684 would not have a predictable result because their purposes and structures are incompatible. *See* CX-2060C (Prucnal RWS) Q/A 571, 573. Hoffer '030 discloses vertically oriented cards that slide between two sides of a bulky enclosure that looks like a box or shelf. A person of ordinary skill would not have reason to think that the sliding rail adapter pack system disclosed in Smrha '684 would be compatible with the cards-in-a-shelf system disclosed by Hoffer '030. *Id*.

Second, neither respondents nor Dr. Blumenthal explain why a person of ordinary skill would add rear removability of adapter packs to Smrha '684 to improve access to connections in adapter packs, given that Smrha '684 already discloses an open sliding system for access to connections in adapter packs that remain securely in its chassis. *See* CX-2060C (Prucnal RWS) Q/A 573.

Third, Dr. Blumenthal does not explain how a person of ordinary skill could

307

incorporate the rear releasability feature allegedly disclosed by Hoffer '030 into Smrha '684. *See* CX-2060C (Prucnal RWS) Q/A 572. As shown above, Smrha '684 does not disclose removability of its adapter packs at all, much less incorporate features for rear access and removability. The design of Smrha '684 teaches away from such rear access and removability by providing access to the rear connections on the back of the adapter packs through removable panels. *See* CX-2060C (Prucnal RWS) Q/A 602; CX-0032 (Smrha '684) at 9:22-27. Smrha '684 does not contemplate removal of the adapter packs, much less from the rear.

iii. Smrha '684 with Wagner '089

The PTO also reviewed U.S. Patent No. 7,689,089 to Wagner, CX-1761 (Wagner '089), before issuing the '153 patent. *See* JX-0008 ('153 Prosecution History) at 10350; CX-2060C (Prucnal RWS) Q/A 574. Wagner '089 is owned by Panduit, but there is no evidence that Panduit used Wagner '089 to develop the Panduit accused products. *See* CX-2060C (Prucnal RWS) Q/A 574. To the contrary, as discussed above, Panduit did not consider its prior art in designing its own products, which calls into question Dr. Blumenthal's opinion that there would be motivation to use this reference in matching the EDGE features. *See* CX-2060C (Prucnal RWS) Q/A 295 ("The group agreed on developing a new 1U enclosure that supported 144 connections using cassettes with "72 LC front ports," the same as EDGE. No mention was made of attempting to modify any of Panduit's existing products to achieve this result. Mr. Kuffel testified that he did not even consider Panduit's existing products in developing a new high-density platform to match EDGE. This testimony can be found at JX-0017C (Kuffel Dep.) at 22:3-23:10.").

Wagner '089 discloses an optical cassette designed to be inserted in and engage

308

Case: 22-1228 Document: 29 VERSON 499 Filed: 04/25/2022 Confidential Material Omitted on this Page

with latches on a patch panel. *See* RX-0001C (Blumenthal WS) Q/A 564. Dr. Blumenthal opines that a person of ordinary skill would rebuild the Smrha '684 adapter packs with the Wagner '089 cassette release mechanisms. *Id.* He opines that such a person would have reason to not only make the adapter packs of Smrha' 684 removable, but removable from the rear of the tray, and removable using tabs actuated from the rear of the adapter packs. *Id.* Q/A 566. He states that Smrha '684 and Wagner '089 have similar module functionality, and they would therefore be combinable with a reasonable expectation of success. *Id.* Those opinions are speculative.

First, a person of ordinary skill would not think to combine a patch panel and cassette combination with the system disclosed in Smrha '684, which discloses a system of independently sliding adapter panel sections. *See* CX-2060C (Prucnal RWS) Q/A 577. Dr. Blumenthal's contrary opinion presupposes that rear access would be useful in a system like Smrha '684, but as shown above, Smrha '684 teaches away from the type of rear accessibility claimed in the '153 patent by providing its own system for access through sliding adapter packs.

Second, Dr. Blumenthal has not shown that Smrha '684 discloses side walls with which the tabs of the Wagner '089 cassettes could interact; or that the retaining and releasing features of Wagner '089 are compatible with a system, like that of Smrha '684, in which adapter packs are designed to slide on mounting guides during operation. *Id.* Wagner '089 contains no disclosures on how such walls could be incorporated into the different architecture of Smrha '684, which uses fixed adapter packs rather than removable modules. *See* RX-0001C (Blumenthal WS) Q/A 565-66.

Third, for the same reasons, there is no basis to Dr. Blumenthal's opinion that a

309

Case: 22-1228 Document: 29 VERSON 500 Filed: 04/25/2022 Confidential Material Omitted on this Page

person of ordinary skill would add a depressing tab similar to the one in Wagner '089 to the rear of Smrha '684's module, so as to permit rear removability. *See* CX-2060C (Prucnal RWS) Q/A 578. As noted, the modules in the two references are not remotely alike; those in Smrha '684 are not designed to be removed. *See* RX-0001C (Blumenthal WS) Q/A 565.

iv. Smrha '684 with Sanchez '415

Respondents rely on U.S. Patent No. 6,086,415 to Sanchez (RX-0449) for a disclosure of fiber optic routing elements required by the asserted claims of the '153 patent. Sanchez '415 discloses a patch panel comprising a jack holder, which has a plurality of openings for mounting connectors, a front panel, and a cable tray that extends forward from the front of the tray and can be angled up and down to provide access to front-end connections. *See* CX-2060C (Prucnal RWS) Q/A 580. As Dr. Prucnal demonstrates, Dr. Blumenthal has not shown that a person of ordinary skill would combine this reference with Smrha '684.

First, Dr. Blumenthal does not explain how the features of Sanchez '415 could be incorporated into Smrha '684. *See* CX-2060C (Prucnal RWS) Q/A 583. His opinion assumes that the tray in Smrha '684 could be bent up to create a U shape, but does not account for the fact that the Smrha '684 tray would be unsuitable for this modification because the tray does not move along with the adapter packs, which move independently of each other and the tray. *See* CX-0032 (Smrha '684) at 5:6-16 & Figs. 2-3; CX-2060C (Prucnal RWS) Q/A 586. In addition, the tray in Smrha '684 is designed to be fully closed during operation while the adapter packs are mobile; putting a fiber optic routing guide on this tray would serve no clear purpose and impair cable management. *See* CX-

310

Case: 22-1228 Document: 29 VERSON 501 Filed: 04/25/2022 Confidential Material Omitted on this Page

2060C (Prucnal RWS) Q/A 585-86. Also, the chassis of Smrha '684 does not have space for both sliding adapter packs and a fiber optic routing element on the tray. *Id.* Q/A 586.

Second, a person of ordinary skill would not have been motivated to combine the routing feature of Sanchez '415 with the tray of Smrha '684. Dr. Blumenthal opines that, because both references seek to provide effective cable management, a person of ordinary skill would convert the clips of Smrha '684 into an extended lip like the flange in Figure 1 of Sanchez '415. *See* RX-0001C (Blumenthal WS) Q/A 532. However, the Smrha '684 routing elements are on the adapter packs (modules), not the tray. Also, the flange in Sanchez '415 is not part of a fiber optic equipment tray and is instead part of a separate "cable tray" that is used to hold cables, but not modules or adapters. *See* CX-2060C (Prucnal RWS) Q/A 586. The Sanchez '415 tray is permanently attached to the front of the chassis and cannot move except to be angled up and down to provide access to the connections. *Id.* These features offer no useful disclosures for modifying Smrha '684, which has no cable tray and has modules installed on a separate framework.

Even assuming that both Smrha '684 and Sanchez '415 share a goal of effective cable management, that motivation is far too generic to explain why two very different systems should, or how they could, be combined. *Id*; *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371, 1377 (Fed. Cir. 2004) ("[r]ecognition of a need" does not alone provide a motivation to combine references). Dr. Blumenthal's opinion that an extended lip would provide better cable management than Smrha '684 is unsupported. See CX-2060C (Prucnal RWS) Q/A 586.

v. Smrha '684 with Johnston '079

Respondents rely alternatively on U.S. Patent No. 6,175,079 to Johnston (RX-

311

0450, "Johnston '079") for a fiber optic routing element. Johnston '079 was before the PTO when the '153 patent was issued. *See* JX-0008 ('153 Prosecution History) at 3150; CX-2060C (Prucnal RWS) Q/A 581. It discloses a fiber optic cable management cabinet with adjustable clips mounted by frictional force in a track for managing the cable that exits the cabinet. *See* CX-2060C (Prucnal RWS) Q/A 581. As Dr. Prucnal demonstrates, Dr. Blumenthal has not shown that a person of ordinary skill would combine this reference with Smrha '684.

First, Dr. Blumenthal opines that the routing clips on the adapter packs in Smrha '684 could be replaced with the clips from Johnston '079 attached (via screw, bolt, or other "routine" means) to the drawer in Smrha '684. *See* RX-0001C (Blumenthal WS) Q/A 541. The Johnston '079 clips are not designed for such attachment and are instead held by friction within a mounting track. *See* CX-2060C (Prucnal RWS) Q/A 583. There is no such mounting track in Smrha '684, and Johnston '079 does not show how to use its mounting clips absent that track. *Id*.

Second, Dr. Blumenthal has not shown that a person of ordinary skill would be motivated to combine the routing feature of Johnston '079 with Smrha '684. Again, the clips of Johnston '079 are not part of the tray (as claim 1 requires), but are attached to a mounting track. *See* RX-0450 (Johnston '079) at 7:50-58; CX-2060C (Prucnal RWS) Q/A 588. By contrast, the clips in Smrha '684 are attached to the adapter pack, a structure that Johnston '079 does not disclose. *See* CX-2060C (Prucnal RWS) Q/A 588. Combining the two would not result in a tray with a fiber routing element. Dr. Blumenthal also concedes that the clips in Johnston '079 are larger than those in Smrha '684 and would operate differently, but does not explain how these differences would be

312



overcome and what the effect would be. CX-2060C (Prucnal RWS) Q/A 589.

b. Asserted Claims

i. Unasserted Claim 1

Respondents argue that the following six different combinations render obvious

unasserted claim 1:

- (1) Smrha '684 (RX-0458) alone renders unasserted claim 1 obvious;
- (2) Smrha '684 in combination with RX-0442 (U.S. Patent App. Publ. No. 2008/0037209 to Niazi) ("Niazi") renders unasserted claim 1 obvious;
- (3) Smrha '684 in combination with RX-0449 (U.S. Patent No. 6,086,415 to Sanchez) ("Sanchez") renders unasserted claim 1 obvious;
- (4) Smrha '684 in combination with Niazi and Sanchez renders unasserted claim 1 obvious;
- (5) Smrha '684 in combination with RX-0450 (U.S. Patent No. 6,175,079 to Johnston) ("Johnston") render unasserted claim 1 obvious; and
- (6) Smrha '684 in combination with Niazi and Johnston renders unasserted claim 1 obvious.

See Resps. Br. at 200-11.

As discussed below, respondents have not shown by clear and convincing

evidence that unasserted claim 1 of the '153 patent is rendered obvious by the above

combinations.

Corning is not asserting claim 1 in this investigation, but it is the independent

claim from which asserted claims 9 and 16 depend.

Fiber Routing Element

Respondents have not shown that Smrha '684 in combination with Niazi '209 and

Sanchez '415 or Johnston '079 discloses

Case: 22-1228 Document: 29 VERSON 504 Filed: 04/25/2022 Confidential Material Omitted on this Page

at least one fiber optic equipment tray comprising a front end with at least one fiber optic routing element that comprises successive material sections extending frontward, upward, and rearward, respectively, to permit optical fibers to be routed to either left or right portions of the at least one fiber optic equipment tray toward the first and second ends of the chassis.

First, Dr. Blumenthal has not shown that Smrha '684 discloses the claimed routing element on its tray. *See* CX-2060C (Prucnal RWS) Q/A 591. He identifies the routing element on the adapter pack, not the drawer that he identifies as the tray. In addition, Dr. Blumenthal wrongly claims — based on a speculative interpretation of a detail in a figure, rather than a disclosure in the specification — that the Smrha '684 clips disclose a hinge that allows its clip to extend rearward. *See* CX-2060C (Prucnal RWS) Q/A 591; RX-0001C (Blumenthal WS) Q/A 540.

Second, although respondents argue that Niazi '209 would teach a person of ordinary skill to multiply the trays of Smrha '684, they do not contend that Niazi '209 would teach a person of ordinary skill to move the routing elements from the Smrha '684 adapter packs to those trays. With or without Niazi '209, a person of ordinary skill would not make that modification. Moving the clips from the adapter packs to the tray would limit the independent movement of the adapter packs because the cables into those packs would be routed through clips on the separate tray that is designed to stay in place after installation. *See* CX-2060C (Prucnal RWS) Q/A 592-93. When the adapter packs slide, the connected cables would pull at the clip on the tray. This runs contrary to the central teaching of Smrha '684, entitled in part "Sliding Adapter Panel," which uses specialized framework assemblies precisely to enable the adapter packs to handle their own cable management so they can slide independently of the tray. *Id.* Although Dr. Blumenthal opines that such a modification would make "the bend ... more gradual," RX-0001C

314

Case: 22-1228 Document: 29 VERSON 505 Filed: 04/25/2022 Confidential Material Omitted on this Page

(Blumenthal WS) Q/A 527, he did not provide support for his opinion. CX-2060C (Pruenal RWS) Q/A 593.

Third, Dr. Blumenthal has not shown that Johnston '079 discloses the routing element required by claim 1. CX-2060C (Prucnal RWS) Q/A 596. As set forth above, Johnston '079 discloses independent clips held by friction in a specially designed track on the bottom of a cabinet, not a fiber optic equipment tray. *Id.; see* RX-0450 (Johnston '079) at 7:34-67; CX-2060C (Prucnal RWS) Q/A 596.

Modules Installed in a Tray

Respondents have not shown that Smrha '684 discloses independently movable modules configured to be received by a fiber optic equipment tray. As shown for the '456 patent, Dr. Blumenthal has not shown that the adapter packs disclosed by Smrha '684 are received by its tray. *See* CX-2060C (Prucnal RWS) Q/A 597. The "tray" in Smrha '684 sits at the bottom of the chassis and supports the first level of mounting guides, which in turn hold the first level of adapter packs and support the second level of mounting guides, which in turn hold the second level of adapter packs. *Id.* That system is independent of the tray so that the adapters can move independently from each other and from the tray. *Id.*; CX-0032 (Smrha '684) at 3:10-19 and 9:28-45.

i. Claim 9

Respondents argue that the following three different combinations render obvious asserted dependent claim 9 of the '153 patent:

- asserted claim 9 is obvious over Smrha '684, Niazi, and RX-0446 (U.S. Patent No. 5,613,030 to Hoffer) ("Hoffer")
- (2) asserted claim 9 is obvious over Smrha '684, Niazi, and Hoffer, in further combination with Sanchez;

315

(3) asserted claim 9 is obvious over Smrha '684, Niazi, and Hoffer, in further combination with Johnston;

See Resps. Br. at 211-16.

As discussed below, respondents have not shown by clear and convincing evidence that asserted claim 9 of the '153 patent is rendered obvious by the above combinations.

Claim 9 depends from dependent claim 6. With respect to the elements of claim 6, Dr. Blumenthal has not shown that Smrha '684 in combination with Niazi '209 discloses a "plurality of fiber optic equipment trays," as shown above for the '456 patent. Dr. Blumenthal acknowledges that Smrha '684 discloses only one tray. *See* CX-2060C (Prucnal RWS) Q/A 600; RX-0001C (Blumenthal WS) Q/A 546. Niazi '209 contains no disclosures allowing additional trays to be added to Smrha '684 without a fundamental redesign. *See* CX-2060C (Prucnal RWS) Q/A 600.

Dr. Blumenthal also has not shown that Smrha '684 discloses the additional limitation of claim 9, which recites fiber optic trays configured to permit modules to be removable from a front of the plurality of fiber optic equipment trays, and releasably removable from a rear of the plurality of fiber optic equipment trays." In addition to failing to show that Smrha '684 discloses a plurality of trays that receive multiple modules, he also has not shown that Smrha '684 in combination with Hoffer '030 discloses the removability limitations of claim 9. He opines that Smrha '684 provides the front removal limitation while Hoffer '030 provides the missing rear removal limitation. RX-0001C (Blumenthal WS) Q/A 551-52. As Dr. Prucnal has demonstrated, this is not so.

316

Case: 22-1228 Document: 29 VE Rage: 507 Filed: 04/25/2022 Confidential Material Omitted on this Page

First, with respect to front removal, Dr. Blumenthal opines that "Smrha '684 discloses access for installing each of its fiber optic modules from the front of the drawer." RX-0001C (Blumenthal WS) Q/A 551; see CX-2060C (Prucnal RWS) Q/A 602. This disclosure in Smrha '684, however, relates solely to the initial installation of the adapter packs and does not disclose their removal. *See* CX-2060C (Prucnal RWS) Q/A 602. Smrha '684 instead discloses accessibility via movement of adapter packs in the mounting guides, not by individual insertion or removal.

Dr. Blumenthal opines that front removal would have been obvious to a person of ordinary skill in the art, but gives no basis for that assertion. *See* RX-0001C (Blumenthal WS) Q/A 551. A person of ordinary skill would instead recognize that an adapter pack may not function in the same way for installation and removal, and might see an advantage in restricting removal after installation to prevent unwanted movement and fiber damage. *See* CX-2060C (Prucnal RWS) Q/A 602. Indeed, as shown above as to infringement of the '153 patent, respondent Siemon has modified its product to permit front installation but not front removal of its modules. *Id*.

Second, Dr. Blumenthal has not shown that Hoffer '030 discloses the claimed fiber optic module or the claimed fiber optic equipment tray. *See* CX-2060C (Prucnal RWS) Q/A 602. As shown above, Hoffer '030 discloses an system of "cards" and a shelf-like chassis that is incompatible with Smrha '684's sliding adapter pack system. Dr. Blumenthal suggests that the cable management tray of Hoffer '030 is the structure from which the cards are removed, but the reference shows instead that the cards are removed from a "card-receiving region," CX-1752 (Hoffer '030) at 2:48-51. *See* CX-2060C (Prucnal RWS) Q/A 602. Regardless, neither the card-receiving region nor the

317

Case: 22-1228 Document: 29 VERSON 508 Filed: 04/25/2022 Confidential Material Omitted on this Page

cable management tray is a fiber optic equipment tray that supports modules, and so Hoffer '030 cannot disclose modules removable from the rear of such a tray.

Third, Dr. Blumenthal also has not shown that Hoffer '030 discloses modules releasably removable from the rear of the tray. *Id.* He provides no basis for his conclusion that a user could "remove the modules from either the front or rear of its trays," other than quoting a statement that the card can be "pulled forwardly or rearwardly." RX-0001C (Blumenthal WS) Q/A 554. Even on its face, this vague disclosure does not explain from which end of the tray (or chassis) the card is removed. *See* CX-1752 (Hoffer '030) at 5:38-53; CX-2060C (Prucnal RWS) Q/A 602.

ii. Claim 16

Respondents argue that the following six different combinations render obvious

dependent claims 16 of the '153 patent:

- asserted claim 16 is obvious over Smrha '684, Hoffer, and RX-0457 (U.S. Patent No. 7,689,089 to Wagner) ("Wagner");
- (2) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner and Niazi;
- (3) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner and Sanchez;
- (4) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner and Johnston;
- (5) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner, Niazi and Sanchez;
- (6) asserted claim 16 is obvious over Smrha '684, Hoffer, Wagner, Niazi and Johnston;

See Resps. Br. at 216-20.

As discussed below, respondents have not shown by clear and convincing

evidence that asserted claim 16 of the '153 patent is rendered obvious by the above

318

combinations.

Respondents have not shown that Smrha '684, in combination with Hoffer '030 and Wagner '089, discloses fiber optic modules that comprise "a locking latch comprising a lateral protrusion configured to prevent the at least one fiber optic module from moving rearward relative to the" tray and that is "actuatable by a user from a rear of" the module to enable rear removal.

As shown above, Dr. Blumenthal does not show that Smrha '684 discloses modules that can be removed at all, much less from a fiber optic equipment tray. *See* CX-2060C (Prucnal RWS) Q/A 605. He also has not shown that Smrha '684 discloses adapter packs with the claimed locking latch to permit removal of the adapter packs from the tray, as opposed to features related to the moving and locking of the adapter pack framework assembly within the mounting guide. *Id*.

Dr. Blumenthal relies on Hoffer '030, RX-0001C (Blumenthal WS) Q/A 564, to supply rear removability. As shown above, Hoffer '030 does not disclose this element, and a person of ordinary skill would not combine the references. *See* CX-2060C (Prucnal RWS) Q/A 605.

Dr. Blumenthal further relies on Wagner '089 to supply the actuatable latch element. *See* RX-0001C (Blumenthal WS) Q/A 564. Dr. Blumenthal opines that Wagner '089 applies to modules that snap into place on a panel or are locked in an equivalent manner. *Id.* Q/A 546. Wagner '089 does not disclose this. It merely states that the disclosed cassettes are designed to be inserted into a patch panel. Further, the "guide latch tabs 64" on which Dr. Blumenthal relies are disposed on the patch panel enclosure, not the disclosed cassette, as the claims require. *See* CX-1761 (Wagner '089) at Fig. 1.

319

Case: 22-1228 Document: 29 VERSON 510 Filed: 04/25/2022 Confidential Material Omitted on this Page

Wagner '089 shows that latch tab 128 is on the cassette, but Dr. Blumenthal does not opines or show that latch tab 128 is a lateral protrusion, or how it could be actuated from the rear of the cassette. To the contrary, Dr. Blumenthal points to a different locking feature, the release tabs 84, to disclose this limitation. *See* RX-0001C (Blumenthal WS) Q/A 564.

In sum, respondents did not particularly point out what features of Wagner '089 he alleges a person of ordinary skill would combine with Smrha '684 and how that combination would operate. *See ActiveVideo Networks*, 694 F.3d at 1327 (holding expert's testimony insufficient where he failed to explain how a "specific combination would operate or read on the asserted claims").

iii. Claim 23

Respondents argue that the following three different combinations render obvious asserted independent claim 23 of the '153 patent:

- (1) asserted claim 23 is obvious over Smrha '684, Niazi, and Hoffer;
- (2) asserted claim 23 is obvious over Smrha '684, Niazi, Hoffer and Sanchez; and
- (3) asserted claim 23 is obvious over Smrha '684, Niazi, Hoffer and Johnston.

See Resps. Br. at 220-23.

As discussed below, respondents have not shown by clear and convincing evidence that asserted claim 23 of the '153 patent is rendered obvious by the above combinations.

Dr. Blumenthal has not shown that Smrha '684 in combination with one or more of Niazi '209 and Hoffer '030, alone or in combination with Sanchez '415 or Johnston

320
Case: 22-1228 Document: 29 VE Rade: 511 Filed: 04/25/2022 Confidential Material Omitted on this Page

'079, discloses two additional elements of claim 23 that were not previously discussed in view of claim 1.

First, respondents have not shown that Smrha '684 discloses a plurality of trays configured to receive multiple modules. As shown above for claim 6, Dr. Blumenthal has not shown that Smrha '684 discloses such trays or could be modified to add them. *See* CX-2060C (Prucnal RWS) Q/A 609.

Second, as shown above for claim 9, Dr. Blumenthal has not shown that Smrha '684 in combination with Hoffer '030 discloses modules "removable from a front" of the

tray and "releasably removable from a rear of the" tray.

iv. Claim 26

Respondents argue that the following three different combinations render obvious dependent claim 26 of the '153 patent:

- (1) asserted claim 26 is obvious over Smrha '684, Niazi, Hoffer, and Wagner;
- (2) asserted claim 26 is obvious over Smrha '684, Niazi, Hoffer, Wagner, and Sanchez; and
- (3) asserted claim 26 is obvious over Smrha '684, Niazi, Hoffer, Wagner, and Johnston.

See Resps. Br. at 223-25.

As discussed below, respondents have not shown by clear and convincing evidence that asserted claim 26 of the '153 patent is rendered obvious by the above combinations.

Respondents have not shown that Smrha '684, in combination with Niazi '209, Hoffer '030 and Wagner '089, discloses the additional limitation of claim 26 (a locking feature), which depends from independent claim 1 and dependent claim 25 (module

321

guides defining channels through which modules are inserted).

As to the elements of claim 25, as set forth above, Dr. Blumenthal has not shown that Smrha '684 alone or in combination with other references discloses trays that comprise module guides. *See* CX-2060C (Prucnal RWS) Q/A 613. Further, Dr. Blumenthal has not shown that Smrha '684 discloses modules that can be inserted into the plurality of module guides from the rear and guided toward the front of the chassis. *Id.*

Dr. Blumenthal concedes that Smrha '684 does not disclose modules insertable from the rear of the chassis, but opines Hoffer '030 discloses this feature. *See* RX-0001C (Blumenthal WS) Q/A 580-81. He has not shown where such disclosures can be found. *See* CX-2060C (Prucnal RWS) Q/A 614. He provides no basis for his opinion that the "card guides" are "module guides," much less the claimed module guides. *Id.* Even assuming the "card guides" could be module guides, he has not shown how they make a guide channel that is open on a rear end. *Id.* Hoffer '030 at most discloses that card guides delineate a space in between which the cards can be slid; it does not disclose module guides that permit cards to be inserted from the rear of the enclosure. *Id.* Further, Smrha '684 already discloses an installation method involving a pullout drawer and sliding adapter packs, and Dr. Blumenthal does not show how or why a person of ordinary skill would redesign the architecture of Smrha '684 to change this operation. *Id.* Q/A 613.

Respondents also have not shown that Smrha '684, in combination with Niazi '209, Hoffer '030, and Wagner '089, disclose claim 26's additional limitation of a locking latch like that of claim 16. As shown above for claim 16, Dr. Blumenthal does

322

Case: 22-1228 Document: 29 VERSON 513 Filed: 04/25/2022 Confidential Material Omitted on this Page

not show how Smrha '684, alone or in combination, discloses the claimed latch. *See* CX-2060C (Prucnal RWS) Q/A 612.

* * *

Accordingly, respondents have not shown by clear and convincing evidence that asserted independent claim 23 and dependent claims 9, 16, and 26 of the '153 patent are invalid.

VII. U.S. Patent No. 8,712,206

U.S. Patent No. 8,712,206, entitled "High-Density Fiber Optic Modules and Module Housings and Related Equipment," was filed on April 30, 2010 and issued on April 29, 2014. JX-0001 ('206 Patent). The '206 patent is assigned to Corning. JX-0003 ('206 Patent Assignment Record). The '206 patent states, "The technology of the disclosure relates to fiber optic modules and fiber optic modules housings provided in fiber optic equipment to support fiber optic connections." JX-0001 at 1:17-19. The '206 patent has a total of 73 claims, of which Corning asserts dependent claims 22 and 23. *See* Compl. Br. at 8.

As discussed below, the evidence shows that (1) the accused products of FS and Wirewerks infringe asserted claims 22 and 23; (2) Siemon's accused products infringe asserted claim 22; (3) Panduit's accused products do not infringe asserted claims 22 and 23; (4) complainant has satisfied the technical prong of the domestic industry requirement; and (5) the asserted claims are not invalid.

323

A. Claim Construction

1. A Person of Ordinary Skill in the Art

As noted in the '320 patent section of this initial determination, the administrative law judge finds that a person of ordinary skill in the art with respect to the four asserted patents is a person who has at least a bachelor's degree in mechanical engineering, materials science, or a related field, and at least two years of experience in fiber optic equipment.

2. "front opening" ('206 Patent, Claims 22, 23)

The claim term "front opening" appears in unasserted claim 14 of the '206 patent,

from which asserted claims 22 and 23 depend. Below is a chart showing the parties'

proposed claim constructions.

Complainant and the Staff ⁴⁵	Respondents			
"an opening located in the front side of a fiber optic module, <i>e.g.</i> , the opening depicted in Figure 13 of the '206 Patent as having dimensions H_1 and W_1 "	"a single opening located in the front side of a fiber optic module"			

Joint Chart at 5; Compl. Br. at 50-53; Resps. Br. at 50-53; Staff Br. at 50-54.

