

IN THE UNITED STATES DISTRICT COURT
 FOR THE SOUTHERN DISTRICT OF TEXAS
 HOUSTON DIVISION

MILLENNIUM CRYOGENIC
 TECHNOLOGIES, LTD.,

Plaintiff,

v.

WEATHERFORD ARTIFICIAL
 LIFT SYSTEMS, INC., *et al.*,

Defendants.

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Civil Action No. H-12-0890

MEMORANDUM AND ORDER

In this patent infringement suit, the parties seek construction of several terms contained in the asserted claims of U.S. Patent No. RE 42,416 (the “’416 Patent”). The Court held a hearing on September 19, 2012, during which the parties presented argument in support of their proposed constructions. This Court now construes the disputed claim terms as a matter of law under *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).

I. BACKGROUND

This case involves a patent for a process for the removal of worn elastomer stators from certain motors or pumps used in the petroleum industry. Specifically, the ’416 Patent, entitled, “Method of Removing Stators From Tubular Stator Housings,” describes a method of removing worn stators from tubular stator housings by subjecting the housing to cryogenic

refrigeration until the stator shrinks and pulls away from the interior surface of the housing. Plaintiff MCT asserts through one or more causes of action in this lawsuit that Defendant Weatherford's processes infringe on the '416 Patent.

The '416 Patent includes eleven claims. U.S. Patent RE 42,416 cols. 3: 1–40, 4: 1–40. Claims 1, 4, and 6 are independent. Claims 2 and 3 depend from independent Claim 1, Claim 5 depends from independent Claim 4, and Claims 7–11 depend from independent Claim 6. The '416 Patent is a reissue of U.S. Patent No. 6,973,707 (the "'707 Patent"). Claims 1–5 of the '416 Patent originally issued with the '707 Patent, while Claims 6–11 were added during reissue proceedings. U.S. Patent RE 42,416 col. 1:4–9.

A. Background and Invention

The "Background of the Invention" for the '416 Patent states as follows:

In the petroleum industry extensive use is made of moineau style pumps, so named after the french aviator who invented them. These pumps utilize metal rotators and polymer plastic rotors. The stators are secured with adhesive within a tubular stator housing. When a moineau style pump is new, there is a tight sealing engagement between the tubular stator housing and the stator. Upon rotation of the rotor, liquids are moved sequentially through a series of cavities formed between the tubular stator housing and the stator. After prolonged use the polymer plastic stator begins to wear and the rotator and stator are no longer able to move liquids efficiently due to inadequate sealing.

In order to service the moineau pump, the worn polymer plastic stator must be removed from the tubular stator housing and replaced with a new stator. At the present time the removal of the worn stator represents approximately one half of the cost of replacing the stator. Hydraulic or mechanical rams are used to break the bond of the adhesive and push the worn stator out of the stator housing. The tubular stator housing must then be reamed out to remove any residue of polymer plastic which remains.

B. Summary of the Invention

The patent provides a “Summary of the Invention,” as follows:

What is required is a method of removing stators from tubular stator housings which will simplify removal and lower the cost of removal.

According to the present invention there is provided a method of removing stators from tubular stator housings, involving subjecting a tubular stator housing having an interior surface to which a worn stator is adhered by adhesive to cryogenic refrigeration until the stator shrinks and pulls away from the interior surface of the tubular stator housing.

The method, as described above, provides an alternative to the use of rams. More importantly, it removes the worn stator in a comparably clean fashion thereby reducing the reaming and post reaming preparation of the interior surface of the tubular stator housing. Reducing reaming and post reaming preparation provides a substantial savings.

C. Detailed Description of the Preferred Embodiment

The “Detailed Description of the Preferred Embodiment” reads as follows:

The preferred method of removing stators from tubular stator housings will now be described with reference to FIG. 1.¹

Referring to FIG. 1, the preferred method involves subjecting a tubular stator housing having an interior surface to which a worn stator is adhered by adhesive to cryogenic refrigeration in a cryogenic refrigeration unit until worn stator shrinks and pulls away from interior surface of tubular stator housing.

The cryogenic temperature range starts at approximately minus 50 degrees celsius. It will be understood that the method works on a combination of temperature and time. As the temperature is made colder within the cryogenic temperature range, the less time it takes for the worn stator to shrink sufficiently to pull away from the interior surface. In tests proving the concept

¹Because the Figure 1 diagram has not been reproduced within this Memorandum and Order, the label numbers appearing within the quoted materials have been deleted.

a temperature range of between minus 150 degrees celsius and minus 200 degrees celsius was used.

In order to avoid thermal shock, the temperature of tubular stator housing must be gradually brought down into the cryogenic range and then gradually brought back up. In tests proving the concept the temperature was brought down by 2.5 degrees celsius per minute until minus 196 degrees celsius, the temperature of liquid nitrogen, was reached. Once worn stator separated from tubular stator housing, the temperature was brought back up at the rate of 2.5 degrees celsius per minute. There was minimal dwell time required at minus 196 degrees celsius. The time consuming part of the process was in gradually bringing down and then bringing up the temperature, which took approximately 3 to 24 hours. Although the preferred range of between minus 150 degrees celcius [sic] to minus 200 degrees celcius [sic] was used in tests, lower cryogenic temperatures may be used. Some experimentation would be required to determine the optimal temperature and dwell time.

Once worn stator has shrunk and pulled away from interior surface, removal of worn stator from tubular stator housing becomes an extremely simple matter. Worn stator is removed simply by exerting force upon worn stator to slide worn stator out of tubular stator housing as indicated by arrow. It will be understood that this can be done in any number of ways. It can be done by pushing or pulling upon worn stator. It can also be done by tipping tubular stator housing, so that stator slides from tubular stator housing by force of gravity. It can also be done by utilizing centrifugal force or other principles of physics.

Cautionary Note:

In most cases the cryogenic treatment will actually enhance the mechanical properties of tubular stator housing. Cryogenic treatments are used on metal to increase abrasion resistance, toughness, dimensional stability and tensile strength. However, there is a danger that ostenite will be transformed into martensite in some metals. In such cases, the virgin martensite will have to be tempered through a subsequent heat treatment.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

D. The Claims

The three independent claims are set forth below, with disputed terms highlighted in bold type. The related dependent claims are set forth under each independent claim. Key to all or most of the disputed claims are the terms or phrases, “gradually,” “cryogenic levels,” “cryogenic temperature,” “thermal shock,” “temperature in the cryogenic refrigeration unit,” and “ambient temperatures.”

Claim 1 of the '416 Patent (independent) provides as follows:

A method of removing stators from tubular stator housings, comprising the steps of:
placing a metal tubular stator housing having an interior surface to which a worn elastomer moineau-style stator is adhered by adhesive into a cryogenic refrigeration unit;
lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels in order to avoid thermal shock to the tubular stator housing;
raising the temperature of the tubular stator housing gradually to ambient temperatures, the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered and then gradually raised.

Claim 2 (dependent) states, “The method as defined in claim 1, the tubular metal stator housing being subjected to temperatures between minus 150 degrees celcius [sic] and minus 200 degrees celsius.”

Claim 3 (dependent) states, “The method as defined in claim 1, wherein the temperature in the cryogenic refrigeration unit is gradually decreased to cryogenic levels over a period of time of approximately 3 to 24 hours.”

Claim 4 of the '416 Patent (independent) provides as follows:

A method of removing stators from tubular stator housings, comprising the steps of:

placing a tubular metal stator housing having an interior surface to which a worn elastomer moineau-style stator is adhered by adhesive into a cryogenic refrigeration unit;

lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels in order to have the tubular metal stator housing and the stator shrink at substantially the same rate and **avoid thermal shock, the temperatures in the cryogenic refrigeration unit reaching temperatures of between minus 150 degrees celsius and minus 200 degrees celsius;**

raising the temperature in the cryogenic refrigeration unit gradually to ambient temperatures in order to avoid thermal shock, the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered and then gradually raised; and

exerting a force upon the stator to slide the stator out of the tubular stator housing.

Claim 5 (dependent) states, “The method as defined in claim 4, wherein the temperature in the cryogenic refrigeration unit is gradually decreased to cryogenic levels over a period of time of approximately 3 to 24 hours.”

