IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

GREATBATCH LTD.,	:	
	:	
Plaintiff,	:	
	:	
v.	:	C.A. No. 13-723-LPS
	:	
AVX CORPORATION and	:	
AVX FILTERS CORPORATION,	:	
	:	
Defendants.	:	
	:	
	:	
	:	

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MEMORANDUM OPINION

March 20, 2015
Wilmington, Delaware

STARK, U.S. District Judge:

On April 25, 2013, Plaintiff Greatbatch Ltd. ("Greatbatch" or "Plaintiff") filed suit against AVX Corporation and AVX Filters Corporation (collectively, "AVX" or "Defendants") (C.A. No. 13-723-LPS D.I. 1) alleging infringement of U.S. Patent No. 5,905,627 ("the '627 patent"). On February 7, 2014, Greatbatch filed its Amended Complaint (D.I. 57) also alleging infringement of U.S. Patent Nos. 5,333,095 ("the '095 patent"), 6,765,779 ("the '779 patent"), 6,888,715 ("the '715 patent"), 7,035,077 ("the '077 patent"), and 7,327,553 ("the '553 patent") (collectively, "the patents-in-suit"). The patents-in-suit generally relate to feedthrough filter assemblies for passing signals through a housing or bulkhead and protecting the circuitry within against high frequency electromagnetic interference ("EMI").

Pending before the Court is the issue of claim construction of various disputed terms of the patents-in-suit. The parties completed briefing on claim construction on October 30, 2014. (D.I. 121, 124, 152, 155) The parties also submitted technology tutorials (D.I. 87, 89) and Greatbatch provided expert declarations (D.I. 122, 156). The Court held a *Markman* hearing on December 19, 2014. (*See* D.I. 219) (Transcript) ("Tr.") Pursuant to the Court's direction at the conclusion of the hearing, the parties jointly submit a letter on January 9, 2015 indicating where the parties had managed to narrow some of the disputed issues. (D.I. 218)

I. LEGAL STANDARDS

The ultimate question of the proper construction of the patent is a question of law. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837 (2015) (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388-91 (1996)). "It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude."

Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal quotation marks omitted). "[T]here is no magic formula or catechism for conducting claim construction." *Phillips*, 415 F.3d at 1324. Instead, the court is free to attach the appropriate weight to appropriate sources "in light of the statutes and policies that inform patent law." *Id.*

"[T]he words of a claim are generally given their ordinary and customary meaning . . . [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1312-13 (internal citations and quotation marks omitted). "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted). The patent specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

While "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Phillips*, 415 F.3d at 1314. Furthermore, "[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are normally used consistently throughout the patent . . . ." *Id.* (internal citation omitted).

It is likewise true that "[d]ifferences among claims can also be a useful guide . . . . For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Id.* at 1314-15 (internal citation omitted). This "presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one

party is urging that the limitation in the dependent claim should be read into the independent claim." *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003).

It is also possible that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. It bears emphasis that "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (internal quotation marks omitted), *aff'd*, 481 F.3d 1371 (Fed. Cir. 2007).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is "intrinsic evidence," "consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

In some cases, "the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at

841. Extrinsic evidence "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the court in determining the meaning of a term to those of skill in the relevant art because such dictionaries "endeavor to collect the accepted meanings of terms used in various fields of science and technology." *Phillips*, 415 F.3d at 1318. In addition, expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of ordinary skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Id.* Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, while extrinsic evidence "may be useful" to the court, it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

Finally, "[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." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that "a claim interpretation that would exclude the inventor's device is rarely the correct interpretation." *Osram GmbH v. Int'l Trade Comm'n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007).

II. CONSTRUCTION OF DISPUTED TERMS[1]

1. "feedthrough filter capacitor" / "feed-through filter capacitor" / "feedthrough capacitor" ['627 patent, claims 1, 2, 7, 11, 19; '095 patent, claim 1; '779 patent, claim 1; '715 patent, claims 1, 16, 31, 38]

Greatbatch's Proposed Construction	AVX's Proposed Construction
"a capacitor designed for use in combination with an electrical connector that connects electrical signals through the housing or case of an electronic instrument, where the capacitor contains sets of multiple electrode plates surrounded by an insulative dielectric material, and provides frequency filtering by providing a low impedance shunt to the device housing for high frequency electrical signals while permitting low frequency electrical signals to pass through"	"a capacitor designed for use in combination with an electrical connector that connects electrical signals through a housing or case and filters high frequency electrical signals while permitting low frequency electrical signals to pass through"
Court's Construction: "a capacitor designed for use in combination with an electrical connector that connects electrical signals through a housing or case and filters high frequency electrical signals while permitting low frequency electrical signals to pass through"	

The parties dispute whether a feethrough capacitor must (i) include "multiple sets of electrodes" and (ii) provide "a low impedance shunt."[2] Neither the claims nor the specification support reading either limitation into the term "feedthrough filter capacitor." Given that claim 1

[1]Pursuant to the parties' joint letter narrowing the issues in dispute, the Court has incorporated amended constructions for several of the disputed terms contained therein. (*See* D.I, 218) The Court also adopts the jointly proposed constructions for the eight undisputed terms identified by the parties (*see* D.I. 109 (Joint Claim Construction Chart) ("JCCC") at 44-46), finding them consistent with the intrinsic evidence.

[2]Formerly, the parties also disputed whether the term is limited to a particular type of insulative "ceramic" material. (*See* D.I. 131, 155) Greatbatch has now amended its construction to require only "dielectric" material. (*See* D.I. 218 at 3) AVX represented that with such a change, it would no longer dispute this limitation. (Tr. at 38) However, AVX's amended construction does not include the phrase. (*See* D.I. 218 at 3) To the extent a dispute remains, the Court finds the claims do not expressly recite nor inherently imply that the term is limited to a particular type of material.

itself contains another limitation expressly requiring the claimed "capacitor" has "first and second sets of electrode plates," the claim language in context strongly suggests that the phrase "feedthrough capacitor" alone does not inherently contain such a requirement. *See Phillips*, 415 F.3d at 1314 ("[T]he claim in this case refers to 'steel baffles,' which strongly implies that the term 'baffles' does not inherently mean objects made of steel."). Likewise, including a requirement of how the filtering occurs – i.e. via a "low impedance shunt" – ignores that elsewhere the claims themselves recite the structure required to electrically connect the capacitor to allow the signals to go to ground. (*See, e.g.*, '627 patent at 11:5-8) Indeed, the term "low impedance shunt" does not appear anywhere in the claims or specification. Greatbatch relies only on what appear to be some ***present-day*** AVX technical publications and an expert declaration to support its position that the Court should read this limitation into the disputed term. (*See* D.I. 121 at 5-6 (citing *AVX EMI Filters* publication); D.I. 122 (Declaration of Steven M. Pilgrim) ("Pilgrim Decl.") at ¶¶ 16-30) The Court declines to do so.[3]

[3]To support its position on this particular point, Greatbatch's expert opinion itself relies primarily on additional extrinsic evidence, failing to discuss the surrounding language of the claims of the '627, '779, and '715 patents or acknowledge the structure imposed by other parts of the claims for shunting or allowing the signal to go to ground.

2. "conductive ferrule" ['627 patent, claims 1, 16, 26; '095 patent, claim 5; '779 patent, claim 1; '715 patent, claims 5, 31; '077 patent, claim 35; '553 patent, claim 1]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
"A conductive structure having: (1) a generalized peripheral shape of a metal ring, cap, or sleeve; (2) at least one aperture through which a terminal pin extends; (3) and structure for mounting the ferrule to the conductive housing of an electronic instrument"	"conductive structure containing an aperture through which a connection is directed"
Court's Construction: "conductive structure containing an aperture through which a connection is directed"	

It is undisputed that "conductive ferrule" is a conductive structure having at least one aperture through which a terminal pin extends (*see* D.I. 124 at 9; D.I. 218 at 1), but the parties disagree over whether the claimed ferrule must include (i) a generalized peripheral shape[4] and (ii) structure for mounting the ferrule to the conductive housing of an electronic device.