Corning argues:

The concrete dispute involving the "front opening" arises because Respondents' Accused Products, and some prior art devices, have multiple cutouts or spaces for adapters. As an example, Dr. Min argues that certain Accused Products do not infringe the Asserted Claims of the '206 patent because they "include multiple distinct openings along the longitudinal axis on the front side." RX-0006C (Min RWS) Q/A 186. Indeed, later in his analysis Dr. Min suggests, even while purporting to apply Corning's construction, that the opening must be a "single, continuous" opening, *id*.

⁴⁵ As discussed in detail below, the Staff changed its position to require a single opening as proposed by respondents.

Q/A 190, which would add two limitations that are contrary to the claim language and specification. Respondents also suggest that, even if Corning's construction is applied, the structural material *between* the cutouts or spaces for adapters should be excluded when measuring the width of the front opening (W_1). *See id.* Q/A 221.

The language of claim 14 does not support reading either "single" or "continuous" into "front opening." The term "opening" is preceded by "a," but the Federal Circuit has recognized a "'general rule [that] the words "a" or "an" in a patent claim carry the meaning of "one or more." "" *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012) (quoting *TiVo, Inc. v. EchoStar Commc 'ns Corp.*, 516 F.3d 1290, 1303 (Fed. Cir .2008)). To "limit 'a' or 'an' to 'one," the "patentee must evince a clear intent." *Id.* (quoting *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008)). Nothing in the claims of the '206 patent manifests any such intent, much less a clear one.

The specification confirms that the phrase "front opening" includes devices that have more than one cutout or space for adapters. Although Figure 13 depicts an embodiment with one single, continuous space for adapters, the specification includes other embodiments, such as Figure 15, that contain multiple spaces and that include the structural material separating the adapters as part of the "front opening 126." *See* CX-2060C (Prucnal RWS) Q/A 110; CDX-0005C (Prucnal Rebuttal) at 22. It would therefore be improper to limit the claims to the embodiment in Figure 13. *See Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) ("We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification.").

Compl. Br. at 51-52, see Compl. Reply Br. 24-25.

Respondents argue:

Respondents' construction is consistent with the plain language of the claim and with the specification while Complainant's and Staff's proposed constructions contradict both. In fact. Complainant's and Staff's proposed constructions allows for an improper outcome of counting multiple openings as one opening. *See, e.g.*, RX-0001C (Blumenthal WS) Q/A 191.

Indeed, Claim 14 of the '206 Patent requires "<u>a</u> front opening" which means a single opening, rather than multiple. *See TiVo, Inc. v. EchoStar Commc'ns Corp.*, 516 F.3d 1290, 1303 (Fed. Cir. 2008) (interpreting "an MPEG stream" to mean a single MPEG stream); *see also* Prucnal Tr. 341:19-24. The patent specifically distinguishes and separately claims multiple front opening<u>s</u>, which is shown in claim 63 and

325

Figure 18. The specification also distinguishes between single front opening and multiple front openings embodiments. *Compare* JX-001 ('206 Patent) at 9:64-10:4 (describing Fig. 13 depicting a module with a *single* front opening **126**) *with id.* at 14:35-42 (describing Fig. 18 depicting a single module with *two* front openings **178A** and **178B**); *see also id.* at Figs. 3, 16-17 RX-0001C (Blumenthal WS) Q/A 192. Therefore, the '206 Patent distinguishes between embodiments with a single front opening and embodiments with multiple front openings. Complainant's and Staff's proposed construction which allow for multiple openings to read on a single opening are incorrect and inconsistent with the specification and differentiated claim language.

Complainant's expert, Dr. Prucnal, admits that according to Complainant's and Staff's proposed constructions, "Corning would consider the multiple cutouts or spaces as all part of the 'front opening,"" essentially changing a meaning of a singular term "a front opening" into a plural "front openings" in direct contradiction to the plain language of the claims. *See* CX-2060C (Prucnal RWS) Q/A 107. Additionally, under Complainant's and Staff's proposed constructions, Corning would consider the structural material between fiber optic components on the front of the module that supports those fiber optic components as part of the 'front opening." *Id*. This interpretation effectively results in counting multiple, individual openings as a single opening, as shown below:



RDX-0001.51; *see also* RX-0001C (Blumenthal WS) Q/A 191. Under Complainant's and Staff's proposed constructions, in Example 2, the three openings would be counted as one. Additionally, under that construction, the dark red material between the individual openings would be considered part of the opening, such that the entire "W₁" in Example 2 would need to be accounted for essentially rendering the singular form of a front opening used in the claim meaningless. *See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950-51 (Fed. Cir. 2006); *see also* RX-0001C (Blumenthal WS) Q/A 191.

Complainant's and Staff's proposed constructions contradict the plain meaning of "an opening." A POSITA would understand that Example 2 shows three front openings, and not one. *See, e.g.,* RX-0001C (Blumenthal WS) Q/A 191; Prucnal Tr. 343:21-344:14. Notably, Dr. Prucnal relies on Figure 15 to support Complainant's argument that structural material between cutouts or adapters should be included in the

calculation of the width of a front opening. *See* CX-2060C Q/A 111-113. Yet, Figure 15 does not show structural material between the adapters disposed through a single opening 126. JX-001 ('206 Patent) at Fig. 15. Figure 14's description states that "[h]owever, in the fiber optic module 22", four (4) MPO fiber optic adapters 154 are disposed through the front opening 126 of the fiber optic module 22." JX-0001 ('206 Patent) at 12:59-61. There is no mention of structural material between the adapters in the entire description of Figure 15. *Id.* at 12:54-13:49. Dr. Prucnal has not shown that such material would have to be inherently present. *See* CX-2060C (Prucnal WS) Q/A 111-113; *see also Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159 (Fed. Cir. 1998) ("In order for a disclosure to be inherent, . . . the missing descriptive matter must *necessarily* be present in the . . . application's specification such that one skilled in the art would recognize such a disclosure." (emphasis added)).

Resps. Br. at 51-53, see Resps. Reply Br. 14-15.

The Staff argues:

At the time that the parties' proposed claim constructions were due, the dispute between the private parties appeared to be on how to define the dimensions of the opening. The Staff's focus was therefore on emphasizing that the opening at issue was the one shown in Figure 13 and having the dimensions H_1 and W_1 . Since then, it has become clear that the real dispute is whether the front opening can consist of multiple openings. On this point, the Staff agrees with Respondents – claim 14 is limited to embodiments with one, and only one, opening, as depicted in Figure 13 of the '206 patent. Although the Staff still prefers its proposed construction, to avoid any ambiguity, the Staff would not object to adopting a compromise construction of "front opening" that read "a single opening located in the front side of a fiber optic module, *e.g.*, the opening depicted in Figure 13 of the '206 Patent as having dimensions H_1 and W_1 ."

In this respect, the intrinsic evidence shows that Figures 13 and 18 depict different embodiments of the '206 invention, one with a single front opening and one with multiple front openings. The evidence further shows that claim 14 is directed to the embodiment shown in Figure 13. *See* RX-0001C (Blumenthal WS) Q/A 191-93. Claim 14 discloses "*a* front opening," not plural openings. JX-0001 ('206 Patent) at 20:53-54 (emphasis added). In contrast, unasserted claims 63-65 disclose plural "front openings." *Id.* at 24:15-37 ("A fiber optic module, comprising: . . . front openings having a width being at least eighty-five percent (85%) of the width of the front side of the main body;"). Where different phrases are used in separate claims, the doctrine of claim differentiation creates a rebuttable presumption that a difference in meaning and scope was

intended. *Tandon Corp. v. International Trade Comm'n*, 831 F.2d 1017, 1023 (Fed. Cir. 1987); *see also Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (when different words are used in separate claims, they are presumed to have different meanings); *cf. InterDigital Communications, LLC v. International Trade Comm'n*, 690 F.3d 1318, 1334 (Fed. Cir. 2012) ("Whether or not claims differ from each other, one can not interpret a claim to be broader than what is contained in the specification and claims as filed."). If both claim 14 and claim 63 were interpreted to encompass modules with multiple front openings, then one of the two claims would be superfluous. To avoid this presumptively incorrect result, claim 14 must be limited to modules with a single front opening. *See Tandon*, 831 F.2d at 1023 ("To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant.").

Staff Br. at 52-54, see Staff Reply Br. 11-15.

For the reasons discussed below, the administrative law judge has determined that

the claim term "front opening" should be construed to mean "a single opening located in

the front side of a fiber optic module, e.g., the opening depicted in Figure 13 of the '206

patent as having dimensions H₁ and W₁."

Unasserted independent claim 14 and asserted dependent claims 22 and 23 read as

follows:

14. A fiber optic module, comprising:

- a main body defining an internal chamber disposed between a front side and a rear side;
- a plurality of optical fibers disposed in the internal chamber;
- *a front opening* disposed along a longitudinal axis in the front side;
- a first plurality of fiber optic components optically connected to the plurality of optical fibers, the first plurality of fiber optic components disposed through the front opening providing a fiber optic connection density of at least one fiber optic

328

connection per 7.0 millimeters (mm) of width of the front opening; and

at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components.

22. The fiber optic module of claim **14**, further comprising at least one rail disposed on the main body.

23. The fiber optic module of claim 22, further comprising at least one latch attached to the at least one rail and configured to engage the at least one rail.

JX-0001 ('206 Patent) at 20:48-65, 21:27-31 (emphasis added).

Firstly, the limitation at issue is expressed in claim 14 in terms of "a front opening." In the '206 patent, as respondents and the Staff argued, asserted claim 14 clearly claims "a front opening" as opposed to "front openings" claimed in unasserted claim 63. While "[a]s a general rule, the words 'a' or 'an' in a patent claim carry the meaning of 'one or more[,]" an exception to this rule arises when a patentee "evince[s] a clear intent to limit 'a' or 'an' to 'one." *01 Communique Lab., Inc. v. LogMeIn, Inc.,* 687 F.3d 1292, 1297 (Fed. Cir. 2012). The exception to the general rule arises "where the language of the claims themselves, the specification, or the prosecution history necessitate a departure from the rule." *Id.; Baldwin Graphic Sys., Inc. v. Siebert, Inc.,* 512 F.3d 1338, 1342-43 (Fed. Cir. 2008). That is the case here. The explicit contrast between the language of claims 14 and 63 of the '206 patent indicates that the exception should apply.

An element by element comparison of asserted claim 14 and unasserted claim 18 is shown in the table below.

329

Case: 22-1228 Document: 29 VERSION 520 Filed: 04/25/2022 Confidential Material Omitted on this Page

Claim 14	Claim 63			
14 . A fiber optic module, comprising: a main body defining an internal chamber disposed between a front side and a rear side;	63 . A fiber optic module, comprising: a main body defining an internal chamber disposed between a front side and a rear side, <i>wherein the front side has a width</i> ;			
a plurality of optical fibers disposed in the internal chamber;	a plurality of optical fibers disposed in the internal chamber;			
<i>a front opening</i> disposed along a longitudinal axis in the front side;	front openings having a width being at least eighty-five percent (85%) of the width of the front side of the main body;			
a first plurality of fiber optic components optically connected to the plurality of optical fibers, the first plurality of fiber optic components disposed through the front opening <i>providing a fiber optic</i> <i>connection density of at least one fiber</i> <i>optic connection per 7.0 millimeters (mm)</i> <i>of width of the front opening</i> ; and	a first plurality of fiber optic components optically connected to the plurality of optical fibers, the fiber optic components disposed through the front openings; and			
at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components.	at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components.			

JX-0001 ('206 Patent) at 20:48-65, 24:15-31 (emphasis added).

It can be seen that there are some substantive differences between claims 14 and 63 in addition to the front opening(s). The fourth element of claim 14 requires a "front opening providing a fiber optic connection density of at least one fiber optic connection per 7.0 millimeters (mm) of width of the front opening." This requirement is missing in claim 63. The third element of claim 63 requires that the front openings should have "a width being at least eighty-five percent (85%) of the width of the front side of the main

Case: 22-1228 Document: 29 VERSON 521 Filed: 04/25/2022 Confidential Material Omitted on this Page

body" whereas claim 14 simply requires that the front opening be "disposed along a longitudinal axis in the front side."

In any event, it is clear that claim 63 is relevant to the question of whether claim 14 claims a single front opening or more than multiple front openings. Based on plain language of the claims and claim differentiation,⁴⁶ it is determined that claim 14 claims only a single front opening.

Corning argues that "[a]lthough Figure 13 depicts an embodiment with one single, continuous space for adapters, the specification includes other embodiments, such as Figure 15, that contain multiple spaces and that include the structural material separating the adapters as part of the 'front opening 126'.... It would therefore be improper to limit the claims to the embodiment in Figure 13." Compl. Br. at 52.

Concerning the embodiment shown in FIG. 15, the '206 patent discloses:

FIG. 15 is a front perspective view of another alternate fiber optic module 22" that can be installed in the fiber optic equipment tray 20 of FIG. 1. The form factor of the fiber optic module 22" is the same as the form factor of the fiber optic module 22 illustrated in FIGS. 1-13. However, in the fiber optic module 22", four (4) MPO fiber optic adapters 154 are disposed through the front opening 126 of the fiber

⁴⁶ Where different phrases are used in separate claims, the doctrine of claim differentiation creates a rebuttable presumption that a difference in meaning and scope was intended. *Tandon Corp. v. International Trade Comm'n*, 831 F.2d 1017, 1023 (Fed. Cir. 1987); *see also Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (when different words are used in separate claims, they are presumed to have different meanings); *cf. InterDigital Communications, LLC v. International Trade Comm'n*, 690 F.3d 1318, 1334 (Fed. Cir. 2012).

optic module 22''. The MPO fiber optic adapters 154 are connected to four (4) MPO fiber optic adapters 156 disposed in the rear end 98 of the main body 90 of the fiber optic module 22'. Thus, if the MPO fiber optic adapters 150 support twelve (12) fibers, the fiber optic module 22'' can support up to forty-eight (48) fiber optic connections. Thus, in this example, if up to twelve (12) fiber optic modules 22'' are provided in the fiber optic equipment trays 20 of the chassis 12, up to five hundred seventy-six (756) fiber optic connections can be supported by the chassis 12 in a 1-U space. *Further in this example, the front opening 126 of the fiber optic module 22'' may support twenty-four (24) fiber optic connection density of at least one fiber optic connection per 1.7 mm of width W_1 of the front opening 126.*

JX-0001 ('206 Patent) at 12:54-13:8 (emphasis added).

Thus, the specification teaches that the embodiment of the fiber optic module shown in FIG. 15 (1) has the same form factor as the module shown in FIGS. 1-13; and (2) unlike the module shown in FIGS. 1-13, in the FIG. 15 module "four (4) MPO fiber optic adapters 154 are disposed through the front opening 126"; and (3) unlike the module shown in FIGS. 1-13, the FIG. 15 module supports "a fiber optic connection density of at least one fiber optic connection per 1.7 mm of width W1 of the front opening 126."⁴⁷

⁴⁷ Corning did not cite FIG. 14 but it is also relevant. Concerning the embodiment shown in FIG. 14, the '206 patent discloses:

Alternate fiber optic modules with alternative fiber optic connection densities are possible. FIG. 14 is a front perspective view of an alternate fiber optic module 22' that can be installed in the fiber optic equipment tray 20 of FIG. 1. *The form factor of the fiber optic module* 22' is the same as the form factor of the fiber optic module 22 illustrated in FIGS. 1-13. However, in the fiber optic module 22' of FIG. 14, two (2) MPO fiber optic adapters 150 are disposed through the front opening 126 of the fiber optic module 22'. The MPO fiber optic adapters 150 are connected to two (2) MPO fiber optic adapters 152 disposed in the rear side 98 of the main body 90 of the fiber optic module 22'. Thus, if the MPO fiber optic adapters 150 each support twelve (12) fibers, the fiber optic module 22' can support up to twenty-four (24) fiber optic

Case: 22-1228 Document: 29 VERSO 523 Filed: 04/25/2022 Confidential Material Omitted on this Page

From the above disclosure, it is clear that multiple fiber optic components (in this

case, LC adapters) may be disposed in a single front opening such as the front opening

shown in FIG. 13. This is consistent with the specification's disclosure that FIGS. 10A,

10B, 11, 12, and 13 are different views of the same module embodiment. The '206

patent specification clearly states, "FIG. 13 is a front view of the fiber optic module of

FIG. 11 without fiber optic components installed." JX-0001 ('206 Patent) at 3:4-5.48

Thus, the single opening shown in FIG. 13 has dimensions H1 and W1 which is the total

connections. Thus, in this example, if up to twelve (12) fiber optic modules 22' are provided in the fiber optic equipment trays 20 of the chassis 12, up to two hundred eighty-eight (288) fiber optic connections can be supported by the chassis 12 in a 1-U space. *Further in this example, the front opening 126 of the fiber optic module 22' may support twenty-four (24) fiber optic connections in the width* W_1 (*FIG. 13) to support a fiber optic connection density of at least one fiber optic connection per 3.4-3.5 mm of width* W_1 *of the front opening 126.* It should be understood that the discussion with regard to modules may also apply to a panel. For purposes of this disclosure, a panel may have one or more adapter on one side and no adapters on the opposite side.

JX-0001 ('206 Patent) at 11:53-12:12 (emphasis added).

Similar to FIG. 15, the specification teaches that the embodiment of the fiber optic module shown in FIG. 14 (1) has the same form factor as the module shown in FIGS. 1-13; and (2) unlike the module shown in FIGS. 1-13, in the FIG. 14 module "two (2) MPO fiber optic adapters 150 are disposed through the front opening 126"; and (3) unlike the module shown in FIGS. 1-13, the FIG. 14 module supports "a fiber optic connection density of at least one fiber optic connection per 3.4-3.5 mm of width W1 of the front opening 126."

⁴⁸ Additionally, the BRIEF DESCRIPTION OF THE FIGURES discloses:

FIGS. 10A and 10B are front right and left perspective views, respectively, of an exemplary fiber optic module that can be disposed in the fiber optic equipment trays of FIG. 3;

FIG. 11 is a perspective, exploded view of the fiber optic module in FIGS. 10A and 10B;

FIG. 12 is a perspective top view of the fiber optic module of FIG. 11 with the cover removed and showing a fiber optic harness installed therein;...

JX-0001 ('206 Patent) at 2:60-67.

area in the front of the module that provides for the insertion of multiple adapters. In this example, the single front opening shown in FIG. 13 supports a plurality of fiber optic components that are shown in FIGS. 10A, 10B, 11, and 12. The main difference between the embodiments shown in FIGS. 14 and 15 and the embodiment shown in FIGS. 10A, 10B, 11, and 12 is that in the former embodiments, the spacing between the two or four MPO adapters can be easily identified whereas the spacing between the six LC adapters shown in FIGS. 10A, 10B, 11, and 12 cannot easily be seen. This is because these figures are not engineering design drawings. This does not mean that there are no spaces (or dividers) between the six LC adapters. Most design drawings are proprietary, so it is not surprising that the '206 patent specification and figures do not identify every single part that make up a module. In any event, the record evidence includes a Corning design drawing (cited by Corning's technical prong expert) that shows two dividers of 0.84 thickness disposed between three duplex LC adapters. See CX-0977C (Corning EDGE Base-12 Module Drawing) (SECTION E-E view); CX-0002C (Ralph WS) Q/A 101 ("This evidence shows that each Base-12 module has six duplex adapters occupying an 81.57 mm opening comprised of three 26.63m spaces for adapters and two 0.84 mm spacers.").

In view of the above analysis, the administrative law judge construes the claim term "front opening" as "a single opening located in the front side of a fiber optic module, *e.g.*, the opening depicted in Figure 13 of the '206 patent as having dimensions H_1 and W_1 ."

B. Infringement Analysis of the '206 Patent

As noted, Corning asserts dependent claims 22 and 23 of the '206 patent, both of

334

Case: 22-1228 Document: 29 VERSON 525 Filed: 04/25/2022 Confidential Material Omitted on this Page

which depend from independent claim 14. Claims 22 and 23 are asserted against FS, Panduit, and Wirewerks. Siemon is accused of infringing claim 22 only. *See* Compl. Br. at 127-39.

For the reasons discussed below, Corning has shown by a preponderance of the evidence that (1) the accused products of FS and Wirewerks infringe asserted claims 22 and 23; and (2) Siemon's accused products infringe asserted claim 22. However, it has not been shown that Panduit's accused products infringe asserted claim 22 or 23.

1. Accused Products

The accused products consist of chassis, modules, and combinations thereof. There are three categories of accused products, Base-8, Base-12, and Base-24, which are defined by the number of fiber connections available per module. First, a Base-8 module supports eight fiber connections, and a Base-8 chassis supports eighteen Base-8 modules per 1U space. CX-0001C (Prucnal WS) Q/A 63. Second, a Base-12 module supports twelve fiber connections, and a Base-12 chassis supports twelve Base-12 modules per 1U space. *Id.* Finally, a Base-24 module supports twenty-four fiber connections, and a Base-24 chassis supports six Base-24 modules per 1U space. *Id.* In each case, there are a total of 144 connections available in a 1U space; the difference in the three categories is in the number of modules needed to fill that space.

Within each category, there are three chassis sizes: 1U, 2U, and 4U, which refer to the chassis height. *Id.* Apart from the total height, these types are materially the same for each respondent. *Id.* That is, the fiber optic connection density for a 1U chassis from a given respondent is the same as the density for a 2U or 4U chassis from that respondent. *Id.* Q/A 64. Complainant argues that therefore "for each Respondent, and within each

335

Case: 22-1228 Document: 29 VE Rage: 526 Filed: 04/25/2022 Confidential Material Omitted on this Page

fiber connectivity configuration (Base-12, Base-8, and Base-24), a 1U chassis is representative of a 2U chassis and a 4U chassis for purposes of the asserted patents." *Id.*; *see also* CX-2042 (Compl. & Siemon Stip. Re Representative Accused Prods.) (stipulating that within each of the three categories, Siemon's 1U chassis is representative of its 2U and 4U chassis for purposes of the asserted patents).

Complainant has offered a complete list of representative accused products for each respondent, along with the group of accused products represented by each such product, through the testimony of Dr. Prucnal. CX-0001C (Prucnal WS) Q/A 62; *see* CDX-0013 (Prucnal list of accused products).

Not all respondents market all types of accused products. The following describes the accused products allegedly imported and/or sold in the United States by each respondent:

Respondent	Brand	Chassis			Module		
		Base-8	Base-12	Base-24	Base- 8	Base- 12	Base- 24
FS	FHX	1U	1U		Х	Х	
Panduit	HD FLEX	1U/2U/4U	1U/2U/4U	1U/2U/4U	Х	Х	Х
Siemon	LightStack	1U/2U/4U	1U/2U/4U		Х	Х	
Wirewerks	NextSTEP					Х	

Summary of Accused Products

See Staff Br. at 20.

a. Panduit

The Panduit accused products are marketed as "HD FLEX Fiber" enclosures and cassettes. The accused Panduit chassis fall into three categories (Base-8, Base-12, and Base-24), and are available in three sizes (1U, 2U, and 4U). The accused Panduit modules are available in three configurations (Base-8, Base-12, and Base-24). *See* CX-0001C (Prucnal WS) Q/A 85; CPX-0062 (Panduit Base-8 1U chassis); CPX-0063 (Panduit Base-12 1U chassis); CPX-0065 (Panduit Base-24 1U chassis); CPX-0073 (Panduit Base-8 module); CPX-0074 (Panduit Base-12 module); CPX-0075 (Panduit Base-24 module).

b. Siemon

The Siemon accused products are marketed under the name "LightStack Ultra High-Density Fiber Plug and Play system." The accused Siemon chassis fall into two categories (Base-8 and Base-12) and are available in three sizes (1U, 2U, and 4U). The accused Siemon modules are available in Base-8 and Base-12 configurations. *See* CX-0001C (Prucnal WS) Q/A 106; CPX-0076 (Siemon Base-8 1U chassis); CPX-0077 (Siemon Base-12 1U chassis); CPX-0078 (pre-Aug. 2019 version of Siemon Base-12 1U chassis); CPX-0079 (Siemon Base-8 module); CPX-0080 (Siemon Base-12 module).

c. FS

The FS accused products are marketed under the names "FHX Series" and "FHX-FCP/FHX-C Series" and include both chassis and modules. The accused FS chassis fall into two categories (Base-8 and Base-12) and are available in just one size (1U). The accused FS modules are available in Base-8 and Base-12 configurations. *See* CX-0001C

337

(Prucnal WS) Q/A 117; CPX-0053 (FS Base-8 1U chassis); CPX-0054 (FS Base-12 1U chassis); CPX-0055 (FS Base-8 module); CPX-0056 (FS Base-12 module).

d. Wirewerks

The Wirewerks accused products consist of modules only, marketed under the name "NextSTEP." The NextSTEP modules all have LC adapters supporting twelve fiber connections on the front and a twelve-fiber MPO adapter on the rear. *See* CX-0001C (Prucnal WS) Q/A 117; CPX-0081 (Wirewerks Base-12 module).

In addition to the Wirewerks accused products, Order No. 23 provided that the parties may seek adjudication of an additional Wirewerks product identified as the "Wirewerks First Alternative Design." Order No. 23 at 5 (Oct. 14, 2020); RPX-0078C (First Alternative Design module). The First Alternative Design includes a new adapter, which is used in the same housing as the accused NextSTEP module. RX-0006C (Min RWS) Q/A 227-28. The adapter includes additional material on the front side that, according to Wirewerks, increases the "connection density" of the total product when using the method for measuring density that was used in the complaint. *Id.*; RX-1673C (Tabet WS) Q/A 41-53.

2. Direct Infringement⁴⁹

As noted, Corning asserts dependent claims 22 and 23 of the '206 patent, both of which depend from independent claim 14. Claims 22 and 23 are asserted against FS, Panduit, and Wirewerks. Siemon is accused of infringing claim 22 only. *See* Compl. Br.

⁴⁹ Unlike the other three asserted patents, the '206 patent is directed only to modules, not also to the chassis that receive and support those modules. Thus, it is not necessary to consider whether any respondent infringes indirectly. The importation or sale of an infringing module, by itself, would be sufficient to establish direct infringement.



at 127-39.

a. Issues Common to Multiple Respondents

i. "front opening"

Unasserted independent claim 14 reads as follows:

- 14. A fiber optic module, comprising:
- a main body defining an internal chamber disposed between a front side and a rear side;
- a plurality of optical fibers disposed in the internal chamber;
- a *front opening* disposed along a longitudinal axis in the front side;
- a first plurality of fiber optic components optically connected to the plurality of optical fibers, the first plurality of fiber optic components disposed through the front opening providing a fiber optic connection density of at least one fiber optic connection per 7.0 millimeters (mm) of width of the front opening; and
- at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components.

JX-0001 ('206 Patent) at 20:48-65 (emphasis added).

Each respondent's Base-12 and Base-8 modules satisfy independent claim 14,

which claims fiber optic connection density in the front opening of the module. Under

Corning's proposed construction (adopted by the administrative law judge with

modification),⁵⁰ the front opening of each accused module is the total area in the front of

⁵⁰ The administrative law judge determined that the claim term "front opening" should be construed to mean "a single opening located in the front side of a fiber optic module, *e.g.*, the opening depicted in Figure 13 of the '206 patent as having dimensions H1 and W1." *See* Section VII. A.2, *supra*.

the module that provides for the insertion of adapters. *See* CX-0001C (Prucnal WS) Q/A 522-23; CDX-0001C (Prucnal Direct Demonstratives) at 609. Further, that space supports a plurality of fiber optic components. Panduit's Base-12 Module, for example, has six spaces for six duplex LC adapters, and each duplex LC adapter is comprised of two simplex LC adapters. *See* CX-0001C (Prucnal WS) Q/A 532; CDX-0001C (Prucnal Direct Demonstratives) at 613-14. The same is true of Panduit's Base-8 modules, which have three spaces for four duplex LC adapters. CX-0001C (Prucnal WS) Q/A 307, 533; CDX-0001C (Prucnal Direct Demonstratives) at 615. The other Accused Base-12 and Base-8 Modules have similar arrangements. *See* CX-0001C (Prucnal WS) Q/A 310-11, 314-15, 533-38; CDX-0001C (Prucnal Direct Demonstratives) at 618, 621.

