United States District Court,
E.D. Texas, Texarkana Division.

INPUT/OUTPUT, INC. and I/O Sensors, Inc,
Plaintiffs.
v.
SERCEL, INC,
Defendant.

Civil Action No. 5:06-CV-236

April 28, 2008.

Melissa Richards Smith, Harry Lee Gillam, Jr., Gillam & Smith, LLP, Marshall, TX, Matthew G. Reeves, Michael O. Sutton, Locke Liddell & Sapp, Tanya Lynn Chaney, Nathaniel Cochran Dunn, Locke Lord Bissell & Liddell LLP, Houston, TX, for Plaintiffs.

Hilda Contreras Galvan, Joseph Matthew Beauchamp, Jones Day, Dallas, TX, Blaney Harper, Jones Day Reavis & Pogue, Washington, DC, Lance Lee, Young Pickett & Lee, Texarkana, TX, for Defendant.

ORDER

DAVID FOLSOM**, District Judge.**

Currently before the Court are Sercel, Inc.'s ("Sercel") Objections to Proposed Claim Construction Findings and Recommendation of Magistrate Judge (Dkt. No. 79) and Input/Output, Inc. and I/O Sensors, Inc's ("Plaintiffs") Response (Dkt. No. 88). Also before the Court are Plaintiffs' Objections to Magistrate Judge Craven's Report and Recommendation on Claim Construction (Dkt. No. 80), Sercel's Response (Dkt. No. 85), and Plaintiffs' Reply (Dkt. No. 89). Accordingly, the Court has made a *de novo* review and determination of the Report and Recommendation ("Recommendation"). 28 U.S.C. s. 636(b)(1)(C). The Court held a hearing on this matter on February 28, 2008. Dkt. No. 103 ("Hr'g Tr."). After considering the patents, arguments of counsel, and all other relevant pleadings and papers, the Court finds that the claims of the patents-in-suit should be construed as set forth herein.

I. BACKGROUND

Magistrate Judge Craven issued a claim construction on December 19, 2007. Dkt. No. 68. The Magistrate Judge considered the claim construction briefs relating to United States Patent No. 5,852,242 (the "'242 Patent"). *Id*. at 1. Twenty four terms were in dispute and claims 1 through 7 of the '242 Patent were asserted. *Id*. at 2 & 9.

Sercel now objects to the Magistrate Judge's recommended construction for three terms: "desired characteristic," "desired mechanical characteristic," and "means responsive to said displacement signal for

applying an electromagnetic feedback force as a function of time." Dkt. No. 79 at 1. Sercel also objects to recommendations for terms that are not given a construction. *Id*. at 1 n. 1 & 9.

Plaintiffs object to the Magistrate Judge's recommended construction for three terms: "means for generating a displacement signal as a function of time," "small positive difference," and "high sensitivity." Dkt. No. 80 at 2-3.

II. THE '242 PATENT

The '242 Patent is entitled "Apparatus with Mechanical and Electric Springs and Method for Its Manufacture" and relates to "measuring a characteristic of motion and methods for its manufacture." '242 Patent, Abstract.

1. "desired characteristic" (claims 4-7) & "desired mechanical characteristic" (claims 4-6)

a. Original Briefing Before Magistrate Judge

Plaintiff's Original Proposed Construction for both terms	Sercel's Original Proposed Construction for both terms	Magistrate Judge's Construction for both terms
No construction necessary (plain and ordinary meaning). Dkt. No. 53, Exh. A at 7-8.	Indefinite and incapable of construction under 35 U.S.C. s. 112. Dkt. No. 53, Exh. A at 7-8.	No construction necessary. Dkt. No. 68 at 59.

Sercel argued that "characteristic" refers to a "distinguishing feature or attribute," and without identifying this feature, Sercel argued that the term "provides no objectively determinable boundary for the claim." Dkt. No. 39 at 33 (citing AMERICAN HERITAGE DICTIONARY 259 (2nd College Ed., Houghton Mifflin Co.1985)). Sercel stated that the inventors testified that the desired characteristic would depend on the particular design. *Id*. (citing Mayo Transcript, Dkt. No. 39, Exh. 8 at 39). Sercel concluded that because these characteristics can change between different designs, the term is indefinite.

Plaintiffs responded that the patent teaches how characteristics can be manipulated and optimized through the provided equations, and specifically noted two example characteristics, "critical damping" and "natural frequency." Dkt. No. 43 at 34 (citing '242 Patent 11:55-12:5; 3:66-67). Plaintiffs stated that the examples "suffice to show that these terms are not indefinite." *Id*.

The Magistrate Judge determined that the terms did not require construction because of the teachings of the two example characteristics, natural frequency and critical damping, but noted that the terms were not limited to the two examples.

b. Parties' Positions in Objections Briefing

Plaintiffs' Proposed Construction	Sercel's Proposed Construction
Adopt the Report and Recommendation and find that no construction is necessary. Dkt. No. 88 at 5.	Terms are indefinite; and if not, Court should construe. Dkt. No. 79 at 6.