Claim 6 of the '416 Patent (independent) provides as follows:

A method of removing an elastomer moineau-style stator adhesively adhered to an interior surface of a metal tubular stator housing, the method comprising the steps of: placing the metal tubular stator housing, having the stator adhesively adhered to the interior surface of the stator housing, into a **cryogenic refrigeration unit; gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature** of between minus 150 degrees celsius and minus 200 degrees celsius so as **to avoid thermal shock to at least the metal tubular stator housing** and cause the metal tubular stator housing and the stator to shrink at substantially a same rate; **allowing the stator, at the cryogenic temperature, to substantially separate from the interior surface of the tubular stator housing during the gradually lowering the temperature in the cryogenic refrigeration unit;** and

removing the stator from the housing following the gradually lowering the temperature in the cryogenic refrigeration unit.

Claim 7 (dependent) states, “The method of claim 6 further comprising the step of gradually lowering the temperature in the cryogenic refrigeration unit from a starting temperature of approximately minus 50 degrees celsius.”

Claim 8 (dependent) states, “the method of claim 6 further comprising the steps [sic] of gradually raising the temperature of the tubular stator housing.”

Claim 9 (dependent) states, “The method of claim 6 further comprising the step of gradually decreasing the temperature in the refrigeration unit at a rate of approximately 2.5 degrees celsius per minute.”

Claim 10 (dependent) states, “The method of claim 6 further comprising the step of gradually decreasing the temperature in the refrigeration unit over a period of time of approximately 1 hour.”

Claim 11 (dependent) states, “The method of claim 6 further comprising the step of gradually decreasing the temperature in the refrigeration unit to a temperature of approximately minus 196 degrees celsius.”

(Docket Entry No. 114, pp. 2–3; original italics deleted; boldface added).

II. LEGAL STANDARDS

A. Claim Construction

Claim construction is a matter of law, and the task of determining the proper construction of all disputed claims lies with the Court. *Markman*, 517 U.S. at 372. The Federal Circuit has opined extensively on the proper approach to claim construction, most notably in its opinion in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the Federal Circuit expressly reaffirmed the principles of claim construction as set forth in *Markman*, *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996), and *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111 (Fed. Cir. 2004).

The goal of a *Markman* hearing is to arrive at the ordinary and customary meaning of a claim term in the eyes of a person of ordinary skill in the art. *Phillips*, 415 F.3d at 1313. “[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Two categories of evidence exist with respect to the meaning of claim language: evidence intrinsic to the patent—the patent itself, including the claims, the specification and, if in evidence, the prosecution history—and evidence extrinsic to the patent, such as expert testimony. *Vitronics*, 90 F.3d at 1582. Extrinsic evidence is “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317. The Court should first look to intrinsic evidence to decide if it clearly and unambiguously defines the disputed terms of the claim. *Vitronics*, 90 F.3d at 1585. Only then may the Court consider the potential use of extrinsic evidence.

In construing claim terms, the court must also determine whether any claim terms are invalid as being indefinite. Under the statutory requirement for definiteness, the claims must particularly point out and distinctly claim the subject matter which the applicant regards as his invention. 35 U.S.C. § 112, ¶ 2. “The purpose of the definiteness requirement is to ensure that the claims delineate the scope of the invention using language that adequately notifies the public of the patentee’s right to exclude.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005). However, the definiteness requirement does not

compel absolute clarity; only claims not amenable to construction or insolubly ambiguous are to be held indefinite. *Id.*

In interpreting a term for purposes of claim construction, the court should strive to remain faithful to the inventor and the invention, as expressed through the claim language.

As observed by the Federal Circuit in *Phillips*,

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually claim. The 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.

415 F.3d at 1316. Under no circumstances is the court to redraft claims, whether to make them operable or to sustain their validity. *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004).

1. Claim Language

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*, 415 F.3d at 1312; *Innova/Pure Water Inc.*, 381 F.3d at 1115. In claim construction, courts examine the patent's intrinsic evidence to define the patented invention's scope. *Id.*; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the

invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The Court begins, as it must, with the words of the claim. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313,1324 (Fed. Cir. 2002); *see also CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (“The terms used in the claims bear a presumption that they mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art.”). The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314; *see also Amgen, Inc. v. Hoechst Marion Roussell, Inc.*, 314 F.3d 1313, 1325 (Fed. Cir. 2003) (“It is the claims that measure the invention.”). A term’s context in the asserted claim can be very instructive. *Phillips*, 415 F.3d at 1314. Other asserted or unasserted claims can also aid in determining a claim’s meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among claim terms can also assist in understanding a term’s meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15. *See also O2 Micro Int’l Ltd. v. Beyond Innovation Technology Co.*, 521 F.3d 1352, 1360 (Fed. Cir. 2008).

Thus, the inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation. *Phillips*, 415 F.3d at 1313. That starting point is based on “the well-settled understanding that inventors

are typically persons skilled in the field of the invention, and that patents are addressed to, and intended to be read by, others of skill in the pertinent art.” *Id.* A district court is not obligated to construe terms with ordinary meanings, lest trial courts be inundated with requests to parse the meaning of every word in the asserted claims. *O2 Micro Int’l*, 521 F.3d at 1360; *see also Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1349 (Fed. Cir. 2001) (finding no error in non-construction of “melting”); *Mentor H/S, Inc. v. Med. Device Alliance, Inc.*, 244 F.3d 1365, 1380 (Fed. Cir. 2001) (finding no error in lower court’s refusal to construe “irrigating” and “frictional heat”).

The determination whether to treat a preamble as a limitation on the claim turns on the importance of the preamble in a particular patent. *Bell Commc’ns Research, Inc. v. Vitalink Commc’ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995). “If the claim preamble, when read in the context of the entire claim, recited limitations of the claim, or, if the claim preamble is ‘necessary to give life, meaning, and vitality’ to the claim, then the claim preamble should be construed as if in the balance of the claim.” *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999); *see also Bell*, 55 F.3d at 620 (“[W]hen the claim drafter chooses to use *both* the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects.”) (original emphasis). On the other hand, a preamble should not be read to limit the claim “where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.”

Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 808 (Fed. Cir. 2002); *see also Pitney Bowes*, 182 F.3d at 1305 (holding that, where a preamble does nothing more than state the purpose or intended use of an invention, the preamble is of no significance to claim construction because it cannot be said to constitute or explain a claim limitation).

2. Specification

In addition, the specification, or the part of the patent where the inventor describes and illustrates the invention in significant detail, “is always highly relevant to the claim construction analysis. Under the patent law, the specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. 35 U.S.C. § 112. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics*, 90 F.3d at 1582. This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. Also, the specification may resolve ambiguous claim terms “where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone.” *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002).

However, because the claim language, not the specification, describes the scope of the patented invention, the specification may not alter the scope of the claim, and the Court must not import limitations in the specification not found in the claim language. *Phillips*, 415 F.3d

at 1323. The “distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice.” *Id.* (citation omitted). To successfully navigate it, the court’s focus should remain on understanding how a person of ordinary skill in the art would understand the claim terms in light of how they are used in the specification. *Id.*; see also *Retractable Technologies, Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011) (“In reviewing the intrinsic record to construe the claims, we strive to capture the scope of the actual invention, rather than strictly limit the scope of claims to disclosed embodiments or allow the claim language to become divorced from what the specification conveys is the invention.”).

It is important to remember that, although the specification often describes very specific embodiments of the invention, the Federal Circuit has cautioned against confining the claims to those embodiments. See *Phillips*, 415 F.3d at 1323. The roles of the specification are to “teach and enable those of skill in the art how to make and use the invention and to provide a best mode for doing so. One of the best ways to teach a person of ordinary skill how to make and use the invention is to provide an example of how to practice the invention in a particular case.” *Id.* “[T]he claims of the patent, not its specifications, measure the invention.” *Innova/Pure Water, Inc.*, 381 F.3d at 1115. “Accordingly, particular embodiments appearing in the written description will not be used to limit claim language that has broader effect. And, even where a patent describes only a

single embodiment, claims will not be interpreted restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.” *Id.* at 1117 (internal quotations omitted).