Respondents argue that, based on their proposed construction of "front opening," only one component is disposed through each front opening in a module, not a "plurality of fiber optic components" as claim 14 requires. *See* Resps. Br. at 229-32. However, the '206 patent defines component to include "connector." JX-0001 ('206 Patent) at 2:6-8 ("The fiber optic components and connections can be provided by fiber optic adapters and/or fiber optic connectors as examples."); 4:51-54 (similar). Each adapter in each respondent's modules receives more than one connector that terminates an internal fiber and can connect to an external fiber in a jumper. *See* CX-2060C (Prucnal RWS) Q/A 84.

Under respondents' proposed construction, any space that houses any LC adapter is a "single opening located on the front of the module" and, thus, the "front opening." *See* Resps. Br. at 50-53. Dr. Min opines that the accused modules do not infringe under respondents' construction because they contain "multiple distinct openings" not a single opening. *See, e.g.*, RX-0006C (Min RWS) Q/A 186-89. The fact that there are multiple

340

openings necessarily means there is at least one "single opening." That single opening is the "front opening" which the administrative law judge construed to mean "a single opening located in the front side of a fiber optic module, e.g., the opening depicted in Figure 13 of the '206 patent as having dimensions H1 and W1." See Section VII. A.2, supra. It is undisputed that that single opening "having dimensions H1 and W1" is the total area in the front of the module that provides for the insertion of adapters. That single front opening supports a plurality of fiber optic components as shown in Figs. 11, 12, and 13 of the '206 patent. See Section VII. A.2, supra (discussing the fact that Figs. 11, 12, and 13 are different views of the same module embodiment). As noted, Panduit's Base-12 Module, for example, has six spaces (or openings) for six duplex LC adapters, and each duplex LC adapter is comprised of two simplex LC adapters. Those six spaces (or openings) are encompassed within the single "opening depicted in Figure 13 of the '206 patent as having dimensions H1 and W1." Indeed, Dr. Min explained during the hearing that he did not think it would be reasonable to treat any of the openings as the "front opening" under the Staff's or Corning's — not respondents' — proposed constructions. Min Tr. 852.

In the Staff's view, modules with plastic spacers between the adapters necessarily have more than one front opening and fall outside the scope of claim 14. *See* Staff Br. at 50-54. Dr. Min seems to support this view of Corning's and Staff's construction, opining that Figure 13 cannot represent the accused modules because Figure 13 does not show spacers installed in the modules. *See* RX-0006C (Min RWS) Q/A 192. As discussed, this cannot be the case when the '206 patent specification clearly discloses, "FIG. 13 is a front view of the fiber optic module of FIG. 11 without fiber optic components installed."

341

JX-0001 ('206 Patent) at 3:4-5.

Relying on respondents' documents, which he confirmed with his own measurements, Dr. Prucnal performed the following calculations for each accused Base-12 and Base-8 module. *See* CX-0001C (Prucnal WS) Q/A 532-40. He determined the space available on the front side for inserting adapters. *See id*. Consistent with Corning's and the Staff's proposed construction (adopted by the administrative law judge with modification), he included any space between adapters (such as that occupied by spacers) as well as any unused space on either side. *See id*. He then determined that the Base-12 modules support 12 fiber optic connections and the Base-8 modules support 8. *See id*. Dr. Prucnal then divided the available space by the number of connections to arrive at a fiber connection density, which, in each case, was greater than "at least one fiber optic connection per 7.0 millimeters (mm) of width of the front opening," and therefore satisfies this claim.

In applying respondents' proposed construction that only one, uninterrupted space should be considered, Dr. Prucnal calculated the space occupied by a single adapter, and divided that by the number of fibers that adapter supports. *See id.* Q/A 532-40. Here, too, Dr. Prucnal found that the density in each case was greater than at least one fiber connection per 7.0 mm of the width of the front opening. *See id.*

ii. Doctrine of Equivalents ("front opening")

While it is not the usual practice to discuss infringement under the doctrine of equivalents before discussing all the merits of literal infringement, this issue is common to multiple respondents, and thus it is appropriate to do so here. For the reasons set forth below, and as Dr. Prucnal has shown, the "front opening" elements of respondents'

342

accused products (discussed in detail immediately above) infringe under the doctrine of equivalents because any differences between the claimed limitations and the accused devices are insubstantial. Respondents' accused modules' front spaces perform substantially the same function as the patented feature in substantially the same way to achieve substantially the same result. *See* Prucnal Tr. 414 (explaining that the "spacers are there just...as structural elements. And it would be an equivalent way to achieve the density"); CX-0001 (Prucnal WS) Q/A 541-44.

First, the front sections in respondents' accused modules perform substantially the same function as the claimed front opening. The front sections in respondents' accused modules house fiber optic adapters that achieve high-density connections, including up to 144 connections per U space, based on using simplex/duplex components. See CX-0001C (Prucnal WS) Q/A 541-44. As Mr. Tabet of Wirewerks explained, a module needs spaces to hold adapters; the plastic separators between the adapters support the adapters and provide no additional function; and the only reason for the spaces in the front of the module is to receive an adapter. JX-0025 (Tabet Dep. Tr.) 153-154, 156. This is the same as the function of the front opening described in the '206 patent: "[a] front opening is disposed along a longitudinal axis in the front side of the main body. A plurality of fiber optic components is disposed through the front opening." JX-0001 ('206 Patent) at 1:57-60; *id.* at 2:7-9 ("The fiber optic components and connections can be provided by fiber optic adapters and/or fiber optic connectors as examples."); see also *id.* at 4:59-60:1, 9:9-17, 9:67-68:7, 10:25-37, 11:23-41, 11:59-61, 12:58-61, 14:5-34. Dr. Min opines that Wirewerks spacers' have the same function as the channel disclosed in Figures 16-18 of the '206 patent, but that is the not the case. The channel separates two

343

Case: 22-1228 Document: 29 VERSON 534 Filed: 04/25/2022 Confidential Material Omitted on this Page

distinct halves of the module and receives a rail; it is not the same as plastic material separating adapters within the module body. *See* RX-0006C (Min RWS) Q/A 212.

Dr. Min opines that, because the accused modules contain spacers that he claims create separate front openings, they do "not function in substantially the same way as a single opening." *See* RX-0006C (Min RWS) Q/A 209. The only claimed function of the front opening — as Dr. Min does not dispute — is to receive fiber optic components (adapters), and Dr. Min shows no difference in terms of function between modules with spacers and those without. To the contrary, the modules shown in the '206 patent (without spacers) achieve the same result as the accused modules.

Second, the front sections in respondents' accused modules perform that function in substantially the same way as the claimed front opening. The Base-12 accused modules create spaces in the module to receive and support a total of 12 fiber optic ports (which receive 6 LC duplex connectors) on the front face of the module, so that when twelve modules are installed in the three trays of a chassis, that apparatus achieves 144 LC connections per 1U space, based on using simplex/duplex components. *See* CX-0001C (Prucnal WS) Q/A 543. This is the same configuration that the '206 patent specification describes for achieving that density. JX-0001 ('206 Patent) at 10:34-37 ("Thus, the chassis 12 is capable of supporting up to one hundred forty-four (144) fiber optic connections in a 1-U space by twelve (12) simplex or six (6) duplex fiber optic adapters being disposed in the fiber optic modules 22.").

Dr. Min opines that the spacers in the accused modules provide "structural support during molding and also allow for a more straightforward molding process," and therefore perform the claimed function in a different way. *See* RX-0006C (Min RWS)

344

Case: 22-1228 Document: 29 VERSON 535 Filed: 04/25/2022 Confidential Material Omitted on this Page

Q/A 211-15. Dr. Min provides no support for this opinion. In any event, even assuming the spacers provided these or benefits, it would not change the fact that the way the modules perform the function of supporting adapters is by creating spaces for them. *See Miles Labs., Inc. v. Shandon Inc.*, 997 F.2d 870, 877 (Fed. Cir. 1993) (finding equivalence where accused product offered additional features unrelated to the result recited by the claims); *Insta-Foam Prods.*, 906 F.2d at 702.

Third, the front sections in respondents' accused modules achieve the same result as the claimed front opening. As explained, respondents' accused modules provide 144 connections per U space, using duplex LC connectors, in a configuration using three sliding trays and 4 modules per tray. *See* CX-0001C (Prucnal WS) Q/A 544.

b. Direct Infringement - Panduit

i. Unasserted Independent Claim 14

Corning has shown by a preponderance of the evidence that each Panduit Base-12 and Base-8 accused module practices each element of claims 14, 22, and 23 of the '206 patent. *See* CX-0001C (Prucnal WS) Q/A 507-14, 518, 522-24, 528, 532-33, 541-45, 549-51, 555-56.

345



Representative modules are shown below:



Left: CX-1849 (Panduit photos) at 23 (depicting CPX-0074 (Panduit Base-12 module)) Right: CX-1849 (Panduit photos) at 45 (depicting CPX-0073 (Panduit Base-8 module))

As shown above in the common issues discussion, Dr. Prucnal has shown that Panduit's accused modules each have an infringing front opening. Respondents agree with Dr. Prucnal's calculations and concede that Panduit's Base-8 and Base-12 Modules practice this limitation under Corning's proposed construction (adopted by the administrative law judge with modification). *See* CX-0001C (Prucnal WS) Q/A 532-33. Respondents concede that all other limitations of claim 14 are met. Nonetheless, claim 14 is not asserted by Corning.

ii. Dependent Claims 22 and 23

Asserted dependent claims 22 and 23 read as follows:

22. The fiber optic module of claim 14, further comprising *at least one rail* disposed on the main body.

23. The fiber optic module of claim 22, further comprising *at least one latch attached to the at least one rail* and configured to engage the at least one rail.

JX-0001 ('206 Patent) at 21:27-31 (emphasis added).

346

Corning argues, *inter alia*:

Dr. Prucnal demonstrated that the Panduit accused Base-12 and Base-8 modules contain triangular protrusions on both the front and rear end of both end of the module that are used to help guide the module into a fiber optic equipment tray. *See* CX-0001C (Prucnal WS) Q/A 551; CDX-0001C (Prucnal Direct) at 629; CX-1631 (Panduit HD FLEX MPO Cassette Customer Drawing); CX-1672C (Panduit HD Flex 1-Port LC Cassette Drawing); CX-1678C (Panduit HD Flex Cassette Drawing 2); CX-0620 (Panduit HD Flex Ordering Guide-1) at 5-7; CX-1607C (Panduit HDFE 12 Fiber LC Cassette Drawing); and CX-0147 (Panduit HD Flex Cassettes Spec.). Dr. Prucnal also provided an extensive explanation as to how these rails interact with the module guides to guide the modules into the fiber optic equipment tray. *See* CX-0001C (Prucnal WS) Q/A 460. Dr. Prucnal clearly labeled the identified rails on Panduit's accused modules, as shown for example below (CDX-0001C (Prucnal Direct) at 629):



....The rail on the side of each Panduit accused module extends into a protrusion at the rear of the module that forms a latch; when the module is inserted into a module guide in the tray of a corresponding chassis, the latch-protrusion snaps into an opening in the module guide, engaging the rail so that it is locked into place. A release tab that extends from the rail beyond the rear of the module is used to remove the latchprotrusion from the opening in the module, engaging the rail so that it can move within the module guide. CX-0001C (Prucnal WS) Q/A 556; CDX-0001C (Prucnal Direct) at 634; CX-0620 (Panduit HD Flex Ordering Guide-1) at 5-7; CX-1607C (Panduit HDFE 12 Fiber LC Cassette Drawing); CX-0147 (Panduit HD Flex Cassettes Spec.); and CX-1631 (Panduit HD FLEX MPO Cassette Customer Drawing); JX-0017C (Kuffel Dep. Tr.) 354:16-355:5, 433:3-12 (HD Flex modules have latches that allow movement of the module).

Compl. Br. at 133-34.

Dr. Min opined that the Panduit accused modules do not read on the limitations

added by claims 22 and 23. Claim 22 requires "at least one rail disposed on the main

Case: 22-1228 Document: 29 VERSON 538 Filed: 04/25/2022 Confidential Material Omitted on this Page

body." JX-0001 ('206 Patent) at 21:27-28. Claim 23 further requires "at least one latch attached to the at least one rail and configured to engage the at least one rail." *Id.* at 21:29-31. Dr. Min testified that the Panduit accused modules do not have either a "rail" or a "latch attached to the . . . rail." RX-0006C (Min RWS) Q/A 230-36, 243-46.

Dr. Prucnal testified that "a rail disposed on a module is a protrusion on the side of the module that is used for purposes of guiding the module into a device[.]" CX-0001C (Prucnal WS) Q/A 550. He further testified that the Panduit accused modules "contain[] triangular protrusions on both the front and rear end of both end[s] of the module that are used to help guide the module into a fiber optic equipment tray. *Id.* Q/A 551; *see also* CX-1631 (Panduit HD FLEX MPO Cassette customer drawing); CX-1672C (Panduit HD Flex 1-Port LC Cassette drawing).

As the Staff noted, the evidence shows that these protrusions are just that – triangular lumps or protrusions on the sides of the modules, not rails as that term is commonly understood. *See* Staff Br. at 180-81 (citing CPX-0073; CPX-0074; CX-1631 (Panduit HD FLEX MPO Cassette customer drawing); CX-1672C (Panduit HD Flex 1-Port LC Cassette drawing)). As Dr. Min testified, Dr. Prucnal failed to explain how these protrusions are used to guide the module into a device. RX-0006C (Min RWS) Q/A 236.

348

Case: 22-1228 Document: 29 VERSON 539 Filed: 04/25/2022 Confidential Material Omitted on this Page



CX-1631 (HD FLEX MPO Cassette customer drawing) (depicting triangular protrusions) (arrow added by Staff)

Dr. Prucnal also testified that "[t]he rail on the side of each of these modules extends into a protrusion at the rear of the module that forms a latch[.]" CX-0001C (Prucnal WS) Q/A 551. According to Dr. Prucnal, "when the module is inserted into a module guide in the tray of a corresponding chassis, the latch-protrusion snaps into an opening in the module guide, engaging the rail so that it is locked into place." *Id*. However, the latch of claim 23 must be "attached to the at least one rail and configured to engage the at least one rail." JX-0001 ('206 Patent) at 21:29-31. Inasmuch as the Panduit accused modules do not have a rail, there can be no latch "attached to the at least one rail." *See id*.

Accordingly, although Panduit accused modules practice unasserted claim 14, they do not infringe asserted claims 22 and 23 of the '206 patent.

c. Direct Infringement - Siemon

i. Unasserted Independent Claim 14

Corning has shown by a preponderance of the evidence that each Base-12 and Base-8 Siemon accused module practices each element of claims 14 and 22 of the '206 patent. *See* CX-0001 (Prucnal WS) Q/A 507-13, 515, 519, 522-23, 525, 529, 532, 534-

349



35, 541-44, 546, 549-50, and 552.

Representative modules are shown below:



Left: CX-1853 (Siemon photos) at 14 (depicting CPX-0080 (Siemon Base-12 module)) Right: CX-1853 (Siemon photos) at 28 (depicting CPX-0079 (Siemon Base-8 module))

As in the case of Panduit, the principal issue is the dispute over the front opening. With respect to the front opening, Dr. Prucnal measured Siemon's module density the same way he measured Panduit's. *See* CX-0001C (Prucnal WS) Q/A 534-35. Respondents agree with Dr. Prucnal's calculations and concede that Siemon's Base-8 and Base-12 Modules practice this limitation under Corning's view of the proposed constructions. Respondents concede that all other limitations of claim 14 are met.

ii. Dependent Claim 22

Dr. Prucnal demonstrated that the Siemon accused Base-12 and Base-8 modules



have protrusions on the middle left and right sides of the module that are used to help guide the movement of the module into the tray. *See* CX-0001C (Prucnal WS) Q/A 552; CDX-0001C (Prucnal Direct Demonstratives) at 630-631.



CX-0179C (Siemon Plug and Play presentation) at 10 (excerpt) (depicting Siemon Base-12 LightStack module) (arrow added by Staff)

Dr. Prucnal also explained as to how these rails interact with the module guides to

guide the modules into the fiber optic equipment tray. See CX-0001C (Prucnal WS) Q/A

462. Dr. Prucnal clearly labeled the identified rails on Siemon's accused modules.

CDX-0001C (Prucnal Direct Demonstratives) at 630.

Dr. Min opines that Dr. Prucnal has provided no "explanation as to how" the rails that Dr. Prucnal identified" interact with a rail guide. Here again, Dr. Min overlooks the relevant part of Dr. Prucnal's testimony. Dr. Prucnal explains:

When a Representative Siemon Base-12 Module or Siemon Base-8 Module is inserted in the front or rear of the tray of a Representative Siemon Base-12 Chassis or Siemon Base-8 Chassis, respectively, the latch on [the] left divider grabs the left rear edge of the module; the latch on the right divider grabs the front edge of the module; and the module rail protrusions slide between the surface of the tray and a plastic rail on the divider.

CX-0001C (Prucnal WS) Q/A 462. That is sufficient to explain how the rails on the module guide the module into the tray. When the module is guided into the tray, these protrusions fit under a module guide that "keep it from going . . . up and down."

351

Case: 22-1228 Document: 29 VERSON 542 Filed: 04/25/2022 Confidential Material Omitted on this Page

JX-0018C (Maynard Dep. Tr.) 144. Thus, the protrusions interact with the module guides to direct module movement, as the claim requires. CX-0001C (Prucnal WS) Q/A 8, 109-10, 552.

The Staff agrees that claim 22 is satisfied. *See* Staff Br. at 182-83 ("Unlike the Panduit modules, the Siemon modules have left- and right-side protrusions that are rail-shaped, and there is testimony by a Siemon engineer explaining that the protrusions, or "guides," are used to align the modules within the chassis.").

d. Direct Infringement - FS

i. Unasserted Independent Claim 14

Corning has shown by a preponderance of the evidence that each FS Base-12 and Base-8 accused module practices each element of claims 14, 22, and 23 of the '206 patent. *See* CX-0001C (Prucnal WS) Q/A 507-13, 516, 520, 522-23, 526, 530, 532, 536-37, 541-44, 547, 549-50, 553, 555, 557.

The FS accused modules are available in Base-12 and Base-8 configurations. Representative modules are shown below:



352





Left: CX-1855 (FS photos) at 20 (depicting CPX-0056 (FS Base-12 module)) Right: CX-1855 (FS photos) at 40 (depicting CPX-0055 (FS Base-8 module))

The parties agree that the FS accused modules comprise a main body defining an internal chamber, disposed between a front side and a rear side. *See* CX-0001C (Prucnal WS) Q/A 516. They also agree that there are a plurality of optical fibers disposed in the internal chamber, that there are fiber optic components optically connected to the optical fibers on the front side of the module, and that there is a second fiber optic component optically connected to at least one of the plurality of optical fibers. *See id.* Q/A 520, 530, 547.

Dr. Prucnal measured FS's module density the same way he measured Siemon's. See CX-0001C (Prucnal WS) Q/A 536-37. FS did not provide documents with measurements of the front opening of its accused modules, and so Dr. Prucnal took these measurements himself. He found that the FS Base-12 module had a front opening of 84.2 mm (including unused space in the opening), and a fiber optic connection density of at least one connection per 6.7 mm of a front opening of the module; and that the FS Base-8 modules had a front opening of 54.3 mm (including unused space in the opening), and the same density as the Base-12 module. See CX-0001C (Prucnal WS) Q/A 536-37.

353

Case: 22-1228 Document: 29 VERSON 544 Filed: 04/25/2022 Confidential Material Omitted on this Page

Respondents argue that the Base-12 module density is less than required because it comes out to one fiber optic connection per 7.017 mm; but a person of ordinary skill would round that number to 7.0 mm. *See Viskase Corp. v. Am. Nat'l. Can Co.*, 261 F.3d 1316, 1320 (Fed. Cir. 2001); Prucnal Tr. 375-376. Dr. Min's extreme position on numerical precision — for example, that "84.999 million 9's" still could not be rounded up to 85, Min Tr. 849 — is thus contrary to the understanding of a person of ordinary skill and to Federal Circuit precedent.

Respondents argue that "rather than measuring the openings, Dr. Prucnal measured the space occupied by the adapters." Resps. Br. at 235. That is incorrect: Dr. Prucnal's measurements included the spacers, and therefore encompassed the entire front opening. *See* CX-0001C (Prucnal) Q/A 535-36 ("including any unused space on either side"); CDX-0001C (Prucnal Direct Demonstratives) at 617-18 (including spacers in measurements), 620-21 (showing W₁ for FS).

FS provides alternative measurements, citing Dr. Min's testimony. *See* Resps. Br. at 235. Dr. Min, however, does not describe what or how he is measuring, or provide any description or support for them. *See id.* Dr. Min's unsupported measurements are unpersuasive.

Respondents argue that the claims exclude densities even two-hundredths of a millimeter outside the 7.0 mm limitation. *See* Resps. Br. at 235. They offer no evidence that the '206 patent requires greater precision than conventional tolerances, especially where the claim recites a measurement with a single digit after the decimal point.

Respondents concede that all other limitations of claim 14 are met.

354



ii. Dependent Claims 22 and 23

Respondents have not argued that the FS accused modules fail to satisfy the additional limitations of claims 22 and 23. Respondents concede that the FS accused modules practice these claims. *See* Resps. Br. at 237-40.

e. Direct Infringement - Wirewerks

i. Unasserted Independent Claim 14

Corning has shown by a preponderance of the evidence that each Wirewerks Base-12 accused module practices each element of claims 14, 22, and 23 of the '206 patent. *See* CX-0001 (Prucnal WS) Q/A 507-13, 517, 521-23, 527, 531, 538-40, 541-44, 54-50, 554-55, 558.

Wirewerks accused NextSTEP Base-12 module is shown below:



CX-1857 (Wirewerks photos) at 4 (depicting CPX-0081 (Wirewerks Base-12 module))

Dr. Prucnal measured Wirewerks' module density the same way he measured Siemon's. *See* CX-0001C (Prucnal WS) Q/A 538.

355

Case: 22-1228 Document: 29 VE Rego: 546 Filed: 04/25/2022 Confidential Material Omitted on this Page

Respondents argue that, based on Figure 13, Dr. Prucnal's measurement of the front opening should have included structural material to the sides of the space designed to receive those adapters. *See* Resps. Br. at 232-34. As Dr. Prucnal explained, that structural material is not part of any opening, but falls outside the opening, and the lines drawn next to the arrows in Figure 13 do not provide a basis to conclude otherwise. Prucnal Tr. 352-353; *see In re Anderson*, 743 F.2d 1578, 1581 (Fed. Cir. 1984) (per curiam) (holding that ambiguities arising from a figure do not alter otherwise clear language in the specification).

Respondents argue that Corning "improperly measured the connection density, by measuring the adapter cutouts rather than the space occupied by the adapters." *See* Resps. Br. at 232. This is argument is based on the unsupported assumption that "W₁ is wider than the cutout to account for the space occupied by the components themselves." *Id.* at 233. The specification says the opposite — describing W₁ as the open space for receiving adapters, while additional space on the front side, such as item 96 in Figure 10A, is part of W₂. JX-0001 ('206 Patent) at 9:64-10:18. Accordingly, Dr. Prucnal measured the module housing that holds the components, not the components themselves. *See* CX-0001C (Prucnal WS) Q/A 536-40. As a result, there is no difference in density between the Wirewerks accused module and the Wirewerks First Alternative Design discussed below.

Respondents argue that Wirewerks doesn't infringe because its connection density is "7.04167 mm" rather than 7.0 mm or less. *See* Resps. Br. at 235; RX-0006C (Min RWS) Q/A 225. A person of ordinary skill would consider 7.04 mm to satisfy a claim requiring 7.0 mm — the extra decimal place is not recited in the claim, and in this case

356
would round down according to standard practice. *See Viskase Corp.*, 261 F.3d at 1320; *Noven Pharms., Inc. v. Actavis Labs. UT, Inc.*, C.A. No. 15-249-LPS, 2016 WL 3625541, at *3, 5 (D. Del. July 5, 2016) (construing the term "15 mg/cm²" as having a "plain and ordinary meaning . . . of greater than or equal to 14.5 mg/cm² and less than 15.5 mg/cm²"). Respondents offer no evidence that the '206 patent requires greater precision than conventional tolerances, especially where the claim recites a measurement with a single digit after the decimal point.

Wirewerks has asked for an additional new design to be adjudicated in this investigation, the Wirewerks First Alternative Design. *See* Order No. 23 at 5 (Oct. 14, 2020). The housing for the First Alternative Design is the same as the NextSTEP housing shown above. RX-1673C (Tabet WS) Q/A 43. The adapters, however, are modified in the manner shown below:



Thus, Wirewerks First Alternative Design uses the same module housing but differently shaped adapters. *See* CX-0276C (Wirewerks Custom LC Quad Adapter

357

Case: 22-1228 Document: 29 VERSON 548 Filed: 04/25/2022 Confidential Material Omitted on this Page

Drawing). There is no difference between the front opening inasmuch as there is no difference between module housings. Tabet Tr. 444-445. Nor is there a difference, even if relevant, between the widths of the adapters. *Id.* As a result, the same analysis Dr. Prucnal applied to the Wirewerks accused module applies to the First Alternative.

ii. Dependent Claims 22 and 23

The accused module and the First Alternative Design satisfy the additional limitations of claims 22 and 23. Claim 22 requires "at least one rail disposed on the main body." JX-0001 ('206 Patent) at 21:27-28. Dr. Prucnal testified that the housing used for the two Wirewerks modules "contains rails on the left and right sides of the module." CX-0001C (Prucnal WS) Q/A 554; *see* CX-0645 (Wirewerks NextSTEP module datasheet) at 2; CPX-0081 (Wirewerks Base-12 module). A Wirewerks engineer testified that this raised structure is a "slider," an alignment feature used to align the module within the chassis. JX-0025C (Tabet Dep. Tr.) at 94:15-105:20.



CX-0645 (Wirewerks NextSTEP module datasheet) at 2 (arrow added by Staff)

Dr. Min opined that this rail "appears to be at least partially disposed on the arm, rather than the main body." RX-0006C (Min RWS) Q/A 237. According to Dr. Min, this

is inconsistent with the language of claim 22, which requires the rail to be "disposed on the main body." *Id.*; *see* JX-0001 ('206 Patent) at 21:27-28. The bulk of the identified rail on the NextSTEP module, however, is attached to the main body of the module, with only a small portion extending to the "arm" region. CX-0645 (Wirewerks NextSTEP module datasheet) at 2; CPX-0081 (Wirewerks accused module). This is sufficient to read on the limitation of claim 22.

Claim 23 requires "at least one latch attached to the at least one rail and configured to engage the at least one rail." *Id.* at 21:29-31. Dr. Prucnal testified that "[t]he rail on the side of each of these modules extends into a protrusion at the front of the module that forms a latch[.]" *See* CX-0001C (Prucnal WS) Q/A 558. He further testified that "when the module is inserted into its corresponding chassis, the latch-protrusion snaps into an opening in the module guide, engaging the rail so that it is locked into place." *Id.*; *see* CX-1857 (Wirewerks photos) at 3; CX-0277C (Wirewerks module drawing); CPX-0081 (Wirewerks accused module); CDX-0001C (Prucnal Direct Demonstratives) at 639.

Case: 22-1228 Document: 29 VE Rege: 550 Filed: 04/25/2022 Confidential Material Omitted on this Page



Dr. Min opined that the alleged latch "is located on the arm, which is not part of the main body." RX-0006C (Min RWS) Q/A 247. Claim 23, however, does not require the latch to be attached to the main body; rather, it must be attached to the rail. The asserted "latch" is attached to both the module arm and to the asserted "rail." *See* CX-1857 (Wirewerks photos) at 3; CX-0277C (Wirewerks module drawing); CPX-0081 (Wirewerks accused module).