Sercel objects to the lack of construction because it asserts that the two examples provided "do not, however, relate to the 'desired mechanical characteristic' of the 'connecting arrangement' nor to the 'desired

characteristic' of the 'apparatus' required in claims 4, 5, and 6," but rather the examples relate to the "desired characteristic" of the "sensor structure." Dkt. No. 79 at 4-5. Sercel argues that while the claim language of "desired mechanical characteristic" refers to "connecting arrangement" and "desired characteristic" refers to "apparatus," the specification relates to two example characteristics to the "sensor structure." *Id*. at 5 (citing '242 Patent, 3:62-67; 11:55-60). Sercel concludes that the examples provided do not relate to the terms as used in claims 4, 5, and 6, but may be relevant to the terms as used in claim 7 which relates a "desired characteristic" to a "sense structure." *Id*. at 5-6. Sercel asserts that "an example does not, without more, provide an objective standard of whether a competitor's product has the 'desired characteristic.' " *Id*. at 6 (citing Datamize L.L. C. v. Plumtree Software, Inc., 417 F.3d 1342, 1352 (Fed.Cir.2005)). Sercel further objects to the lack of construction for the terms, arguing that the Federal Circuit establishes that the court has an "obligation to construe as a matter of law the meaning of language used in the patent claim." *Id*. (quoting Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed.Cir.1995) (en banc); citing Exxon Chemical Patents, Inc. v. Lubrizol Corp., 64 F.3d 1553, 1555 (Fed.Cir.1995)).

Plaintiffs respond that the terms' usage in the specification is relevant to claims 4, 5, and 6 because the " 'connecting arrangement' is part of the 'sensor structure' which in turn is part of the 'apparatus.' " Dkt. No. 88 at 2. Plaintiffs note that the claims mentioned, as well as claims 1-3, state that the "apparatus comprises 'a sensor structure including a mass carried from a support structure by a connecting arrangement....' " *Id*. at 2-3 (quoting ' 242 Patent, 17:63-66). Plaintiffs argue that Sercel's reliance on *Datamize* is inappropriate because *Datamize* concerned a "totally subjective claim term: 'aesthetically pleasing.' " *Id*. at 3 (citing Datamize, 417 F.3d at 1348).

c. Court's Construction

The Federal Circuit explained in *Datamize* that definiteness "does not compel absolute clarity," rather, recognizing the statutory presumption of validity, a claim term is definite so long as it is discernible. Datamize, 417 F.3d at 1347.

To support its indefiniteness argument, Sercel focuses on the fact that the examples provided in the specification relate to a "sensor structure," as referenced in the specification, and not to the "connecting arrangement" or the "apparatus," as referenced in the claims. However, as noted by Plaintiffs, the claims themselves indicate that the apparatus comprises "a sensor structure including a mass carried from a support structure by a connecting arrangement." *See* Claim 3, '242 Patent, 16:51-53. As explained in *Phillips,* a claim term is to be read in the "context of the entire patent, including the specification." Phillips v. AWH Corp., 415 F.3d 1303, 1313 (Fed.Cir.2005) (en banc).

In the "Summary of the Invention," the specification states:

Such method includes the step of fabricating the *sensor structure* having a mechanical spring constant K_m which is representative of a *desired mechanical characteristic* of the *connecting arrangement* and the step of providing electromagnetic sensing and feedback forces of a level represented by an electric spring constant K_e, so that the difference between the mechanical spring constant and the electric spring constant produces a desired characteristic of the *apparatus*.

'242 Patent, 3:38-46 (emphasis added).

The patent further states:

Next, the mechanical spring constant of the *connecting arrangement,* such as springs between the mass and the support, is determined by first determining an effective spring constant

$K_{eff} = K_m - K_e$,

where K_m represents the mechanical spring constant of the *connecting arrangement,* such that a *desired characteristic* of the *sensor structure* as a function of K_{eff} results,....

'242 Patent, 3:55-64 (emphasis added).

Therefore, the Court determines that examples relating to a sensor structure also relate to the apparatus as a whole and to the related component parts, such as the connecting arrangement, which the specification explains that the spring constant directly affects the desired characteristic of the sensor structure.

In the briefing and at the hearing, Sercel asserted that the Federal Circuit's finding of indefiniteness in *Datamize* to the term "aesthetically pleasing" would apply to the term "desired characteristic." Dkt. No. 79 at 6. In *Datamize,* the district court understood "aesthetically pleasing" to have the ordinary meaning of " 'having beauty that gives pleasure or enjoyment' or, in other words 'beautiful' " but ultimately declared the term to be "hopelessly indefinite." 417 F.3d at 1347-48. The claim related to the custom interface screens on kiosks and stated that element types on the screen were to conform to a desired uniform and "aesthetically pleasing look and feel for said interface screens on all kiosks of said kiosk system." *Id. (U.S.* Patent No. 6,014,137, 20 :50-57). Another example in the claim stated that the "aggregate layout of said plurality of selected elements on said interface screen under construction will be aesthetically pleasing and functionally operable for effective delivery of information to a kiosk user." Id. at 1349 (citing U.S. Patent No. 6,014,137, 20 :58-63). The Federal Circuit determined that "aesthetically pleasing" related to the "look and feel" and the "aggregate layout of elements" on an interface screen. *Id.* However, the Federal Circuit concluded that "[m]erely understanding that 'aesthetically pleasing' relates to the look and feel of interface screens, or more specifically to the aggregate layout of elements on interface screens, fails to provide one of ordinary skill in the art with any way to determine whether an interface screen is 'aesthetically pleasing.' " *Id.*

The Court notes that *Datamize* is distinguishable from the case here. The district court noted that the prosecution of the patent in *Datamize* revealed that the patent examiner for a continuation patent "questioned the term 'aesthetically pleasing' as being 'highly subjective.' " *Datamize, LLC v. Plumtree Software, Inc.,* 2004 U.S. Dist. LEXIS 28382, at (N.D.Cal. July 9, 2004). Here, there is no such history cited by Sercel that would indicate that the examiner determined the term to be subjective. Also, the term "desired characteristic" is not describing another term as the term "aesthetically pleasing" describes "look and feel." Rather, "desired characteristic" is the element itself, and two examples of a desired characteristic are the natural frequency or the critical damping. '242 Patent, 3:67, 11:55-65.