Greatbatch's first limitation, requiring the ferrule to have a generalized peripheral shape, is vague and unsupported by the broad claim language or the specification. (*See, e.g.*, '627 patent at claims 1, 16, 26) (making no mention of peripheral shape or any particular contour for ferrule) Furthermore, much of Greatbatch's reasoning for the need for a peripheral shape conforming to the connection (e.g., terminal pin) is subsumed by the now undisputed fact the ferrule requires "an aperture." (*See* Tr. at 50-51) ("[The ferrule] can be a thinner or thicker shape, but it has to have the aperture, and that aperture then creates a perimeter, a periphery around the aperture that

[4]Greatbatch concedes ferrules can be rectangular or have other non-cylindrical shapes, but contends the structure must have "some peripheral shape so that it surrounds the terminal pins being supported." (D.I. 155 at 7)

just has to match the opening in the device.") Greatbatch also dropped its original contention that "conductive ferrule" includes an added limitation in which the ferrule must support the terminal pin. (*Id.* at 23-24) (indicating limitation properly arises instead in the "means for sealing," or "terminal pin mounting means," or "insulator means" terms) This limitation might have otherwise supported the need for a closely fitting peripheral shape conforming to the shape of the pin. Therefore, the Court finds its conclusion is further reinforced by the undisputed aspects of the intrinsic evidence.

With regard to the second contested limitation, Greatbatch's proposed construction once more ignores the broad claim language and instead reads in a "structure for mounting" limitation present in some claims (*see* '627 patent at claim 16 ("conductive ferrule ***adapted for mounting onto the substrate***") (emphasis added)), but not others (*id.* at claim 1 ("conductive ferrule through which the terminal pin passes . . . .")).

Greatbatch insists AVX's construction is overbroad because it would encompass the device housing itself. (*See id.* at 4:6-13) (disclosing "a conductive substrate," such as "a conductive pacemaker housing," with "means for mounting the ***terminal pin for passage through an opening formed in the conductive substrate*** . . . .") (emphasis added) Greatbatch fails to explain why the claims do not cover embodiments where the ferrule is formed from part of the device housing. Indeed, claim 1 only recites a feedthrough filter capacitor assembly, and makes no mention of the need for a ***separate*** device housing. (*Id.* at claim 1) Greatbatch has failed to provide a reason why construing this term to cover embodiments where the ferrule is formed from such a housing would somehow read out existing claim language or render the claim language meaningless. Accordingly, the Court adopts AVX's construction.

3. "conductively coupled" / "in conductive relation" / "conductively coupling" / "conductively couples" ['627 Patent claims 1, 2, 7, 11, 19; '095 Patent claim 1; '779 Patent claim 1; '715 Patent claims 1, 16, 31, 38]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
"electrically connected by physical contact via a conductive medium that passes a broad spectrum of frequencies including direct current"	"coupled in a way that permits transmission of electrical signals"
Court's Construction: "electrically connected by physical contact via a conductive medium that passes a broad spectrum of frequencies including direct current"	

The core dispute between the parties is whether conductive coupling must be accomplished ***through physical contact*** or could also be achieved through capacitive coupling ***without physical contact***. When discussing conductive coupling, the specification evidences that a person of ordinary skill would understand that such electrical connections are made via physical connections, such as through conductive adhesive, solder, and braze. (*See e.g.*, *id.* at 4:58-62 ("A ceramic feedthrough capacitor is mounted at an inboard side of the terminal pin subassembly, with capacitor electrode plate sets coupled respectively to a ground pin and to active terminal pin(s) by conductive adhesive, soldering, brazing or the like."); *id.* at 8:1-5 ("[T]he conductive connection 62 between the terminal pins 32 and the ground lead 50 with the feedthrough filter capacitor 40 may be effected by any suitable means such as a solder or an electrically conductive thermosetting material or brazing."))[5] AVX points to no portion of the

[5]AVX misreads the word "between" in a similar passage in the specification of the '715 and '779 patents to argue that there is a "conductive connection" between the terminal pins and the ground lead even though they are not physically connected. (D.I. 124 at 13) However, in context, the word "between" is being used to describe the conductive connections in a ***physical, locational sense*** (i.e. placement between objects), rather than an ***electrical sense*** (i.e. electrical connections between components). ('715 patent at 19:53-57; '779 patent at 20:1-5)

intrinsic record showing that conductive coupling involves the distinct process of capacitive coupling,[6] but instead merely states that the patent does not describe the relationship between these concepts. (D.I. 152 at 7; *see also* Pilgrim Decl. at ¶¶ 36-37) (unchallenged expert testimony that conductive coupling concerns flow of electrical charge through physical connection, such as signals flowing from point A to B, through a wire) AVX's reliance on the absence of the phrase "capacitive coupling" here is unavailing where there is no other evidence – intrinsic or extrinsic – that a person of ordinary skill would understand the disputed term "conductive coupling" to encompass capacitive coupling.

[6]The patents are silent on "capacitive coupling." AVX leaves unrebutted Greatbatch's expert opinion that a person of ordinary skill would understand that capacitive coupling transmits an electrical signal from point A to point B ***without movement of electrical charge*** from point A to point B. (*See* Pilgrim Decl. at ¶¶ 19-20, 38, 39) That is, the insulative dielectric in a capacitor prevents the flow of electrical charge from one electrode to another. (*Id.* at ¶¶ 19, 38) Capacitive coupling transmits an electrical signal when an electrical charge on one electrode induces an equal but opposite electrical charge on the other electrode. (*Id.* at ¶¶ 20, 38)

4. "means for hermetically sealing passage of the terminal pin through the conductive ferrule" / "means for hermetically sealing passage of the terminal pin through the terminal pin mounting means" ['627 patent, claims 4, 25]

Greatbatch's Proposed Construction	AVX's Proposed Construction
Claimed Function: "hermetically sealing passage of the terminal pin through the conductive ferrule" Corresponding Structure: an insulator comprised of glass-fired or ceramic-based materials that surrounds and supports one or more terminal pins, and means for hermetically sealing disclosed in the specification of the '095 patent which is incorporated by reference into the '627 patent (1:54-56); and structural equivalents thereto[7]	Claimed Function: "hermetically sealing passage of the terminal pin" Corresponding Structure: an insulator comprised of highly stable alumina ceramic glass materials with a very low bulk permeability that surrounds and supports the terminal pin
Court's Construction: Claimed Function: "hermetically sealing passage of the terminal pin" Corresponding Structure: an insulator comprised of highly stable alumina ceramic glass materials with a very low bulk permeability that surrounds and supports the terminal pin	

The parties agree this is a means-plus-function limitation subject to 35 U.S.C. § 112, ¶ 6 and appear to have no genuine dispute over the claimed function.[8] The parties disagree on the

[7]The Court finds that Greatbatch's inclusion of the phrase "and structural equivalents thereto" is inappropriate because identification of corresponding structure includes only structure disclosed in the specification, and the question of statutory equivalents is a separate inquiry under § 112, ¶ 6 reserved for the finder of fact. *See Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1267 (Fed. Cir. 1999) (reciting test for statutory equivalents); *see also Pressure Products Med. Supplies, Inc. v. Greatbatch Ltd.*, 599 F.3d 1308, 1317 (Fed. Cir. 2010) ("Although many of the disclosed alternatives may well be determined to be structural equivalents permitted by section 112, paragraph 6 – a question of fact for the jury – these alternative methods of splitting or peeling cannot be treated as the disclosed structures for the removal means.").

[8]AVX clarified at the hearing that it agrees with Greatbatch's proposed function in the context of claims 4 and 25, but opted to present the broader phrase as it more accurately reflects the use of the "means for hermetically sealing" phrase across the other claim language. (*See* Tr.

corresponding structure in the specification. A structure disclosed in the specification qualifies as corresponding structure if the specification or the prosecution history "clearly links or associates that structure to the function recited in the claim." *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997).