Accordingly, the accused module and the First Alternative Design satisfy the additional limitations of claims 22 and 23.

C. Domestic Industry (Technical Prong)

Respondents do not contest that the EDGE DI Modules practice asserted 22 and 23 of the '206 patent. *See* Joint Outline at 9. The Staff argues that the EDGE modules do not satisfy the "front opening" limitation of claim 14, and thus do not practice the claim, literally or under the doctrine of equivalents. Staff Br. at 189.

For the reasons set forth below, the evidence shows that the Corning domestic



industry products are covered by asserted dependent claims 22 and 23 of the '206 patent.

i. Independent Claim 14 (not asserted)

The Staff argues, inter alia:

In the Staff's view, however, the EDGE modules do not practice independent claim 14 because there is no "front opening disposed along a longitudinal axis in the front side" under Respondents' or the Staff's proposed constructions. For the reasons discussed in Part VIII.A.1.a above, the Staff agrees with Respondents that the "front opening" disclosed in claim 14 must be a single opening, not a series of multiple openings. The EDGE Base-12 and Base-8 modules all have multiple openings in the front side of the module, and there are physical dividers between those multiple openings. See CX-0002C (Ralph WS) Q/A 178, 80. The Base-12 modules have three openings containing two duplex adapters each, while the Base-8 modules have four. Id.; see CX-1869 (Corning photos) at 45, 51; CPX-0042 (EDGE Base-8 module); CPX-0043 (EDGE Base-12 module). Because they do not have a single contiguous opening, the Staff submits that the EDGE modules do not satisfy the "front opening" limitation of claim 14, and thus do not practice the claim, literally or under the doctrine of equivalents.

Staff Br. at 189.

ii. Dependent Claims 22 and 23

The Staff argues:

With respect to the additional limitations of the dependent claims, the evidence shows that the EDGE modules have rails along the left and right sides of the main body of the module. CX-0002C (Ralph WS) Q/A 185; JX-0035C (Staber Dep. Tr.) at 134:16-135:5. "The rail on the right side of each of these modules extends into a protrusion at the rear of the module that forms a latch." CX-0002C Q/A 187. When an EDGE module is inserted into a module guide in the tray of an EDGE chassis, "the latch-protrusion snaps into an opening in the module guide, engaging the rail so that it is locked into place" *Id.*; JX-0034C (Rhoney Dep. Tr.) at 109:21-110:7. Thus, if the EDGE modules are found to practice claim 14, they will practice claims 22 and 23 as well. Nevertheless, because the EDGE modules do not practice claim 14, and therefore do not practice either claim 22 or claim 23, Corning has not satisfied the technical prong of the domestic industry requirement with regard to the '206 Patent.

Staff Br. at 190.

Respondents do not contest that the EDGE DI Modules practice asserted claims 22 and 23 of the '206 patent. Claims 22 and 23 depend from unasserted independent claim 14, which is directed to a fiber optic module with an internal chamber housing optical fibers connecting components on the front and rear, a front opening on the front side of the module, and a plurality of fiber optic components disposed through the front opening providing at least one connection per 7.0 mm of the front opening. JX-0001 ('206 Patent), Claim 14. Dr. Ralph demonstrated that the EDGE DI Modules satisfy each of these elements. *See* CX-0002C (Ralph WS) Q/A 167-182; CPX-0042 (EDGE Base-8 Module); CPX-0043 (EDGE Base-12 Module).

Specifically, the EDGE DI Modules have duplex adapters on the front side and an MTP adapter on the rear side; the duplex adapters provide densities of at least one connection per 7.0 mm, for both EDGE and EDGE8 modules, under Corning's and respondents' proposed constructions of "front opening." *See id.* Q/A 178-181; CX-1869 (Corning Photos Ex. D) at 46-47, 52-53. Claim 22 further recites a rail disposed on the main body of the module, and claim 23 recites a latch attached to the rail configured to engage with it: Dr. Ralph explained why the EDGE DI Modules satisfy each of these asserted claims. *See id.* Q/A 183-87.

Although respondents do not contest any of these elements, the Staff argues that the EDGE DI Modules do not practice unasserted independent claim 14 because they lack the "front opening" recited in independent claim 14. The Staff argues the modules do not practice claim 14 because they "have multiple openings in the front side of the module, and there are physical dividers between these multiple openings." *See* Staff Br.

362

at 189. As discussed above with respect to infringement in the common issues section (*see* Section VII.B.2.a.1, *supra*), however, the "front opening" in the '206 patent is the entire space into which adapters are disposed, not each individual adapter space. The presence of spacers between adapters does not change the scope of the patent. *See* CDX-0002C (Ralph Direct Demonstratives) at 129 (citing CX-1869C). As with the accused products, under the correct construction of "front opening," the EDGE DI Modules practice the asserted claims. That extensive discussion need not be repeated here.

Accordingly, the evidence shows that the Corning domestic industry products

practice asserted dependent claims 22 and 23 of the '206 patent.

D. Validity of the '206 Patent

As noted, Corning asserts dependent claims 22 and 23 of the '206 patent.

Respondents argue:

- (1) Siemon Plug and Play Module (RX-0499 (Siemon Plug and Play Module Drawing)) anticipates the asserted claims 22 and 23;
- (2) Castonguay (RX-0453 (U.S. Patent No. 7,349,616)) anticipates the unasserted claim 14;
- (3) asserted claims 22 and 23 are rendered obvious by Siemon Plug and Play Module in view of Wheeler '444 (RX-0445 (U.S. Patent No. 5,497,444 to Wheeler));
- (4) asserted claims 22 and 23 are rendered obvious by Siemon Plug and Play Module in view of Wagner '089 (RX-0457 (U.S. Patent No. 7,689,089));
- (5) asserted claims 22 and 23 are obvious over Castonguay in view of Wagner '089;
- (6) asserted claims 22 and 23 are obvious over Castonguay in view of Wheeler '444; and
- (7) asserted claims 22 and 23 are obvious over Castonguay in view of Siemon Plug and Play Module.

363

See Resps. Br. at 240-54.

Complainant and the Staff disagree. See Compl. Br. at 186-99; Staff Br. at 190-

202.

For the reasons set forth below, respondents have not shown by clear and

convincing evidence that the asserted claims 22 and 23 of the '206 patent are invalid under any theory.

1. Anticipation

a. Siemon Plug & Play Module

Respondents argue that Siemon Plug and Play Module (RX-0499 (Siemon Plug

and Play Module Drawing)) anticipates the asserted claims 22 and 23. See Resps. Br.

240-44. Corning and the Staff disagree. See Compl. Br. at 186-90; Staff Br. at 190-93.

Respondents argue that claim 22 is anticipated, inter alia:

As demonstrated below, Siemon Plug and Play renders these limitations anticipated. The Plug and Play module includes "rails", as they are claimed in the '206 Patent, along the front sides of the modules. The rails slide into guides on the chassis to assist in the insertion of the modules. In particular, the Plug and Play module discloses angled protrusions shown in orange below near the front sides of the modules. *See* annotated drawing of RX-0499 (Siemon Plug and Play Drawing). The edges of the protrusions engage with and slide along guides on the Siemon FCP3 enclosure to enable insertion of the modules into the chassis:



Annotated RX-0499 (Siemon Plug and Play Drawing) and RX-0498 (Siemon FCP3 Drawing).

The corresponding guides, shown above in orange, located on the tray of the FCP3 enclosure engage with the protrusions on the modules to guide the modules into position within the enclosure, where it latches into place, as shown below in the demonstrative exhibit. *See* annotated

364

drawing of RX-0498 (Siemon FCP3 Drawing) RDX-0001.210-211 (RX-0001C (Blumenthal WS) Q/A 640); RX-1266C (Veatch WS) Q/A 41.



RDX-0012.2-5 (RX-1266C (Veatch WS) Q/A 41).

The Plug and Play discloses the "rails" as claimed in the '206 Patent along the front sides of the modules that interact and engage with the notches in an I-shaped guide structure on the FCP3 enclosure. RX-1266C (Veatch WS) Q/A 41; RX-0001C (Blumenthal WS) Q/A 640; RX-0498 (Siemon FCP3 Drawing). Complainant argued in its Pretrial Brief that "these protrusions do not perform the function of a rail as understood by a person of ordinary skill, which is to facilitate the insertion of the module into an enclosure". CPHB at 202. However, Dr. Prucnal testified that a structure is a rail if it has a corresponding rail guide. Prucnal Tr. 1009:3-1010:9. He then acknowledged the structure on the enclosure tray does in fact guide the insertion of the modules into the enclosure and admitted the notches in the rail guide on the FCP3 enclosure interact with the Plug and Play module's angled protrusions, or rails, to slide the module into position before the latch is actuated. Prucnal Tr. 1007:19-1010:9. Accordingly, by disclosing a structure on the module that is guided, this demonstrates a "rail" by Dr. Prucnal's definition. Id.

Resps. Br. at 242-44. Respondents also argue that claim 23 is anticipated, inter alia:

Claim 23, which recites a latch attached to the rail, is anticipated by the Siemon Plug and Play module. RX-0001C (Blumenthal WS) Q/A 640, 645. Complainant attempts to muddy the water by claiming in its Pretrial Brief that no latch has been identified. CPTB at 203-204. Their arguments are specious. In addition to the reasons set forth in the previous paragraph, Dr. Prucnal admitted that a latch is present on the Siemon Plug and Play module; he only claims that the latch does not anticipate claim 23 because the rail of claim 22 is not present. CX-2060C (Prucnal RWS) Q/A 636; Prucnal Tr. 1010:16-1012:7, 1015:4-1016:2.

When the rails are guided into place, the latch portion of the structure is actuated and secures the module in place, as shown for example in the demonstrative exhibit above. RDX-0001.210-211 (RX-0001C (Blumenthal WS) Q/A 640, 645); RDX-0012.2-5 (RX-1266C (Veatch WS) Q/A 41). Dr. Prucnal could not deny the latch can be

Case: 22-1228 Document: 29 VE Rage: 556 Filed: 04/25/2022 Confidential Material Omitted on this Page

actuated to allow for the module to be slid in and out of position. Prucnal Tr. 1015:4-1016:2. Accordingly, the claimed latch is anticipated by the Siemon Plug and Play module.

Resps. Br. at 244.

For the reasons discussed below, respondents have not shown by clear and convincing evidence that Siemon Plug and Play Module anticipates the asserted claims 22 and 23 of the '206 patent.

As an initial matter, the '206 patent, which claims the module density in the highdensity EDGE system, has been subjected to vigorous scrutiny over several years. The examiner allowed all of the asserted claims of the '206 patent over at least Wheeler '444, which respondents nonetheless assert as prior art against asserted claim 22. *See* JX-0002 ('206 Prosecution History) at 4257. After the '206 patent issued, Panduit filed a petition requesting *inter partes* review of claims 22 and 23 (among others). *Id.* at 5138. The PTAB denied institution, finding that Panduit had not shown even "a reasonable likelihood that it [could] prevail in showing claims 14-40... of the '206 patent are unpatentable." *Id.*

Unasserted independent claim 14 and asserted dependent claims 22 and 23 read as follows:

14. A fiber optic module, comprising:

- a main body defining an internal chamber disposed between a front side and a rear side;
- a plurality of optical fibers disposed in the internal chamber;
- a *front opening* disposed along a longitudinal axis in the front side;
- a first plurality of fiber optic components optically connected to the plurality of optical fibers, the first

366

plurality of fiber optic components disposed through the front opening providing a fiber optic connection density of at least one fiber optic connection per 7.0 millimeters (mm) of width of the front opening; and

at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components.

22. The fiber optic module of claim **14**, further comprising at least one rail disposed on the main body.

23. The fiber optic module of claim 22, further comprising at least one latch attached to the at least one rail and configured to engage the at least one rail.

JX-0001 ('206 Patent) at 20:48-65, 21:27-31 (emphasis added).

The Siemon Plug and Play Modules ("Plug and Play"), enclosed fiber connector modules that could be installed in a rack-mountable enclosure, were offered for sale in the United States by no later than 2004. *See* RX-1266C (Veatch WS) Q/A 40; RX-0001C (Blumenthal) Q/A 618. The modules include three or six openings on the front end for installation of either one row of twelve connections or two rows totaling twenty four fiber connections. RX-0499 (Siemon Plug and Play Module drawing); Blumenthal Tr. 786 ("Looking at this module, how many front openings are there in the front side of the Siemon plug and play module? A. So in terms of actual openings, there are six openings in the front of this module."). Fiber from the front connections is routed internally within the module to a single twelve- or twenty-four port connector at the rear of the module. *See* RX-0001C (Blumenthal) Q/A 621. It is roughly rectangular in shape, with top, bottom, front, rear, and two lateral sides, but also an angled side between the rear side and one of the lateral sides. *See* CX-2060C (Prucnal RWS) Q/A 621. The rear port is



located on an angled edge between the rear of the module and one of its two lateral sides.

RX-0499; see id.



RX-0499 (Siemon Plug and Play Module drawing) 24-port version

According to Siemon's product documentation, Plug and Play fits into multiple Siemon enclosure models, although Dr. Blumenthal and Mr. Veatch testified only to its fit within the FCP3 patch panel. *Id.*; RX-0506 (Siemon Plug & Play fiber products sheet) at 1; RX-0001C (Blumenthal WS) Q/A 640; RX-1266C (Veatch WS) Q/A 41. To lock into place within these enclosures, "the front side of the Plug and Play module has flanges that extend laterally from each of that side's four corners beyond the side walls of the module." CX-2060C (Prucnal RWS) Q/A 621. Between these flanges, affixed to the side walls, Plug and Play features "integrated latches for snap-in installation and singlefinger removal." RX-0506 at 1; *see* CX-2060C (Prucnal RWS) Q/A 621. The module has no other mechanisms for guiding or locking it into place. CX-2060C (Prucnal RWS) Q/A 621.



i. Claim 22

Claim 22 requires "at least one rail disposed on the main body." Dr. Blumenthal incorrectly opines that the latching mechanism, on the flanges, on the front corner of Plug and Play is a rail. *See* CX-2060C (Prucnal RWS) Q/A 630-31; RX-0001C (Blumenthal WS) Q/A 640-41. This feature comprises angled protrusions that are not rails. *See* CX-2060C (Prucnal RWS) Q/A 632-33.

Siemon Plug and Play Rails and FCP3 Rail Guides



RDX-0001C (Blumenthal Demonstratives) at 210.

These protrusions do not perform the function of a rail as understood by a person of ordinary skill, which is to facilitate the insertion of the module into an enclosure. *See* CX-2060C (Prucnal RWS) Q/A 632-33. To the contrary, the protrusions are used to secure the module to the enclosure, not to facilitate movement within it. *Id.; see also* Prucnal Tr. 1005-1008. Consistent with this, the protrusions interact with flat pieces at the front of the enclosure, not with a module guide system (as a rail would do). *See* CX-2060C (Prucnal RWS) Q/A 276. Although respondents argue that the feature outlined in blue, RDX-0001C (Blumenthal Demonstratives) at 210, "slide[s] into guides on the chassis," Dr. Blumenthal states only that "the structure of the guide on the tray of the module interacts with and guides the module's rails," RX-0001C (Blumenthal WS) Q/A 640.

As Dr. Prucnal explained, the I-shaped structure that respondents call a "rail guide" does not interact with the supposed module rail when the module is inserted, but instead interacts with the side of the module body. Prucnal Tr. 1006-1009 ("I think the sides of the module are actually interacting with the — with the edges of the I to guide it."). That interaction — not any interaction with the supposed module rail — facilitates the insertion of the module. *Id.*

Further, Dr. Blumenthal points to no evidence that a person of ordinary skill would identify the angled protrusions as rails. RX-0001C (Blumenthal WS) Q/A 641; CX-2060C (Prucnal RWS) Q/A 634. His expert report originally claimed that this feature was a latch. *See* CX-2060C (Prucnal RWS) Q/A 632; CDX-0005C (Prucnal Rebuttal Demonstratives) at 276. Moreover, Siemon's own documents describe this feature not as a rail, but as a latch. *See, e.g.*, CX-0029 (Siemon Plug & Play Fiber Prod. Sheet) (describing the feature as an "integrated latch[] for snap-in installation"); CX-1776 (Siemon Light Systems Catalog) (describing the feature as a latch that allows the module to "be snapped into wall or rack mount enclosures"); CX-2060C (Prucnal RWS) Q/A 635. Without a rail, Plug and Play does not anticipate either claim 22 or 23.

ii. Claim 23

Respondents have not shown that Plug and Play anticipates the additional limitation of claim 23, which depends from claim 22 and further comprises "at least one latch attached to the at least one rail and configured to engage the at least one rail." Dr. Blumenthal opines these modules disclose "latches . . . attached at one end of the" features he identified as rails, and that, "[u]pon insertion of the modules, the latches

370

Case: 22-1228 Document: 29 VERSON 561 Filed: 04/25/2022 Confidential Material Omitted on this Page

deflect behind the receiving guide on the tray, holding the module in place." *See* RX-0001C (Blumenthal WS) Q/A 645; CX-2060C (Prucnal RWS) Q/A 637. This feature is not a latch disposed on a rail. As set forth above, there is no rail on which a latch can be attached or with which the latch could be engaged. *See* CX-2060C (Prucnal RWS) Q/A 636.

In addition, Dr. Blumenthal has not explained with specificity the feature he identifies as the latch, particularly given his previous opinion that what he now calls the "rail" was the "latch." Similarly, Siemon witness Mr. Veatch claims the alleged rail includes a "tab that allowed the module to be latched in place." *See* RX-1266C (Veatch WS) Q/A 41. The demonstrative image he uses does not distinguish between the "rail" and the "latch"; instead, it outlines a single feature in blue. *Id.*; RDX-0012C (Veatch Demonstratives) at 2-5. This ambiguous showing is not enough to anticipate. *See Wasica*, 853 F.3d at 1284 (ambiguous references cannot anticipate a claim).

b. Castonguay

Respondents argue that Castonguay (RX-0453 (U.S. Patent No. 7,349,616))

anticipates the unasserted claim 14. See Resps. Br. at 249-50.

Respondents argue, inter alia:

The evidence shows that Castonguay anticipates claim 14 of the '206 Patent. *See, e.g.*, RPHB at 250-55; RX-0001C (Blumenthal WS) Q/A 648-716; RDX-0001C.220-238 (Blumenthal Demonstratives); RX-0453 (Castonguay) at 2:61-3:18, 4:34-5:55, 11:19-12:32, 13:7-14, Figures 8-11. Corning concedes claim 14 is invalid. CPHB at 200-212; see also Prucnal Tr. 1000:13-24.

Castonguay discloses various embodiments of the preamble "a fiber optic module," referred to as fiber distribution terminals ("FDTs"). RX-0001C (Blumenthal WS) Q/A 653-58. Castonguay discloses limitation 14[a] "a main body defining an internal chamber disposed

371

between a front side and a rear side." *Id.* Q/A 659-67. For example, Figures 8-11 show a module comprising a generally rectangular housing that defines an "internal chamber" as the enclosed space visible in Figures 10 and 11 and invisible in Figures 8 and 9. *Id.*

Figures 8-11 and accompanying specification of Castonguay describe, and/or visibly show, a plurality of optical fibers in the internal chamber, satisfying limitation 14[b] "a plurality of optical fibers disposed in the internal chamber." RX-0001C (Blumenthal WS) Q/A 668-71. Castonguay discloses limitation 14[c] "a front opening disposed along a longitudinal axis in the front side." *Id.* at 672-79.

Castonguay discloses limitation 14[d] "a first plurality of fiber optic components optically connected to the plurality of optical fibers, the first plurality of fiber optic components disposed through the front opening providing a fiber optic connection density of at least one fiber optic connection per 7.0 millimeters (mm) of width of the front opening." RX-0001C (Blumenthal WS) Q/A 680-93. In some embodiments, twelve 5 mm fiber optic connectors are oriented as two rows and six columns (or "6X2"); in some other embodiments, eight 5 mm optical connectors are oriented as one row of eight (or "8X1"). *Id*. In each of the 6X2 and 8X1 orientations, the figures and the accompanying description show the connectors optically connected to the fibers within the internal chamber. *Id*. Each of the 6X2 and 8X1 configurations show a density below 7.0 mm. *Id*.

Castonguay discloses limitation 14[e] "at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components." RX-0001C (Blumenthal WS) Q/A 694-98. Each of Figures 8A-11C show the second fiber optic component, described as an "input opening," and the plurality of optic components are disposed through an output opening. *Id*.

Resps. Br. at 249-50.

Corning states that "Claim 14 is not asserted and Corning does not agree this is an issue that should be decided." *See* Joint Outline at 8-9. Corning also cites to pages 193-199 of its brief which discusses obviousness issues concerning Castonguay but not anticipation. *See* Compl. Br. at 193-99. Consistent with Corning's position, the Staff does not address the merits of whether Castonguay anticipates unasserted claim 14. *See*



Staff Br. at 200.

The administrative law judge agrees that validity of unasserted claim 14 is not at

issue in this investigation.

2. Obviousness

As noted, Corning asserts dependent claims 22 and 23 of the '206 patent.

Respondents argue that the following five different combinations render obvious asserted

claims 22 and 23 of the '206 patent.

- asserted claims 22 and 23 are rendered obvious by Siemon Plug and Play Module in view of Wheeler '444 (RX-0445 (U.S. Patent No. 5,497,444 to Wheeler));
- (2) asserted claims 22 and 23 are rendered obvious by Siemon Plug and Play Module in view of Wagner '089 (RX-0457 (U.S. Patent No. 7,689,089));
- (3) asserted claims 22 and 23 are obvious over Castonguay in view of Wagner '089;
- (4) asserted claims 22 and 23 are obvious over Castonguay in view of Wheeler '444; and
- (5) asserted claims 22 and 23 are obvious over Castonguay in view of Siemon Plug and Play Module.

See Resps. Br. at 244-54.

Complainant and the Staff disagree. See Compl. Br. at 190-99; Staff Br. at 194-

202.

For the reasons discussed below, respondents have not shown by clear and

convincing evidence that the five different combinations render asserted claims 22 and 23

of the '206 patent obvious.



a. Siemon Plug and Play in combination with Wheeler '444 or Wagner '089

As discussed below, respondents have not shown by clear and convincing evidence that Plug and Play in view of Wheeler '444 or Wagner '089 renders claims 22 and 23 obvious.

i. Claim 22

As set forth above, Dr. Blumenthal has not shown that Plug and Play anticipates claim 22, and he offers no further evidence that a person of ordinary skill would find claim 22 obvious from Plug and Play alone. Dr. Blumenthal also has not demonstrated a motivation to combine Plug and Play with U.S. Patent No. 5,497,444 to Wheeler (CX-1751 (Wheeler '444)). *See* CX-2060C (Prucnal RWS) Q/A 640. As Dr. Prucnal explains, the structure and function of Wheeler '444 make it incompatible with Plug and Play. *See id.* Q/A 640 and 625 (explaining that Plug and Play is designed to snap securely in place without movement, and explaining that modules are designed to interact with specially designed enclosures and are likely incompatible with others).

Wheeler '444 discloses "rail[s]" attached to a "module," but only to permit movement in the vertical direction. *See* CX-1751 (Wheeler '444) at 4:39-44; CX-2060C (Prucnal RWS) Q/A 641. It discloses this vertical movement as an advantage over "forward or backward" movement to reduce fiber displacement. Prucnal Tr. 1034 (explaining that Wheeler '444 taught away from "axial movement, because of wobble [which is] a problem when you have optical fibers connecting") CX-2060C (Prucnal RWS) Q/A 641; CX-1751 (Wheeler '444) at 7:12-20. Vertical movement creates spatial inefficiency and would be a poor choice for a module designed for a high-density system.

374

Case: 22-1228 Document: 29 VERSON 565 Filed: 04/25/2022 Confidential Material Omitted on this Page

CX-2060C (Prucnal RWS) Q/A 641. Wheeler '444 requires substantial space above and below for the module to move — about 1.5" in each direction. *Id.*; CX-1751 (Wheeler '444) at 7:15. Including three additional inches of space around each Plug and Play module would wipe out the density sought by the '206 patent. *See* CX-2060C (Prucnal RWS) Q/A 641.

The density achieved by the '206 patent was not a concern of Wheeler '444, which was filed in 1995 at a time when such equipment was not intended for high-density fiber optic data center environments. *Id.* Wheeler was likely meant for telecommunications services in a central office. *Id.*; CX-1751 (Wheeler '444) at 1:10-11. Thus, even if Wheeler '444 took density into account, it did so at a time when the pursuit of density in the art was far less advanced. *See* CX-2060C (Prucnal RWS) Q/A 641. It is implausible that a person of ordinary skill at the time of EDGE's invention would have relied on a mid-1990s reference such as Wheeler '444 to solve the problems that confronted Corning's inventors. *Id.*; *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) (holding that prior art is analogous only if it is from the same "field of endeavor" or "reasonably pertinent" "because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem").

Respondents argue for the first time in their posthearing brief that "protrusion 125" in Wagner '089 discloses the claimed rail. *Compare* Resps. Br. at 247 *with* Resps. Prehearing Br. at 247-48 (identifying the "side wall" as the alleged rail; no mention of "protrusion 125"). Inasmuch as it was not timely disclosed, this contention is waived. *See* Ground Rule 7.c. Even if not waived, it is unsupported by expert testimony. Respondents mischaracterize Dr. Prucnal's testimony as supporting their new argument;

375

Case: 22-1228 Document: 29 VE Rage: 566 Filed: 04/25/2022 Confidential Material Omitted on this Page

but Dr. Prucnal testified just the opposite, that Wagner '089 does not disclose the claimed rail. *See* CX-2060C (Prucnal RWS) Q/A 648, 663. Also, inasmuch as Wagner '089 does not disclose a rail, the alleged latch of Wagner '089 is not attached to a rail or designed to engage the rail, as claim 23 requires.

ii. Claim 23

Combining Plug and Play with Wheeler '444 does not render claim 23 obvious. See CX-2060C (Prucnal RWS) Q/A 640. As shown above, the structures are incompatible — Wheeler '444's lock mechanism is unsuitable for combination with the Plug and Play module because it would consume significant space on the front side of the chassis. See CX-2060C (Prucnal RWS) Q/A 645.

In any event, Wheeler '444 does not disclose the claimed latch. Apart from claim 15, it does not use the word latch, and it recites "latch means for securing [the module] body to [a] fixture in any one of a plurality of fixed positions along [the] line of travel" without suggesting such "latch means" are attached to the rail. *See* CX-2060C (Prucnal RWS) Q/A 642. Dr. Blumenthal opines that the "latch means" language refers to "lock mechanism 70." RX-0001C (Blumenthal WS) Q/A 705. However, "lock mechanism 70" is not attached to any rails; it is instead attached to the "top and bottom walls," while the features Dr. Blumenthal identifies as rails are attached to the "side walls." *See* CX-1751 (Wheeler '444) at 4:40-43, 4:57-62; *see* CX-2060C (Prucnal RWS) Q/A 642. Wheeler '444 contains no disclosure suggesting that one should move the disclosed lock mechanism from its top and bottom walls to its sides.

Dr. Blumenthal further opines that the "rails are illustrated in contiguous proximity to the latch" — meaning the locking mechanism — "and appear to be a

376

Case: 22-1228 Document: 29 VERSON 567 Filed: 04/25/2022 Confidential Material Omitted on this Page

unibody construction." RX-0001C (Blumenthal WS) Q/A 705. However, claim 23 does not read on a latch that is "in . . . proximity" to rails; it requires a latch that is "attached" to a rail and "configured to engage" that rail. *See* CX-2060C (Prucnal RWS) Q/A 644. Nor is there a basis for Dr. Blumenthal's unsupported opinion that the rails and latch "appear to be a unibody construction," which he appears to infer from the drawing of Figure 23. CX-2060C (Prucnal RWS) Q/A 644.