The district court in *Datamize* cited to another district court case which found the term "readily follow" as indefinite because the patent "does not mention or even attempt to establish any criteria for determining whether a display can be 'readily followed." *Id.* at * 18. *Mossman v. Broderbund Software, Inc.,* 1999 U.S. Dist LEXIS 8014, at (E.D.Mich. May 18, 1999). However, the Court determines that this situation is more similar to *Orthokinetics, Inc. v. Safety Travel Chairs,* where the Federal Circuit determined that the term "so dimensioned" of the phrase "front leg portion so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof" was not indefinite because one skilled in the

art could determine the dimension necessary. 806 F.2d 1565, 1575-76 (Fed.Cir.1986). Here, examples of desired characteristics are provided, and equations are provided for one skilled in the art to measure those characteristics. *See* '242 Patent, 11:55-65. The "desired characteristic" relates to the mechanical spring constant of the sensor structure and the connecting arrangement. Unlike "aesthetically pleasing" or words of degree, such as "substantially equal to," the Court determines that the word "desired characteristic" in the context of an apparatus, wherein "the electric spring constant which, with a mechanical spring constant, provides a certain sensor structure characteristic, e.g., natural frequency, and then providing a connecting arrangement characterized by a mechanical spring constant which yields such sensor characteristic," would have an "objective standard" so as to provide the public notice to determine the scope of the claimed invention. *See* '242 Patent, Abstract; Datamize, 417 F.3d at 1350-51.

Sercel argues that this term should be construed. As explained above, a "desired characteristic" is a characteristic that relates to the mechanical spring constant of the sensor structure and the connecting arrangement. In order to serve a notice function, the Court finds that this term should require construction to clarify that a "characteristic" does not cover any possible characteristic imaginable. For example, the claim language itself provides guidance that a "desired" characteristic is one that is affected by the difference K_e, K_m, and the relationship between the two variables. Specifically, the claims provide that a K_m is "representative of a desired mechanical characteristic of said connecting arrangement" and the difference between K_e and K_m produces a "desired characteristic of the apparatus." The Recommendation construed "connecting arrangement" to mean "an arrangement of springs or beams." Dkt. No. 68 at 20. The two examples in the specification provide "natural frequency" and "critical damping" as example "desired characteristics" that relate to the spring constants, and these examples relate to the responsiveness of a system. Moreover, the primary object of the invention is "to provide an apparatus ... in which electromagnetic sensing and restoring forces are coordinated with mechanical restoring forces of the apparatus so that it has a desired response characteristic." '242 Patent, 2:31-26. Reading the term in light of the claim and the specification, the Court construes "desired characteristic" to mean "a characteristic, relating to the responsiveness of the system, that may be affected or manipulated by the springs or beams."

The Court determines that the variation, "desired mechanical characteristic," by the nature of the term, would also have a mechanical component. In addition to the example characteristics above, the specification explains that "[t]he high mechanical spring constant results in a connecting arrangement of springs or beams which is capable of withstanding large g-force shocks to the sensor." '242 Patent, 3:19-21; *see also* '242 Patent, 3:29-31.

Thus, the Court construes "desired mechanical characteristic" to mean "a mechanical characteristic, relating to the responsiveness or structural integrity of the system, that may be affected or manipulated by the springs or beams."

2. "means responsive to said displacement signal for applying an electromagnetic feedback force as a function of time" (claims 1-7)

a. Original Briefing Before Magistrate Judge

Plaintiff's Original Proposed Construction	Sercel's Original Proposed Construction	Magistrate Judge's Construction
Means-plus-function The means responsive	***Means-plus-function*** Structure: Micro Computer Based Switch Controller 100; Operational Amplifier	Function: "applying an electromagnetic

to said displacement signal is a feedback compensator circuit or its equivalent. Dkt. No. 53, Exh. A at 3-4.	OA2; switches S1, S2, S3, S4, S5, S10, S11, S12, S13; Top and Bottom Plates 50; Top and Bottom Plates 52; Reference Voltages +VR, - VR; Feedback Compensator Circuit 102, including an operational amplifier and RC network as shown in Fig. 3. Dkt. No. 39 at 17; Oct. 17, 2007, Original Claim Construction Hearing Transcript at 159 (correcting structure).	feedback force as a function of time on said mass in a direction to move said mass to a predetermined position with respect to said support structure"
Function: "applying an electromagnetic feedback force as a function of time on said mass in a direction to move said mass to a predetermined position with respect to said support structure" Dkt. No. 36 at 15.	Function: "responsive to said displacement signal for applying an electromagnetic feedback force as a function of time." Dkt. No. 39 at 17; Oct. 17, 2007, Original Claim Construction Hearing Transcript at 159.	Structure: "a feedback compensator circuit and a switch S5 controlled by a micro computer based switch controller 100, and equivalents thereof" Dkt. No. 68 at 58.

Plaintiffs proposed that the function is the phrase after the "for" and suggested that the corresponding structure is "a force balancing feedback arrangement." Dkt. No. 36 at 15 (quoting '242 Patent, 3:35-37). Plaintiffs stated that the patent teaches that a "feedback compensator circuit 102" performs this function and that a "feedback compensator" is known in the art to refer to a "circuit in a feedback loop that compensates for the displacement of the mass and forces it back to the desired position." *Id*. at 16. Plaintiffs noted that block 2 of Figure 3 labeled "feedback compensator" discloses the circuit needed to perform the function, but Plaintiffs argued the corresponding structure should not be narrowly construed to this preferred embodiment. *Id*. at 17. For example, Plaintiffs argued that other feedback compensator circuits are disclosed, such as a digital accelerometer using sigma-delta analog-to-digital converter technology. *Id*. at 18 (citing '242 Patent, 12:17-21).