As a threshold issue transcending several of the means-plus-function terms, the parties dispute whether a patentee can add "corresponding structure" by incorporating another U.S. patent by reference in the specification. The parties' briefing provides little clarity on this issue. However, several aspects of the case law are clear.

First, the specification of the patent-in-suit cannot rely on structure within non-patent prior art merely because the name of the prior art is "incorporated by reference." *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1381-82 (Fed. Cir. 1999) ("[T]he district court correctly held that structure supporting a means-plus-function claim under § 112, ¶ 6 must appear in the specification."); *see also Pressure Products Med. Supplies, Inc. v. Greatbatch Ltd.*, 599 F.3d 1308, 1317 (Fed. Cir. 2010) ("Trial courts cannot look to the prior art, identified by nothing more than its title and citation in a patent, to provide corresponding structure for a means-plus-function limitation.").

As for incorporating another U.S. patent by reference, *Default Proof Credit Card Sys.,*

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at 80-81) Claims 4, 15, and 25 all recite a function of "hermetically sealing passage of the terminal pin," and subsequent claim language varies as to where that passage occurs. In the context of claim 4 and 25, the hermetic sealing occurs "through the terminal pin mounting means," whereas in claim 15 hermetic sealing occurs "through the substrate opening." Greatbatch has not articulated how this approach raises a dispute. The specification does not suggest that the function of hermetically sealing changes in any way as the terminal pin passes through the different structures. Thus, to the extent there is a dispute, the Court adopts AVX's construction of the claimed function, as it is supported by the plain language of the claims and specification.

Inc. v. Home Depot U.S.A., Inc., 412 F.3d 1291, 1301 (Fed. Cir. 2005), addressed a related issue in the context of an indefiniteness analysis under § 112, ¶ 2. There, the Federal Circuit found "material incorporated by reference cannot provide the corresponding structure necessary to satisfy the definiteness requirement for a means-plus-function clause." *Id.* (holding "kiosk" did not constitute structure for "means for dispensing," despite expert's understanding that prior art Muehlberger patent disclosed "kiosks," because of failure to explain how kiosk could be gleaned from specification of patent-in-suit). *Default Proof* reasoned that "[t]he inquiry under § 112, ¶ 2, does not turn on whether a patentee has 'incorporated by reference' material into the specification relating to structure, but instead asks first 'whether structure ***is described in specification***, and, if so, whether one skilled in the art would identify the structure from that description.'" *Id.* (quoting *Atmel*, 198 F.3d at 1381) (emphasis added). Though the discussion of corresponding structure arose in the first phase of the related definiteness inquiry under § 112, ¶ 2, it follows from the Federal Circuit's reasoning in *Default Proof* that when examining the specification for corresponding structure, the Court is limited to what is actually described in the patent's specification.

However, most recently, the Federal Circuit in *Otto Bock HealthCare LP v. %20Ossur HF* stated, "*Atmel* only foreclosed the use of the content of a nonpatent publication incorporated by reference to add structure to a means-plus-function claim" and "did not purport to include U.S. patent applications." 557 F. App'x 950, 955 (Fed. Cir. 2014) (finding district court did not err in using patent-in-suit's reference to "a weight-actuated vacuum pump and shock absorber as disclosed in [the '274 application]" to construe term "means for maintaining a vacuum"). *Otto Bock* reasoned that 37 C.F.R. 1.57(d) "specifically envisions using a U.S. patent application

incorporated by reference to define structure for the purpose of 35 U.S.C. § 112, ¶ 6." *Id.* at 955-56.[9]

Turning to the written disclosure here, the '627 patent specification incorporates the '095 patent largely for the purpose of criticizing it. After describing some of the '095 patent's features generally, the specification states, "[w]ithstanding the high temperature and thermal stresses associated with the welding of a hermetically sealed terminal with a premounted ceramic feedthrough capacitor is very difficult to achieve with the '551, '095 and other prior art designs." ('627 patent at 3:17-21) Greatbatch offers no other intrinsic evidence or expert testimony indicating that a person of ordinary skill would understand the citations to the '095 patent – and the surrounding text of the '627 patent specification that criticize it – to be describing corresponding structure for the purposes of § 112, ¶ 6.

While 37 C.F.R. § 1.57(d)(3) allows for incorporation by reference for such a purpose, the controlling inquiry under § 112, ¶ 6 remains whether the specification "clearly links or associates" the structure to the claimed function. *Abbott Labs.*, 124 F.3d at 1424 ("[S]tructure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim."). Under certain circumstances, it is conceivable a patentee may need only make an "incorporation by reference" and do little more. However, when the specification incorporates another patent and proceeds to criticize the flaws of the prior art patent's structure for performing the very function

[9]Indeed, pursuant to 37 C.F.R. 1.57(d), U.S. patents and U.S. patent applications can be considered "essential material" necessary to "[d]escribe the structure, material, or acts that correspond to a claimed means or step for performing a specified function as required by 35 U.S.C. 112(f)." 37 C.F.R. § 1.57(d)(3).

later recited in the claims in means-plus-function format, the Court cannot conclude that this clearly links that structure to the claimed function. Hence, *Otto Bock* is distinguishable. The patent-in-suit in *Otto Bock* expressly linked the structure from the U.S. application incorporated by reference to performing the claimed "vacuum actuated" function. 557 F. App'x at 955. Here, the specification incorporates the '095 patent in large part for the purpose of criticizing it. As such, there is no link – not even an implicit one – between the criticized structures in the '095 patent and the claimed function here of "hermetically sealing passage of the terminal pin." Indeed, the specification suggests the structures in the '095 patent are not adequate to perform the claimed function. Merely saying the words "incorporation by reference" does not exempt the patentee from respecting the general notice function animating the requirements of § 112. Consequently, the structures recited in the '095 patent, which Greatbatch characterizes as including "an insulator comprised of glass-fired or ceramic-based materials," and "a conductive ferrule with a flange that is designed to be brazed or welded into the opening in the housing," do not constitute corresponding structure. (*See* D.I. 121 at 19-20) (citing '095 patent at 6:20-26)

Turning to the specification of the '627 patent, the parties agree the corresponding structure expressly found therein is an insulator that surrounds and supports the terminal pin, but dispute what types of materials make up the insulator. The specification discloses a "hermetic seal for medical implant (as well as space and military) applications is typically constructed of highly stable alumina ceramic or glass materials with very low bulk permeability." ('627 patent at 3:4-7) Accordingly, the Court adopts AVX's construction as it contains the proper corresponding structure clearly linked to the claimed function of "hermetically sealing."

5. "means for hermetically sealing passage of the terminal pin through the substrate opening" ['627 patent, claim 15]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "hermetically sealing passage of the terminal pin through the substrate opening" Corresponding Structure: an insulator comprised of glass-fired or ceramic-based materials, and a conductive ferrule with a flange that is designed to be brazed or welded into the opening in the housing; and any structural equivalents thereto	Claimed Function: "hermetically sealing passage of the terminal pin" Corresponding Structure: an insulator comprised of highly stable alumina ceramic glass materials with a very low bulk permeability that surrounds and supports the terminal pin
Court's Construction: Claimed Function: "hermetically sealing passage of the terminal pin" Corresponding Structure: an insulator comprised of highly stable alumina ceramic glass materials with a very low bulk permeability that surrounds and supports the terminal pin	

Once more, the parties dispute only the corresponding structure, and for the reasons stated for the previous term, the Court adopts AVX's proposed construction.