Combining Plug and Play with Wagner '089 would not satisfy claim 23. *See* CX-2060C (Prucnal RWS) Q/A 648-49. Respondents propose that the "side wall" in Wagner '089 is the rail of claim 22, but have provided no expert opinion or evidence why the side wall, which is part of the main body of the module, is a "rail disposed on the main body," as required by claim 22.

Further, even if the Wagner '089 latch could satisfy claim 23, a person of ordinary skill would not think that those latches (items 122 and 128), built into the angled side of its cassette, should be combined with the Plug and Play. *Id.*; CX-1761 (Wagner '089) at Fig. 19. Plug and Play is largely rectangular and has only one small angled side, which holds the rear adapter and lacks space for a latch. *See* CX-2060C (Prucnal RWS) Q/A 650. If a person of ordinary skill were seeking to combine the Plug and Play module with Wagner '089, she would need either to redesign the Plug and Play module to accommodate a latch similar to the latch of Wagner '089, or redesign the latch of Wagner '089 to accommodate the rectangular design of the Plug and Play module. *Id.* Although respondents attempt to provide an explanations for why a person of ordinary skill would be motivated to make this combination, Resps. Br. at 248, Dr. Blumenthal does not explain which of these approaches he thinks a person of ordinary skill would take, why it

377



would be obvious to do so, or how the results of doing so would be predictable. *Id.* Nor did Siemon's or Panduit's engineers actually take such an approach in the real world.

b. Castonguay '616 combined with Wheeler '444, Wagner '089, or Siemon Plug and Play

As discussed below, respondents have not shown by clear and convincing evidence that U.S. Patent. No. 7,349,616 to Castonguay, CX-1758 (Castonguay '616), in combination with Wheeler '444, Wagner '089, or Plug and Play, renders claims 22 or 23 obvious.

Castonguay '616 claims an invention in the field of "fiber optic local convergence points adapted for multiple-dwelling units," such as buildings like "apartments" and "condominiums" where different residents each need internet or cable television access. CX-1758 (Castonguay '616) at 1:9-10, 1:24-25. It discloses a device called a "fiber distribution terminal" or "FDT," which is "adapted for use in a fiber optic network of a multiple dwelling unit," and that, in its various embodiments, comprises a "housing defining a top wall, a bottom wall, and at least one sidewall extending between the top wall and bottom wall." CX-1758 (Castonguay '616) at Figs. 8A-11A, 11:19-25, 11:31-32, 12:13-18, 12:23-25, 12:57-64, 13:1-8, & cl. 33; *see* CX-2060C (Prucnal RWS) Q/A 655.

> i. Motivation to Combine Castonguay '616 with Wheeler '444, Wagner '089, or Plug and Play

A person of ordinary skill would not seek to solve the problem of the '206 patent — dense fiber optic modules that fit within an enclosure that provides accessible, practicable density in a fiber optic data center environment — by combining Castonguay

378

'616 with Wheeler '444, Wagner '089, or Plug and Play.

First, Castonguay '616 and the other references cited are not in the same field of art, and a person of ordinary skill would not take Castonguay '616 as a starting point for solving the problems solved by EDGE. *See* CX-2060C (Prucnal RWS) Q/A 659. In its claims and its specification, Castonguay defines its field as devices for "multiple dwelling units," not for data centers. *See* CX-1758 (Castonguay '616) at 1:9-10 & cl.31; CX-2060C (Prucnal RWS) Q/A 659; Ralph Tr. 244 (testifying that wiring Internet or cables in an apartment building is a "distinct skill" from designing structured cabling equipment in commercial data centers).

Second, Castonguay '616 is designed for wall mounting. The constraints facing a person of ordinary skill in designing dwelling-unit devices to be mounted to a wall in a basement or utility room are very different from those facing one designing data-center devices to be inserted into chassis that are installed in racks that are in turn installed in long rows. *See* CX-2060C (Prucnal RWS) Q/A 659. For example, a person of ordinary skill would mount Castonguay '616 on the wall and attach the incoming and outgoing fiber cables to the wall to conserve space and protect fibers. *See* CX-2060C (Prucnal RWS) Q/A 659; *see also, e.g.*, CX-1758 (Castonguay '616) at Fig. 7. This makes sense when the device is installed in a room that has multiple purposes and contains equipment for other functions. *See* CX-2060C (Prucnal RWS) Q/A 659. This same wall-mounted layout would be grossly inefficient in a data-center environment because it would reduce the space available for fiber optic cable distribution to the two-dimensional space available on the walls rather than the three-dimensional space available by lining up racks with chassis on the data center floor. *Id*.

379

Case: 22-1228 Document: 29 VE Regen 570 Filed: 04/25/2022 Confidential Material Omitted on this Page

Castonguay '616 describes its wall-mounted "housing" as a "top wall," a "bottom wall," and one or more "sidewalls." *See* CX-2060C (Prucnal RWS) Q/A 660. The "top wall" faces outward from the wall; the "bottom wall" faces the wall, and the "sidewalls" — which contain adapter opening — are the much narrower sides that are perpendicular to the wall and do not face the technician. *See* CX-1758 (Castonguay '616) at Fig. 8A; CX-2060C (Prucnal RWS) Q/A 660. Although turning the adapter openings away from the user may work in a dwelling unit where the device is installed once and rarely (if ever) accessed, it is not practical in a data center where there is a need for repeated access for moves, adds, or changes. CX-2060C (Prucnal RWS) Q/A 660.

Third, Castonguay '616 relies on adapters that are not necessarily compatible with the other references (or with the '206 patent). The density achieved by the Figure 8 and Figure 9 embodiments of Castonguay '616 relies on using "5 mm fiber optic receptacles," which appear to be non-standard and therefore unsuited for data center use. *See* CX-1758 (Castonguay '616) at 12:63-64; CX-2060C (Prucnal RWS) Q/A 661. Although Castonguay also discloses standardized "MU fiber optic receptacles," respondents provide no evidence that a person of ordinary skill would have been motivated to use these adapters in a data center, where LC and MPO/MTP components prevailed. *See* CX-2060C (Prucnal RWS) Q/A 661.

ii. Claim 22

Dr. Blumenthal admits that Castonguay '616 does not disclose the rail in claim 22. *See* CX-2060C (Prucnal RWS) Q/A 662. Although Wheeler '444 discloses a rail, it is for vertical movement, which, as shown above for the Plug-and-Play combination, is fundamentally incompatible with Castonguay '616. *See* CX-2060C (Prucnal RWS) Q/A

380

665-67.

As also shown above, Wagner '089 also does not disclose a rail. *See* CX-2060C (Prucnal RWS) Q/A 663; CX-1761 (Wagner '089) at 5:51-62 & Figs. 12-14, 19. To the extent respondents cite the "side wall" as disclosing a rail, Dr. Blumenthal's only opinion is a conclusory statement that the "side wall" shown in Figure 13 is used to guide the cassette for easy installation into the patch panel. *See* RX-0001C (Blumenthal WS) Q/A 707. He also relies on Figure 15, which does not have side wall 125 labeled, without identifying the feature himself. Dr. Blumenthal's assumptions are drawn from a side detail in one figure and unsupported by any text in the specification that describes the side wall as performing a guiding function. For example, the specification passage at 3:25-27 of Wagner '089, says nothing about installation; instead, it describes Figure 15 as illustrating "a partial top view of the pre-terminated cassette of Fig. 12 installed in the patch panel."

Dr. Blumenthal also opines that Plug and Play could be combined with Castonguay '616. However, as shown above, the feature Dr. Blumenthal identifies as a rail in Plug and Play is actually a latch, and that latch neither attaches to nor engages with a rail. *See* CX-0029 (Siemon Plug & Play Fiber Prod. Sheet); CX-2060C (Prucnal RWS) Q/A 669. In addition, a person of ordinary skill would not have been motivated to combine Castonguay '616 with Plug and Play. *See* CX-2060C (Prucnal RWS) Q/A 670. The angled protrusions disclosed by Plug and Play are unsuitable for combination with Castonguay '616 because they would consume significant space on the front end of the chassis. *Id.* The drawings in CX-0185 (Siemon LC Module Drawing) show that, unlike the rails and latches of the EDGE modules, which are disposed on the sides of those

381



modules, the angled protrusions near the front of Siemon Plug and Play require more than a half-inch of space on the front end of the chassis to accommodate them (5.04 - 4.50 = 0.54). CX-2060C (Prucnal RWS) Q/A 670.



Thus, a person of ordinary skill would not merely assume that the angled protrusions of Siemon Plug and Play could be combined with Castonguay '616 without compromising the ability to achieve density. *See* CX-2060C (Prucnal RWS) Q/A 670.

iii. Claim 23

Dr. Blumenthal admits that Castonguay '616 does not disclose the latch in claim 23. *See* CX-2060C (Prucnal RWS) Q/A 662. As shown above, although Wagner '089 discloses a latch, it is not attached to a rail and so does not disclose this limitation. *See* CX-2060C (Prucnal RWS) Q/A 664; CX-1761 (Wagner '089) at 5:51-62 & Figs. 12-14, 19. The latch disclosed by Wagner '089 (items 122 and 128) is instead built into the angled side of the Wagner '089 cassette, as shown below. CX-1761 (Wagner '089) at Fig. 19; CX-2060C (Prucnal RWS) Q/A 664.

382

Case: 22-1228 Document: 29 VERSON 573 Filed: 04/25/2022 Confidential Material Omitted on this Page



The design of Wagner '089 is incompatible with that of Castonguay '616, which is rectangular and does not have angled sides. *See* CX-2060C (Prucnal RWS) Q/A 664. If a person of ordinary skill were seeking to combine Castonguay '616 with Wagner '089, they would either need to redesign Castonguay '616 to accommodate a latch similar to the latch of Wagner '089, or to redesign the latch of Wagner '089 to accommodate the rectangular design of Castonguay. *Id.* Dr. Blumenthal does not explain which of these approaches he thinks a person of ordinary skill would take, why it would be obvious to do so, or how the results would be predictable. *Id.*

Dr. Blumenthal also opines that Wheeler '444 could provide a latch, but as described above the locking mechanism disclosed by Wheeler '444 is not attached to a rail and also is unsuitable for combination with Castonguay '616. *Id*. Castonguay '616 involves FDTs that attach to walls, and such a device does not a locking mechanism because they do not lock into any other structure. *Id*. Further, as shown above, the vertical movement described by Wheeler '444 already requires three additional inches of clearance for Wheeler's module on its top and bottom sides, and the lock mechanism (70) requires even more. *Id*.

383



Finally, Dr. Blumenthal opines that Castonguay '616 could be combined with Plug and Play. As shown above, there would be no motivation to combine these incompatible designs; nor would they satisfy the limitation because Plug & Play does not sufficiently disclose a rail and a latch. CX-0029 (Siemon Plug & Play Fiber Prod. Sheet); CX-2060C (Prucnal RWS) Q/A 669.

Accordingly, respondents have not shown by clear and convincing evidence that Plug and Play in view of Wheeler '444 or Wagner '089 renders claims 22 and 23 of the '206 patent obvious.

* * *

Further, for the reasons discussed above, respondents have not shown by clear and convincing evidence that the asserted claims 22 and 23 of the '206 patent are invalid under any theory.

VIII. Domestic Industry (Economic Prong)

A violation of section 337(a)(1)(B), (C), (D), or (E) can be found "only if an industry in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). Section 337(a) further provides:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned—

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

384

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

These statutory requirements consist of an economic prong (which requires certain activities)⁵¹ and a technical prong (which requires that these activities relate to the intellectual property being protected). *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm'n Op. at 13 (May 16, 2008) ("*Stringed Musical Instruments*"). The burden is on the complainant to show by a preponderance of the evidence that the domestic industry requirement is satisfied. *Certain Multimedia Display and Navigation Devices and Systems, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-694, Comm'n Op. at 5 (July 22, 2011) ("*Navigation Devices*").

With respect to the economic prong, and whether or not section 337(a)(3)(A) or

(B) is satisfied, the Commission has held that "whether a complainant has established that its investment and/or employment activities are significant with respect to the articles

protected by the intellectual property right concerned is not evaluated according to any

⁵¹ The Commission practice is usually to assess the facts relating to the economic prong at the time that the complaint was filed. *See Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, Inv. No. 337-TA-560, Comm'n Op. at 39 n.17 (Apr. 14, 2010) ("We note that only activities that occurred before the filing of a complaint with the Commission are relevant to whether a domestic industry exists or is in the process of being established under sections 337(a)(2)-(3).") (citing *Bally/Midway Mfg. Co. v. U.S. Int'l Trade Comm'n*, 714 F.2d 1117, 1121 (Fed. Cir. 1983)). In some cases, however, the Commission will consider later developments in the alleged industry, such as "when a significant and unusual development occurred after the complaint has been filed." *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op., at 5-6 (Jan. 20, 2012) ("[I]n appropriate situations based on the specific facts and circumstances of an investigation, the Commission may consider activities and investments beyond the filing of the complaint.").

Case: 22-1228 Document: 29 VERSON 576 Filed: 04/25/2022 Confidential Material Omitted on this Page

rigid mathematical formula." *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. at 27 (Feb. 17, 2011) ("*Printing and Imaging Devices*") (citing *Certain Male Prophylactic Devices*, Inv. No. 337 TA-546, Comm'n Op. at 39 (Aug. 1, 2007)). Rather, the Commission examines "the facts in each investigation, the article of commerce, and the realities of the marketplace." *Id.* "The determination takes into account the nature of the investment and/or employment activities, 'the industry in question, and the complainant's relative size." *Id.* (citing *Stringed Musical Instruments* at 26).

With respect to section 337(a)(3)(C), whether an investment in domestic industry is "substantial" is a fact-dependent inquiry for which the complainant bears the burden of proof. *Stringed Musical Instruments* at 14. There is no minimum monetary expenditure that a complainant must demonstrate to qualify as a domestic industry under the "substantial investment" requirement of this section. *Id.* at 25. There is no need to define or quantify an industry in absolute mathematical terms. *Id.* at 26. Rather, "the requirement for showing the existence of a domestic industry will depend on the industry in question, and the complainant's relative size." *Id.* at 25-26.

Investments in plant and equipment, labor, and capital that are also related to research and development or licensing may be considered under subparagraph (C) as well as under subparagraphs (A) and (B). *Certain Optoelectronic Devices for Fiber Optic Communications, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-860, USITC Pub. No. 4852, Comm'n Op. at 15 (Nov. 2018); *Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm'n Op. at 14 (June 29, 2018) ("[T]he text of the statute, the

386

legislative history, and Commission precedent do not support narrowing subsections (A) and (B) to exclude non-manufacturing activities, such as investments in engineering and research and development. Rather, the guiding principle is whether the asserted expenditures satisfy the plain language of the statute."); *Certain Marine Sonar Imaging Devices, Including Downscan and Sidescan Devices, Products Containing the Same, and Components Thereof*, Inv. No. 337-TA-921, Comm'n Op. at 58-59, 64, 66 (Jan. 6, 2016) (reversing finding that expenses could not be counted under both subparagraphs (B) and (C); holding that the same R&D expenses "separately constitute[d]" a domestic industry under each subparagraph).

Corning argues that it satisfies the economic prong of the domestic industry requirement under subparagraphs (B) and (C). *See* Compl. Br. at 237-59. The Staff agrees and argues that Corning's "investment was shown to be significant and substantial in the context of the marketplace for fiber optic equipment," and concludes, "Corning has satisfied the economic prong of the domestic industry requirement of 19 U.S.C. § 1337(a) under either of subparagraphs (B) or (C)." Staff Br. at 203, 220, *see id.* 202-20.

Respondents disagree with Corning and the Staff, and argue, inter alia:

Complainant alleges a domestic industry under subsections (B) and (C) of section 337(a)(3).⁵² All of Complainant's alleged investments are the same for both subsections (B) and (C). CX-0005C (Schoettelkotte WS) Q/A 118, 120. All of Complainant's alleged investments relate to the entire EDGE and EDGE8 product lines even though Complainant's alleged DI products, the patent claims, and Notice of Investigation are limited to only chassis and modules. *Id.*; RX-0007C (Mulhern RWS) Q/A 61. Complainant ceased all R&D projects arguably related to the alleged DI products in ______. Any ________

387

 $^{^{52}}$ Complainant does not allege a domestic industry under subsection (A) of Section 337(a)(3).

the patents.

Complainant bears the burden to show that it meets the economic prong of the domestic industry requirement. *See, e.g., Certain Multimedia Display and Navigation Devices and Systems, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-694, Comm'n Op. at 5 (July 22, 2011). Complainant fails to meet its burden for three independent reasons.

First, Complainant's claimed investments are overstated and not attributable to its alleged DI products. Rather, the investments relate to an overbroad "product line" or "system," including products unrelated to alleged DI products or the asserted patents. Second, Complainant abandoned its domestic research and development activities in its alleged DI products in **1999**, with no continuing qualifying activities at the time of filing its Complaint. Reliance on attenuated, decade-old investments is improper. Complainant's attempt to salvage or resurrect its domestic industry through its misplaced allocation methodology and *de minimis* service investments fail. Third, even crediting Complainant's overbroad *and* stale investments, Complainant's investments are not significant or substantial in any relevant context.

Resps. Br. at 262-63.

For the reasons discussed below, the record evidence supports a finding that

Corning has satisfied the economic prong of the domestic industry requirement of 19

U.S.C. § 1337(a) under either of subparagraphs (B) or (C).

In summary, the evidence shows that between 2008 and 2019, Corning invested

approximately in domestic labor and capital related to the engineering,

research, and development of the EDGE and EDGE8 product lines. Of that amount,

is attributable to investments in chassis and modules that practice the asserted

patents. This investment is significant and substantial in the context of the marketplace

for fiber optic equipment.

A. Employment of Labor or Capital

Corning argues that development of its EDGE and EDGE8 solutions involved "significant employment of labor and capital" in connection with research, development, engineering, maintenance, and technical support activities in the United States. *See* Compl. Br. at 237, 250-55; CX-0003C (Schoettelkotte WS) Q/A 67. As discussed below in more detail, Corning's investments are slightly smaller than alleged inasmuch as some of these investments are related to cable assemblies and other EDGE components that do not practice the asserted patents.

1. Continuity of Investment in the EDGE and EDGE8 Platforms

In an effort to address growing customer demand for greater connection densities in data centers, Corning initiated a research and development program in 2007, known as the Next Generation Data Center Program. *See* CX-0006C (Staber WS) Q/A 6; CX-0007C (Rhoney WS) Q/A 11; CX-0003C (Schoettelkotte WS) Q/A 61. Corning began marketing the resulting EDGE product line in mid-2009 and made its first EDGE product sale in August 2009. *See* CX-0006C Q/A 22; CX-0007C Q/A 14; CX-0003C Q/A 63. The first EDGE products sold were known as the "Pretium EDGE platform," and consisted of a chassis that could accommodate twelve modules per U space and removable Base-12 modules. *See* CX-0005C (Clark WS) Q/A 9; CX-0003C (Schoettelkotte WS) Q/A 63.

In later years, Corning developed a Base-8 extension to the original platform in addition to refining the Base-12 solution. *See* CX-0007 (Rhoney WS) Q/A 18-19; CX-0003C Q/A 64. Corning introduced its EDGE8 platform in 2015, consisting of removable Base-8 modules and chassis that could accommodate eighteen such modules

389

in a 1U space. *See* CX-0005C (Clark WS) Q/A 9; CX-0003C Q/A 64. Corning argues, and has provided evidence to show, that since 2015, it has continued to refine various aspects of both the EDGE and EDGE8 solutions, as well as providing ongoing maintenance and technical support services related to these products for its data center customers in the United States. *See* CX-0004C (Hicks WS) Q/A 49-50; CX-0005C (Clark WS) Q/A 49, 57; CX3C (Schoettelkotte WS) Q/A 64.

Corning's economic prong expert, Mr. Schoettelkotte, testified that Corning continues to invest heavily in phased upgrades of its flagship products like EDGE, and that it was doing so at the time the Complaint was filed on February 21, 2020. *See* CX-0003C (Schoettelkotte WS) Q/A 65. The evidence shows that EDGE-related investments in labor varied from year to year, at one point

. *See* CX-1812C (Corning EDGE Project Labor - U.S. Labor Investments). Corning argues that this is because over EDGE's lifetime, it has invested in "getting feedback from customers" and using that feedback to make "continuous improvements." CX-0005C (Clark WS) Q/A 25. Corning's Mr. Clark testified that "Corning's R&D process for projects like EDGE can be compared to a slinky that expands, contracts, and walks, corresponding to the rise in labor hours in key moments like **______**." *Id.*

Despite the **Despite the Despite the date range for Corning's investments in its EDGE solutions should be included in the domestic industry analysis. The Commission will include past investments its analysis where a complainant has continued to make ongoing investments, such as continued sales of the domestic industry products, or warranty and technical support.** *See, e.g., Certain*

390

Case: 22-1228 Document: 29 VERSON 581 Filed: 04/25/2022 Confidential Material Omitted on this Page

Marine Sonar Imaging Devices, Including Downscan and Sidescan Devices, Products Containing the Same, and Components Thereof, Inv. No. 337-TA-921, Comm'n Op. at 54-57 (Jan. 6. 2016) (crediting past investments in research and development for discontinued products because of ongoing investments in warranty, technical support, and software updates) (reversed on other grounds); *Certain Electronic Digital Media Devices and Components Thereof*, Inv. No. 337-TA-796, Comm'n Op. at 99-100 (Sept. 6, 2013) (crediting past investments where complainant was "further develop[ing] its existing products").

Despite the **Construction**, Corning has continued to invest in its EDGE solutions and to sell its domestic industry chassis and modules, and it has no plans to discontinue its efforts. *See* Schoettelkotte Tr. 171-172; CX-1812C (Corning labor investments) (showing large investments in 2019-2020); CX-0004C (Hicks WS) Q/A 49 (

Thus, the fact that there is a **second second second** is not a reason to find that Corning failed to satisfy the economic prong of the domestic industry requirement.

2. Allocation of Domestic Industry Investments

Corning's economic prong analysis includes investments in the entire EDGE and EDGE8 platforms, including chassis, modules, and cable assemblies. Mr. Schoettelkotte testified that Corning's EDGE and EDGE8 solutions rely on cable assemblies that are required for the EDGE chassis and modules to perform the fiber optic connection functions desired by Corning's customers. He testified that "without the EDGE and EDGE8 cable assemblies, there would be no EDGE or EDGE8 solution for Corning to

Case: 22-1228 Document: 29 VERSON 582 Filed: 04/25/2022 Confidential Material Omitted on this Page

offer its data center customers." *See* CX-0003C (Schoettelkotte WS) Q/A 122. Accordingly, Corning included EDGE project codes relating to the research and development of EDGE cable assemblies and related components in its claimed domestic industry investments. *See, e.g.*, CX-0006C (Staber WS) Q/A 41 (describing project code D189, which involved "designing and developing a new cable system to work specifically and exclusively with the EDGE8 system"), 42 (describing project code D190, which involved "designing and developing new trunk cables, jumper cables, harnesses, and connectors specifically for the 8-fiber connection solution in the EDGE8 system"), 44 (describing project code D367, which involved

). Corning also

included investments in certain EDGE chassis and modules that are not alleged to practice the asserted patents. *See* CX-0003C (Schoettelkotte WS) Q/A 149. Mr. Schoettelkotte testified that including all of these investments in the domestic industry analysis is appropriate because it is Corning's investments in the overall EDGE and EDGE8 solutions that have allowed for the development, commercialization, and continued exploitation of the technologies claimed by the asserted patents. *See* CX-0003C (Schoettelkotte WS) Q/A 122.

Respondents argue that EDGE cable assemblies and "non-DI" EDGE chassis and modules are not domestic industry products and that their inclusion in Corning's domestic industry analysis is inappropriate. *See* Resps. Br. at 273; RX-0007C (Mulhern RWS) Q/A 84-100. Respondents' economic prong expert, Ms. Mulhern, testified that "relevant DI investments should not be expanded in this investigation to include investments in non-patent-practicing EDGE products." *Id.* Q/A 86. In support of her


opinion, she noted that due to the industry-wide standardization of racks and connectors, "customers can mix and match EDGE DI Products with non-DI EDGE products and with products sold by third-parties." RX-0007C (Mulhern RWS) Q/A 86; RX-0008C (Lebby RWS) Q/A 398-402.

The evidence shows the following:

- Corning's cable assemblies can be used with third-party chassis and modules;
- Corning's cable assemblies can be used with Corning's non-DI EDGE/EDGE8 system chassis and modules;
- EDGE chassis and modules alleged to practice the asserted patents can be used with third-party cable assemblies; and
- Corning's EDGE chassis and modules are sold independently from each other and from the EDGE cable assemblies.

RX-0007C (Mulhern RWS) Q/A 86; CX-0006C (Staber WS) Q/A 13 (Corning "designed other devices that could be inserted into the fiber optic equipment trays"); CX-0007C (Rhoney WS) Q/A 25 (EDGE customers can buy cable assemblies made by other manufacturers); CX-0004C (Hicks WS) Q/A 24 (Corning sells its chassis, modules, and cable assemblies separately). Ms. Mulhern testifed that her review of this evidence "calls into question the inclusion of investments in non-patented products of the EDGE system as domestic industry investments in this investigation." RX-0007C (Mulhern RWS) Q/A 85.

As argued by respondents and the Staff, the EDGE cable assemblies and non-DI EDGE chassis and modules should not be included in the domestic industry analysis. In general, the domestic industry is defined by the patented articles. *See Certain Dynamic Sequential Gradient Compression Devices and Components Parts Thereof*, Inv. No. 337-

TA-335, Initial Det. at 60 (May 15, 1992) ("Congress did not intend . . . that activities of a complainant which generally relate to the subject area of the patent fall within the statutory definition of a domestic industry."). It is true that "[t]he Commission has held that in certain circumstances, the realities of the marketplace require a modification of [this] principle[.]" *Certain Video Game Systems and Wireless Controllers and Components Thereof*, Inv. No. 337-TA-770, Comm'n Op. at 66 (Oct. 28, 2013). Those circumstances, however, are not present here.

The initial determination in *Certain Sleep-Disordered Breathing Treatment Systems* is instructive. *Certain Sleep-Disordered Breathing Treatment Systems and Components Thereof*, Inv. No. 337-TA-890, Initial Det. at 139 (Sept. 16, 2014). There, the complainant advocated for a "system" approach that considered all of its CPAP treatment products to be within the scope of the domestic industry, including its CPAP masks, flow generators, and humidifiers. The respondents argued that the only articles protected by the asserted patents were the masks and humidifiers that practiced the claims. With regard to patents that disclosed mask-related inventions ("the ResMed Mask Patents"), the presiding administrative law judge found that the articles protected by the ResMed Mask Patents did not include flow generators or humidifiers.⁵³ The decision turned on the following three factors:

• Although customers could order masks along with flow generators

⁵³ On appeal, the Commission moved for a remand in light of intervening domestic industry precedent in *Lelo Inv. v. International Trade Comm'n*, 786 F.3d 879 (Fed. Cir. 2015). On remand, the presiding administrative law judge reversed his previous determination and found that a domestic industry did not exist because the claimed investments were not quantitatively "significant" under *Lelo. Certain Sleep-Disordered Breathing Treatment Systems and Components Thereof*, Inv. No. 337-TA-890, Final Initial Det. on Remand (Nov. 10, 2016).

Case: 22-1228 Document: 29 VERSO 585 Filed: 04/25/2022 Confidential Material Omitted on this Page

and humidifiers, the masks were almost always purchased separately and were not packaged together with the flow generators and humidifiers.

- Unlike the H5i humidifier, which could only be used with the S9 flow generator, ResMed's masks could be used with other companies' flow generators and humidifiers because they used a standard 22mm connector and tubing, thus making the masks separate articles of commerce.
- The flow generator and humidifier were not central to enabling ResMed to exploit the patented technology of its masks.

Sleep-Disordered Breathing Treatment Systems, Inv. No. 337-TA-890, Initial Det. at 150.