Sercel's proposed construction of the function included the language after the "for" but also included the phrase "responsive to said displacement signal" between the "means" and the "for." Dkt. No. 39 at 17. Sercel agreed that the "feedback compensator circuit 102" is a disclosed structure, but added that because the function is "responsive to said displacement signal," a "sample and hold structure 99" uses the displacement signal "from node 97 as an input and holds it at a particular level for a particular time." *Id*. at 17-18.

Plaintiffs responded that the function requires the "output of the feedback compensator to be applied at certain time intervals to the seismic mass, for example, through a switch," but the switch and hold circuit, while holding the signal steady to enable the feedback compensator circuit to generate the necessary feedback force, is not directly related to the claimed function. Dkt. No. 43 at 10-11. Plaintiffs argued that the other structures proposed by Sercel, such as the conductive plates, power supply voltages, switches S10, S11, S12, and S13, are not actually necessary to perform the claimed function. *Id*. at 10-13. Plaintiffs argued that these structures merely cooperate with or enable other structures but do not perform the functions themselves. *Id*. at 9, 12 (citing Asyst Techs. Inc. v. Empak Inc., 268 F.3d 1364, 1370 (Fed.Cir.2001)).

Sercel replied that the sample and hold circuit is directly related to the feedback force being applied "as a

function of time." Dkt. No. 46 at 6. Sercel also argued that the specification fails to provide the structure of a delta sigma modulator. *Id*. at 7.

The Recommendation noted that the language of the claim indicates that the function was "applying an electromagnetic feedback force as a function of time" and the corresponding structure was generally a feedback circuit that performed the forcing function. Dkt. No. 68 at 35-36 (citing '242 Patent, 3:35-37, 3:52-54, 4:24-25, 10:10-13, 10:19-20, Figure 3 element 102). The Magistrate Judge explained that the function focuses on a "force as a function of time" rather than the responsiveness of the input of the feedback compensator circuit. *Id*. at 37. The Magistrate Judge included the "state controlled switch S5 which is controlled by micro computer based switch controller 100" which was disclosed as applying the force as a function of time. *Id*. (citing '242 Patent, Figure 3, 7:55-67, 9:35-36).

b. Parties' Positions in Objections Briefing

Plaintiffs' Proposed Construction	Sercel's Proposed Construction
Adopt the Report and Recommendation. Dkt. No. 88 at 5.	Adopt Sercel's previously proposed construction. Dkt. No. 79 at 8.

Sercel objects to the Magistrate Judge's recommendation because the function excluded the phrase "responsive to said displacement signal." Dkt. No. 79 at 7. As a result the sample and hold portion of the circuit was excluded from the structure. *Id*. Sercel also objects to the Magistrate's recommendation that identifies the structure "almost ***any*** 'feedback compensator circuit' " including those that were not identified in the '242 patent. *Id*. (emphasis in original). Sercel argues that the structure for a generalized "feedback compensator circuit" was not described in the specification, thus concluding that its proposed structure must be adopted. *Id*. at 7-8 (citing Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1213 (Fed.Cir.2002); *Ben* Braun Medical Inc. v. Abbott Labs., 124 F.3d 1419, 1424 (Fed.Cir.1997)).

Plaintiffs respond that the function of a means-plus-function term is typically the phrase following the word "for." Dkt. No. 88 at 4 (citing Automotive Techs. Int'l, Inc. v. BMW of North Am., Inc., 501 F.3d 1274, 1278 (Fed.Cir.2007)). Plaintiffs also argue that the extra language are characteristic of the "means" rather than a part of the function. *Id*. (citing Automotive Techs., 501 F.3d at 1278; Transclean Corp. v. Bridgewood Servs. Inc., 290 F.3d 1364, 1375 (Fed.Cir.2002)). Plaintiffs also argue that the all the structures in Figure 3 need not be listed as the corresponding structure, but rather one of ordinary skill would understand the structure identified as a "feedback compensator." *Id*. at 5.

c. Court's Construction

Sercel's primary objection to the Magistrate's recommendation is the preclusion of the phrase "responsive to said displacement signal." *See* Dkt. No. 79 at 7. The Court adopts the Magistrate Judge's recommendation and its corresponding reasoning. The Court notes that the "general convention" is that the phrase following "for" indicates a claimed function. Cardiac Pacemakers, Inc. v. St. Jude Med., Inc., 296 F.3d 1106, 1115 (Fed.Cir.2002). Ultimately, the function "must be construed to include the limitations contained in the claim language" and the function must not be narrowed or broadened beyond the scope of the claim. *Id*. at 1319. From the context of the claim language itself, the Court determines that the function is only the portion after the word "for." Like the examples provided by Plaintiffs, the Court determines that the superfluous language is merely a characteristic of the means and is not part of the function itself. *See* Transclean Corp., 290 F.3d at 1375.

The Court notes that since Sercel argues that the sample and hold portion of the circuit is the corresponding structure only insofar as it relates to the language of "responsive to said displacement signal," the Court determines that the Magistrate Judge was correct in not including the sample and hold circuit in the structure. Sercel otherwise repeats its arguments regarding the additional structures.

Therefore, the Court construes the term "means for applying an electromagnetic feedback force as a function of time on said mass in a direction to move said mass to a predetermined position with respect to said support structure" to have a function of "applying an electromagnetic feedback force as a function of time on said mass in a direction to move said mass to a predetermined position with respect to said support structure" and a corresponding structure of "a feedback compensator circuit and a switch S5 controlled by a micro computer based switch controller 100, and equivalents thereof."