Thus, while the specification may describe very specific embodiments of the invention, the claims are not to be confined to those embodiments. *Ventana Medical Systems, Inc. v. Biogenex Laboratories, Inc.*, 473 F.3d 1173, 1181 (Fed. Cir. 2006). An accused infringer may not limit a claim term’s ordinary meaning “simply by pointing to the preferred embodiment or other structures or steps disclosed in the specification[.]” *CCS Fitness, Inc. v. Brunswick Corp.*, 228 F.3d 1359, 1366 (Fed. Cir. 2002). The Federal Circuit has repeatedly rejected the contention that “if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment.” *Phillips*, 415 F.3d at 1323. Thus, courts must take extreme care when ascertaining the scope of a claim not to simultaneously import into the claims limitations that were not intended by the patentee. *See Amgen*, 314 F.3d at 1325.

At the same time, the Federal Circuit has recognized that limiting language in the specification may properly be used to construe the terms of a patent. *Amgen*, 314 F.3d at 1323. The importance of limiting language in the specification has been discussed by the Federal Circuit in terms that favor a restrictive reading. For example, in *Lizardtech, Inc. v. Earth Resource Mapping, Inc.*, 433 F.3d 1373, 1375 (Fed. Cir. 2006), the court stated:

However, in whatever form the claims are finally issued, they must be interpreted, in light of the written description, but not beyond it, because otherwise they would be interpreted to cover inventions or aspects of an invention that have not been disclosed. Claims are not necessarily limited to preferred embodiments, but, if there are no other embodiments, and no other disclosure, then they may be so limited. One does not receive entitlement to a period of exclusivity for what one has not disclosed to the public.

See also Honeywell Int'l, Inc. v. ITT Indus., Inc., 452 F.3d 1312 (Fed. Cir. 2006) (holding that the meaning of a claim was limited to the single embodiment disclosed in the specification). There is “a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.” *Comark*, 156 F.3d at 1186.

The parties in the present case disagree whether language or descriptions from the instant patent specification may be used to limit the scope or meaning of one or more disputed claims; that is, whether, and when, claim language may be limited by embodiments disclosed in the specification. In *Honeywell*, the Federal Circuit, in construing the claim term “fuel injection system component,” held that the term was limited to a fuel filter. 452 F.3d at 1318. The court there noted that a fuel filter was discussed in the specification not merely as a preferred embodiment, but as a limitation to the patent scope, because on at least four occasions the specification referred to the fuel filter as “this invention” or “the present invention.” *Id.* More recently, in *Verizon Services Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007), the Federal Circuit reiterated that “when a patent [thus] describes the features of the ‘present invention’ as a whole, this description limits the scope of the invention.” These cases suggest, therefore, that the use of certain language such as

“present invention” or “this invention” raises the presumption that the claim terms can be limited by the description of the invention provided in the specification.

However, the Federal Circuit has also held that, while clear language characterizing “the present invention” may limit the ordinary meaning of claim terms, such language must be read in context of the entire specification, the claims, and the prosecution history. *Rambus, Inc. v. Infineon Technologies Ag*, 318 F.3d 1081, 1094–95 (Fed. Cir. 2003). In *Rambus*, the Federal Circuit declined to limit the term “bus” to a “multiplexing bus,” noting that, although the phrase “present invention” was used in certain parts of the specification, the remainder of the specification and prosecution history showed that the patentee did not “clearly disclaim or disavow” such claim scope. *Id.* The *Rambus* court went on to examine the patent language and prosecution history, reasoning that “multiplexing is not a requirement in all of [the patentee’s] claims.” *Id.* Accordingly, one district court, in determining whether “present invention” language within the specification could be used to limit the scope of a patent, determined that the specification language was being used to describe only an embodiment of the invention. The court accordingly held that the claim scope could not be limited so that the process of modifying a PDL image file was required to be “automatic.”

3. Prosecution History

Finally, the prosecution history, which has been designated as part of the “intrinsic evidence,” consists of the complete record of the proceedings before the U.S. Patent and

Trade Office (“PTO”) and includes the prior art cited during the examination of the patent. As with the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent. *Phillips*, 415 F.3d at 1317. Yet, because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes. *Id.* Still, “a patentee may limit the meaning of a claim term by making a clear and unmistakable disavowal of scope during prosecution.” *Purdue Pharma L.P. v. Endo Pharms., Inc.*, 438 F.3d 1123, 1136 (Fed. Cir. 2006); *see also Omega Engineering Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (finding that the doctrine of prosecution disclaimer is well established and precludes patentees from recapturing through claim construction specific meanings disclaimed during prosecution). A patentee could do so, for example, by clearly characterizing the invention in a way to try to overcome rejection based on prior art. *See, e.g., Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1349 (Fed. Cir. 2004) (limiting the term “transmitting” to require direct transmission over telephone lines because the patentee stated during prosecution that the invention transmits over a standard telephone line, thus disclaiming transmission over a packet-switch network); *Alloc v. Int’l Trade Comm’n*, 342 F.3d 1361, 1372 (Fed. Cir. 2003) (finding that patentee expressly disavowed floor paneling systems without “play” because the applicant cited the feature during prosecution to overcome prior art); *Bell Atl. Network Servs. v. Covad Commc’ns Group, Inc.*, 262 F.3d 1258, 1273 (Fed. Cir. 2001) (limiting

operation of the “transceiver” to the three stated models because of clearly limiting statements made by the patentee to try to overcome a prior art rejection).

The parties in this case dispute the relevance of the patent’s prosecution history, particularly the evidentiary status and relevance of the prosecution history for an earlier corresponding Canadian patent, the ’707 Patent. Weatherford argues that not only does the Canadian prosecution history of the ’707 Patent constitute intrinsic evidence regarding the ’416 Patent, but that it controls several ’416 Patent claim construction issues. MCT, on the other hand, argues that the prosecution history for the ’707 Patent is, at best, undisclosed and irrelevant extrinsic evidence as to the ’416 Patent.

Generally speaking, statements made during prosecution of foreign counterparts to a domestic patent are irrelevant to claim construction if made in response to patentability requirements unique to the applicable foreign law. *Pfizer, Inc. v. Ranbaxy Labs.*, 457 F.3d 1284, 1290 (Fed. Cir. 2006); *TI Group Auto. Sys. (N. Am.), Inc. v. VDO N. Am. LLC*, 375 F.3d 1126, 1136 (Fed. Cir. 2004) (holding that “the varying legal and procedural requirements for obtaining patent protection in foreign countries might render consideration of certain types of representations inappropriate” for consideration in a claim construction analysis of a United States counterpart.) In *Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009), the Federal Circuit noted that,

While statements made during prosecution of a foreign counterpart to a U.S. patent application have a narrow application to U.S. claim construction, *Pfizer Inc. v. Ranbaxy Labs. Ltd.*, 457 F.3d 1284, 1290 (Fed. Cir. 2006), in this case

the JP '199 application is part of the prosecution history of the '507 patent itself. Indeed the '507 patent claims priority from the JP '199 application. Furthermore, the trial court did not rely on attorney argument or amendments during a foreign prosecution as in *Pfizer*, but consulted only the contents of the foreign priority application.

566 F.3d at 1290. Thus, the fact that the prosecution history of the '707 Patent is “foreign” does not render it *per se* irrelevant in the instant proceeding. Rather, its relevance and usefulness will be determined by the Court if, and as, necessary under the applicable provisions herein.

The Court has reviewed the United States prosecution history materials provided by the parties, and has utilized the prosecution history in construing the disputed claims. Where relevant to construction of a particular claim or term, the prosecution history will be noted.

4. Extrinsic Evidence

Only if there is still some genuine ambiguity in the claims, after consideration of all available intrinsic evidence, should a trial court resort to extrinsic evidence, such as expert witness testimony, dictionary definitions, and legal treatises. *See Vitronics*, 90 F.3d at 1585. While extrinsic evidence can shed useful light on the relevant art, it is less significant than the intrinsic record in determining the legally operative meaning of claim language. *Phillips*, 415 F.3d at 1317; *C.R. Bard, Inc.*, 388 F.3d at 862. Furthermore, extrinsic evidence may be used only to aid in the proper understanding of the claims, and may not be used to vary or contradict the claim language itself. *Vitronics*, 90 F.3d at 1584. The courts have recognized that dictionaries and treatises may be especially useful in claim construction. *Phillips*, 415

F.3d at 1317. Specifically, technical dictionaries may enable a court “to better understand the underlying technology” and the way in which one of skill in the art might use the claim terms. *Vitronics*, 90 F.3d at 1584 n.6. Nevertheless, technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Phillips*, 415 F.3d at 1318.

Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert’s conclusory, unsupported assertions as to a term’s definition is entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.*

III. ANALYSIS OF CLAIM TERMS

The Court will apply these general principles of claim construction to the terms at issue here.

A. Agreed Constructions

The parties have agreed to the following constructions for two additional phrases from the patent-in-suit:

1. **“elastomer”** will be construed as “a rubber polymer, or rubber-like polymer.” (Docket Entry No. 114, p. 13.)

2. **“substantially separate from the interior surface of the tubular stator housing”** will be construed using the plain and ordinary meaning of the term. (*Markman* hearing; fax communication to the Court dated September 18, 2012.)

B. “lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels/gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature”

These phrases appear in the independent claims, Claims 1, 4, and 6. Defendant Weatherford seeks to construe the phrases as requiring lowering the specific temperature throughout the cryogenic refrigeration unit at 2.5 degrees C per minute or slower to at least -150 degrees C. Plaintiff MCT, on the other hand, asserts that only certain relevant terms need be construed, not the phrases as an entirety; as such, MCT contends that the term “gradually” should be given its plain and ordinary meaning; that “cryogenic levels” should be construed as “approximately minus 50 degrees or below”; and that “to a cryogenic temperature” needs no construction, as language in Claim 6 limits the terms to the range of between minus 150 degrees C and minus 200 degrees C. MCT further contends that the term “in” needs no construction and should be given its plain and ordinary meaning.

Weatherford’s proposed construction encompasses three specifics: that “in” be construed as meaning “throughout,” that “gradually” be construed as “at 2.5 degrees C per minute or slower,” and that “cryogenic temperature” and “cryogenic levels” be construed as at least minus 150 degrees C. The Court disagrees with Weatherford’s argument that the term “in” needs construction, and that it should be construed as meaning “throughout.”

Neither the claim language, the specifications, nor the prosecution history for the '416 Patent support Weatherford's position that "lowering the temperature *in* the cryogenic refrigeration unit" should be construed as "lowering the temperature *throughout* the cryogenic refrigeration unit." The Court further notes that in Claim 4, the patentee references "the *temperatures* in the cryogenic refrigeration unit reaching *temperatures* of between minus 150 degrees celsius and minus 200 degrees celsius." The use of the plural "temperatures" in this Claim would negate any construction of the term "in" for Claims 1, 4, and 6 as requiring a uniform temperature at any point *throughout* the cryogenic refrigeration unit.²

The Court further disagrees with Weatherford's suggested construction of the term "gradually" as "at 2.5 degrees C per minute or slower." The term "gradually" is a general qualitative descriptor, while "at 2.5 degrees C per minute or slower" is a specific quantitative rate. Although the term "gradually" appears in all eleven claims except Claim 2, the actual quantitative rate of "at 2.5 degrees C per minute" appears only in *dependent* Claim 9, and does not include the additional descriptor, "or slower." Weatherford then turns to the preferred embodiment of the specification, noting that it states, "In tests proving the concept the temperature was brought down by 2.5 degrees celsius per minute until minus 196 degrees celsius, the temperature of liquid nitrogen, was reached," and that the temperature "was brought back up at the rate of 2.5 degrees celsius per minute." However, the embodiment

²To any extent this Court would look to the prosecution history of the Canadian '155 Patent, it finds such history unhelpful and not relevant to the pending construction question.

further states that, “Although the preferred range of between minus 150 degrees celcius [sic] to minus 200 degrees celcius [sic] was used in tests, lower cryogenic temperatures may be used. Some experimentation would be required to determine the optimal temperature and dwell time.” Moreover, the embodiment notes that, “It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.” For these reasons, neither the embodiment nor the Claims themselves support Weatherford’s proposed construction of the term “gradually.”

Regardless, Weatherford’s proposed construction runs afoul of well established claim construction guidelines. A specification often describes very specific embodiments of an invention, and the Federal Circuit has “repeatedly warned against confining the claims to those embodiments.” *Phillips*, 415 F.3d at 1323. Indeed,

To avoid importing limitations from the specification into the claims, it is important to keep in mind that the purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so. One of the best ways to teach a person of ordinary skill in the art how to make and use the invention is to provide an example of how to practice the invention in a particular case. *Much of the time, upon reading the specification in that context, it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive.* The manner in which the patentee uses a term within the specification and claims usually will make the distinction apparent.

Id. (citations omitted, emphasis added).

It is clear from the specification in the instant case that the context indicates that the patentee contemplated other alternative embodiments to those set forth in the specification. Notably, the patentee referenced the specified rate in context of “tests proving the concept,” but added the rate to only one dependent claim. Most significantly, the patentee closed the specification with the following statement:

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

Clearly, the preferred embodiment reference to the rate of 2.5 degrees celsius per minute was not intended by the inventor to constitute the sole method of raising or lowering the temperature “gradually.” Accordingly, the Court does not accept Weatherford’s proposed claim construction of the term “gradually” as requiring the raising and lowering of the temperature at a rate of 2.5 degrees celsius per minute or slower.

“Cryogenic levels” and “cryogenic temperature” are two separate phrases appearing in different claims. “Cryogenic temperature” appears only in Claim 6. Weatherford agrees with MCT’s argument that for Claim 6 only, “cryogenic temperature” needs no construction because the language of that claim actually has an understandable and explicitly stated scope of -150°C to - 200°C (Docket Entry No. 105, p. 121 n. 11.) The Court agrees with the parties’ argument, and finds that the term “cryogenic temperature” needs no construction.

“Cryogenic levels” appears in Claims 1 and 4. In Claim 1, the temperature in the cryogenic refrigeration unit is gradually lowered “to cryogenic levels in order to avoid

thermal shock to the tubular stator housing[.]” No specific temperature range is given. Claim 2, on the other hand, depends from Claim 1, and states, “The method as defined in claim 1, the tubular metal stator housing being subjected to temperatures between minus 150 degrees celcius [sic] and minus 200 degrees celsius.” In Claim 4, however, the temperature in the cryogenic refrigeration unit is gradually lowered “to cryogenic levels in order to have the tubular metal stator housing and the stator shrink at substantially the same rate and avoid thermal shock,” with the temperatures in the cryogenic refrigeration unit reaching “between minus 150 degrees celsius and minus 200 degrees celsius.”

Given the differences among these claims, it is clear that “cryogenic levels” cannot be limited to temperatures between minus 150 degrees C and minus 200 degrees C, as such a construction would improperly import a dependent claim limit into an independent claim. *Phillips*, 415 F.3d at 1314. Moreover, Claim 4 uses the phrase “cryogenic levels” but subsequently limits temperatures in the cryogenic refrigeration unit to a range “between minus 150 degrees celsius and minus 200 degrees celsius.” Thus, temperatures between -150 degrees C and -200 degrees C may fall within “cryogenic levels,” but they do not define or limit “cryogenic levels.”

MCT argues that “cryogenic levels” should be construed as “approximately minus 50 C or below.” In support, MCT references the “Detailed Description of the Preferred Embodiment” for the ’416 Patent, which states that, “The cryogenic temperature range starts at approximately minus 50 degrees celsius.” Col. 2:19-20. Weatherford contends that the

term should be construed as meaning “minus 150 degrees C or below.” In support, Weatherford references the National Institute of Standards and Technology, the National Bureau of Standards, and “historical Cryogenics references” as holding the traditional understanding of cryogenic temperatures as minus 150 degrees C or below. (Weatherford’s Claim Construction Proposals, p. 23.) Weatherford’s argument, however, cannot prevail. The Court is mindful of the Federal Circuit’s guidance in *Phillips* that, “[T]he 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.” 415 F.3d at 1316. Given that the inventor’s definition here differs from the standards recognized by the institutions cited by Weatherford, the inventor’s lexicography must govern. Accordingly, the Court construes “cryogenic levels” as “a temperature range starting at approximately minus 50 degrees celsius.”