6. **"means for mounting the terminal pin for passage through an opening formed in the conductive substrate with the terminal pin and the substrate in non-conductive relation" ['627 patent, claims 11, 25]**

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation" Corresponding Structure: a conductive ferrule adapted for mounting in an opening in a housing (e.g., has a flange) and an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule; and any structural equivalents thereto	Claimed Function: "mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation" Revised Corresponding Structure: conductive ferrule and insulator that surrounds and supports the terminal pin from the ferrule
Court's Construction: Claimed Function: "mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation" Corresponding Structure: a conductive ferrule adapted for mounting in an opening in a housing (using a flange, or segmented planar radial perimeter and threads) and an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule	

The parties dispute whether one of the agreed corresponding structures identified in the specification – a conductive ferrule – must have a flange. The parties do not dispute the construction of the claimed function, which requires the terminal pin be mounted securely in relation to the conductive substrate – not just mounted to some free-floating entity – to enable "passage through an opening formed in the conductive substrate." (*Id.* at claims 11, 25) The conductive ferrule disclosed in the '627 patent as a means for mounting the terminal pin is itself mounted on a device housing using a flange to fully perform the claimed function. (*Id.* at Figs. 4, 5, 10, 14, 19 (depicting H flange); Figs. 16, 20 (depicting flange); Fig. 21 (threads and flange);

see also id. at 4:20-22) AVX essentially invites the Court to ignore this aspect of the claimed function and eliminates portions of the structure disclosed in the specification linked to fully performing the recited function. Accordingly, the Court largely adopts Greatbatch's construction.[10]

7. "insulator means for supporting the terminal pin from the ferrule in electrically insulated relation" ['627 patent, claims 16, 26]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "supporting the terminal pin from the ferrule in electrically insulated relation" Corresponding Structure: an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule; and any structural equivalents thereto.	Claimed Function: "supporting the terminal pin from the ferrule in electrically insulated relation" Corresponding Structure: an insulator that supports the terminal pin from the ferrule in electrically insulated relation
Court's Construction: Claimed Function: "supporting the terminal pin from the ferrule in electrically insulated relation" Corresponding Structure: an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule	

Once more, the parties agree this term is governed by § 112, ¶ 6 and agree on its claimed function. Originally, the parties disputed the corresponding structure. More precisely, Greatbatch included an insulator "comprised of glass fired or ceramic based materials," which prompted AVX to take the position that Greatbatch's construction goes too far in attempting to limit the insulator to hermetic insulators. Subsequently, at the *Markman* hearing, AVX

[10]The parties agree that the specification also identifies "a segmented planar radial perimeter, typically formed as a standard hex head, and adjacent threads" for attaching the conductive ferrule to the substrate. ('627 patent at 10:10-13)

represented that if Greatbatch struck the phrase regarding the materials of the insulator, it would no longer dispute Greatbatch's corresponding structure. (Tr. at 85) In the post-hearing joint letter to the Court, Greatbatch did strike the phrase, but AVX still presents a slightly different construction. (D.I. 218 at 7) To the extent a dispute remains, the Court now address the issue and adopts Greatbatch's construction.

There are two instances in the specification where such structures are clearly linked to preforming the function. First, "[a]n insulator 36-436 ***supports*** each conductive terminal pin 32-432 from the conductive ferrule 34-434 in electrically insulated relation, and the assembly of the terminal pin(s)." ('627 patent at 6:49-52 (emphasis added); *see also id.* at Figs. 5, 10, 14, 16, 19-21 (depicting insulator 36-436 ***surrounding*** terminal pin 32-432)) Second, the specification discloses "[t]he conductive terminal pins 32' and 32" are supported through the outer apertures by means of an insulator 36' and 36" (which also may be hermetic")." (*Id.* at 7:54-57; *see also id.* at Fig. 4 (depicting insulator 36' surrounding terminal pin 32')) Therefore, the Court adopts Greatbatch's construction as it properly identifies the corresponding structure consistent with these two disclosures in the specification.

8. "means for mounting said terminal pin for passage through an opening formed in a conductive substrate with said terminal pin and substrate in non-conductive relation" ['095 patent, claim 1]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation" Corresponding Structure: a conductive ferrule adapted for mounting in an opening in a housing (e.g. has a flange) and an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule; and any structural equivalents thereto	Claimed Function: "mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation" Corresponding Structure: a cylindrical conductive ferrule and an insulative mounting ring or bead that supports the terminal pin within the ferrule in a spaced nonconductive relation
Court's Construction: Claimed Function: "mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation" Corresponding Structure: a cylindrical conductive ferrule adapted for mounting in an opening in a housing (e.g. has a flange or shoulder) and an insulative mounting ring or bead that supports the terminal pin within the ferrule in a spaced nonconductive relation	

The parties agree this term is governed by § 112, ¶ 6. Furthermore, the parties have agreed that the claimed function requires: (a) supporting the terminal pin such that it passes through an opening in the conductive substrate, while (b) keeping the terminal pin and the substrate in non-conductive relation to one another. The parties dispute whether the corresponding structure disclosed in the specification includes (i) an insulative mounting ***ring or bead*** and, separately, whether the agreed upon conductive ferrule structure (ii) takes a ***cylindrical*** shape and/or (iii) includes a ***flange***.

In every instance of corresponding structure in the specification, a cylindrical conductive ferrule and an insulator ring or insulator bead work in tandem to achieve the claimed mounting

function. While the specification notes other shapes or configurations might be possible,[11] a cylindrical ferrule is the only such ***structure actually disclosed*** within the text of the specification as associated with this particular claimed function. ('095 patent at 3:27 ("a cylindrical conductive ferrule"); *id.* at 5:62 ("an outer cylindrical ferrule"); *id.* at 8:66-9:2; *id.* at Figs. 2-6, 9, 13, 17-21 (every illustration of a ferrule identified by the numbers 28, 128, 228, 328, and 428)) Relatedly, the disclosed insulator's "ring or bead" shape is clearly associated with the claimed function – enabling the insulator to conform to the shape of the cylindrical ferrule to fully accomplish the function of not only supporting "the terminal pin from the ferrule," but also keeping them "in non-conductive relation."[12] (*See, e.g.*, *id.* at Fig. 3, 5:64-66 ("The terminal pin 12 is supported within the ferrule 28 in spaced nonconductive relation, by means of an insulative mounting ring or bead 30."); *id.* at Figs. 13-16, 8:66-68, 9:1-2 ("The illustrative terminal pin subassembly has four parallel terminal pins 112 supported in insulative relation within a typically glass-based or ceramic based insulator ring 130 mounted in turn within a cylindrical conductive ferrule 128."); *id.* at Fig. 17, 9:37-38, Fig. 18, 9:57-60, Fig. 19, 10:20-23))

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[11] *See* '095 patent at 11:12-23 ("The improved feedthrough capacitor assembly of the present invention may thus be implemented in a variety of specific configurations . . . . [F]eatures of the disclosed forms may be interchanged to provide a terminal pin subassembly of any desired configuration adapted for mounting onto a device housing or the like, in combination with a feedthrough capacitor installed in operative relation with one or more terminal pins.").

[12] The patent also discusses the prior art using rings or beads. However, these structures are not as clearly associated with the claimed function in that they disclose keeping the ferrule and ***device housing*** in electrically insulated relation, but make no mention specifically of keeping the terminal pins and the ferrule in electrically insulated relation. (*See* '095 patent at 2:20-37) ("More specifically, the terminal pin subassembly is prefabricated to include one or more conductive terminal pins supported within the conductive ferrule by means of a hermetically sealed insulator ring or bead . . . with the conductive ferrule in electrical and hermetically sealed relation with the housing of the medical device.")

A flange or shoulder is also part of the recited structure. As discussed above, the undisputed claimed function of claim 1 inherently requires the terminal pin be mounted securely ***in relation*** to the conductive substrate – rather than being "mounted" to any free floating entity without reference to the substrate – to facilitate "passage through an opening formed in the conductive substrate." Therefore, to perform the claimed function, the mounting means itself must be fixed to some degree (i.e. not free floating) in relation to the substrate. The only structure disclosed in the '095 patent specification for fastening the conductive ferrule under these circumstances is either a flange or shoulder. (*Id.* at 9:65-68 ("The ferrule . . . includes outboard and inboard flanges 334 and 335 spaced apart sufficient to define an outwardly open circumferential groove to receive adjacent edges of the housing shells . . . ."); *id.* at 10:24-26 ("The ferrules 428 are adapted for mounting as by welding or brazing onto a subplate . . . ."); *id.* at Fig. 18 (depicting ferrule with flanges); *id.* at 6:13–17 ("[T]he preferred ferrule shape includes an outboard end segment 28' of expanded diametric size to define a radially outwardly projecting shoulder 34 sized to seat against an outboard surface of the housing 22 . . . .")) Accordingly, the Court construes the term to properly reflect this corresponding structure.