3. General Objection to the Lack of Construction Of Terms

a. Parties' Positions in Objections Briefing

In addition to its objection to the lack of construction in "desired characteristic" and "desired mechanical characteristic," Sercel broadly objects to any of the other terms that the Magistrate Judge declined to construe. Dkt. No. 79 at 8. Sercel notes that the "meaning of claim terms in view of complicated circuit diagrams and electronic concepts may not be apparent to a person that is **not** skilled in the art" and states that failure to construe disputed claim terms is legal error. *Id*. (emphasis in original) (citing Lunareye, Inc. v. Independent Witness, Inc., 2006 WL 2854490 (E.D.Tex.2006)). Sercel concludes that the Court should adopt Sercel's constructions because the Plaintiffs did not offer constructions for those claim terms that were not given construction by the Magistrate Judge. *Id*. at 8-9.

Plaintiffs respond that the "true purpose of the *Markman* process is not to construe *every* claim term, but rather to clarify terms whose meaning may not be clear to a jury." Dkt. No. 88 at 6 (emphasis in original) (citing United States Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed.Cir.1997)). Plaintiffs distinguish this case from *LunarEye* by explaining that the *LunarEye* terms were "terminology specifically relating to electronics," whereas the terms here "relate to mechanical concepts." *Id*. Plaintiffs accuse Sercel of attempting to "improperly narrow the patent claims by importing limitations from the preferred embodiment described in the specification" instead of allowing claim terms to carry their "heavy presumption" of having their "ordinary and customary meaning." *Id*. at 6-7 (citing CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366 & 1368 (Fed.Cir.2002)). Plaintiffs cite to various excerpts of the '242 specification which note that the preferred embodiments are meant to be illustrative and not to limit the claims. *Id*. at 7 (quoting '242 Patent, 4:8-11; 15:30-38).

b. Discussion

The Court notes that while it construes the terms as a matter of law, the Court is not required to provide a new definition or rewrite a term, particularly when it finds that the term has its plain and ordinary meaning. The Federal Circuit recently addressed this issue in *O2 Micro International Ltd v. Beyond Innovation Technology Co.,* 2008 U.S.App. LEXIS 7053, at (Fed. Cir. April 3, 2008). In *O2 Micro,* the Federal Circuit considered the term "only if" in independent claim 1 which requires "a DC/AC converter circuit comprising: a feedback control loop circuit ... adapted to generate a second pulse signal ... only if said feedback signal is above a predetermined threshold." *Id*. at *6-*7. The defendant asserted that its controllers did not satisfy the limitation of claim one because there were circumstances where the feedback signal controlled power to the

load "even though the feedback signal falls below the predetermined threshold." *Id*. at *8. Two defendants had asked the district court to construe the term "only if" to mean "exclusively or solely in the event that," another defendant argued the term to mean "never except when," and the plaintiff argued that no construction was needed. *Id*. at 10. The district court had noted that there was a dispute as to whether "only if" would have an exception but chose to rule that the term needed no construction. *Id*. at * 11.

The Federal Circuit noted that "[a]t trial, the 'only if' limitation was a key issue disputed by the parties." *Id*. at *12. The Federal Circuit stated that the "purpose of claim construction is to 'determin[e] the meaning and scope of the patent claims asserted to be infringed." *Id*. at * 19 (citing Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed.Cir.1995) (en banc)). The Federal Circuit clarified that "[w]hen the parties raise an actual dispute regarding the proper scope of these claims, the court, not the jury, must resolve that dispute." *Id*. (citing Markman, 52 F.3d at 979). The primary dispute, as acknowledged by the district court, was whether the "only if" limitation applied during the "the steady state operation of the switching circuit" or at all times without exception. *Id*. at *20-*21.

The Federal Circuit noted that the parties had agreed to the "meaning" of the term but not the "scope." *Id*. at *22-*23. The Federal Circuit stated that "[a] determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." *Id*. at *22. The Federal Circuit found that the district court's failure to construe "only if" allowed the jury to construe the term. *Id*. at *24.

The Federal Circuit recognized that "district courts are not (and should not be) required to construe *every* limitation present in a patent's asserted claims." *O2 Micro,* 2008 U.S.App. LEXIS 7053 at *25-*26 (emphasis in original) (citing Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc., 249 F.3d 1341, 1349 (Fed.Cir.2001); U.S. Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed.Cir.1997)). This Court and many of the other courts in this district have often found that no construction was necessary for a contested term. *See, e.g., Cooper Techs. Co. v. Thomas & Betts Corp.,* 2008 U.S. Dist. LEXIS 11457, at *20-*21 (E.D.Tex. Feb. 15, 2008) (finding the terms "radial distance / radial spacing / radially spaced" did not need construction); *911EP v.* Whelen Eng'g Co., 512 F.Supp.2d 713, 725 (E.D.Tex.) (finding the term "visible exterior surface" did not need construction even though both parties proposed a construction for the phrase); Konami Corp. v. Roxor Games, Inc., 445 F.Supp.2d 725, 733 n. 7 (E.D.Tex.2006) (declining to provide a construction for the term "matching relationship" and determining that a party's proposed construction of "corresponding relationship" was unhelpful because it merely restated the term "relationship").