C. “raising the temperature of the tubular stator housing gradually/gradually raising the temperature of the tubular stator housing”

These phrases appear in independent Claim 1 and in dependent Claim 8. Weatherford argues that the phrase should be construed as requiring raising the specific temperature throughout the tubular stator housing at 2.5 degrees C per minute or slower as part of the removal process. MCT contends that the term “gradually” should be given its plain and ordinary meaning; otherwise, it should be construed as “slowly, as opposed to abruptly.” MCT further proposed that “of” be given its plain and ordinary meaning, and argues that “as

part of the removal process” does not appear in any claim and is not a limitation on this claim term.

The Court has already discussed construction issues surrounding the terms “gradually” and “in,” and further analysis is unnecessary. The Court determines that the term “of” also should be given its plain and ordinary meaning, as persons of ordinary skill in the art would understand the term as written. Neither the specification, claim language, nor prosecution history evince any meaning other than the plain and ordinary meaning of the term.

D. “raising the temperature in the cryogenic refrigeration unit gradually to ambient temperatures”

This phrase appears in independent Claim 4. Weatherford again argues that the phrase should be construed as requiring raising the specific temperature throughout the cryogenic refrigeration unit at 2.5 degrees C per minute or slower to room temperature as part of the removal process. MCT again argues that “gradually” should be given its plain and ordinary meaning, or that it otherwise be construed as “slowly, as opposed to abruptly.” MCT further posits that “to ambient temperatures” means “towards ambient temperatures,” “in” should be given its plain and ordinary meaning, and that “as part of the removal process” does not appear in any claim and is not a limitation on this claim term.

The Court has already discussed construction of the terms “gradually” and “in,” and no additional or further discussion or construction is necessary. Both terms are given their plain and ordinary meaning.

The parties disagree whether the term “to” in “to ambient temperatures” refers to a process of moving towards ambient temperatures or to the point of reaching ambient temperatures. MCT argues it means a process; Weatherford argues that it means an end point. Although the specific phrase or clause presented here pertains to raising the temperature in the cryogenic refrigeration unit to ambient temperatures, the phrase “to ambient temperatures” also appears in independent Claim 1 in reference to the temperature of the tubular stator housing.

MCT supports its argument by noting that “temperatures” is stated in the plural, negating Weatherford’s contention that “to ambient temperatures” is an end point rather than a process. Problematic with MCT’s version, however, is that the inventor stated that the *temperature* (singular) in the cryogenic refrigeration unit (Claim 4) and tubular stator housing (Claim 1) is gradually raised to ambient *temperatures* (plural). Construction wise, this is no different than the temperature in the unit or housing being lowered to cryogenic *levels*, as seen in Claim 1 and Claim 4. In all four instances, a certain “temperature” is being raised/lowered to “temperatures.” Accordingly, the Court construes “to ambient temperatures” as meaning “until ambient temperatures are reached.”³

³The Court discusses the phrase “ambient temperatures” in Subpart G, *infra*.

E. “further comprising the step of gradually lowering/raising/decreasing”

These phrases appear in dependent Claims 7, 8, 9, 10, and 11, which depend from independent Claim 6. These dependent claims all commence with, “The method of claim 6 further comprising the step of gradually. . .” and state as follows:

- _____7. The method of claim 6 further comprising the step of gradually lowering the temperature in the cryogenic refrigeration unit from a starting temperature of approximately minus 50 degrees celsius.
8. the method of claim 6 further comprising the steps [sic] of gradually raising the temperature of the tubular stator housing.
9. The method of claim 6 further comprising the step of gradually decreasing the temperature in the refrigeration unit at a rate of approximately 2.5 degrees celsius per minute.
- _____10. The method of claim 6 further comprising the step of gradually decreasing the temperature in the refrigeration unit over a period of time of approximately 1 hour.
11. The method of claim 6 further comprising the step of gradually decreasing the temperature in the refrigeration unit to a temperature of approximately minus 196 degrees celsius.

Weatherford argues that each of these dependent claims constitutes an additional, separate step after completion of the steps in Claim 6. MCT, on the other hand, argues that each of these dependent claims modifies Claim 6 but does not constitute an additional, separate step from Claim 6. MCT proposes the following constructions for these claims:

- Claim 7: The method of Claim 6 wherein the step of gradually lowering the temperature in the cryogenic unit to a cryogenic temperature of between -150 degrees C and -200 degrees C further includes, but is not limited to a starting temperature of approximately -50 degrees C.

- Claim 8: The method of Claim 6 further including but not limited to the step of gradually raising the temperature of the tubular stator housing.
- Claim 9: The method of Claim 6 wherein the step of gradually lowering the temperature in the cryogenic unit to a cryogenic temperature of between -150 degrees C and -200 degrees C further includes, but is not limited to gradually decreasing the temperature in the refrigeration unit [at] a rate of approximately 2.5 degrees C per minute.
- Claim 10: The method of Claim 6 wherein the step of gradually lowering the temperature in the cryogenic unit to a cryogenic temperature of between -150 degrees C and -200 degrees C further includes, but is not limited to gradually decreasing the temperature in the refrigeration unit over a period of time of approximately 1 hour.
- Claim 11: The method of Claim 6 wherein the step of gradually lowering the temperature in the cryogenic unit to a cryogenic temperature of between -150 degrees C and -200 degrees C further includes, but is not limited to gradually decreasing the temperature in the refrigeration unit to a temperature of approximately -196 degrees C.

In short, MCT argues that “further comprising the step(s) of “ *modifies* the steps of Claim 6, while Weatherford contends that the language *adds* a step to the steps of Claim 6.

In support of its contention, Weatherford cites the federal district court cases of *Remediation Prods., Inc. v. Adventus Ams. Inc.*, No. 3:07cv153, 2009 WL 57456, at *1 (W.D.N.C. Jan 7, 2009) (“The phrase ‘further comprising,’ standing alone and in light of its use in a dependent claim context, simply means that the dependent claim adds additional steps to Claim 1. Accordingly, the phrase ‘further comprising’ means: the dependent claim includes additional steps.”); *Biedermann Motech GmbH v. Acme Spine, LLC*, No. 06-3619, 2007 WL 6210841, at *11 (C.D. Cal. Aug. 31, 2007) (“[C]laim 2 uses the phrase ‘further

comprising’ which is standard in dependent claims for adding additional elements to a device.”); *Acacia Media Techs. Corp. v. New Destiny Internet Group*, No. C-05-01114, 2007 WL 678317, at *13 (N.D. Cal. Mar. 2, 2007) (“The introductory language of Claim 6 uses the phrase ‘further comprising,’ which means that the elements of Claim 6 are in addition to those recited in Claim 4.”)

MCT, in support of its own argument, directs the Court to *Bright Response, LLC v. Google Inc.*, C.A. No. 2:07-cv-371, 2010 WL 2522424, at *11 (E.D. Tex. June 18, 2010). In *Bright Response*, the Federal Circuit construed independent claims containing “further comprising the steps of” as follows:

Claim 28’s preamble contains the transition ‘further comprising the steps of.’ *This transition indicates that the steps of the independent claim are incorporated into the dependent claim.* For steps having the same label, *e.g.*, both claim 26 and claim 28 have a step “(c),” *the step recited in the dependent claim replaces the step recited in the independent claim.* Otherwise, for steps not having the same label, *e.g.*, step (b) in claim 26 and step (b1) in claim 28, *the step recited in the dependent claim supplements the step recited in the independent claim.* Thus, claim 28 requires the following steps: claim 26’s step (a), claim 26’s step (b), claim 28’s step (b1), and claim 28’s step (c).