9. "means for hermetically sealing passage of said terminal pin through said substrate opening" ['095 patent, claim 4]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "hermetically sealing passage of said terminal pin through said substrate opening" Corresponding Structure: an insulator comprised of glass-fired or ceramic-based materials, and a conductive ferrule with a flange that is designed to be brazed or welded into the opening in the housing; and any structural equivalents thereto	Claimed Function: "hermetically sealing passage of said terminal pin through said substrate opening" Corresponding Structure: an insulative mounting ring or bead comprised of glass-fired or ceramic-based materials and a cylindrical conductive ferrule brazed or welded into the substrate opening
Court's Construction: Claimed Function: "hermetically sealing passage of said terminal pin through said substrate opening" Corresponding Structure: an insulative mounting ring or bead comprised of glass-fired or ceramic-based materials and a cylindrical conductive ferrule with a flange or shoulder that is designed to be brazed or welded into the opening in the housing	

Having agreed that the disputed term here is governed by § 112, ¶ 6 and that the claimed function should be construed as "hermetically sealing passage of said terminal pin through said substrate opening," the parties dispute the proper corresponding structure. These disputes are largely identical to those concerning the "means for mounting" term above.

As part of the disclosed structure for performing the "hermetically sealing" function, the specification once more only discloses configurations involving a ***cylindrical*** ferrule in concert with an insulative ***ring or bead***. (*Id.* at 5:64-6:4, 8:66-9:6) AVX concedes that one of the disclosed structures for forming the hermetic seal is composed of an insulative ring/bead and a cylindrical conductive ferrule, and fails to point to structure in the specification where either ***a flange or shoulder*** is not part of that ferrule involved in the hermetic seal. (*See id.* at 9:2-6

("The ferrule 128 includes a radially outwardly projecting flange 134 for secure attachment in a hermetically sealed manner, as by welding or brazing, to a conductive housing 22 of an implanted medical device . . . ."); *id.* at Figs. 13, 17) Furthermore, AVX's arguments that the flange is unnecessary to the claimed function are inapposite; in order for a hermetic seal to form, the ferrule must be held in place, which is achieved here by the flange or shoulder.

By insisting that the "hermetically sealing" function of dependent claim 4 could be performed with a ferrule that was not mounted with a flange/shoulder to keep it fastened to the housing, AVX disassociates the claimed function here from the integrated claimed apparatus recited in claim 4 and undercuts the separately required "mounting the terminal pin" function (required by claim 1, from which claim 4 depends), which necessarily relies on the flange or shoulder structure for keeping the ferrule in position to allow passage of the terminal pin through the opening. (*See id.* at claim 4) (requiring the "means for mounting said terminal pin" (in claim 1) include the presently disputed "means for hermetically sealing" that passage) *See also Phillips*, 415 F.3d at 1313-14 ("the surrounding words of the claim . . . must be considered" when determining the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention) (internal quotation marks omitted); *Lockheed Martin Corp. v. Space Sys./Loral, Inc.*, 324 F.3d 1308, 1319 (Fed. Cir. 2003) (courts use "ordinary principles of claim construction" to construe the claimed function).

10. "insulator means for supporting said terminal pin from said ferrule in electrically insulated relation" ['095 patent, claim 5]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "supporting the terminal pin from the ferrule in electrically insulated relation" Corresponding Structure: an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule; and any structural equivalents thereto	Claimed Function: "supporting the terminal pin from the ferrule in electrically insulated relation" Corresponding Structure: an insulative mounting ring or bead
Court's Construction: Claimed Function: "supporting the terminal pin from the ferrule in electrically insulated relation" Corresponding Structure: an insulative mounting ring or bead	

Having again agreed this term is governed by § 112, ¶ 6 and agreed on its claimed function, the parties dispute whether the corresponding structure includes "an insulative mounting ***ring or bead***," or any structure that "surrounds and supports one or more terminal pins." The agreed claimed function requires the insulator means (i) support the terminal pin from the ferrule, while also (ii) keeping the terminal pin and ferrule electrically insulated from one another. In every instance of corresponding structure in the specification, either an insulator ring or insulator bead is clearly associated with the claimed function, allowing the insulator to conform to the shape of the ferrule to accomplish this full function of both supporting the terminal pin from the ferrule, and keeping them in electrically insulated relation. (*See, e.g.*, '095 patent at Figs. 13-16, 8:66-9:2 ("The illustrative terminal pin subassembly has four parallel terminal pins 112 supported in insulative relation within a typically glass-based or ceramic based insulator ring 130 mounted in turn within a cylindrical conductive ferrule 128."); *id.* at Fig. 17,

9:37-38, Fig. 18, 9:57-60, Fig. 19, 10:20-23) Consequently, the Court adopts AVX's construction.

11. "adapted for" ['095 patent, claims 1, 9]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
"made for, designed for, or configured for"	"modified to include a structure or includes a modified structure"
Court's Construction: "made for, designed for, or configured for"	

Greatbatch appears to contest AVX's construction because it requires "modifying" the ferrule after it is first designed (imposing a limitation in a temporal sense), but AVX insists on its construction because it is concerned "adapted for" must include some sort of structure (imposing a structural limitation to prevent what it fears is pure functional claiming). The Court adopts Greatbatch's construction. AVX's construction, which would read in an additional "to include a structure" limitation, is unnecessary and not supported by the claim language. Claim 1 recites a "feedthrough filter" that is physically adapted for axial mounting – expressly imposing structure for this claim limitation. (*Id.* at claim 1) ("[A] ***feedthrough filter capacitor adapted for*** mounting axially at one outer side of said terminal pin mounting means and having a central opening formed therein for pass-through reception of said terminal pin.") (emphasis added) Likewise, claim 9 recites "a ***conductive ferrule adapted for*** mounting onto the substrate in a position extending through the substrate opening, said feedthrough filter capacitor being mounted onto said ferrule" (emphasis added). This is not functional claiming.

Accordingly, the Court adopts Greatbatch's proposed construction as it more closely aligns with the language of claims 1 and 9.

12. "second means for electrically connecting said second set of electrode plates to the substrate" ['095 patent, claim 12]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "electrically connecting said second set of electrode plates to the substrate" Corresponding Structure: solder, braze, or conductive adhesive establishing a conductive connection between the external metallization of the second set of electrode plates of the feedthrough filter capacitor and either (1) the housing; (2) the ferrule; or (3) subplate; and any structural equivalents thereto.	Claimed Function: "electrically connecting said second set of electrode plates to the substrate" Corresponding Structure: the combination of a metalized or silverized or plated metallic film and a conductive adhesive, solder, or braze
Court's Construction: Claimed Function: "electrically connecting said second set of electrode plates to the substrate" Corresponding Structure: solder, braze, or conductive adhesive establishing a conductive connection with the external metallization of the second set of electrode plates composed of a metalized or silverized or plated metallic film	

The first dispute here centers on what constitutes the corresponding structure performing the agreed claimed function in this means-plus-function element. Originally, both parties insisted that the opposing side's corresponding structure ("solder or braze" vs. "metalized or silverized or plated metallic film") was "unnecessary" to perform the claimed function. Now, AVX has agreed to include solder or braze as corresponding structure, but Greatbatch continues to assert that metalized film is unnecessary.