The Court notes that other districts also frequently do not construe terms. *See, e.g.,* Adco Prods. v. Carlisle Syntec, Inc., 110 F.Supp.2d 276, 286 (D.Del.) (holding that no additional construction is necessary for the terms "a rubbery polymer comprising a blend of ... and polyisobutylene" or "substantially equal amounts"). As one district court in Delaware noted, "only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy." Biovail Labs. Int'l SRI v. Impax Labs., 433 F.Supp.2d 501, 505 (D.Del.2006) (quoting Vivid Techs., Inc. v. American Science & Eng'g, Inc., 200 F.3d 795, 803 (Fed.Cir.1999)). As explained by another district court, there is a heavy presumption that a claim term carries its ordinary meaning. *Bd. of Trustees of the Leland Stanford Junior University v. Roche Molecular Sys.,* 2007 U.S. Dist. LEXIS 87219, at * 19 (N.D.Cal. Nov. 27, 2007) (citing Phillips, 415 F.3d at 1314). The court further explained that some terms, such as "therapeutically effective," are commonplace terms that a juror could understand without further direction from the court. *Id*. The court found that the

terms "do not need to be construed because they are neither unfamiliar to the jury, confusing to the jury, nor affected by the specification or prosecution history." *Id*. at * 19-(citing Ethicon, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.")). However, the Federal Circuit held that "[w]hen the parties present a fundamental dispute regarding the scope of a claim term, it is the court's duty to resolve it." *O2 Micro,* 2008 U.S.App. LEXIS 7053, at *26.

Therefore, the Court concludes that when two parties offer different constructions, or if one side argues for ordinary meaning, then the Court must first determine whether it has a duty to resolve the meaning and the scope. While a district court's role is to construe the claims as matter of law, part of this role is to determine the extent of which to construe the claims or whether construction is even necessary. With regard to meaning, where additional language may be unduly limiting, confusing, or redundant, it is in the court's power to determine that no construction is necessary. A court may decline to adopt constructions that violate claim construction doctrine, such as improperly importing limitations, and may still construe terms to have their ordinary meaning. *See id*. at * 19. Similarly, with regard to scope, a Court may have a duty to determine the scope of a claim, but need not provide a construction that is redundant or is prohibitively limiting.

Other than "desired characteristic" above, the Recommendation determined that seven additional claims did not require construction. The Court notes that with many of the terms, Sercel disputed the scope by specifically importing limitations from the specification to limit the term to specific elements. The Court declines to import the limitations from the specification in accordance with well-established claim construction doctrine. Phillips, 415 F.3d at 1320. While the Court did not find the construction should be limited to those elements, the Court declines to provide constructions where it would cause further confusion by introducing synonymous words that would themselves require construction or where providing a construction would improperly limit the scope of the claim. The Court notes that often times, the plain and ordinary meaning was sufficient.

Claim Term	**Plaintiffs' Construction**	**Sercel's Construction**
"sensor structure"	No construction necessary (plain and ordinary meaning)	A body, including a top cover, a bottom cover, a central mass between the top cover and the bottom cover, a generally rectangular frame, and mechanical springs between the mass and the frame
"support structure"	No construction necessary (plain and ordinary meaning)	Generally rectangular frame.
"displacement"	No construction necessary (plain and ordinary meaning)	Movement of the mass perpendicular to its top and bottom surfaces
"predetermined position"	No construction necessary (plain and ordinary meaning)	rest position
"cover plates"	No construction necessary (plain and ordinary meaning)	Conducting surfaces of a capacitor covering portions of the mass and support structure
"substantially	No construction	No effective difference

zero"	necessary (plain and ordinary meaning)	
"less susceptible to breaking"	No construction necessary (plain and ordinary meaning)	Indefinite and incapable of construction under 35 U.S.C. s. 112.

Dkt. No. 53, Exh. A.

1. "sensor structure" (claims 1-7)

The Recommendation explained that Sercel's construction "would render needless portions of the claim that recite certain specific aspects of the sensor structure." Dkt. No. 68 at 17. The Recommendation also notes that Sercel's construction improperly imports limitations from the specification. *Id*. The Court agrees that Sercel's definition would have improperly limited the claim and also agrees that no construction is necessary as the "sensor structure" may be given its ordinary meaning and any attempt to construe the term may imbue the term with improper limitations.

2. "support structure" (claims 1-7)

The Recommendation notes that Sercel provides little argument other than citing a single passage in support of its construction. Dkt. No. 68 at 18. The Court agrees with the Magistrate's conclusion that no construction is needed. *Id*. Like "sensor structure" above, Sercel needlessly imports limitations from the specification. While the Court rejects Sercel's limiting construction, the Court does not adopt an alternative construction that may be repetitive or unnecessarily limiting. Therefore, the Court determines that the term "support structure" has its plain and ordinary meaning.

3. "displacement" (claims 1-7)

As explained by the Recommendation, Sercel primarily argues that its construction is supported by limitations of the specification, the lack of enablement for any movement other than in a perpendicular direction, and the "teaching away" of the lateral movement in the patent. Dkt. No. 68 at 20. The Recommendation determined that, contrary to "teaching away" from lateral movement, implied that some lateral movement occurred. *Id*. at 21. The Recommendation then concluded that, based on the record as a whole, the movement need not be limited to be implemented in a perpendicular direction, rather the passages cited in the '242 Patent "seem more directed at preventing motion in a second direction from the intended direction of measurement as opposed to indicating that the disclosed concepts would not be relevant to lateral measurement scheme." *Id*. at 21 (citing '242 Patent, 6:1-7:14). The Court determines that while the limitations in Sercel's construction implicate the scope of the term, the Court finds that the Sercel's definition unnecessarily limits the term. Having determined that the scope is not necessarily limited to perpendicular movement, the Court finds that the term should be construed according to its plain and ordinary meaning, which is not limited to a perpendicular direction.