Id., at *11 (emphasis added). Under this approach, a step recited in a dependent claim can either replace or supplement a step in the independent claim, depending on how the steps appear in the relevant claims.⁴ However, the court must also look to 35 U.S.C. § 112, ¶ 4,

⁴The various steps of Claims 6 through 11 are not set out as individually-lettered steps as in *Bright Response*; nevertheless, the steps are readily discernable.

which provides that a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

Given these principles espoused by the Federal Circuit, the Court construes dependent Claim 7 to be the method of Claim 6, with the starting temperature in the cryogenic refrigeration unit being approximately minus 50 degrees celsius (thus the dependent claim replaces the independent claim starting temperature); dependent Claim 8 to be the method of Claim 6, with a supplemental step of gradually raising the temperature of the tubular stator housing prior to removal of the stator from the housing; dependent Claim 9 to be the method of Claim 6, with the step “gradually lowering the temperature in the cryogenic refrigeration unit” being replaced with “gradually decreasing the temperature in the cryogenic refrigeration unit at a rate of approximately 2.5 degrees celsius per minute”; dependent Claim 10 to be the method of Claim 6, with the step “gradually lowering the temperature in the cryogenic refrigeration unit” being replaced with “gradually decreasing the temperature in the refrigeration unit over a period of time of approximately 1 hour”; dependent Claim 11 to be the method of Claim 6, with the step “gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature of between minus 150 degrees celsius and minus 200 degrees celsius” being replaced with “gradually decreasing the temperature in the refrigeration unit to a temperature of approximately minus 196 degrees celsius.”

F. “gradually”

This term, for the present purpose, appears in the independent claims, Claims 1, 4, and 6. MCT argues that “gradually” should be construed as meaning “in a gradual manner; making slow progress; slowly, as opposed to abruptly.” Weatherford contends that the term needs no construction as a separate term, and that previously proposed constructions should be followed. Weatherford states that to any extent construction necessary, however, “gradually” should be construed as requiring “at 2.5 degrees C per minute or slower.”

The Court has already addressed this claim construction issue regarding the term “gradually,” and no further or independent consideration is necessary.

G. “ambient temperatures”

This term appears in independent Claims 1 and 4. In its claim construction materials, MCT argues again that the term “to” in the phrase “to ambient temperatures” needs construction, but proffers no proposed construction for the underlying terms “ambient” or “ambient temperatures” themselves. In the parties’ Joint Claims Construction Chart, MCT does not maintain a need for construction of the phrase “ambient temperatures.” (Docket Entry No. 114, p. 5.) In its Opening Claim Construction Brief, MCT states that, “Though ‘room temperatures’ works as a direct translation in its singular form appears reasonable [sic], clearly there is no one temperature required by the claims.” (Docket Entry No. 101, p. 20, emphasis omitted.) Consequently, it appears that MCT does not disagree that “ambient temperatures” and “room temperatures” have the same meaning.

At the *Markman* hearing, MCT posited that “ambient” has a fairly common and ordinary meaning, and that “ambient temperatures” refer to the temperature in the surrounding area. *Markman Hearing*, p. 29. The ’416 Patent specification, claims, and prosecution history do not set forth any particular location or type of location for application or use of the patent method and, as noted by MCT, the process could be carried on outdoors.

Id. Accordingly, the Court does not construe “ambient temperatures” as “room temperatures,” as such construction might inadvertently limit the scope of the process to indoor use, a limitation not appearing within the intrinsic evidence. Nor does the Court construe the phrase as meaning any particular single temperature, as the phrase is unambiguously stated in the plural.

The Court agrees with MCT that the phrase “ambient temperatures” needs no construction, as it has a plain and ordinary meaning that would be understood by a person of ordinary skill in the art.

H. “the temperature in the cryogenic refrigeration unit”

This phrase appears in the independent claims, Claims 1, 4, and 6. MCT contends that “in” should be given its plain and ordinary meaning; Weatherford contends that the phrase should be construed as referring to the specific temperature throughout the cryogenic refrigeration unit.

The Court has already addressed this claim construction issue regarding the term “in,” and no further or independent consideration is necessary. “In” shall be given its plain and ordinary meaning.

I. “cryogenic refrigeration unit”

This phrase appears in the independent claims, Claims 1, 4, and 6. MCT argues that the phrase should be construed as “a refrigeration unit capable of reaching temperatures of approximately -50 degrees C or below.” Weatherford argues that it should be construed as “a refrigerator for controlled cooling of objects to cryogenic temperatures without immersing the objects in a liquid cryogen.”

In support of its position, Weatherford argues that the prosecution history clearly shows how the inventor disavowed any process for immersing the objects in liquid nitrogen, in that the inventor stated as follows:

Combining the teaching of this reference with the moineau-style stator of the current application is a prescription for disaster. *The Applicant is perfectly content to disclaim any immersing technique under the doctrine of file wrapper estoppel.* Immersing the moineau-style stator of the current application, as taught in the method of Waldsmith '159, leads directly to stator housing failure, in the form of one or more of distortion, thermal shock or micro-cracking. *It is respectfully submitted that as soon as one immerses a component into liquid nitrogen, it is rapidly lowered to the temperature of the bath into which it is immersed. It is respectfully submitted that it is not taught to lower the temperature of the component in a controlled manner, as currently claimed, using the immersion technique as proposed by Waldsmith '159.*

Contrary to Weatherford's position, this statement does not constitute a clear and unequivocal disclaimer or disavowal of any and all techniques for the immersion of stators in a liquid cryogen, particularly liquid nitrogen. Rather, the inventor's disavowal was of an uncontrolled immersion of stators into liquids already cooled to cryogenic levels: "as soon as one immerses a component into liquid nitrogen, it is rapidly lowered to the temperature of the bath into which it is immersed." It was this process that the inventor labeled "a prescription for disaster." The inventor instead sought to utilize a technique for lowering the temperature in the refrigeration unit within which the stator had already been placed, such that the stator's cooling was neither rapid nor uncontrolled. This can be seen in the following statement made by MCT's prosecuting attorney:

Q: Do you consider the language, 'The applicant is perfectly content to disclaim any immersing technique under the doctrine of file wrapper estoppel,' to be a clear disavowal of the scope of immersing techniques from the subject matter of the U.S. claims?

A: Yes. Later on, we say look, we have to lower the temperature of the component in a controlled manner, so as soon as you go and you rapidly immerse something in, where is your control?

This is further evinced by the inventor's own statements that his process claimed controlled cooling, not uncontrolled rapid cooling:

Furthermore, Waldsmith '159 teaches a process of cooling the component by immersing it into liquid nitrogen for a period of 'about five minutes.' As noted above such uncontrolled rapid cooling would cause damage to the moineau-style stator. In contrast, the current application claims that the moineau-style stator is cooled in a controlled manner over a specific period of time.

Thus, the inventor's disavowal was limited to a process of immersing a stator into a bath of liquid nitrogen already at cryogenic temperatures, in a rapid and uncontrolled manner. Weatherford, however, unnecessarily and improperly attempts to bootstrap this disclaimer of a specific process into its proposed construction of the term, "cryogenic refrigeration unit." By arguing that a cryogenic refrigeration unit should be construed as a refrigerator for controlled cooling of *objects* to cryogenic temperatures, Weatherford subverts the inventor's language, which calls for the gradual lowering of the temperature in the cryogenic refrigeration unit to cryogenic levels but the raising of the temperature of the stators (the objects).

It is clear to this Court that the phrase "cryogenic refrigeration unit" should be construed as "a refrigeration unit capable of reaching temperatures of approximately -50 degrees C or below."

J. "the temperatures in the cryogenic refrigeration unit reaching temperatures of between minus 150 degrees celcius [sic] and minus 200 degrees celcius [sic]"

This phrase appears in Claim 4. MCT contends that "in" should be given its plain and ordinary meaning. Weatherford argues that it should be construed as requiring that the temperature throughout the cryogenic refrigeration unit range from -150 degrees C to -200 degrees C.

The Court has already addressed this claim construction issue regarding the term “in,” and no further or independent consideration is necessary. “In” shall be given its plain and ordinary meaning.

K. “cryogenic levels”

The phrase “cryogenic levels” appears in Claims 1 and 4. MCT posits that the phrase means “approximately -50 degrees C or below,” while Weatherford contends that it means “a temperature of -150 degrees C or lower.”

The Court has already addressed this claim construction issue regarding the phrase “cryogenic levels,” and no further or independent consideration is necessary.