Under the controlling inquiry for § 112, ¶ 6, "a structure disclosed in the specification qualifies as a 'corresponding structure' if the specification or the prosecution history 'clearly links or associates that structure to the function recited in the claim.'" *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311-12 (Fed. Cir. 2012) (quoting *Abbott Labs.*, 124 F.3d at 1424). As

such, "[p]roper application of § 112 ¶ 6 generally reads the claim element to embrace distinct and alternative described structures for performing the claimed function. Specifically, '[d]isclosed structure includes that which is described in a patent specification, including any alternative structures identified.'" *Ishida Co. v. Taylor*, 221 F.3d 1310, 1316 (Fed. Cir. 2000) (quoting *Serrano v. Telular Corp.*, 111 F.3d 1578, 1583 (Fed. Cir. 1997)). In keeping, a court may "not import into the claim features that are unnecessary to perform the claimed function. Features that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations." *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1352 (Fed. Cir. 2003) (internal citation omitted). Thus, courts include ***alternative*** embodiments as corresponding structure so long as they are clearly associated with performing the claimed function, but do not read in ***additional features*** of that corresponding structure unnecessary for performing the function.[13]

Here, the parties each identify aspects of alternative embodiments that properly constitute corresponding structure. More precisely, the specification discloses either a "solder," "braze," or "conductive adhesive" working in tandem with the external "metallization" of the second set of electrode plates of the feedthrough filter capacitor to perform the claimed function:

> Similarly, the metallized surface 52 associated with the outer electrode plates 42 of the capacitor is connected electrically to the

[13] *See, e.g.*, *Acromed Corp. v. Sofamor Danek Grp., Inc.*, 253 F.3d 1371, 1382 (Fed. Cir. 2001) (refusing to "impermissibly import into the claim limitation ***specific dimensions*** of a preferred embodiment that are unnecessary to perform the claimed function of blocking effluence and restricting transverse movement") (emphasis added); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1308 (Fed. Cir. 1998) ("The specification of the '499 patent elaborates on the details of the preferred skid plate, more particularly defining the structure in ways unrelated to the recited function. These additional structural aspects are not what the statute contemplates as structure corresponding to the recited function.").

> inboard surface of the pacemaker housing 22 by means of an additional fillet 56 of conductive adhesive or the like. One preferred conductive adhesive comprises a curable polyimide adhesive loaded with conductive particles such as spheres or flakes, as described by way of example in U.S. Pat. No. 4,424,551, which is incorporated by reference herein. However, it will be understood that other conductive connecting means may be used, such as solder, braze or the like. Importantly, the adhesive beads 54, 56 establish an electrically conductive mounting of the capacitor 24 in a secured stable manner to the housing 22.

('095 patent at 7:28-42; *see also id.* at 3:50-54 ("The capacitor is mounted . . . preferably by means of a conductive adhesive or soldering or the like, for electrically connecting the capacitor electrode plate sets respectively to the terminal pin and to the pacemaker housing.")) The structure for the "metalized surface," "metalized surface film," or "metalization" surrounding the second set of electrode plates is disclosed as being either "metallized or silverized or plated metallic film." (*Id.* at 6:59-62) (". . . wherein these outer plates 42 are electrically connected to each other by an appropriate metallized or silverized or plated metallic film")

Greatbatch includes in its construction "(1) the housing; (2) the ferrule; or (3) subplate," none of which constitutes corresponding structure. Greatbatch has not meaningfully distinguished "the housing" as being anything but a type of "substrate." (*See id.* at 3:13-15) (describing housing of pacemaker as type of substrate) The disputed term here is a "second means" for "electrically connecting said second set of electrode plates ***to the substrate.***" (*Id.* at claim 12) Thus, the substrate is not disclosed structure for performing the "connecting" function but rather it is a component upon which the function is performed – i.e. it is one of two objects between which the connection is made by some other structure.

Likewise, the ferrule and subplate do not constitute corresponding structure. As a general

matter, the '095 patent specification makes little to no mention of the relationship between the capacitor and the ferrule, especially with regard to the substrate. While the ferrule is characterized as "conductive" throughout the written disclosure, and some embodiments describe it as being electrically connected to the substrate,[14] Greatbatch has not pointed to any portion of the specification that in turn establishes structure for a ***conductive*** relationship – direct physical contact between the two components or via some additional physically abutting structure – between the ferrule and the second set of capacitor plates. (*See id.* at 2:35-37) (". . . with the conductive ferrule in electrical and hermetically sealed relation with the housing of the medical device") Several figures, such as Figure 18, show the ferrule in physical contact with the capacitor, but nothing clearly links this physical relationship to "electrically connecting [the capacitor's] second set of electrode plates to the substrate." The same holds true for the subplate. (*See id.* at Fig. 19, 10:13-61) Corresponding structure is limited to the structure actually disclosed in the specification and under this standard neither the ferrule nor the subplate qualifies.

13. "oxide resistant conductive pad" ['779 patent, claims 1, 15, 25; '715 patent, claims 1, 10, 31]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
"an area of oxide-resistant conductive material"	"noble metal pad applied to an insulator via an unique metallization that has high malleability and very high adhesive strength"
Court's Construction: "a pad area of oxide-resistant conductive material"	

[14] *See* '095 patent at 6:20-25 ("The ferrule 28 is securely connected to the conductive housing 22, formed typically from titanium or titanium alloy, by means of a welded or brazed connection 38. Importantly, this connection 38 forms a high quality electrical connection between the ferrule 28 and the housing 22 . . . .")

The parties dispute whether the term is limited to (i) "noble metals" (ii) applied to an insulator via an "unique metallization."[15] The Court finds neither of these limitations are supported by the intrinsic evidence.

The claim language raises the presumption that "an oxide resistant conductive pad" in claim 1 of the '779 patent and claim 1 of the '715 patent are not so limited. "[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips*, 415 F.3d at 1315. Here, claim 4 of the '779 patent, which depends from claim 1, expressly claims a terminal assembly "wherein the oxide resistant conductive pad comprises a noble metal." (*See also* '715 patent at claims 3, 15) Likewise, claim 25 of the '715 patent, which depends from claim 1, recites a terminal assembly "wherein the oxide resistant conductive pad is applied through any one of the following: a soldering process, a physical vapor deposition process, an electroplating process, a plasma arc deposition process, an ion beam process, a chemical vapor deposition process, or a laser ablation process." (*See also* '779 patent at 19, 20, 21, 22, 23, 24) (claiming other process for applying oxide resistant conductive pad)

Attempting to rebut this presumption, AVX points to the passage mentioning the "present invention" in relation to "the novel integrated gold hermetic seal/bonding pad as described herein," reading it as requiring all "oxide resistant conductive pads" to include a "unique metallization" limitation:

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[15]Though Greatbatch's proposed construction uses the word "material," it appears not to dispute AVX's proposed construction of "pad," which is consistent with the language of the claim itself. (*See, e.g.*, '779 patent at claim 1) Therefore, the Court incorporates this structure into its construction.

> A unique challenge for formation of the novel bond pads of the present invention is that they are formed as an integral part of the hermetic seal joint. This requires a relatively large amount of gold braze material (or other noble metal) to be used. In prior art EMI filtered human implant hermetic seals, the volume of braze material is by design relatively small. In the present invention, with the larger volume of braze material that is required, higher stresses due to shrinkage and mismatches in the thermal coefficient of expansion (TCE) of the braze material become a major design challenge. The biggest concern is the added stress in tension or shear which is transmitted to the metallic layer on the alumina hermetic seal/insulator (this layer is what allows the braze material to wet to the alumina and form the hermetic seal and is preferably applied by sputtering or equivalent methods). Unfortunately, the TCE of the high alumina content ceramic insulator does not match the TCE of any of the noble metal braze materials. Accordingly, for formation of the novel integrated gold hermetic seal/bonding pad as described herein, ***a unique metallization is required to be used in combination with the present invention that has high malleability and very high adhesion strength to the alumina ceramic and will also wet well to the braze material.*** It is a feature of the present invention that the preferred metallization on high alumina ceramics for miniature medical implantable device hermetic terminals, is titanium/molybdenum.