4. "predetermined position" (claims 1-7)

The Recommendation focused on the passage of the '242 Patent cited by Sercel, which states: "linear movement of the springs enables an extremely accurate measurement of a variable related to such input force by measuring the displacement of mass 16 from its rest position." Dkt. No. 68 at 21 (citing Dkt. No. 39 at 19 (citing '242 Patent, 5:28-33)). The Recommendation determined, on the other hand, that

"predetermined position" was utilized throughout the specification without being limited to a "rest position." *Id*. at 22 (citing '242 Patent, 1:15-16, 3:35-38; 4:25). Agreeing with the Recommendation, the Court determines that Sercel is simply importing a limitation from the specification. *Id*. Having determined that the scope is not narrowly construed as the term provided by Sercel, the Court declines to provide a construction, as any attempt to define the term may be unnecessarily repetitive or may simply replace the construction with terms that would likely require construction themselves. Therefore, the term is construed to have its plain and ordinary meaning.

5. "cover plates" (claims 2-3)

Sercel argued that "cover plates" were the "conducting surfaces of a capacitor" and that the surfaces covered portions of the mass and support structure. The Court notes that the claim describes top and bottom cover plates as "having conductive surfaces." Including this limitation in the definition would potentially confuse a jury into limiting the cover plates to only conductive surfaces, and this phrase is redundant particularly when its is already explained by the claim itself. '242 Patent, 16:41-42. The Recommendation explained that the "specification indicates that the cover plates are more than the conductive surfaces." Dkt. No. 68 at 25 (citing ' 242 Patent, Figure 3). Therefore, the scope of a cover plate is not limited to only "conductive surfaces," but, again, the Court does not seek to provide a definition that would be potentially limiting. Therefore, the Court adopts the Magistrate's Recommendation and determines that no construction is needed.

6. "substantially zero" (claim 5)

In the original briefing Sercel argues that "[b]ecause the loop dynamics are optimized when Km=Ke, and the difference between Km and Ke is therefore actually zero, any effective difference between Km and Ke is not supported by the specification." Dkt. No. 39 at 27. Sercel further makes a prosecution disclaimer argument, remarking that the "patentee argued in the response to an Office Action that '[claim 5] requires the mechanical spring constant of the sensor and the electric spring constant ***to be equal to another ...*** ' " *Id*. (emphasis in original) (citing '242 Patent Pros. Hist. Resp. to Office Action B at 9 (Oct. 21, 1997), Dkt. No. 39, Exh. 15 at 6). Sercel concludes that "substantially zero" is "no effective difference." *Id*.

Plaintiffs respond that straightforward terms need not be construed if they are easily understood by a jury. Dkt. No. 43 at 19-20. Sercel replies that while some terms, such as "small positive difference," are incapable of being construed, other terms, such as "substantially zero," can be construed due to the context those terms are used in the '242 Patent. Dkt. No. 46 at 21. Sercel notes that "Plaintiffs completely ignore that arguments were made during prosecution that require Km = Ke in this claim. The patentee's arguments to obtain patentability for this claim limit the scope and meaning of this claim term." *Id*.

The Recommendation rejected the argument of prosecution disclaimer and found that intrinsic evidence did not equate "substantially zero" to "equal to one another" or "no effective difference" as argued by Sercel. Dkt. No. 68 at 26-27. The Recommendation noted that one response to an office action stated that the mechanical spring constant and electric spring constant to be "equal to one another" whereas another response required a "zero effective spring constant." *Id*. at 26. The Recommendation had interpreted the word "effective" to modify the word "zero," in other words, that the value was "effectively zero" which would be similar to "substantially zero." Based on this, the Recommendation determined there was not a sufficient disavowal because of the contrasting interpretations in the prosecution history. *Id*. at 27.

The term "effective spring constant," or $K_{eff,}$ is a term of art supplied by the patent, wherein $K_{eff} = K_m - K_e$, where K_m is the mechanical spring constant, and K_e is the electric spring constant. '242 Patent, 3:51-66. Therefore, if K_{eff} is "zero" then the mechanical spring constant must be equal to the electric spring constant. As explained above, there are two instances in two separate responses where the patentee referred to this value. First, as explained in an October 21, 1997 response: "Claim 5 covers the method of manufacture subject matter as described in the specification from page 27, line 9 to page 28 line 3. Specifically it requires that the **mechanical spring constant** of the sensor and the **electric spring constant be equal to one another** so that the transfer function of the sensor includes a pure integrator." Dkt. No. 39, Exh. 15 at 6 (emphasis added). Thus, the patentee is stating that the two constants must be equal, in other words, that the effective spring constant is zero. In a second response dated May 12, 1998, the patentee argues that claim 5 is distinguished from a Hemrion reference, stating:

There is not a hint of a suggestion in Hemrion of adjusting the *difference* between the *mechanical* spring constant and the *electric* spring constant to achieve desired characteristics:

(A) of claims 1 and 2, *high mechanical springs* constant, but *small* effective spring constant,

or

(A) of claims 4 and 5, *zero* effective spring constant.

Dkt. No. 46, Exh. C at I-O-000216 (emphasis in original).

The Court determines that the word "effective" is used as part of the term of art and the word "zero" is modifying the term "effective spring constant." Therefore, in this second instance, the patentee is arguing that the "effective spring constant" is "zero," in other words, that the mechanical spring constant of the sensor and the electric spring constant are equal to one another.

In *Phillips,* the Federal Circuit recognized that in some cases the "specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor." 415 F.3d at 1316. "[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable." Omega Eng'g, Inc. v. Raytec Corp., 334 F.3d 1314, 1326 (Fed.Cir.2003). The Federal Circuit has "declined to apply the doctrine of prosecution disclaimer where the alleged disavowal of claim scope is ambiguous." Id. at 1324; *see also* Northern Telecom Ltd. v. Samsung Electronics Co., 215 F.3d 1281 (Fed.Cir.2000); Rexnord Corp. v. Laitram Corp., 274 F.3d 1336 (Fed.Cir.2001); Vanguard Prods. Corp. v. Parker Hannifin Corp., 234 F.3d 1370, 1372 (Fed.Cir.2000) (refusing to narrow the asserted claim based on prosecution disclaimer because "the prosecution history does not support [the infringer]'s argument that the Vanguard inventors 'expressly disclaimed' claim scope beyond products made by co-extrusion"). While the disavowal or disclaimer must be "clear," the Federal Circuit has stated that a clear disavowal does not require the "rigid formalism" of an " 'expression of manifest exclusion or restriction' in the form of 'my invention does not include ----.' " Astrazeneca AB v. Mut. Pharm. Co., 384 F.3d 1333, 1340 (Fed.Cir.2004).