L. “in order to avoid thermal shock to the tubular stator housing/to avoid thermal shock to at least the metal tubular stator housing”

This phrase appears in Claims 1, 4, and 6. Weatherford argues that the phrase represents an affirmative or deliberate step or act to prevent thermal shock, and should be construed as a claim limitation. MCT argues that the phrase is not a claim limitation, but rather, sets forth the purpose or result of gradually lowering the temperature.

The '416 Patent provides, in relevant part, as follows:

The Detailed Description of the Preferred Embodiment:

In order to avoid thermal shock, the temperature of [the] tubular stator housing must be gradually brought down into the cryogenic range and then gradually brought back up.

Claim 1: lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels in order to avoid thermal shock to the tubular stator housing[.]

Claim 4: lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels in order to have the tubular metal stator housing and the stator shrink at substantially the same rate and avoid thermal shock[;]. . . raising the temperature in the cryogenic refrigeration unit gradually to ambient temperatures in order to avoid thermal shock[.]

Claim 6: gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature . . . so as to avoid thermal shock to at least the metal tubular stator housing and cause the metal tubular stator housing and the stator to shrink at substantially a same rate[.]

In arguing that the phrase should be construed as a claim limitation, Weatherford directs the Court to Federal Circuit case law construing functional and “whereby” language in a claim as functional claim limitation language. *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329 (Fed. Cir. 2005) (“It is correct that a ‘whereby’ clause generally states the result of the patent process. However, when the ‘whereby’ clause states a condition that is material to patentability, it cannot be ignored in order to change the substance of the invention.”); *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1363 (Fed. Cir. 1999) (“The functional language is, of course, an additional limitation in the claim.”). Other Federal Circuit cases, however, have held such language not to constitute a claim limitation. *See, e.g., Minton v. National Ass’n of Securities Dealers, Inc.*, 336 F.3d 1373, 1381 (Fed. Cir. 2003) (holding that “whereby” clause in method for trading securities did not constitute a claim limitation). However, as there is no “whereby” clause in the ’416 Patent, the potential construction of such a clause is of no moment.

The Court is not persuaded by Weatherford’s position that thermal stress avoidance “is, in fact, the very essence of Millennium’s claimed process and ignoring it would be ‘contrary to the fundamental invention.’” (Docket Entry No. 105, p. 45.) While the patented process undeniably calls for the gradual lowering and raising of temperatures in order to avoid thermal shock to the tubular housing, the claims do not teach methods of thermal shock prevention. *See, e.g., In re Omeprazole Patent Litig.*, 536 F.3d 1361, 1370 (Fed. Cir. 2008) (refusing to read in a limitation where the term “enhanced stability” only referred to the intended result of the invention).

Construing the patent and claims language as a whole, the Court finds that the phrase, “in order to avoid thermal shock to the tubular stator housing/to avoid thermal shock to at least the metal tubular stator housing,” needs no further construction and should not be construed as a claim limitation.

M. “thermal shock”

In the Joint Claim Construction Chart, and prior to the *Markman* hearing, MCT proposed the following construction of “thermal shock”:

This is not a claim limitation, but is the purpose or result to be avoided by gradually lowering the temperature. Alternatively, and potentially the subject of expert testimony, ‘thermal shock’ is change to the metallic structure of the tubular stator housing that can result in failure of the housing when in use.

(Docket Entry No. 114, pp. 24–25, p. 9.) In its subsequent Claim Construction Hearing brief, however, MCT contends that “thermal shock” should be construed as “a sudden temperature

change affecting the metallic structure of the tubular stator housing that can result in failure of the housing, which either immediately occurs or occurs in use.” (Claim Construction Hearing brief, p. 34.)

Weatherford contends that the phrase should be construed as referring to destructive cracking or bending caused by a change in temperature. (Docket Entry No. 114, p. 9.)

The term “thermal shock” appears in the following claims and specification provisions:

Detailed Description of the Preferred Embodiment:

“In order to avoid thermal shock, the temperature of tubular stator housing must be gradually brought down into the cryogenic range and then gradually brought back up.”

Claim 1: “lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels *in order to avoid thermal shock* to the tubular stator housing”

Claim 4: “lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels in order to have the tubular metal stator housing and the stator shrink at substantially the same rate *and avoid thermal shock*”

“raising the temperature in the cryogenic refrigeration unit gradually to ambient temperatures *in order to avoid thermal shock*”

Claim 6: “gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature of between minus 150 degrees celsius and minus 200 degrees celsius *so as to avoid thermal shock* to at least the metal tubular stator housing and cause the metal tubular stator housing and the stator to shrink at substantially a same rate”

If any substantive difference can be seen between the two (final) proposed constructions, it is that MCT’s proposed construction recognizes thermal shock as a process,

while Weatherford's proposal defines thermal shock as destructive changes resulting from a temperature change. In short, MCT's proposal is a cause, Weatherford's proposal a result.

Neither of the proposed constructions finds support within the intrinsic evidence presently before the Court, as the inventor uses the term without reference or explanation. Rather, based on the intrinsic evidence and the extrinsic evidence presented at the *Markman* hearing, the Court finds that the term "thermal shock" needs no construction in that a person of ordinary skill in the art would understand the meaning of the term.

N. "the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered and then gradually raised"

This phrase appears in Claims 1 and 4. According to MCT, the phrase should be construed as "the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered, followed by the temperature being gradually raised." Weatherford contends the phrase means that "the stator shrinks as the temperature is gradually lowered to the cryogenic temperature and then pulls away from the interior surface of the tubular stator housing as the temperature is gradually raised to room temperature."

Stated succinctly, the parties dispute at what point, if any, the shrinking and pulling away and/or separation from the stator housing occurs during the claim process. MCT argues that the shrinking and pulling away occurs during the gradual lowering of the temperature; Weatherford argues that it occurs as a result of the lowering and raising of the temperatures.

A review of the specification is helpful at this point. In the “Summary of the Invention,” the inventor states as follows:

According to the present invention there is provided a method of removing stators from tubular stator housings, involving subjecting a tubular stator housing having an interior surface to which a worn stator is adhered by adhesive *to cryogenic refrigeration until the stator shrinks and pulls away* from the interior surface of the tubular stator housing.

That is, the method is described as “subjecting a tubular stator housing . . . to cryogenic refrigeration until the stator shrinks and pulls away” from the housing. This is further seen in the following excerpts from the “Detailed Description of the Preferred Embodiment,” wherein the inventor states that:

the preferred method involves subjecting a tubular stator housing . . . *to cryogenic refrigeration until the stator shrinks and pulls away* from [the] interior surface of [the] tubular stator housing.

As the temperature is made colder within the cryogenic temperature range, the less time it takes for the worn stator to shrink sufficiently to pull away from the interior surface. . .

Once [the] worn stator separated from [the] tubular stator housing, the temperature was brought back up. . .

In each of these instances, the method described the shrinking and pulling away and/or separation occurring as a result of the cryogenic refrigeration. Indeed, the inventor noted a direct correlation between colder cryogenic temperatures and the speed of the shrinking for pulling away. Following the stator’s separation from the stator housing, the temperature was then brought back up.

Moreover, reference should be made to the language of Claim 6, which states that the separation occurs during the lowering of the temperature: “allowing the stator, at the cryogenic temperature, to substantially separate from the interior surface of the tubular stator housing during the gradually lowering the temperature in the cryogenic refrigeration unit[.]” Claim 6 also calls for “removing the stator from the housing following the gradually lowering the temperature in the cryogenic refrigeration unit.”

Construing the patent specification and claims as a whole, it is clear to the Court that the inventor’s method provided for the shrinking and pulling away and/or separation of the stator from the stator housing to occur as a result of, or during, the cryogenic refrigeration at cryogenic levels. Accordingly, the Court agrees with MCT’s position and construes the terms of the phrase, “the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered and then gradually raised,” as “the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered, followed by the temperature being gradually raised.”

O. “allowing the stator, at the cryogenic temperature, to substantially separate from the interior surface of the tubular stator housing during the gradually lowering the temperature in the cryogenic refrigeration unit”

This phrase appears in Claim 6. MCT argues that the phrase should be given its plain and ordinary meaning. Weatherford contends that the terminology is internally inconsistent and indefinite and cannot be logically construed. Weatherford argues in the alternative that the phrase is a limitation that should be construed as “allowing the stator, at -150 degrees C

to -200 degrees C, to substantially separate from the interior surface of the tubular stator housing during the lowering of the temperature throughout the cryogenic refrigeration unit by 2.5 degrees C per minute or slower to -150 degrees C to -200 degrees C.”