(*Id.* at 18:32-58) (emphasis added) In context, it is clear that while the present invention is being discussed in portions of the passage, the specification is discussing gold hermetic seal/bonding pad, a particular embodiment, rather than oxide resistant conductive pads generally. Indeed, earlier in the specification, the disclosure expressly states: "The conductive pads of oxide resistant biostable material, ***typically*** comprise ***gold bond pads*** that may be associated with a titanium/molybdenum base." (*Id.* at 9:21-23 (emphasis added); *see also id.* at 9:35-40, 12:11-14, 21:52-58; '715 patent at 21:36-43) Therefore,"oxide resistant conductive pad" is given its broader meaning.

14. "means for hermetically sealing passage of the terminal pin through the ferrule" ['779 patent, claim 7]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
Claimed Function: "hermetically sealing passage of the terminal pin through the ferrule" Corresponding Structure: an electrically insulating or dielectric structure such as gold-brazed alumina, fused glass or ceramic-based insulator installed within the ferrule central aperture; and any structural equivalents thereto	Claimed Function: "hermetically sealing passage of the terminal pin through the ferrule" Revised Corresponding Structure: a noble metal applied to a terminal pin and to an insulator via a unique metallization that has high malleability and very high adhesive strength
Court's Construction: Claimed Function: "hermetically sealing passage of the terminal pin through the ferrule" Corresponding Structure: an electrically insulating or dielectric structure such as gold-brazed alumina, fused glass or ceramic-based insulator installed within the ferrule central aperture; and a noble metal applied to a terminal pin and to an insulator via a unique metallization that has high malleability and very high adhesive strength	

As with the preceding means-plus-function elements in the '627 and '095 patents, the parties agree this term in the '779 patent is subject to § 112, ¶ 6 and agree on its claimed function, disputing only what constitutes corresponding structure.

Both structures (proposed respectively by the parties above) are clearly linked to "hermetically sealing passage of the terminal pin through the ferrule" in the specification. In discussing the prior art, the specification discloses an assembly in which a "hermetic terminal includes a ferrule" (*see* '779 patent at Figs. 5, 6), and "the hermetic seal comprises electrically insulating or dielectric structure such as a gold-brazed alumina or fused glass type or ceramic-based insulator installed within the ferrule central aperture" that "desirably forms a fluid-tight seal about the inner diameter surface of the conductive ferrule, and also forms a

fluid-tight seal about the terminal pin thereby forming a hermetic seal suitable for human implant" (*id.* at 2:26-55). As an alternative structural embodiment, noble metals are also disclosed as hermetically sealing the terminal pin, and these particular embodiments (as discussed earlier) require use of "a unique metallization . . . that has high malleability and very high adhesion strength" to perform the sealing. (*Id.* at 18:49-60; *see also id.* at 16:27-38, 17:60-63) Accordingly, the Court includes both parties' structures in its construction.

15. "conformal coating" ['077 patent claims 35, 40]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
"a thin nonconductive film or coating that conforms to the surface of an electronic component"	"a thin nonconductive coating applied to a circuit or electronic component for environmental and/or mechanical protection that conforms to the shape of the device being coated"
Court's Construction: "a thin nonconductive film or coating that conforms to the surface of an electronic component"	

The parties dispute whether "conformal coating" includes the requirement that it protect the coated electronics from "environmental and/or mechanical" damage. As it appears in the claims and specification, nothing about the conformal coating requires it to provide such protection. ('077 patent at claim 35 (". . . a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor"); *id.* at claim 40 (". . . wherein the conformal coating comprises a non-conductive polymer, a thermal setting epoxy, or a polyimide")) AVX points to no intrinsic evidence to suggest otherwise, and relies instead solely on a dictionary definition (*see* D.I. 124 at 34) (citing *Modern Dictionary of Electronics* 194 (6th ed. 1997)), which is not an adequate basis in the context of the intrinsic evidence to limit the term as AVX proposes. The Court therefore adopts Greatbatch's

construction, which reflects the plain language of the claim term itself, as well as undisputed aspects of what a person of ordinary skill in the art would understand "conformal" to mean in the context here.

16. "laminar delamination gap" ['553 patent, claims 1, 7, 12]

Greatbatch's Proposed Construction	**AVX's Proposed Construction**
"a very thin space between unbonded or separated layers of material allowing passage of helium gas to the outer edges of the capacitor"	"a very thin gap on the order of 50 angstroms or so"
Court's Construction: "a very thin space between layers of material allowing passage of helium gas to the outer edges of the capacitor"	

The parties appear to dispute whether the patentee coined the term "laminar delamination gap." AVX contends the term was first coined by the inventor. By contrast, Greatbatch relies on the opinion of Professor Pilgrim that the term had meaning to one of ordinary skill in the field at the time. (D.I. 156 (Supplemental Declaration of Steven M. Pilgrim) ("Pilgrim Supp. Decl.") at ¶¶ 18-22) However, the Pilgrim Declaration provides mostly conclusory opinion on this issue. Implicitly, Professor Pilgrim concedes the term "laminar delamination gap" in its entirety was not known in the field. (*See id.*) Instead, Professor Pilgrim states, without any additional support, that "delamination gap" and "laminar" were separately known and had common meanings in the field, which if combined, would allow a person of ordinary skill to have understood laminar delamination gap "to mean a space between unbonded or separated layers that extends for a large area across (or between) the layers." (*Id.* at ¶ 22) The Court is not entirely persuaded by this conclusory statement and treats the disputed term as one coined by the inventor.

"[I]f a disputed term has 'no previous meaning to those of ordinary skill in the prior art[,] its meaning, then, must be found [elsewhere] in the patent.'" *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004) (alterations in original) (quoting *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1570 (Fed. Cir. 1997)). When guidance is not provided in "explicit definitional format," the specification may define claim terms "'by implication' such that the meaning may be 'found in or ascertained by a reading of the patent documents.'" *Id.* (quoting *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1268 (Fed. Cir. 2001)).

The heart of the parties' dispute over the meaning of this term is whether the size of the gap between the layers that form the "laminar delamination gap" is specifically limited to around 50 angstroms. Here, the specification generally discloses embodiments where the gap is large enough to allow helium molecules to pass. (*See* '553 patent at 7:47-50 ("This demonstrates the fact that any helium that is contained within the laminar delamination gap 62 can pass readily to the outside of the ceramic capacitor"); *id.* at 7:22-26; *id.* at 8:57-58 ("[T]his laminar delamination gap 62 is sufficient to allow for ready passage of helium molecules during a helium leak test.")) Describing an embodiment of the laminar delamination gap depicted in Fig. 7, the specification also states: "Even in FIG. 7, delamination gap 62 is exaggerated in thickness for purposes of depiction. In application, delamination gap 62 is a very thin gap on the order of 50 angstroms or so. ***However, this small delamination gap 62 is sufficient to readily allow helium atoms to pass during a helium leak detection test.***" (*Id.* at 6:29-34) (emphasis added) Contrary to AVX's suggestion, the mention of a particular spacing – "on the order of 50 angstroms or so" – in the embodiment depicted in Figure 7 is not strong evidence of a clear definitional statement

by the patentee extending to all instances of the term, especially when elsewhere in the specification (including the following sentence), it is clarified that the gap is defined by a space that need only be sufficient to allow the passage of helium.

Therefore, the Court adopts Greatbatch's construction as consistent with the patentee's broader definition throughout the specification, with the exception of the phrase "unbonded or separated." Greatbatch appears to have added this phrase (without explanation) to its construction – which comes from the supplemental declaration of Professor Pilgrim – in the parties' joint letter to the Court. (D.I. 218 at 7; *see also* Pilgrim Supp. Decl. at ¶¶ 20, 22) Since the inventor coined the term, the Court relies on the intrinsic evidence, which nowhere requires unbonded or separated layers, and disregards this conclusory extrinsic evidence.