The "realities of the marketplace" in the fiber optic equipment field appear to mirror those that were present with respect to sleep-disordered breathing treatment systems. First, although Corning's customers typically order cable assemblies at the same time that they order chassis and modules, and are encouraged to do so, Corning "sells these pieces individually" rather than packaging them together. See CX-0004C (Hicks WS) Q/A 24; Schoettelkotte Tr. 170-171 ("[T]hey're sold separately, they have separate SKUs, ... they would be on the same bill of materials, but ... they're not in the same package, if you will."). Second, Corning's EDGE components use standard connectors and are designed to fit in standard rack sizes. As a result, not only can customers choose to use third-party cable assemblies with their EDGE chassis and modules, but customers purchasing other companies' chassis and modules can use EDGE cable assemblies with those products. The cable assemblies are thus articles of commerce separate from the chassis and modules. See CX-0007C (Rhoney WS) Q/A 25 (EDGE customers can buy cable assemblies from other companies). Third, the cable assemblies are not central to enabling Corning to exploit the patented technology of its

Case: 22-1228 Document: 29 VERSON 586 Filed: 04/25/2022 Confidential Material Omitted on this Page

chassis and modules. The asserted patents are directed to the physical characteristics of the chassis and modules, and not to their operation. Thus, a combination of chassis and modules may infringe an asserted patent even before any cable assemblies are installed. Given the similarities in this investigation to the facts in *Sleep-Disordered Breathing Treatment Systems*, the domestic industry here should be limited to investments related to chassis and modules that practice the asserted patents.

3. Calculation of EDGE Investments, 2008 - February 21, 2020

Corning documented approximately invested in labor and capital related to the EDGE and EDGE8 product lines as a whole. *See* CX-0003C (Schoettelkotte WS) Q/A 163; CX-1809C (summary of Corning DI investments). Of that amount, approximately is attributable to chassis and modules that practice the '320, '153, and '456 patents, approximately is of which is attributable to modules that practice the '206 patent.

a. Base Calculation

Mr. Schoettelkotte testified that to calculate the domestic labor investments recorded under Corning's EDGE project codes, he multiplied the number of U.S. labor hours reported by Corning employees for each year from 2008 through 2020 times the corresponding annual labor rate. *See* CX-0003C (Schoettelkotte WS) Q/A 81; CX-1810C (Corning U.S. labor hours); CX-1811C (Corning labor rates). These hours were worked primarily in Corning's facilities located in Keller, Texas and Hickory, North Carolina. *See* CX-0003C Q/A 68. Mr. Schoettelkotte calculated the following total annual U.S. investments in labor associated with EDGE:

396



Year	U.S. Dollars
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020 (through Feb. 21, 2020)	
2008-2020 Total	
2019-2020 Total	

Corning EDGE Project Labor – U.S. Labor Investments

See CX-0003C (Schoettelkotte WS) Q/A 69-83; CX-1812C (Corning labor investments); CX-1810C (Corning EDGE Project labor – U.S. labor hours); CX-1811C (Corning Technology Division hourly labor rates).

In addition to its investment in labor, Corning has incurred capital expenses associated with EDGE. Corning's witness Mr. Clark, a senior development analyst, testified that such direct expenses includes purchases for prototype items, testing materials, consulting work, travel expenses, vendor charges, sample products, and other spending associated with a given project. *See* CX-0005C (Clark WS) Q/A 42-44; CX-0003C (Schoettelkotte WS) Q/A 88. Such expenses are tracked according to an internal order number that in many cases is assigned to a particular project code. *See* CX-0003C

Q/A 89. Mr. Clark testified that he collected all project direct expenses for EDGE-related project codes that were assigned an internal order number. *See* CX-0005C (Clark WS) Q/A 42-48. Inasmuch as not every EDGE project code was assigned an order number, the resulting totals are conservative figures that may underreport the total direct expenses that were incurred over the life of EDGE. *See id.* Q/A 46. All expenses were limited to those made in the United States, primarily at Corning's facilities in Keller, Texas and Hickory, North Carolina. *Id.* Q/A 44; CX-0003C (Schoettelkotte WS) Q/A 90. Corning incurred the following EDGE-related U.S. capital expenses between 2008 and February 2020:

Year	U.S. Dollars
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020 (through Feb. 21, 2020)	
2008-2020 Total	
2019-2020 Total	

Corning EDGE Project Direct Expenses – U.S. Spend

398

Case: 22-1228 Document: 29 VE Rade: 589 Filed: 04/25/2022 Confidential Material Omitted on this Page

See CX-0003C (Schoettelkotte WS) Q/A 91-92; CX-1813C (Corning EDGE Project U.S. direct expenses); CX-0711C (2008-2019 direct expenses Spreadsheet); CX-0983C ("20190101–20200221 Manhours and Expenses" Spreadsheet).

Mr. Schoettelkotte testified that in addition to the labor and capital expenses detailed above, Corning provides field engineering services to its key data center customers in the United States. *See* CX-0003C (Schoettelkotte WS) Q/A 93. These services include assistance with the installation, maintenance, and operation of Corning's EDGE products. *See* CX-0005C (Clark WS) Q/A 49. Since 2017, Corning has tracked the number of days that its engineers provide this assistance to U.S. customers. Records are not available for services performed before 2017. *Id.* Q/A 51-52; CX-0003C (Schoettelkotte WS) Q/A 94. In the normal course of business, Corning assumes an eight-hour work day and applies a daily labor rate of per hour for all field engineering services. *See* CX-0003C Q/A 96-97; CX-0987C (FES rates). The evidence shows that on applying these figures, Corning invested the following amounts in field engineering services for U.S. EDGE customers between 2017 and February 2020:

|--|

Year	U.S. Dollars
2017	
2018	
2019	
2020 (through Feb. 21, 2020)	
2017-2020 Total	
2019-2020 Total	

399

Case: 22-1228 Document: 29 VERSON 590 Filed: 04/25/2022 Confidential Material Omitted on this Page

See CX-0003C (Schoettelkotte WS) Q/A 95-96; CX-1814C (Corning field engineering investments); see also CX-0707C (2017 Field Engineering FTE Tracker); CX-0708C (2018 Field Engineering FTE Tracker); CX-0710C (2019 Field Engineering FTE Tracker R1); CX-0984C ("2020 FE - FTE Tracker gbs" Spreadsheet); CX-0987C (FES rates).

Mr. Schoettelkotte testified that in addition to the field engineering services provided by full-time Corning employees, Corning also invests in similar services provided by contractors, or "Pioneers." *See* CX-0003C (Schoettelkotte WS) Q/A 99-104; CX-0005C (Clark WS) Q/A 57-65. Corning has maintained data regarding Pioneerrelated expenses since 2016. *See* CX-0003C Q/A 100. Mr. Schoettelkotte testified that he determined Corning's total investment in EDGE-related Pioneer services by multiplying the hourly rate for each Pioneer by the number of hours of technical support services that that Pioneer provided to EDGE customers in the United States. *Id.* Q/A 104; CX-0988C (Pioneer hourly rates). Corning invested the following in Pioneer services for U.S. EDGE customers between 2016 and February 2020:

Year	U.S. Dollars
2016	
2017	
2018	
2019	
2020 (through Feb. 21, 2020)	
2016-2020 Total	
2019-2020 Total	

Corning EDGE Field Engineering Services Expenses

400

Case: 22-1228 Document: 29 VERSO 591 Filed: 04/25/2022 Confidential Material Omitted on this Page

See CX-0003C (Schoettelkotte WS) Q/A 104; CX-1815C (Corning Pioneer investments);

CX-0749C to CX-0752C (Corning EMP-Contractors time sheets, 2016-2019); CX-

0988C (Pioneer rates); CX-0999C ("2020 Pioneers" Spreadsheet).

When the labor, direct expense, field engineering services, and Pioneer

investments detailed above are added together, the result is a total investment in EDGE of

of which was incurred in the period from January 1, 2019 to

February 21, 2020:

Summary of Alleged Corning Domestic Industry Investments

Investment Type	2008-Feb. 21, 2020	2019-Feb. 21, 2020
EDGE Project Labor		
EDGE Project Direct Expenses		
EDGE Field Engineering Services		
EDGE Pioneer Technical Support		
Total Investment in Labor and Capital		

See CX-0003C (Schoettelkotte WS) Q/A 117-18; CX-1809C (summary of Corning domestic industry investments); *see also* CX-1812C through CX-1815C (detail per investment category).

b. Reallocation to Eliminate Investments in Non-DI Products

As discussed above, the **provide the figure argued by Corning should be reduced** to eliminate investments related to cable assemblies and other EDGE components that do not practice the asserted patents. Mr. Schoettelkotte testified that it is possible to do so by using a sales-based allocation method. *See* CX-0003C (Schoettelkotte WS) Q/A 150. Sales-based allocations are commonly used "to determine how much . . . investment is

401

Case: 22-1228 Document: 29 VE Rage: 592 Filed: 04/25/2022 Confidential Material Omitted on this Page

related to the asserted patents and the DI products." *Certain Semiconductor Devices and Consumer Audiovisual Products Containing the Same*, Inv. No. 337-TA-1047, Initial Det. at 437 (May 11, 2018), *reviewed on other grounds*, Comm'n Op. (Sept. 11, 2019).

Of the three potential allocation methods that Mr. Schoettelkotte proposed, as the Staff argues, the third method is the most conservative version, and is the most appropriate here. *See* CX-0003C (Schoettelkotte WS) Q/A 149-61; Staff Br. at 214-15. That allocation eliminates investments related to EDGE cable assemblies and the small number of EDGE chassis and modules that are not alleged to practice the asserted patents. It also calculates a patent-by-patent allocation of investments to account for the fact that the '206 patent is directed to a module only, and not to a combination of chassis and modules. *Id.* Q/A 158, 161. Mr. Schoettelkotte testified to the results of this allocation:

From 2015 through 2019, Corning's U.S. sales of EDGE and EDGE8 modules that practice the '206 Patent made up (based on quantity) and (based on revenue) of the total U.S. sales of EDGE and EDGE8 chassis, modules, and cable assemblies. . . . Applying these allocation figures to Corning's total domestic industry investments of results in approximately (based on quantity) and (based on revenue) of investments with respect to the EDGE and EDGE8 modules that practice the '206 Patent.

From 2015 through 2019, Corning's U.S. sales of EDGE and EDGE8 chassis and modules that practice the '320, '153, and '456 Patents made up **1999** (based on quantity) and **1999** (based on revenue) of the total U.S. sales of EDGE and EDGE8 chassis, modules, and cable assemblies. . . . Applying these allocation figures to Corning's total domestic industry investments of **1999** (based on revenue) of investments with respect to the EDGE and EDGE8 chassis and modules that practice the '320, '153, and '456 Patents.



Id. Q/A 160-61. He also testified that in his view, if choosing between a sales allocation based on quantity and one based on revenue, in this case "the sales unit is the better approach." Schoettelkotte Tr. 175-176.

Sales-Based Allocation of Corning DI Investments Including <u>Assemblies</u>

Product Type	Quantity	Quantity-Based Allocation		D	Revenue-Based Allocation	
		% of Total	Investment	Revenue	% of Total	Investment
All Chassis, Modules, & Cable Assemblies						
DI Chassis & Modules Only						
DI Modules Only ('206 Patent)						

CX-1819C (Sales-Based Allocation of Corning Domestic Industry Investments Including Assemblies); *see* CX-1820C (Corning U.S. Sales of EDGE & EDGE8 Chassis & Modules – Quantity); CX-1821C (Corning U.S. Sales of EDGE & EDGE8 Chassis & Modules – Revenue); CX-0973C ("Corning Module and Assembly Sales Data" Spreadsheet).

Thus, Corning's domestic investments in labor and capital, when reallocated, total

approximately for the '320, '153, and '456 patents, and approximately

for the '206 patent.

B. Investment in Engineering and Research and Development

Corning argues that its domestic industry investments also constitute a substantial

investment in the exploitation of the asserted patents through engineering and research

403

and development. Mr. Schoettelkotte testified that based on the nature of the activities described above, Corning's labor and capital investments in EDGE Project Labor, EDGE Project Direct Expenses, EDGE Field Engineering Services, and EDGE Pioneer Technical Support also constitute investments in engineering, research, and development of the EDGE and EDGE8 solutions. *See* CX-0003C (Schoettelkotte WS) Q/A 120. In his opinion, the data and calculations discussed above may be considered under either subparagraph (B) or subparagraph (C) of the statute, without modification. *Id*.

The Commission has held that the same R&D expenses may "separately constitute" a domestic industry under each subparagraph of 19 U.S.C. § 1337(a)(3). *Optoelectronic Devices for Fiber Optic Communications*, Comm'n Op. at 15; *Solid State Storage Drives*, Comm'n Op. at 14; *Marine Sonar Imaging Devices*, Comm'n Op. at 58-59, 64, 66. As argued by Corning and the Staff, the administrative law judge finds that the EDGE-related expenses described above are both labor and capital investments and investments in engineering and research and development. Thus, it is equally correct to state that in the period from 2008 through February 21, 2020, Corning invested

Subparagraph (C) has an additional requirement not found in subparagraph (B) – it requires a substantial investment in the "exploitation" of the asserted patents. 19 U.S.C. § 1337(a)(3)(C). "[E]xploitation" is a "generally broad term that encompasses activities such as efforts to improve, develop, or otherwise take advantage of the asserted

patent." Certain Integrated Circuit Chips and Products Containing the Same, Inv. No. 337-TA-859, USITC Pub. No. 4849, Comm'n Op. at 39 (Nov. 2018). The evidence demonstrates a sufficient nexus between the asserted patents and Corning's claimed domestic industry investments. Each asserted patent claims technology relating to aspects of the chassis and modules that make up the base infrastructure of Corning's EDGE and EDGE8 solutions. See CX-0003C (Schoettelkotte WS) Q/A 122 ("More specifically, I understand that the Asserted Patents cover the EDGE and EDGE8 system of sliding trays, removable modules, and other innovative features that enable fiber optic connections to be densely packed inside an equipment rack while improving access to adapters and cables."). Investments related to the research, development, engineering, and implementation of those features of the EDGE chassis and modules are thus related to the asserted patents. See id. Once the expenses that Corning has claimed to be associated with the EDGE and EDGE8 solutions are reduced to eliminate investments related to non-DI components such as cable assemblies, the remaining investments share a nexus with the asserted patents, and it is appropriate to include them in the economic prong analysis under subparagraph (C).

C. Whether Corning's Investments Are "Significant" and "Substantial"

Determining whether an investment is "significant" or "substantial" under 19 U.S.C. § 1337(a)(3) is context-dependent. *Integrated Circuit Chips*, Comm'n Op. at 145. "[T]he magnitude of the investment cannot be assessed without consideration of the nature and importance of the complainant's activities to the patented products in the context of the marketplace or industry in question." *Id.* However, "qualitative factors alone are insufficient" to show that an investment is significant. *Lelo Inc. v.*

405

Case: 22-1228 Document: 29 VE Regen 596 Filed: 04/25/2022 Confidential Material Omitted on this Page

International Trade Comm'n, 786 F.3d 879, 885 (Fed. Cir. 2015). Section 337(a)(3) "requires a quantitative analysis to determine whether there is a 'significant' increase or attribution by virtue of the claimant's asserted commercial activity in the United States." *Id.* at 883.

For the reasons discussed below, Corning's investment in articles practicing the asserted patents (**Constitution** for the '206 patent) is both "significant" under subparagraph (B) of the statute and "substantial" under subparagraph (C). The evidence shows that Corning's domestic investment in labor associated with research and development has been both significant and substantial in overall context.

First, Corning's domestic labor hours spent on the R&D relating to the EDGE Project Codes are significant compared to the foreign labor hours spent on these projects. Commission precedent supports the use of a comparison of domestic to foreign labor expenses to show the domestic investments' significance. *See Certain Pocket Lighters*, Inv. No. 337-TA-1142, Comm'n Op. at 12-13 (July 13, 2020). To make such a comparison, Mr. Clark gathered information reflecting the global hours spent on each of the EDGE Project Codes. *See* CX-0005C (Clark WS) Q/A 38-40. He and Mr. Schoettelkotte calculated the total global hours spent on the EDGE Project Codes, which were hours from 2008 through February 21, 2020. *See* CX-0005C (Clark WS) Q/A 41; CX-0003C (Schoettelkotte WS) Q/A 136; CX-1816C (Corning Global Labor Hours Ex. 4.1). Mr. Schoettelkotte then calculated that for of the labor hours attributed to the EDGE Project Codes were performed in the United States. *See* CX-0003C (Schoettelkotte WS) Q/A 136; CX-1817C (Corning U.S. v. Global Labor Hours Ex. 4.2).

406

Case: 22-1228 Document: 29 VERSON 597 Filed: 04/25/2022 Confidential Material Omitted on this Page

Ms. Mulhern does not dispute Mr. Schoettelkotte's calculations relating to global R&D hours. Mulhern Tr. 932. Instead, she opines that "Corning conducts significant activities related to the DI products outside the U.S." such as manufacturing, and that this should undermine the conclusion that its domestic investments in research, development, and technical support are significant. RX-0007C (Mulhern RWS) Q/A 157. Corning's activities in different areas, such as manufacturing, are irrelevant to this analysis. Corning's domestic investments in research, development, and technical support of the DI products are large when viewed in the relevant context of its foreign investments in those same types of activities. *See Certain Road Milling Machines & Components Thereof*, Inv. No. 337-TA-1067, Initial Det. at 425 (Oct. 1, 2018), *aff'd*, Commission Determination to Review in Part a Final Initial Determination; Schedule for Filing Written Submissions on Remedy, the Public Interest, and Bonding (Apr. 17, 2019) (reviewed on other grounds).

Second, Corning's domestic investments are significant and substantial in the context of the cost of domestic and foreign labor. As Mr. Schoettelkotte testified, Corning's domestic labor rates, which include only salaries, wages and benefits (as opposed to a fully loaded labor rate), ranged from **1000** per hour from 2012 to 2020. *See* CX-0003C (Schoettelkotte WS) Q/A 138; CX-1811C (Corning Labor Rates Ex. 3.3). During that same time period, the labor rates for Corning technology employees in Mexico ranged from **1000** per hour. *See* CX-0003C (Schoettelkotte WS) Q/A 138. Thus, Corning's investment in domestic labor is even larger in context, given the relatively high cost of U.S. employee labor relative to other countries. CX-0003C (Schoettelkotte WS) Q/A 138; Schoettelkotte Tr. 169:8-21; *Certain Pocket Lighters*, Inv.

407

No. 337-TA-1142, Comm'n Op. at 12.

Third, Corning's domestic investments are significant and substantial inasmuch as they were directly responsible for the development and support of EDGE products that have been extremely successful in the market. *See, e.g.*, CX-0004C (Hicks WS) Q/A 55-57 (market share and customers); CX-0007C (Rhoney WS) Q/A 15-17 (market reaction to EDGE products); CX-0006C (Staber WS) Q/A 25-26 (customer reactions and awards). Corning's significant market share (

) further show that Corning's domestic investments are significant because they have resulted in a product that has become a market leader. *See* CX-0003C (Schoettelkotte WS) Q/A 130, 132. Corning's ability to offer a full set of products and technical support services tied to the domestic industry products has led to greater customer satisfaction and repeat purchases in the United States. *See* CX-0004C (Hicks WS) Q/A 23-24; CX-0003C (Schoettelkotte WS) Q/A 133.

Fourth, Corning's domestic investments are significant and substantial when compared to respondents' own spending in connection with the development of the accused products. Mr. Schoettelkotte analyzed the documents respondents produced in this investigation, which showed that respondents' own total investments in developing the accused products were much smaller than Corning's investments in just the areas of U.S. based research and development labor, expenses, and technical support. *See* CX-0003C (Schoettelkotte WS) Q/A 145 (showing Leviton investments around



"[T]here is no minimum monetary expenditure that a complainant must demonstrate to qualify as a domestic industry under the 'substantial investment' requirement" of 19 U.S.C. § 1337(a)(3)(C). *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, USITC Pub. 4120, Comm'n Op. at 25 (Dec. 2009). "[T]he inquiry depends on 'the facts in each investigation, the article of commerce, and the realities of the marketplace." *Certain Carburetors and Products Containing Such Carburetors*, Inv. No. 337-TA-1123, Comm'n Op. at 8 (Oct. 28, 2019) (quoting *Printing and Imaging Devices*, Comm'n Op. at 27).

Here, Corning has established that it invested approximately **Example** in products that practice the asserted patents between 2008 and February 21, 2020. In the full context of this investigation, this amount is quantitatively and qualitatively significant and substantial.

Respondents argue that Corning has not shown that its investments are qualitatively or quantitatively significant or substantial, *inter alia*:

Complainant has not met its burden to prove that its investments are qualitatively or quantitatively significant or substantial. *See Lelo*, 786 F.3d at 883. Complainant performed no assessment of the relative importance of its claimed activities in any relevant context, including the company, the marketplace, the industry, or its overall investment with respect to the DI products, and has provided insufficient information to permit a meaningful contextual analysis. *See Certain Multimedia Display and Navigation Devices and Sys. Components Thereof, and Prods Containing the Same*, Inv. No. 337-TA-694, Comm'n Op. at 15 (Jul. 22, 2011) ("type of efforts that are considered a 'substantial investment' [] will vary depending on the nature of the industry and the resources of the complainant."). The little information Complainant does provide belies a finding of significance or substantiality.

The Commission has considered investments as a percentage of domestic sales as a measure of contextual significance. *Certain Carburetors and Products Containing Such Carburetors*, Inv. No. 337-

409

TA-1123, Comm'n Op. at 17 (Oct. 28, 2019) (finding "domestic investments with respect to the [a]sserted [p]atents are not significant or substantial when considered in light of the only contextual information in the record, i.e., [Complainant]'s U.S. sales and worldwide sales"); *Certain Automated Teller Machines, ATM Modules, Components Thereof and Prods. Containing Same*, Inv. No. 337-TA-972, Final ID at 190-91 (Feb. 1, 2017) (proportion of labor to revenue for domestic industry product was too low and not quantitatively significant); *cf. Certain Table Saws Incorporating Active Injury Mitigation Technology and Components Thereof*, Inv. No. 337-TA-965, Order No. 10, ID at 17 (Apr. 27, 2016) (finding quantitative significance of labor costs amounting to 11 percent to 19 percent of complainant's gross sales).

Using this approved measure, even crediting the *entirety* of Complainant's stale and overbroad claimed investments of dollars in the *entire* EDGE product line over the *entire* claimed 12-year period, Complainant's claimed domestic industry investment from 2008 to February 2020 comprises only of sales for a period less than half as long. RX-0007C (Mulhern RWS) \overline{Q} /A 153. The for the full 12-year period, amounts to only claimed of Corning Optical Communications in sales for the *single year* FY2019 (the year closest to filing the Complaint), of Corning Optical Communications sales for just Enterprise Networks of in for the single year FY2019, and of Corning Optical Communication's research and development expenses for the single year FY2019. See RX-0811 (Corning FY2019 Annual Report); RX-0808C (Corning FY2019 10-K). Focusing just on —the year Complainant argues as its "ongoing" link or bridge between its ended domestic industry and its new projects-Complainant's claimed investments of comprise only of its total claimed investments and of its sales for $\overline{\text{EDGE}}$ and $\overline{\text{EDGE8}}$ chassis and modules for . CX-0003C (Schoettelkotte WS) Q/A 154; CX-1812C (Labor Investments Ex. 3.4) (reflecting investments in U.S. Labor for **EDGE** Projects for); CX-1813C (Direct Expenses Ex. 3.5) (reflecting investments in U.S. Direct Expenses for EDGE Projects for); CX-1814C (Field Engineering Investments Ex. 3.6) (reflecting in U.S. Labor for Field Engineering Services for EDGE customers for); CX-1815C (Pioneer Investments Ex. 3.7) (reflecting U.S. Labor for Pioneer Technical Support for EDGE customers); CX-1821C (EDGE Chassis & Modules Sales Revenue Ex. 5.4) for (reflecting total sales for EDGE chassis and modules for).

See Resps. Br. at 286-87. Thus, citing Carburetors, respondents argue, "Complainant

performed no assessment of the relative importance of its claimed activities in any relevant context, including the company, the marketplace, the industry, or its overall investment with respect to the DI products, and has provided insufficient information to permit a meaningful contextual analysis." Yet, as discussed below, Corning has shown that in the full context of this investigation, the investment amount is quantitatively and qualitatively significant and substantial.

Respondents compare Corning's large investments in the EDGE products with other large dollar figures in a vacuum, but disregards the evidence of significance presented by Corning's witnesses.

First, respondents compare domestic industry investments in R&D and technical support for the EDGE products to Corning's sales revenue as a whole. *See* Resps. Br. at 287. This comparison is at odds with Commission precedent and is not a useful comparison. For a Fortune 500 company such as Corning, investment in any particular product line will seem small compared to total sales. *See Carburetors*, Comm'n Op. at 27-28 (citation omitted) (rejecting idea that "large multinational companies should be expected to invest larger dollar amounts in order for their investments to be deemed 'significant' or 'substantial'").

Second, respondents compare Corning's R&D and technical support investments for the EDGE products to sales of the EDGE products. *See* Resps. Br. at 287. Respondents acknowledge that the EDGE products have enjoyed significant success in the market, garnering **Constitution** of dollars of revenue, but argue that more sales means less significance for the very investments made to bring those products to market. Corning argues that such an approach would reward domestic industries in

411

Case: 22-1228 Document: 29 VERSO 602 Filed: 04/25/2022 Confidential Material Omitted on this Page

unsuccessful products over market leaders like EDGE that were the result of millions of dollars of U.S.-based research and development efforts. *See* Compl. Br. at 254-55.

Respondents' arguments comparing this case to *Carburetors* are unpersuasive. There, "the only contextual information in the record" was complainant's U.S. and worldwide sales of DI products as the complainant provided no additional context to perform any quantitative or qualitative and attempted to rely "solely on the absolute value" of its domestic investments. *Carburetors*, Inv. No. 337-TA-1123, Comm'n Op. at 16-17 (emphasis added). Unlike the complainant in *Carburetors*, as discussed above in detail, Corning provided four analyses of context and is not attempting to rely on the "absolute value" of its investments.

In one of those analyses, Mr. Schoettelkotte compared Corning's domestic R&D expenses for EDGE to the foreign R&D expenses, which shows that over for the R&D labor hours took place in the United States. *See* CX-0003C (Schoettelkotte WS) Q/A 136; CX-1817C (Corning U.S. v. Global Labor Hours Ex. 4.2). In response to this data — which Ms. Mulhern does not dispute, Mulhern Tr. 932 — respondents argue that the only way to show significance is by comparing the cost of research and development to the cost of manufacturing. *See* Resps. Br. at 289. This is not persuasive, unsupported by precedent, and inconsistent with the Commission's requirement of showing the relative importance of domestic activities in context.

Third, respondents argue that Corning "performed no assessment of the relative importance of its claimed activities in any relevant context, including the company, the marketplace, the industry, or its overall investment with respect to the DI products, and has provided insufficient information to permit a meaningful contextual analysis." *See*

412

Case: 22-1228 Document: 29 VE Regeneration 603 Filed: 04/25/2022 Confidential Material Omitted on this Page

Resps. Br. at 286. As discussed above, in addition to opining on the success of the EDGE products in the data center industry, Mr. Schoettelkotte also compared the investments Corning made in the EDGE products with the investments respondents made in developing their own infringing products. *See* CX-0003C (Schoettelkotte WS) Q/A 144-46. Respondents have not shown that comparing Corning's investments to those of respondents, who are in the same industry, is "irrelevant," Resps. Br. at 290, to the contextual analysis.

Respondents also argue that Corning's showing of greater R&D expenses for domestic industry purposes is inconsistent with Corning's showing for validity purposes that respondents took time and effort to develop their products. There is no inconsistency. Corning has shown that respondents invested substantial time and effort in developing their products, even with the benefit of their use of Corning's patents and EDGE. However, Corning has also shown that it invested much more time and effort to create EDGE in the first place, which shows that its domestic R&D investments were substantial. *Compare* Resps. Br. at 290 (hours for Leviton's Accused Product) *with* CX-0005C (Clark WS) Q/A 24 (over hours for EDGE).