Weatherford contends that the phrase and terms are internally inconsistent without a possible logical construction because the temperature in the cryogenic refrigeration unit cannot be lowered to the cryogenic temperature if the stator and housing are already at the cryogenic temperature prior to separation. Reviewing the disputed phrase and terms in context of the claim as a whole, however, shows that the claim is internally consistent and subject to a logical construction:

placing the metal tubular stator housing, having the stator adhesively adhered to the interior surface of the stator housing, into a cryogenic refrigeration unit; gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature of between minus 150 degrees celsius and minus 200 degrees celsius so as to avoid thermal shock to at least the metal tubular stator housing and cause the metal tubular stator housing and the stator to shrink at substantially a same rate;

allowing the stator, at the cryogenic temperature, to substantially separate from the interior surface of the tubular stator housing during the gradually lowering the temperature in the cryogenic refrigeration unit; and

removing the stator from the housing following the gradually lowering the temperature in the cryogenic refrigeration unit.

The relevant provisions of this claim provide as follows:

placing the metal tubular stator housing [with interior stator] . . . into a cryogenic refrigeration unit; gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature of between minus 150

degrees celsius and minus 200 degrees celsius so as to . . . cause the metal tubular stator housing and the stator to shrink at substantially a same rate;

allowing the stator, at the cryogenic temperature, to substantially separate from . . . the tubular stator housing during the gradually lowering the temperature in the cryogenic refrigeration unit[.]

Although the phrasing of the claim arguably suffers from one or more grammatical irregularities, the terms and steps of the claim are not invalid or indefinite. Absolute clarity is not a necessity; only claims not amenable to construction or that are insolubly ambiguous are to be held indefinite. *Datamize*, 417 F.3d at 1347.

Further, Weatherford’s alternative proposed construction is premised upon arguments that have already been declined by the Court. For instance, the Court has not construed the term “gradually” as meaning “at the rate of 2.5 degrees C per minute or slower,” nor has it construed the term “in” as “throughout.”

The Court finds that no further construction of the phrase is necessary beyond those constructions of terms within the phrase already made by the Court.

P. “removing the stator from the housing”

This phrase appears in Claim 6. MCT posits that the term “removing” should be given its plain and ordinary meaning. Weatherford argues that the phrase should be construed as meaning “removing the stator from the housing in a comparatively clean fashion, thereby reducing the reaming and post reaming preparation of the interior surface of the housing.”

Weatherford’s proposed construction language can be found in the “Summary of the Invention,” which states as follows:

The method, as described above, provides an alternative to the use of rams. More importantly, it removes the worn stator in a comparably clean fashion thereby reducing the reaming and post reaming preparation of the interior surface of the tubular stator housing. Reducing reaming and post reaming preparation provides a substantial savings.

The actual claim language, however, states “and removing the stator from the housing following the gradually lowering the temperature in the cryogenic refrigeration unit.” The claim language does not specify any particular condition of the housing following removal, nor does it specify what actions are to be taken or not taken following removal. In short, Weatherford’s proposed construction attempts to import limitations from the specification into the claim, which is contrary to well settled claim construction principles espoused by the Federal Circuit. *See Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1370 (Fed. Cir. 2008); *Phillips*, 415 F.3d 1303, 1320–23 (Fed. Cir. 2005); *Innova/Pure Water, Inc.*, 381 F.3d 1111, 1117 (Fed. Cir. 2004).

The Court finds that the phrase “removing the stator from the housing” needs no construction and should be given its plain and ordinary meaning.

IV. CONCLUSION

In accordance with the analysis set forth in this Memorandum, the Court hereby construes the phrases from the patent-in-suit as follows:

CLAIM TERM, PHRASE, OR CLAUSE	COURT’S CONSTRUCTION
<p>“lowering the temperature in the cryogenic refrigeration unit gradually to cryogenic levels /gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature”</p>	<p>No construction of “in” needed; plain and ordinary meaning</p> <p>No construction of “cryogenic temperature” needed; is construed within the claim.</p> <p>No construction of “gradually” needed; plain and ordinary meaning</p> <p>“cryogenic levels” is construed as “a temperature range starting at approximately minus 50 degrees celsius.”</p>
<p>“raising the temperature of the tubular stator housing gradually/gradually raising the temperature of the tubular stator housing”</p>	<p>No construction of “of” needed; plain and ordinary meaning</p> <p>No construction of “gradually” needed; plain and ordinary meaning</p>
<p>“raising the temperature in the cryogenic refrigeration unit gradually to ambient temperatures”</p>	<p>No construction of “in” needed; plain and ordinary meaning</p> <p>“to ambient temperatures” is construed as “until ambient temperatures are reached”</p>

“further comprising the step of gradually lowering/raising/decreasing”

dependent Claim 7 to be the method of Claim 6, with the starting temperature in the cryogenic refrigeration unit being approximately minus 50 degrees celsius (thus the dependent claim replaces the independent claim starting temperature);

dependent Claim 8 to be the method of Claim 6, with a supplemental step of gradually raising the temperature of the tubular stator housing prior to removal of the stator from the housing;

dependent Claim 9 to be the method of Claim 6, with the step “gradually lowering the temperature in the cryogenic refrigeration unit” being replaced with “gradually decreasing the temperature in the cryogenic refrigeration unit at a rate of approximately 2.5 degrees celsius per minute”;


dependent Claim 10 to be the method of Claim 6, with the step “gradually lowering the temperature in the cryogenic refrigeration unit” being replaced with “gradually decreasing the temperature in the refrigeration unit over a period of time of approximately 1 hour”;

dependent Claim 11 to be the method of Claim 6, with the step “gradually lowering the temperature in the cryogenic refrigeration unit to a cryogenic temperature of between minus 150 degrees celsius and minus 200 degrees celsius” being replaced with “gradually decreasing the temperature in the refrigeration unit to a temperature of

“gradually”	No construction of “gradually” needed; plain and ordinary meaning
“ambient temperatures”	No construction of “ambient temperatures” needed; plain and ordinary meaning
“the temperature in the cryogenic refrigeration unit”	No construction of “in” needed; plain and ordinary meaning
“cryogenic refrigeration unit”	“a refrigeration unit capable of reaching temperatures of approximately -50 degrees C or below.”
“the temperatures in the cryogenic refrigeration unit reaching temperatures of between minus 150 degrees celcius [sic] and minus 200 degrees celcius [sic]”	No construction of “in” needed; plain and ordinary meaning
“cryogenic levels”	“a temperature range starting at approximately minus 50 degrees celsius.”
“in order to avoid thermal shock to the tubular stator housing/to avoid thermal shock to at least the metal tubular stator housing”	No construction needed; plain and ordinary meaning No construction as a claim limitation
“thermal shock”	No construction needed; plain and ordinary meaning
“the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered and then gradually raised”	“the stator shrinking and pulling away from the interior surface of the tubular stator housing as the temperature is gradually lowered, followed by the temperature being gradually raised.”

<p>“allowing the stator, at the cryogenic temperature, to substantially separate from the interior surface of the tubular stator housing during the gradually lowering the temperature in the cryogenic refrigeration unit”</p>	<p>No construction of “in” needed; plain and ordinary meaning</p> <p>No construction of “gradually” needed; plain and ordinary meaning</p> <p>cryogenic refrigeration unit: “a refrigeration unit capable of reaching temperatures of approximately -50 degrees C or below.”</p> <p>cryogenic temperature:</p>
<p>“removing the stator from the housing”</p>	<p>No construction needed; plain and ordinary meaning of the terms</p>
<p>“elastomer”</p>	<p>“a rubber polymer, or rubber-like polymer”</p>
<p>“substantially separate from the interior surface of the tubular stator housing”</p>	<p>No construction needed; plain and ordinary meaning of the terms</p>

Signed at Houston, Texas, on this the 14th day of June, 2013. _



KEITH P. ELLISON
UNITED STATES DISTRICT JUDGE