III. CONCLUSION

The Court construes the disputed terms as explained above. An appropriate Order follows.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

GREATBATCH LTD.,	:	
Plaintiff,	:	
v.	:	C.A. No. 13-723-LPS
AVX CORPORATION and AVX FILTERS CORPORATION,	:	
Defendants.	:	

ORDER

At Wilmington, this **20th** day of **March, 2015**:

For the reasons set forth in the Memorandum Opinion issued this date,

IT IS HEREBY ORDERED that the disputed claim terms of U.S. Patent Nos. 5,905,627 ("the '627 patent"), 5,333,095 ("the '095 patent"), 6,765,779 ("the '779 patent"), 6,888,715 ("the '715 patent"), 7,035,077 ("the '077 patent"), and 7,327,553 ("the '553 patent") are construed as follows:

Claim Term	Court's Construction
feedthrough filter capacitor; **feed-through filter capacitor;** **feedthrough capacitor** ['627 patent, claims 1, 2, 7, 11, 19; '095 patent, claim 1; '779 patent, claim 1; '715 patent, claims 1, 16, 31, 38	a capacitor designed for use in combination with an electrical connector that connects electrical signals through a housing or case and filters high frequency electrical signals while permitting low frequency electrical signals to pass through
conductive ferrule ['627 patent, claims 1, 16, 26; '095 patent, claim 5; '779 patent, claim 1; '715 patent, claims 5, 31; '077 patent, claim 35; '553 patent, claim 1]	conductive structure containing an aperture through which a connection is directed
conductively coupled; **in conductive relation;** **conductively coupling;** **conductively couples** ['627 patent claims 1, 2, 7, 11, 19; '095 patent claim 1; '779 patent claim 1; '715 patent claims 1, 16, 31, 38]	electrically connected by physical contact via a conductive medium that passes a broad spectrum of frequencies including direct current

means for hermetically sealing passage of the terminal pin through the conductive ferrule; **means for hermetically sealing passage of the terminal pin through the terminal pin mounting means** ['627 patent, claims 4, 25]	Claimed Function: hermetically sealing passage of the terminal pin Corresponding Structure: an insulator comprised of highly stable alumina ceramic glass materials with a very low bulk permeability that surrounds and supports the terminal pin
means for hermetically sealing passage of the terminal pin through the substrate opening ['627 patent, claim 15]	Claimed Function: hermetically sealing passage of the terminal pin Corresponding Structure: an insulator comprised of highly stable alumina ceramic glass materials with a very low bulk permeability that surrounds and supports the terminal pin
means for mounting the terminal pin for passage through an opening formed in the conductive substrate with the terminal pin and the substrate in non-conductive relation ['627 patent, claims 11, 25]	Claimed Function: mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation Corresponding Structure: a conductive ferrule adapted for mounting in an opening in a housing (using a flange, or segmented planar radial perimeter and threads) and an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule
insulator means for supporting the terminal pin from the ferrule in electrically insulated relation ['627 patent, claims 16, 26]	Claimed Function: supporting the terminal pin from the ferrule in electrically insulated relation Corresponding Structure: an insulator that surrounds and supports one or more terminal pins that are not conductively connected to the ferrule

means for mounting said terminal pin for passage through an opening formed in a conductive substrate with said terminal pin and substrate in non-conductive relation ['095 patent, claim 1]	Claimed Function: mounting the terminal pin for passage through an opening in the conductive substrate with the terminal pin and the substrate in non-conductive relation Corresponding Structure: a cylindrical conductive ferrule adapted for mounting in an opening in a housing (e.g. has a flange or shoulder) and an insulative mounting ring or bead that supports the terminal pin within the ferrule in a spaced nonconductive relation
means for hermetically sealing passage of said terminal pin through said substrate opening ['095 patent, claim 4]	Claimed Function: hermetically sealing passage of said terminal pin through said substrate opening Corresponding Structure: an insulative mounting ring or bead comprised of glass-fired or ceramic-based materials and a cylindrical conductive ferrule with a flange or shoulder that is designed to be brazed or welded into the opening in the housing
insulator means for supporting said terminal pin from said ferrule in electrically insulated relation ['095 patent, claim 5]	Claimed Function: supporting the terminal pin from the ferrule in electrically insulated relation Corresponding Structure: an insulative mounting ring or bead
adapted for ['095 patent, claims 1, 9]	made for, designed for, or configured for
second means for electrically connecting said second set of electrode plates to the substrate ['095 patent, claim 12]	Claimed Function: electrically connecting said second set of electrode plates to the substrate Corresponding Structure: solder, braze, or conductive adhesive establishing a conductive connection with the external metallization of the second set of electrode plates composed of a metalized or silverized or plated metallic film
oxide resistant conductive pad ['779 patent, claims 1, 15, 25; '715 patent, claims 1, 10, 31]	a pad area of oxide-resistant conductive material

means for hermetically sealing passage of the terminal pin through the ferrule ['779 patent, claim 7]	Claimed Function: hermetically sealing passage of the terminal pin through the ferrule Corresponding Structure: an electrically insulating or dielectric structure such as gold-brazed alumina, fused glass or ceramic-based insulator installed within the ferrule central aperture; and a noble metal applied to a terminal pin and to an insulator via a unique metallization that has high malleability and very high adhesive strength
conformal coating ['077 patent claims 35, 40]	a thin nonconductive film or coating that conforms to the surface of an electronic component
laminar delamination gap ['553 patent, claims 1, 7, 12]	a very thin space between layers of material allowing passage of helium gas to the outer edges of the capacitor

IT IS FURTHER ORDERED that the following agreed-upon constructions are adopted by the Court:

Claim Term	Court's Construction
first means for electrically connecting said first set of electrode plates to said terminal pin ['095 patent, claim 12]	Claimed Function: electrically connecting the first set of electrode plates to said terminal pin Corresponding Structure: solder, braze, or conductive adhesive establishing a conductive connection between the metallization within the passageway and the terminal pin; and any structural equivalents thereto
termination surface ['779 patent, claim 1; '715 patent, claims 1, 7, 8, 31, 38]	a surface of the feedthrough filter capacitor having conductive material that connects to one set of the electrode plates
conductive polyimide ['779 patent, claim 3]	a polymer that has two or more imide groups in the polymer chain and that is loaded with conductive material

nonconductive polyimide; non-conductive polyimide ['553 patent, claims 5, 10]	a polymer that has two or more imide groups in the polymer chain
noble metal ['779 patent, claim 15]	a metallic element that is resistant to oxidization or an alloy of such a metallic element, including rhenium, ruthenium, palladium, silver, osmium, iridium, platinum, and gold, and oxide resistant alloys of these elements
means for conductively coupling the [] pad to the first termination surface independently of the [terminal pin / lead wire] ['779 patent, claim 14; '715 patent, claims 1, 31]	Claimed Function: conductively coupling the pad to the capacitor termination surface independently of the terminal pin Corresponding Structure: conductive polyimide, solder or conductive adhesive establishing a conductive connection between the metallization on the interior surface of the passageway of the capacitor to the oxide resistant conductive pad on the terminal pin or lead wire; and any structural equivalents thereto
means for conductively coupling the second pad to the second termination surface independently of the ferrule ['715 patent, claim 8]	Claimed Function: conductively coupling the second pad to the second termination surface independently of the ferrule Corresponding Structure: conductive polyimide, solder, or conductive thermal setting material establishing a conductive connection between the external metallization of the second set of electrode plates to the gold pad between the insulator and the ferrule; and any structural equivalents thereto
means for conductively coupling the termination surface to the ferrule ['715 patent, claim 31]	Claimed Function: conductively coupling the second termination surface to the ferrule Corresponding Structure: conductive polyimide, solder, or conductive thermal setting material establishing a conductive connection between the external metallization of the second set of electrode plates to the ferrule; and any structural equivalents thereto

UNITED STATES DISTRICT JUDGE