* * *

Accordingly, it is determined that Corning has satisfied the economic prong of the domestic industry requirement of 19 U.S.C. § 1337(a) under either of subparagraphs (B) or (C).

IX. Conclusions of Law

1. The Commission has subject matter jurisdiction, personal jurisdiction over the parties, and *in rem* jurisdiction in this investigation.

2. The accused products have been imported or sold for importation into the United States.

 The accused products infringe the asserted claims of U.S. Patent No. 9,020,320.

4. The accused products infringe the asserted claims of U.S. Patent No. 10,444,456.

5. The accused products infringe the asserted claims of U.S. Patent No. 10,120,153.

6. With respect to U.S. Patent No. 8,712,206, (a) the accused products of FS and Wirewerks infringe asserted claims 22 and 23; (b) the accused products of Siemon infringe claim 22; and (c) the accused products of Panduit do not infringe claim 22 or claim 23.

7. The domestic industry requirement has been satisfied with respect to all asserted patents

8. It has not been shown by clear and convincing evidence that any of the asserted claims are invalid.

X. Initial Determination on Violation

Accordingly, it is the INITIAL DETERMINATION of the undersigned that a violation of section 337 (19 U.S.C. § 1337) has occurred in the importation into the

414

Case: 22-1228 Document: 29 VERSO 605 Filed: 04/25/2022 Confidential Material Omitted on this Page

United States, the sale for importation, or the sale within the United States after importation, of certain high-density fiber optic equipment and components thereof that infringe the asserted claims of U.S. Patent No. 9,020,320; U.S. Patent No. 10,444,456; U.S. Patent No. 10,120,153; and U.S. Patent No. 8,712,206.

Further, this initial determination, together with the record of the hearing in this investigation consisting of (1) the transcript of the hearing, with appropriate corrections as may hereafter be ordered, and (2) the exhibits received into evidence in this investigation, is hereby certified to the Commission.

In accordance with 19 C.F.R. § 210.93(c), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this initial determination upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order, as amended, issued in this investigation.

Pursuant to 19 C.F.R. § 210.42(h), this initial determination shall become the determination of the Commission unless a party files a petition for review pursuant to § 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the initial determination or certain issues herein.

XI. Recommended Determination on Remedy and Bonding

Pursuant to the notice of investigation, 85 Fed. Reg. 16653 (Mar. 24, 2020), this is the recommended determination in *Certain High-Density Fiber Optic Equipment and Components Thereof*, United States International Trade Commission Investigation No. 337-TA-1194.

A. Limited Exclusion Order

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. United States Int'l Trade Comm'n*, 787 F.2d 544, 548 (Fed. Cir. 1986). A limited exclusion order directed to respondents' infringing products is among the remedies that the Commission may impose. *See* 19 U.S.C. § 1337(d).

Corning argues, "if a general exclusion order is not issued, permanent limited exclusion orders should issue barring from entry into the United States all of Respondents' high-density fiber optic equipment and components thereof that infringe one or more claims of the Asserted Patents." Compl. Br. at 287. The Staff agrees. Staff Br. at 227 n.44. Respondents, on the other hand, argue that "any remedy should be narrowly tailored." *See* Resps. Br. at 291-92. Respondents' requests are addressed below.

As discussed below, it is the recommendation of the administrative law judge that in the event that a violation of section 337 is found, and subject to any public interest determination that the Commission may make, at least a limited exclusion order should issue.

B. Respondents' Requests

Respondents request numerous restrictions of and exceptions to any remedial orders issued in this investigation. Respondents argue that "any remedy should be narrowly tailored":

Any issued remedy must have a "reasonable relation to the unlawful practices found to exist." *Hyundai Elecs. Indus. Co., Ltd. v. U.S. Int'l Trade Comm'n*, 899 F.2d 1204, 1209 (Fed. Cir. 1990). If a

416

violation is found, any remedy should be restricted to imported accused products found to infringe a valid patent and should not extend to products with substantial non-infringing uses, or to domestically manufactured, non-imported products. Any remedy should include exceptions to allow for Respondents' continued service and repair of any products sold before the effective date of any remedial order and to complete any pending contracts or purchase orders. Any remedy should be delayed to permit Respondents an opportunity to develop alternative, non-infringing products. Any remedy should contain an exception for products to be sold to or used by any government agency, branch, facility, or base. Any exclusion order should contain a certification provision. Any remedy should also be appropriate in light of the public interest.

For any remedial order issued against the parties for the '320, '456, or '153 Patents, the scope of the order should not encompass components imported for use with domestically-developed products. No respondent imports the accused chassis and module combinations. No respondent sells such combinations. Schoettelkotte Tr. 130:15-20.

Panduit and Siemon do not import the accused chassis. Panduit's chassis are developed and manufactured in Illinois. *See, e.g.*, JX-0028C (Wagner Dep. Tr.) 42:5-43:7, 79:6-22, 81:21-82:3; JX-0029C (Wiltjer Dep. Tr.) 64:5-65-8. Siemon's LightStack enclosures are manufactured by Siemon in Connecticut. Veatch Tr. 468:10-24; RX-1266C (Veatch WS) Q/A 17. Accordingly, modules imported for use with domestically-developed chassis should be excluded from any remedial order.

Leviton does not import the accused cassettes or enclosures. RX-0005C (Kim WS) Q/A 34-35. Leviton previously imported **Constant** of the accused enclosures, but no longer imports those materials. *Id.* Q/A 37; RX-0005.1C (Kim WS) Q/A 37. No remedy should apply to Leviton's domestically-made products or to products not imported.

Resps. Br. at 291-92.

Corning argues each request should be denied. See Compl. Reply Br. at 76-80.

The Staff argues that each request should be denied, except for the service and repair, as

well as the certification provision. See Staff Reply Br. at 42-44.

As an initial matter, the Commission, not a party found to infringe a valid patent,

has broad discretion in selecting the form, scope, and extent of the remedy in a section

417

337 proceeding. Any summary request for exceptions without legal and/or factual support is without any merit and need not be considered. That is the case here. Further, these exceptions would improperly narrow the remedies and enable respondents to circumvent an exclusion order.

As shown below, for the reasons argued by Corning and the Staff (for the most part), the administrative law judge cannot recommend any of these requests except for service and repair, and the certification provision. *See* Compl. Reply Br. at 76-80; Staff Reply Br. at 42-44.

(1) Restriction of any remedy to "imported accused products found to infringe a valid patent"

"The Commission's long-standing practice is to direct its remedial orders to all products covered by the patent claims as to which a violation has been found, rather than limiting its orders only to those specific models selected for the infringement analysis." *Certain Optical Disk Controller Chips & Chipsets & Prods. Containing Same, Including DVD Players & PC Optical Storage Devices*, Inv. No. 337-TA-506, Comm'n Op. at 56 (Sept. 28, 2005). This practice ensures fulfillment of the central remedial policy of the statute: "ensur[ing] complete relief to the domestic industry." *Certain Road Milling Machines & Components Thereof*, Inv. No. 337-TA-1067, Comm'n Op. at 6 (Aug. 7, 2019) (internal citation and quotation marks omitted). Moreover, an "exclusion order covering only specific models of an accused device could easily be circumvented, thereby denying complete relief." *Id.*

(2) Exception for products that have "substantial non-infringing uses" or are "domestically manufactured[and] non-imported"

Respondents argue that any products that have "substantial non-infringing uses" should be excepted from the remedial orders, including from cease and desist orders. While the existence of substantial noninfringing uses can preclude a finding of contributory infringement, they do not preclude a finding of direct or induced infringement. If infringement of any kind is found, a remedy should issue unless the asserted patent claims are shown to be invalid or the Commission finds that a remedy would violate one or more of the statutory public interest factors.

Respondents argue that "the scope of the order should not encompass components imported for use with domestically-developed products." This argument is inconsistent with the holdings in *Suprema* and *Blood Cholesterol Testing Strips*. A remedial order may apply to components that do not infringe at the time of importation, but infringe when combined with other components post-importation. *See Suprema*, 796 F.3d at 1348-52; *Blood Cholesterol Testing Strips*, Comm'n Op. at 32-33.

(3) Exceptions for service and repair

Corning argues, "Respondents' request for an exception to any exclusion order for "service and repair" must be denied. Although a service and repair exception can be appropriate in investigations where Respondents provide sufficient evidence that these activities are important, Respondents have provided no such evidence here." Compl. Reply Br. at 78. The Staff argues that "to the extent that any third party customers need specific parts for servicing existing products, the Staff would not oppose an exception to any remedial order for service and repair of products sold before the order issued."

419

Case: 22-1228 Document: 29 VE Rade: 610 Filed: 04/25/2022 Confidential Material Omitted on this Page

Here, respondents simply argue, "Any remedy should include exceptions to allow for Respondents' continued service and repair of any products sold before the effective date of any remedial order and to complete any pending contracts or purchase orders." Resps. Br. at 291. Respondents say nothing more, and they do not cite to any evidence. *See* Resps. Br. at 291-92.⁵⁴

Nonetheless, while respondents have not come forward with evidentiary support, the administrative law judge recommends the exception for service and repair inasmuch as that is the Commission practice, and the purpose of the remedy is not to cause disruption to end users.

(4) Exceptions to complete "pending contracts" or "purchase orders";

Respondents have not provided sufficient evidence of either pending contracts or purchase orders in existence, nor have they provided any reason why such contracts being fulfilled would be justified. *See Road Milling Machines*, Inv. No. 337-TA-1067, Comm'n Op. at 14-15 (rejecting exception for shipments "scheduled for delivery" because it "would potentially circumvent the exclusion order," particularly where respondent failed to identify what the shipments entailed or how many shipments the exception would permit).

(5) Delay to permit respondents to develop non-infringing products

Respondents offered no evidence or basis to justify a delay or transition period of any kind. *Certain Mobile Devices, Associated Software, & Components Thereof*, Inv.

⁵⁴ In the Joint Outline, respondents also cite pages 295-300 (of their brief) concerning "the scope, duration, and exceptions." However, in those pages, there is no discussion of "the scope, duration, and exceptions." *See* Resps. Br. at 295-300; *see* also Resps. Reply Br. at 78, 79-80 (no discussion of "the scope, duration, and exceptions).

No. 337-TA-744, Comm'n Op. at 22-23 (June 5, 2012) (rejecting respondent's argument for a "transition period" delaying enforcement of a limited exclusion order because "neither [respondent] nor any third party provided any factual basis to justify implementation of a transition period in this investigation"). They give no reason why the Commission should allow respondents to continue their infringing activities while attempting to design around complainant's patents. *See* Resps. Br. at 291-92.

(6) Exceptions for sales to government agencies

Respondents do not qualify for an exemption for "products to be sold to or used by any government agency, branch, facility, or base." Such exemptions are governed by 19 U.S.C. § 1337(1), which respondents do not cite or discuss. That statute specifically exempts only the United States government, not state or local governments or their affiliates. *See id.* Respondents offer no evidence that they sell the accused products to the federal government. *Certain Intraoral Scanners & Related Hardware & Software*, Inv. No. 337-TA-1090, Initial Det. at 151 (Apr. 26, 2019).

(7) Certification provision

The Staff does not oppose the inclusion of a certification provision. *See* Staff Reply Br. at 43 n.19. As noted by the Staff, certification provisions are standard in all Commission exclusion orders.

(8) Any remedy should be appropriate in light of the public interest

Consideration of the public interest factors has not been delegated to the administrative law judge in this investigation.

C. General Exclusion Order

If a violation is found, Corning has requested a general exclusion order pursuant to 19 U.S.C. § 1337(d)(2), excluding from entry into the United States all products and components thereof that infringe one or more asserted claims of the patents at issue. *See* Compl. Br. at 259-86, 299-300. Corning argues, "A general exclusion order ('GEO') should issue prohibiting the unlicensed entry of all high-density fiber optic equipment and components thereof that infringe the Asserted Claims. Both potential bases for a GEO under 19 U.S.C. § 1337(d)(2) are present: (A) a general exclusion from entry of articles is necessary to prevent circumvention of limited exclusion orders; and (B) there is a pattern of violation, and it is difficult to identify the source of infringing products." Compl. Br. at 259. The Staff argues, "The evidence has established that a general exclusion order is warranted in this investigation under subparagraph (B) of 19 U.S.C. § 1337(d)(2)." Staff Br. at 222.

Under 19 U.S.C. § 1337(g)(2), "a general exclusion from entry of articles, regardless of the source or importer of the articles, may be issued if ---- (A) no person appears to contest an investigation concerning a violation of the provisions of this section, (B) such a violation is established by substantial, reliable, and probative evidence, and (C) the requirements of subsection (d)(2) are met." 19 U.S.C. § 1337(g)(2).

Section 337(d)(2) states in relevant part:

(d) Exclusion of articles from entry . . .

(2) The authority of the Commission to order an exclusion from entry of articles shall be limited to persons determined by the

422

Case: 22-1228 Document: 29 VE Rage: 613 Filed: 04/25/2022 Confidential Material Omitted on this Page

Commission to be violating this section unless the Commission determines that –

- (A) a general exclusion from entry of articles is necessary to prevent circumvention of an exclusion order limited to products of named persons; or
- (B) there is a pattern of violation of this section and it is difficult to identify the source of infringing products.

19 U.S.C. § 1337(d)(2).

Thus, a GEO is warranted when "a general exclusion from entry of articles is necessary to prevent circumvention of an exclusion order limited to products of named persons" or "there is a pattern of violation of this section and it is difficult to identify the source of infringing products." 19 U.S.C. § 1337(d)(2)(A); 19 U.S.C. § 1337(d)(2)(B). Satisfaction of either criterion is sufficient for imposition of a GEO. *Certain Cigarettes and Packaging Thereof*, Inv. No. 337-TA-643, Comm'n Op. at 24 (Oct. 1, 2009). The Commission "now focus[es] principally on the statutory language itself" when determining whether a GEO is warranted. *Certain Ground Fault Circuit Interrupters and Products Containing Same*, Inv. No. 337-TA-615, Comm'n Op. at 25 (Mar. 27, 2009). "In determining whether either criterion is satisfied the Commission may look not only to the activities of active respondents, but also to those of non-respondents as well as respondents who have defaulted or been terminated from an investigation." *Certain Personal Transporters, Components Thereof, and Manuals Therefor*, Inv. No. 337-TA-935, USITC Pub. No. 4906, Comm'n Op. at 6 (June 2019).

For the reasons discussed below, the evidence establishes that a general exclusion order is warranted in this investigation under subparagraph (B) of 19 U.S.C. § 1337(d)(2).

423

1. Preventing Circumvention of a Limited Exclusion Order

The evidence does not demonstrate that conditions in the market for fiber optic equipment provide incentives for the named respondents to attempt to circumvent a limited exclusion order. Corning argues that high demand for infringing products, the availability of high profit margins, and low barriers to entering the market would encourage respondents, particularly the defaulting respondents, to attempt to circumvent any limited exclusion order imposed in this investigation. *See* Compl. Br. at 260-63; *see* CX-0003C (Schoettelkotte WS) Q/A 166-77 (analyzing respondents' profitability). There is evidence, however, suggesting that attempts at circumvention would be unlikely to succeed.

The market in which the named respondents operate is a tight-knit market with sophisticated customers who have established relationships with known suppliers. *See* RX-0007C (Mulhern RWS) Q/A 179 ("[E]nd-users of the fiber optic products at issue are sophisticated and demanding."); *accord* Schoettelkotte Tr. 177. Just four "Hyper4" data center customers (Microsoft, Google, Amazon, and Facebook) account for nearly 50 percent of the entire data center market. *Id.* Q/A 201. Customers "typically look for a complete integrated solution platform that meets the density requirements across the entire application including not only enclosures and cassettes but also horizontal and vertical cable management, cable pathways, and labeling. These customers also demand a high level of technical support in consultative pre- and post-sales support." CX-0003C (Schoettelkotte WS) Q/A 115; CX-1726C (Panduit 2014 Business Plan) at 9. Thus, even if complainant is correct that profits are high and production costs are low in the fiber

424

Case: 22-1228 Document: 29 VE Rade: 615 Filed: 04/25/2022 Confidential Material Omitted on this Page

optic equipment industry, CX-0004C (Hicks WS) Q/A 65, the evidence of customer demand for stable, established relationships with suppliers suggests that barriers to entry are actually quite high. *See* Schoettelkotte Tr. 177.

Customer expectations also provide a significant disincentive for the named respondents to attempt to circumvent a limited exclusion order by importing products under other, less-established brand names or distribution channels. The evidence shows that some respondents have long-standing positions in the fiber optics communications market.⁵⁵ Siemon, for example, was founded in 1903 and began manufacturing and selling telecommunications equipment in 1906. *See* RX-1266C (Veatch WS) Q/A 4. There is insufficient evidence to suggest that such respondents would be willing to risk their relationships with current customers for the sake of circumventing a limited exclusion order.

Accordingly, Corning has not met its burden of establishing that a general exclusion order is necessary to prevent circumvention of a limited exclusion order. *See* 19 U.S.C. § 1337(d)(2)(A).

⁵⁵ An exception is FS.com, which has a history of corporate name changes. The manufacturer of FS products, FS.com Ltd., was "formerly known as Fiberstore Co. Ltd." and appears to still be using that old name on its invoices. CX-1970 (FS June 5, 2020 Resps. to Interrogs.) at 7; CX-0412 (FS.com invoices) at 5. For U.S. distribution, Wei Xiang, the majority owner of the FS.com corporate family, created Fiberstore Inc. in Washington and FS.com in Delaware. JX-0030C (Xiang Dep. Tr.) at 29-30; *see id.* at 20-22, 30 (for a time, both entities fulfilled U.S. orders placed on the FS.com website operated by a third, Chinese entity). A customer making a purchase on the FS.com website could not tell which entity was completing the transaction. *Id.* at 30-31; JX-0031C (Zhang Dep.) at 74-75. Fiberstore Inc. has since ceased operations and FS.com has taken over its inventory and customer relationships. JX-0030C at 30:6-11; JX-0031C at 19-21.



2. Pattern of Violation and Difficulty in Identifying the Source of Infringing Products

While a general exclusion order would not be warranted under subparagraph (A)

of 19 U.S.C. § 1337(d)(2), complainant has established the need for a general exclusion

order under subparagraph (B).

First, a pattern of violation of the asserted patents exists. Of the thirteen original

respondents in this investigation, four have been shown to infringe (FS, Leviton, Panduit,

and Siemon).

Five more respondents have been found in default:

- Order No. 7 (Initial Determination Finding Respondent Huber+Suhner AG in Default) (June 9, 2020), Order No. 8 (Initial Determination Finding Respondent Huber+Suhner Inc. in Default) (June 9, 2020), *aff'd*, Commission Determination Not to Review Initial Determinations Finding Two Respondents in Default (June 22, 2020).
- Order No. 13 (Initial Determination Finding Respondents Anfkom, Tarluz, and Wulei Bonelinks in Default) (Aug. 21, 2020), *aff'd*, Commission Determination Not to Review an Initial Determination Finding Three Respondents in Default (Sept. 15, 2020).

The evidence shows that it is more likely than not that these defaulting

respondents' products infringe. See CX-0597 (Huber+Suhner chassis webpage); CX-

0598 (Huber+Suhner module webpage); CX-0638 (TARLUZ product catalog); CX-0639

(TARLUZ chassis webpage); CX-0582 (Anfkom chassis webpage); CX-0583 (Anfkom

module webpage); CX-0649 (Alibaba.com Wulei Bonelinks Webpage-1); CX-0651

(Wulei Bonelinks sample product photos) (all showing products with strong similarities

to the products disclosed in the asserted patents); see also Complaint, ¶¶ 91-119, 149-75,

286-302, 338-60 (describing alleged infringement by defaulting respondents). The

evidence concerning these nine respondents is sufficient to establish a pattern of violation.

Second, Corning argues, and has shown, that there are many non-respondent entities in the market for fiber optic equipment, any of whom could be the source of infringing products. Corning's Mr. Hicks identified 31 non-respondent entities that sell or offer to sell products that he alleges are copies of EDGE likely to infringe the asserted patents.⁵⁶ *See* Compl. Br. at 275-76 citing (CX-0004C (Hicks WS) Q/A 72-74, CDX-0004.1 (Hicks Direct Demonstratives) at 18-49). Mr. Hicks testified that the products sold by these companies are all "strikingly similar to EDGE." CX-0004C (Hicks WS) Q/A 70; Hicks Tr. 100-102. For example, regarding the products one of the companies identified, Shenzhen DYS Fiberoptic Tech Company, Ltd., Mr. Hicks testified:

> [Y]ou'll see, again, in quotes on the slide, which are quotations taken from the literature from Shenzhen DYS Fiber, which is actually advertised on Alibaba.com, talks about the density of the 144 fiber per 1U, the sliding tray designs, and the 19-inch fitting in a 19-inch installation. That – that in and of itself is not necessarily related to EDGE, because most data center hardware can fit in a 19-

⁵⁶ The entities identified are (1) Amphenol Network Solutions; (2) APS Cables & Connectors OY; (3) CABLExpress (part of CXtec Inc.); (4) Conexus Technologies, Inc.; (5) Fiber Connections, Inc.; (6) Fibernet Ltd. (Israel); (7) Fibernet (Italy); (8) FiberOptic Distribution LLC; (9) Hefei Xingcheng Comms. Co., Ltd.; (10) Hubbell Inc./Hubbell Premise Wiring; (11) Hubei Chenyu Photoelectric Tech. Co., Ltd.; (12) Hunan Twilight Optic Co., Ltd.; (13) HYC Co., Ltd.; (14) JFOPT Co., Ltd./Shenzhen Jiafu Optical Comm. Co., Ltd.; (15) Kocent Optec, Ltd.; (16) Molex Inc.; (17) Nexans; (18) Ningbo Geteknet Telecom Equipment Co., Ltd.; (19) Ningbo Jingkon Fiber Comm. Apparatus Co., Ltd.; (20) Rosenberger-OSI GmbH & Co. OHG; (21) Shenzhen Damu Tech Co., Ltd.; (22) Shenzhen DYS Fiber Optic Tech Co., Ltd.; (23) Shenzhen IH Optics Co., Ltd.; (24) Shenzhen Fibercan Optical Co., Ltd.; (25) Shenzhen IH Optics Co., Ltd.; (26) Shenzhen Junjin Tech. Co., Ltd.; (27) Shenzhen Spring Optical Comm. Tech. Co., Ltd.; (30) SHKE Comm. Tech. Co., Ltd.; and (31) Wuhan Wolon Comm. Tech. Co., Ltd. CX-0004C (Hicks WS) Q/A 72-74.

Case: 22-1228 Document: 29 VERSON 618 Filed: 04/25/2022 Confidential Material Omitted on this Page

inch rack. But there's also, in the foreground, modules that very closely resemble the footprint and look of EDGE, even in terms of the latching mechanisms at the back of the – of the module. The two little tabs that you squeeze, that's actually an invention from a coworker of mine, who's a close friend.

Q. Now, did you obtain the images that are shown in CDX-0004C? Excuse me, in CDX-0004?

A. Yes. Our team did a great deal of due diligence to identify companies, in addition to the Respondents that are - have products that appear to be mere copies of the - of EDGE solution.

Hicks Tr. 101-102.

Finally, there is evidence that it is difficult to identify the sources of potentially infringing products. Mr. Hicks testified that "[t]hese companies pop up quickly and we are unable to determine who they sell to or if they have significant market share. It's also hard for Corning to buy products from these companies." *Id.* Q/A 75. He further testified that "it's often hard to tell which company actually makes any given product." *Id.* Some entities, such as defaulting respondents TARLUZ and Wulei Bonelinks, sell potentially infringing products without branding or identification. *See id.* Q/A 77; CX-0640 (TARLUZ product photos); CX-0651 (Wulei Bonelinks product photos). Such original equipment manufacturers ("OEMs") may easily produce EDGE copies and then sell them to anyone under any brand. *See* CX-0004C (Hicks WS) Q/A 79. Mr. Hicks testified:

There are so many different entities that have been copying Corning's products. Several companies are original equipment manufacturers ("OEMs") that manufacture copied products but under a different company's label. Other times, products are unlabeled, mislabeled, or falsely associated with a different brand. For example, at pages 5-17 of CDX-0004C (Hicks Direct), you can see that certain copied products look

428
identical to each other even though they came from different manufacturers. Page 7 shows five different companies that produce identical modules, and page 11 shows four different companies that produce identical chassis. It's hard (and often impossible) to know whether these companies independently manufactured these products with the same design or bought them from a third party or each other. Finally, once the product arrives in the United States, there are many different domestic distributors. That makes it hard to recognize and keep track of all the copiers.

Id. Q/A 77.

Corning argues that although it would not be practical to name every entity found to be selling products similar to EDGE products as a respondent, there is evidence that any one of them, if named in an investigation, would be found to infringe the asserted patents. *See* Compl. Br. at 277. Corning has shown that a number of non-respondents' products closely resemble respondents' accused products. For example:

- Shenzhen Unifiber, Shenzhen DYS, SHKE, and Ningbo Jingkon sell fiber optic modules that appear identical to respondent FS's modules. *Compare* CX-1412 (Unifiber Tech.); CX-1075 (Shenzhen DYS); CX-1440 (SHKE); CX-1326 (Ningbo Jingkon) *with* CX-0263 (FS module inventory) at 5.
- SHKE also sells fiber optic equipment that appears identical to one of defaulting respondent Anfkom's systems. *Compare* CX-1439 (SHKE 8); CX-1440 (SHKE 9) *with* CX-0582 (Anfkom chassis webpage); CX-0583 (Anfkom module webpage).
- Ningbo Geteknet sells products that appear identical to systems sold by defaulting respondents Anfkom and Wulei Bonelinks. *Compare* CX-1171 (Ningbo Geteknet) *with* CX-0649 (Alibaba.com Wulei Bonelinks webpage); CX-0582 (Anfkom chassis webpage).
- Shenzhen Spring Optical, Hefei Xingcheng, Ningbo Geteknet, and Shenzhen UT-King sell chassis that appear identical to those sold by defaulting respondents TARLUZ and Wulei Bonelinks. *Compare* CX-1395 (Spring Optical); CX-1206 (Hefei); CX-1422 (UT-King Tech.); CX-1169 (Ningbo Geteknet) with CX-0640 (TARLUZ product photos); CX-0651 (Wulei Bonelinks product photos).

See also Hicks Tr. 100-101 ("[Y]ou'll see that [the product sold by JFOPT Co., Ltd. is] a 1U rack mount patch panel that houses three independent sliding trays, just like EDGE, with a density of 144 fibers, just like EDGE. Each independent tray has sliding rail to pull smoothly, just like EDGE. And it – each tray is able to hold four cassettes, just like EDGE. And so it has the same features, the same look, format, as well as matching some of the Chinese Respondents' product."); *see* CDX-0004.1 (Hicks Direct Demonstratives) at 32.

* * *

"In general, in determining whether to issue a GEO, the Commission balances the complainant's interest in obtaining complete protection from all potential foreign infringers against the inherent potential of a GEO to disrupt legitimate trade." *Certain Erasable Programmable Read-Only Memories*, Inv. No. 337-TA-276, USITC Pub. No. 2196, Comm'n Op. at 125 (May 1989), *aff'd sub. nom. Hyundai Elec. Indus. v. International Trade Comm'n*, 899 F.2d 1204 (Fed. Cir. 1990). In this investigation, complainant and the named respondents account for the majority of the fiber optic equipment market, both globally and in the United States. *See* RX-0007C (Mulhern) Q/A 33, 196-205; RX-0731C through RX-0733C (market shares by segment); RDX-0007C (Mulhern demonstratives) at 20 (Corning and respondents account for 57 percent of North American market and 81 percent of sales to the "Hyper4" data center users).

A limited exclusion order directed to the named respondents would provide Corning with most of the relief to which it is entitled, and would avoid the disruption of legitimate trade that a general exclusion order can create. As discussed above, however,

430

the portion of the market not occupied by the named respondents, appears to be full of rapidly appearing and disappearing manufacturers and distributors that make and sell products with strong similarities to both Corning's EDGE products and the infringing products of the named respondents. *See* CX-0004C (Hicks WS) Q/A 75. As the Staff argued, this is exactly the sort of situation that general exclusion orders are designed to address.

* * *

Accordingly, Corning has met its burden of establishing that a pattern of violation exists with respect to the asserted patents and that it is difficult to identify the source of infringing products. *See* 19 U.S.C. § 1337(d)(2)(B).

D. Cease and Desist Order

Corning requests the administrative law judge to recommend the entry of cease and desist orders directed to the respondents discussed below. *See* Compl. Br. at 287-94.

Section 337 provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for a violation of section 337. 19 U.S.C. § 1337(f)(1). The Commission "generally issues a cease and desist order only when a respondent maintains a commercially significant inventory of infringing products in the United States." *Certain Ground Fault Circuit Interrupters and Products Containing Same*, Inv. No. 337-TA-615, Comm'n Op. at 24 (Mar. 26, 2009); *Certain Video Game Systems, Accessories, and Components Thereof*, Inv. No. 337-TA-473, Comm'n Op. at 2 (Dec. 24, 2002).

1. Participating Respondents

With respect to the participating respondents, Corning argues, "The Commission

should issue cease and desist orders to Respondents FS.com, Leviton, and Panduit

because each maintains commercially significant inventory of the Accused Products in

the U.S. and has significant domestic operations relating to the Accused Products."

Compl. Br. at 287.

The Staff agrees. See Staff Br. at 228-32.

Respondents argue:

Complainant and Mr. Schoettelkotte's analysis regarding amounts in inventory is flawed and overstated. First, Mr. Schoettelkotte's opinion regarding aggregate "months of inventory" fails to account for the nature of sales in the data center marketplace and the data produced by Respondents. RX-0007C (Mulhern RWS) Q/A 225–231. Indeed, sales in the data center market are not uniform or steady, since orders from clients tend to be large and sporadic. *Id.*; *see also* JX-0028C (Wagner Dep. Tr.) 102:2–13.

Second, each of the Asserted Patents, except for the '206 Patent, require a combination of chassis and modules that are used together in a particular combination in order to allegedly infringe. See RX-0008C (Lebby RWS) Q/A 194, 252, 290. Certain Respondents do not import either the accused chassis or the accused modules, and none import the accused system or combinations. RX-0007C (Mulhern RWS) Q/A 233-237; RX-0005C (Kim WS) Q/A 34-35; JX-0013C (Byquist Dep. Tr.) 113-114; CX-1982C (Leviton Responses to Requests for Admission); CX-1988C (Leviton Responses to Interrogatories); JX-0028C (Wagner Dep. Tr.) 43, 79, 81-82; RX-1266C (Veatch WS) Q/A 18-19. All of the accused products have substantial non-infringing uses. See §§ VI.A, VII.A, and VIII.A, supra. Staff agrees. SPHB at 78. Mr. Schoettelkotte admitted he did not assess inventories of the accused combinations. Schoettelkotte Tr. 130:6-20. Complainant cannot, on the basis of importation of non-infringing components with substantial non-infringing uses, enjoin entirely domestic products and aspects of Respondents' highdensity fiber optic business.

Third, only imported inventory—not inventory of products manufactured in the United States—is relevant to the CDO analysis.

432

Complainant has not addressed this point at all. Schoettelkotte Tr. 129:11-21 (taking no opinion on importation of inventory). Any remedy provided must have a "reasonable relation to the unlawful practices found to exist." Hyundai Elecs. Indus. Co., Ltd. v. U.S. Int'l Trade Comm'n, 899 F.2d 1204, 1209 (Fed. Cir. 1990); see also 19 U.S.C. § 1337(d). By statute, a CDO is only available "[i]n addition to, or in lieu of, taking action under subsection (d) or (e)." 19 U.S.C. § 1337(f)(1). In other words, if action cannot be taken in this investigation pursuant to subsection (d) or (e), then no CDO can issue because it would not be "[i]n addition to" or "in lieu of" the remedies in subsection (d) or (e). Any CDO against Respondents' domestic products and activities would effectively amount to a conventional patent injunction under 35 U.S.C. § 283, which the Commission is not empowered to or constitutionally authorized to grant as a non-Article III administrative body. CDOs do not give the Commission jurisdiction to issue injunctions on entirely domestic activity, divorced from importation. Doing so turns Section 337 on its head. Any CDO as to Respondents' domestic manufacture and sale exceeds the Commission's statutory authority. 19 U.S.C. § 1337; see also Kisor v. Wilkie, 139 S. Ct. 2400 (2019); Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837 (1984). Any CDO should be limited to imported, infringing products.

Finally, Complainant ignores evidence of no inventory for many products. RX-0007C (Mulhern RWS) Q/A 238-241; RX-0750C (Mulhern Exhibit 26); RX-0752C (Mulhern Exhibit 28); RX-0753C (Exhibit 29 to Mulhern Expert Report). There are no inventories of accused Leviton modules, FS chassis, certain FS modules, and 160 models of Panduit modules. RX-0007C (Mulhern RWS) Q/A 238-241; Schoettelkotte Tr. 129:23-130:5 (confirming no opinion of significant inventory of Leviton modules). Because certain products are not imported, there are also no relevant inventories of imported accused Leviton chassis or Panduit chassis. *Id*.

As Leviton does not import any products—and no longer imports any components or materials—there will be no inventory of any imported infringing products at the time any remedy issues. RX-0005.1C (Kim WS) Q/A 37. No CDO should issue as to any product for which there is zero inventory, or as to any product manufactured in the United States. Even (improperly) using for Leviton, this is . See CX-1820C (U.S. Sales of EDGE Chassis Ex. 5.3) (reflecting . That number is not commercially significant by any measure.

Resps. Br. at 292-95.

Case: 22-1228 Document: 29 VE Rege: 624 Filed: 04/25/2022 Confidential Material Omitted on this Page

Both Mr. Schoettelkotte and Mr. Hicks testified that due to the direct, head-tohead competitive relationship between the parties, Corning has lost sales of the EDGE DI Products to respondents FS, Leviton, and Panduit. *See* CX-0003C (Schoettelkotte WS) Q/A 180; CX-0004C (Hicks WS) Q/A 63-65. Respondents' documents and testimony show that respondents view Corning as the market benchmark both from a technical and pricing standpoint. *See* CX-0003C (Schoettelkotte WS) Q/A 180. Thus, as Mr. Schoettelkotte testified, respondents' domestic inventory, combined with their domestic operations, is commercially significant due to the potential to take sales from Corning. *See* CX-0003C (Schoettelkotte WS) Q/A 180-81.

To assess respondents' inventory, Mr. Schoettelkotte analyzed the available data to determine the average sales of accused products per month for each respondent, separated by accused chassis and accused modules. *See* CX-0003C (Schoettelkotte WS) Q/A 195-97 (FS); 204 (Leviton); 212-13 (Panduit). He used this information to calculate the number of months of inventory held by FS, Leviton, and Panduit, which he found commercially significant. *Id.* He also found these respondents' business operations in the U.S. relating to the accused products commercially significant. *Id.* Q/A 192, 198 (FS); 200-01, 205 (Leviton); 207-08, 214 (Panduit). Mr. Schoettelkotte's analysis of significant business operations is supported by Mr. Polidan's (of former respondent AFL) testimony that Panduit, Leviton, and Siemon have broad distribution networks throughout the country. *See* Polidan Tr. 194-195.

Ms. Mulhern critiques Mr. Schoettelkotte's analysis, but does not dispute that any of these respondents has commercially significant inventory or significant domestic operations relating to the accused products. *See* Mulhern Tr. 944-945. Instead, Ms.

434

Mulhern opines that, inasmuch as sales in this market are "lumpy," an average-monthsof-inventory analysis is inappropriate. *See* RX-0007C (Mulhern RWS) Q/A 226-30. Ms. Mulhern has not opined on a more reliable approach. Ms. Mulhern also opines that some models of some respondents' accused products have no domestic inventory. *Id.* Q/A 230. However, a cease and desist order does not require a product-by-product calculation where, as here, there are hundreds of accused products, and it would be unworkable for the Commission and Customs to differentiate among them.

a. FS

FS's accused products compete with the EDGE DI Products. *See* CX-0003C (Schoettelkotte WS) Q/A 191; CX-0004C (Hicks WS) Q/A 58. FS has significant domestic operations that include a 44,000 square foot warehouse in Delaware with almost 2,000 different parts that provides prompt delivery of products to domestic customers. *See* CX-0003C (Schoettelkotte WS) Q/A 192, 37-38. FS's sales and inventory data relating to the accused products indicate that its domestic inventory is sufficient to satisfy approximately 15-19 months of sales of chassis and modules. *See* CX-0003C (Schoettelkotte WS) Q/A 197; CX-1838C (FS Inventory Amended Ex. 7.2). This inventory is commercially significant, and coupled with FS's significant domestic business operations, supports issuance of a cease and desist order against FS. *See* CX-0003C (Schoettelkotte WS) Q/A 198.

FS argues it stopped selling its accused products when it received Corning's complaint, and that it had no inventory of accused chassis in May 2020. *See* RX-0007C (Mulhern RWS) Q/A 204, 234. As Mr. Schoettelkotte testified, this is inconsistent with FS data showing that it had an inventory of nearly 800 chassis worth over \$100,000 just

435

days before the complaint was filed. Mr. Schoettelkotte therefore considered the data from just before the complaint in his analysis of months of chassis sales for FS. CX-0003C (Schoettelkotte WS) Q/A 195. Also, the testimony of FS's witnesses about the date that it stopped selling products was subject to impeachment at the hearing, where Mr. Zhang first testified that information about the accused products was "removed from [the FS] web site . . . close in time to when FS.com, Inc. received the complaint." However, when confronted with a July download of a web page, he stated that he did not know whether the page was still on the website. *See* Zhang Tr. 583-584.

b. Leviton

Leviton's accused products compete with Corning's DI Products. *See* CX-0003C (Schoettelkotte WS) Q/A 200; CX-0004C (Hicks WS) Q/A 58. Leviton has significant business operations in the United States, including two manufacturing facilities and two distribution centers that maintain inventory of accused products, as well as a wide network of domestic distributors. *See* CX-0003C (Schoettelkotte WS) Q/A 201, 41. Leviton's sales and inventory data relating to the accused products indicate that its current domestic inventory is sufficient to satisfy approximately one month of sales of chassis. *See* CX-0003C (Schoettelkotte WS) Q/A 204; CX-1827C (Leviton Inventory Ex. 7.3). This inventory is commercially significant, and coupled with Leviton's significant domestic business operations, supports a cease and desist order against Leviton. *See* CX-0003C (Schoettelkotte WS) Q/A 205.

c. Panduit

Panduit's accused products compete with Corning's DI Products. See CX-0003C

436



(Schoettelkotte WS) Q/A 207; CX-0004C (Hicks WS) Q/A 58. Panduit has significant business operations in the United States, including a large warehouse in Illinois that maintains an inventory of thousands of accused products and a network of distributors that maintains an unspecified inventory of accused products and accounts for close to 99% of Panduit's sales. *See* CX-0003C (Schoettelkotte WS) Q/A 208-09, 45.

. Id. Q/A 213; CX-1828C

(Panduit Inventory Amended Ex. 7.4).

See CX-0003C (Schoettelkotte WS) Q/A 212. This inventory is commercially significant, and coupled with Panduit's significant domestic operations, supports a cease and desist order against Panduit. *Id.* Q/A 214.

2. Defaulting Respondents

Section 337(g)(l) authorizes the Commission to issue cease and desist orders

against defaulted respondents. 19 U.S.C. § 1337(g)(l); see Certain Hand Dryers and

Housing for Hand Dryers, Inv. No. 337-TA-1015, Comm'n Op. at 9-10 (Oct. 30, 2017)

("Hand Dryers"). This provision provides:

If—

(A) a complaint is filed against a person under this section;

(B) the complaint and a notice of investigation are served on the person;

(C) the person fails to respond to the complaint and notice or otherwise fails to appear to answer the complaint and notice;

(D) the person fails to show good cause why the person should not be found in default; and

437

(E) the complainant seeks relief limited solely to that person;

the Commission shall presume the facts alleged in the complaint to be true and shall, upon request, issue an exclusion from entry or a cease and desist order, or both, limited to that person unless, after considering the effect of such exclusion or order upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, the Commission finds that such exclusion or order should not be issued.

19 U.S.C. § 1337(g)(1).

As discussed above, the Commission has personal jurisdiction over all the respondents in this investigation. Nevertheless, "[i]n determining whether the issuance of a CDO against a defaulted respondent is appropriate, the Commission considers whether the defaulted respondent maintains commercially significant inventories in the United States or has significant domestic operations that could undercut the remedy provided by an exclusion order." *See Hand Dryers*, Inv. No. 337-TA-1015, Comm'n Op. at 10; *Certain Electric Skin Care Devices, Brushes and Chargers Therefore, and Kits Containing the Same*, Inv. No. 337-TA-959, Comm'n Op. at 21-31 (Feb. 13, 2017) ("*Skin Care Devices*") (discussion of statutory provision and Commission precedent). The Commission's practice recognizes that inasmuch as a defaulted respondent has chosen not to participate in the investigation, complainants are not able to obtain detailed information in discovery to support a request for a cease and desist order. *See Hand Dryers*, Inv. No. 337-TA-1015, Comm'n Op. at 10.

As to domestic respondents found in default under section 337(g)(1), the Commission has consistently inferred the presence of commercially significant inventories in the United States and granted complainant's request for relief in the form of a cease and desist order. *See Hand Dryers*, Inv. No. 337-TA-1015, Comm'n Op. at 24

438

Case: 22-1228 Document: 29 VERSO 629 Filed: 04/25/2022 Confidential Material Omitted on this Page

(citing Certain Agricultural Tractors, Lawn Tractors, Riding Lawnmowers, and

Components Thereof, Inv. No. 337-TA-486, Comm'n Op. at 17-18 (July 14, 2003));

Certain Mobile Device Holders and Components Thereof, Inv. No. 337-TA-1028,

Comm'n Op. at 24 (Mar. 22, 2018).

As to defaulting respondents, Corning argues, inter alia:

Cease-and-desist orders are further warranted against defaulting respondents Huber + Suhner, Inc., Huber+Suhner AG, TARLUZ, Anfkom, and Wulei Bonelinks. When a respondent defaults, "the Commission shall presume the facts alleged in the complaint to be true and shall, upon request, issue an exclusion from entry or a cease and desist order, or both, limited to that person." 19 U.S.C. § 1337(g)(1); *see Certain Electric Skin Care Devices, Brushes and Chargers Therefor*, Inv. No. 337-TA-959, Comm'n Op. at 28 (Feb. 13, 2017).

Compl. Br. at 291.

The Staff agrees. See Staff Br. at 231-32.

a. Domestic Defaulting Respondent

Huber + Suhner, Inc. is a Delaware corporation with a principal place of business in Delaware. *See* Complaint, ¶ 19. Huber + Suhner, Inc. filed a notice of default on April 29, 2020 (EDIS Doc. ID No. 709180), the administrative law judge issued an ID finding Huber + Suhner, Inc. in default (Order No. 8 (June 9, 2020)), and the Commission did not review the ID (Comm'n Notice, June 22, 2020). The complaint and its exhibits show sufficient U.S. activities for a cease and desist order. Specifically, complaint Exhibits 94 (H+S Chassis Webpage) and 95 (H+S Module Webpage) are images of H+S's U.S. website, showing that it advertises the accused products and provides a customer service email and phone number for Huber + Suhner, Inc. in the United States. Complaint Exhibit 96 (H+S Sales Contact Webpage) is another image of

439

H+S's U.S. website, showing that it gives a physical address in Charlotte, NC, as well as an email, phone number, and website for Huber + Suhner, Inc. customer service. Complaint Exhibit 93 (H+S Press Release) is a press release discussing H+S displaying the accused products at a trade show in the United States. Complaint Physical Exhibit 19 (IANOS High-Density Connectivity System Video) is a video advertising the features of the Accused H+S Products.

b. Foreign Defaulting Respondents

For foreign companies that default, "the Commission has examined allegations in the complaint that foreign defaulting respondents maintain commercially significant U.S. inventories and/or are engaging in significant commercial business operations in the United States supported by available circumstantial evidence of online offers for sale, sales, and distribution of infringing products (as well as corresponding supporting documents relating to those sales) by foreign defaulting respondents demonstrating such significant domestic presence." *Certain Electric Skin Care Devices*, Inv. No. 337-TA-959, Comm'n Op. at 30 (*citing Certain Digital Photo Frames & Image Display Devices & Components Thereof*, Inv. No. 337-TA-807, Comm'n Op. at 10-11 (March 27, 2013)).

As set forth below, the complaint and its exhibits show that each defaulting respondent has domestic activities that support a cease and desist order.

Huber + Suhner AG

Huber+Suhner AG is a Swiss corporation with a principal place of business in Switzerland. *See* Complaint, ¶ 18. Huber+Suhner AG filed a notice of default on April 29, 2020 (EDIS Doc. ID No. 709180), the administrative law judge issued an ID finding Huber + Suhner, Inc. in default (Order No. 7 (June 9, 2020)), and the Commission did not

440

Case: 22-1228 Document: 29 VE Regeneration 631 Filed: 04/25/2022 Confidential Material Omitted on this Page

review the ID (Comm'n Notice, June 22, 2020). The complaint and its exhibits show sufficient U.S. activities for a cease and desist order. Specifically, complaint Exhibits 91 (H+S U.S. Trademark Application) and 92 (H+S Trademark Status) show that Huber+Suhner AG applied for a trademark in the United States for the name of the accused products, "IANOS," in 2015 and that the trademark remains active today. Complaint Exhibit 93 (H+S Press Release) is a press release discussing H+S displaying the accused products at a trade show in the United States. Complaint Exhibit 97 (H+S Catalog Excerpt) is a publicly available H+S product catalog advertising the features of the Accused H+S Products.

<u>TARLUZ</u>

TARLUZ is a Chinese company with its principal place of business in China. *See* Complaint, ¶ 23. TARLUZ failed to respond to the complaint or to discovery, and the administrative law judge issued an ID finding it in default on August 21, 2020 (Order No. 13), which was not reviewed by the Commission (Comm'n Notice, Sept. 15, 2020). The complaint and its exhibits show sufficient U.S. activities for a cease and desist order. Specifically, complaint Exhibit 139 (CX-0637 (TARLUZ Invoices and Shipping Info)) shows a sale and importation of the Accused TARLUZ Products in the United States, including showing unit prices that are multiple orders of magnitude lower than the DI products. Complaint Exhibits 140 (CX-0638 (TARLUZ Prod. Catalog)) and 141 (TARLUZ Chassis Webpage) show a publicly available price list and advertisements for the accused products from TARLUZ's U.S. website.

<u>Anfkom</u>

Anfkom is a Chinese company with a principal place of business in China. See

441

Case: 22-1228 Document: 29 VERSO 632 Filed: 04/25/2022 Confidential Material Omitted on this Page

Complaint, ¶ 24. Anfkom failed to respond to the complaint or discovery, and the administrative law judge issued an ID finding it in default on August 21, 2020 (Order No. 13), which was not reviewed by the Commission (Comm'n Notice, Sept. 15, 2020). The complaint and its exhibits show sufficient U.S. activities for a cease and desist order. Specifically, complaint Exhibit 74 (CX-0581 (Anfkom Invoice)) shows a sale and importation of the Accused Anfkom Products in the United States, including showing unit prices that are multiple orders of magnitude lower than the DI products. Complaint Exhibits 75 (CX-0582, Anfkom Chassis Webpage) and 76 (CX-0583 (Anfkom Module Webpage)) show publicly available advertisements for the accused products from Anfkom's U.S. website, including links for "Live Chat" and "Send Inquiry."

Wulei Bonelinks

Wulei Bonelinks is a Chinese company with a principal place of business in China. *See* Complaint, ¶ 28. Wulei Bonelinks failed to respond to the complaint or discovery, and the administrative law judge issued an ID finding it in default on August 21, 2020 (Order No. 13), which was not reviewed by the Commission (Comm'n Notice, Sept. 15, 2020). The complaint and its exhibits show sufficient U.S. activities for a cease and desist order. Specifically, complaint Exhibit 154 (Wulei Bonelinks Invoice and Shipment Info) shows a sale and importation of the Accused Wulei Bonelinks Products in the United States, including showing unit prices that are multiple orders of magnitude lower than the DI products. Complaint Exhibits 155 (CX-0649 (Alibaba.com Wulei Bonelinks Webpage-1)) and 156 (Alibaba.com Wulei Bonelinks Webpage-2) show advertisements for the accused products on Alibaba.com, accessed in the United States, indicating that the products could "Ship to United States" in 3-4 days to 7 days, and with

442

Case: 22-1228 Document: 29 VERSON 633 Filed: 04/25/2022 Confidential Material Omitted on this Page

prices as low as \$13.50, compared to several hundred dollars for the DI products.

* * *

Accordingly, should a violation be found, the administrative law judge recommends that the Commission issue a cease and desist order as to the respondents discussed above.

E. Bond

Pursuant to section 337(j)(3), the administrative law judge and the Commission must determine the amount of bond to be required of a respondent, during the 60-day Presidential review period following the issuance of permanent relief, in the event that the Commission determines to issue a remedy. The purpose of the bond is to protect the complainant from any injury. 19 U.S.C. § 1337(j)(3); 19 C.F.R. §§ 210.42(a)(1)(ii), 210.50(a)(3).

When reliable price information is available, the Commission has often set bond by eliminating the differential between the domestic product and the imported, infringing product. *Certain Microsphere Adhesives, Processes for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. at 24 (1995). In other cases, the Commission has turned to alternative approaches, especially when the level of a reasonable royalty rate could be ascertained. *Certain Integrated Circuit Telecommunication Chips and Products Containing Same, Including Dialing Apparatus*, Inv. No. 337-TA-337, Comm'n Op. at 41 (1995). A 100 percent bond has been required when no effective alternative existed. *Certain Flash Memory Circuits and Products Containing Same*, Inv. No. 337-TA-382, USITC Pub. No.

443

Case: 22-1228 Document: 29 VERSO 634 Filed: 04/25/2022 Confidential Material Omitted on this Page

3046, Comm'n Op. at 26-27 (July 1997) (a 100% bond imposed when price comparison was not practical because the parties sold products at different levels of commerce, and the proposed royalty rate appeared to be *de minimis* and without adequate support in the record).

Corning argues, inter alia:

As Mr. Schoettelkotte testified, for each of the participating Respondents, a bond based on the price differential is appropriate and is necessary to protect Corning from injury during Presidential Review. CX-0003C (Schoettelkotte WS) Q/A 219. Because here are no established royalty rates for the Asserted Patents, a bond based on a reasonable royalty would not be appropriate. CX-0004.1C (Hicks WS Errata) Q/A 83-84;⁵⁷ RX-0007C (Mulhern RWS) Q/A 267.

Mr. Schoettelkotte and Mr. Hicks testified that Respondents' Accused Products directly compete with the EDGE DI Products in the U.S., and that Corning has both lost sales to Respondents and had to lower prices of the EDGE DI products to compete. CX-0003C (Schoettelkotte WS) Q/A 217, 219; CX-0004C (Hicks WS) Q/A 63-65. Mr. Schoettelkotte further explained that Respondents advertise and sell their products at a price that is intended to undercut the pricing of the DI Products. CX-0003C (Schoettelkotte WS) Q/A 217. Mr. Schoettelkotte accordingly determined the appropriate bond by calculating the price differential between each Respondent's accused chassis and modules and the EDGE DI chassis and modules, as set forth in CX-1840C (Summary of Price Differential Amended Ex. 8.1).

Ms. Mulhern argues that differences in product characteristics, pricing by distribution channel, and differing sales volumes makes the use of price differential impractical. RX-0007C (Mulhern RWS) Q/A 265. But Ms. Mulhern does not dispute that Respondents' prices are significantly lower than Corning's, or that Corning has lowered prices and lost sales due to this competition. Nor does Ms. Mulhern offer any alternative bond calculations. Thus, while Corning maintains that Mr. Schoettelkotte's price differential analysis is appropriate, the alternative

⁵⁷ Corning recently entered into licenses with former Respondent AFL and with CommScope. However, these licenses do not inform the bond analysis because they do not contain the type of "royalty" the Commission considers relevant. Instead, the licenses are complex business arrangements in which both parties obtain value from various interrelated provisions.

Case: 22-1228 Document: 29 VERSO 635 Filed: 04/25/2022 Confidential Material Omitted on this Page

should be a bond of 100%, given the need to protect Corning from further harm due to Respondents' pricing, the lack of an appropriate standard royalty rate, and Respondents' failure to offer an alternative. *See Certain Flash Memory Circuits*, Inv. No. 337-TA-382, Comm'n Op. at 26-27.

Compl. Br. at 295-96.

Respondents' entire argument on the appropriate bond rate is as follows:

Complainant fails to show any amount is needed to offset any purported injury. Schoettelkotte Tr. 133:6-12. Complainant's price differential analysis is flawed. RX-0007C (Mulhern RWS) Q/A 246-256. Complainant failed to provide information regarding its licenses to Respondents' competitors. Complainant has not met its burden of showing that a bond is warranted, thus no bond should be imposed. *See Magnetic Tape Cartridges*, Inv. No. 337-TA-1058, Comm'n Op. at 73-74 (imposing no bond upon failure to show bond is warranted).

Resps. Br. at 300.

The Staff argues, inter alia:

In the Staff's view, a bond rate of zero percent of entered value is not "sufficient to protect the complainant from any injury." See 19 C.F.R. § 210.50(a)(3). At the same time, Complainant's proposed matrix of multiple bond rates per Respondent may be administratively unworkable in this particular investigation, given the number of products and Respondents involved. The Staff does not object to the particular bond rates suggested by Complainant, but suggests that if the proposed matrix is found to be unmanageable, then a single bond rate of 100 percent would be appropriate. In investigations where available pricing information is inadequate, the Commission may set the bond at 100 percent of entered value. See, e.g., Certain Flash Memory Circuits and Products Containing Same, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm'n. Op. at 26-27 (July 1997); Certain Neodymium-Iron-Boron Magnets, Magnet Alloys, Inv. No. 337-TA-372, USITC Pub. 2964, Comm'n Op. at 15 (May 1996). Accordingly, the Presidential review period bond should either be set according to Complainants' matrix or, if this is found to be unworkable, in the amount of 100 percent of entered value.

Staff Br. at 234.

Corning and the Staff persuasively argued that a bond is required in this instance

to protect Corning from injury during the Presidential review period.

445



Corning provides a thorough analysis for the five participating respondents and the defaulting respondents. *See* Compl. Br. at 296-99. Corning argues that the Commission should set two separate bond rates for each respondent, one for chassis and one for modules, based on a comparison of that respondent's weighted average sales prices to those of complainant. Mr. Schoettelkotte testified that using this approach, he calculated the following bond rates:

Respondent	Chassis Rate	Module Rate
FS	262.5%	239.9%
Leviton	72.5%	N/A
Panduit	43.9%	20.7%
Siemon	N/A	82.4%
Wirewerks	N/A	4.4%
All Other Imports	100%	100%

Complainant's Suggested Bond Rates

See *id.*; Staff Br. at 233 citing (CX-0003C (Schoettelkotte WS) Q/A 221, 228-53; CX-1840C (summary of price differentials)).

In investigations where, as here, "there is no reliable pricing information because the respondents have defaulted and failed to participate in discovery," the Commission typically sets the bond at 100% of the value of the infringing products. *Certain Ink Cartridges & Components Thereof*, Inv. No. 337-TA-946, Comm'n Op. at 18 (June 29, 2016); *Certain Pocket Lighters*, Inv. No. 337-TA-1142, Comm'n Op. at 23-24.

Accordingly, the administrative law judge recommends the bond rates calculated by Corning's expert.



XII. Order

To expedite service of the public version of this document, the parties shall file a joint proposed public version, on the date and in the manner required by Order No. 30.

Shaw

David P. Shaw Administrative Law Judge

Issued: March 23, 2021