Here, the prosecution history has shown that the patentee consistently argued that the value of "substantially zero" meant "zero" and that the patentee disclaimed any values other than but close to zero. The Court recognizes that Plaintiffs' expert has stated that ideally a realistic goal is for the difference between K_m and K_e should be a somewhat positive number in order to avoid stability problems. *See* Declaration of Martin

Schmidt, Dkt. No. 43, Exh. H para. 15 (stating that the ideal is where $K_m = K_e$ but, "to avoid stability problems, this difference should be kept positive"); Original Markman Hearing, Dkt. No. 108 at 78:16-18 (stating that "it's impractical to make Km equal to Ke because of the manufacturing requirements."). The patent itself only focuses on "if K_e becomes too large, as compared to K_m, then one pole enters the right half phase, and the sensor becomes unstable." '242 Patent, 13:29-30. However, as shown from the prosecution history, the patentee intended the value of the difference to be "zero," and where there is an intentional disclaimer of claim scope, "the inventor has dictated the corrected claim scope, and the inventor's intention, as expressed in the specification, is regarded as dispositive." *Phillips,* 415 F.3d at 1416 (citing SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1343-44 (Fed.Cir.2001)). Extrinsic evidence is generally interpreted in light of the intrinsic evidence. Phillips, 415 F.3d at 1319. The Court gives more weight to the intrinsic evidence in deciding that, while impractical, the value of the difference should be construed to be "zero."

Finally, in determining whether any construction should be given, the Court determines that, in light of the disclaimer, a jury would be confused if the Court did not provide a construction. Moreover, in a situation where the claim could potentially have more than one "ordinary" meaning or where the Court is required to determine the scope of the claim, the claim term should be construed. Here, confusion could arise as to whether "substantially zero" should mean "zero" or could mean "almost zero."

The Court construes "substantially zero" to mean "zero or no difference." In other words, where the mechanical spring constant and electric spring constant are "equal to one another."

7. "less susceptible to breaking" (claims 1-3)

Sercel argues that the '242 Patent does not provide an "objective standard for evaluating the bounds of the term." Dkt. No. 39 at 32. Sercel provides that "a structure having an undefined 'low' spring constant is the basis for comparison of the phrase 'less susceptible to breaking.' " *Id*. Sercel argues that this phrase is incapable of being construed.

Plaintiffs respond that the term appears in a "whereby" clause which states the limitation of the claim and "adds nothing to the patentability or substance of the claim." Dkt. No. 43 at 33 (citing Texas Instruments, Inc. v. U.S. Int'l Trade Comm'n, 988 F.2d 1165, 1172 (Fed.Cir.1993)). Plaintiffs argue that the "invention is directed to solving the dilemma that if the mechanical spring constant in a MEMS device is made low enough to be sensitive to low frequencies, such as seismic frequencies, then the device will be too susceptible to breaking to be a useful accelerometer." *Id*. (citing '242 Patent, 3:12-31; 13:54-61). Plaintiffs note that Sercel agrees that there is nothing indefinite about the comparison, rather Sercel argues the "low spring constant" is indefinite. Id. Plaintiffs reply that "low spring constant" would be understood to be low enough to produce an accelerometer that is sensitive to low frequencies. *Id*.

Sercel responds that "[b]ecause Plaintiffs argued for patentability using these phrases, these phrases are material and limiting of the claim." Dkt. No. 46 at 17 (citing Hoffer v. Microsoft Corp., 405 F.3d 1326, 1329-30 (Fed.Cir.2005)). Sercel notes that the patentee distinguished the claims over the prior art. *Id*. at 18 (citing Response to Office Action (Oct. 21, 1997), Dkt. No. 46, Exh. H at I-O-000196).

The Recommendation agreed that the limitations in the whereby clause related to patentability and evaluated the clause. Dkt. No. 68 at 54. The Recommendation noted that the term was related to a comparison of two different structures. *Id*. The Recommendation further construed the term "low mechanical spring constant,"

which was the term that Sercel objected to the most as not having an objective boundary. *Id*. at 55. The language of the term suggests comparative language, and the claim itself states the two elements that are compared. Therefore, the Court determines that one of skill in the art would be able to understand the elements being compared and the attribute to compare, which is susceptibility to breaking. The Court agrees with the Recommendation and determines that this term does not require construction.

4. "means for generating a displacement signal as a function of time" (claims 1-7)

a. Original Briefing Before Magistrate Judge

Plaintiff's Original Proposed Construction	Sercel's Original Proposed Construction	Magistrate Judge's Construction
Means-plus-function The means for generating a displacement signal is a switched capacitor sensing amplifier or its equivalent. Dkt. No. 53, Exh. A at 3.	***Means-plus-function*** Structure Micro Computer Based Switch Controller 100; Switches S1, S2, S3, S4, S5, S6, S7, S8, S9; Top and Bottom Plates 5052; Ground Connection; Reference Voltages +VR,-VR; Capacitors C1, C2; Operational Amplifier OA1	Function: "generating a displacement signal as a function of time which is representative of distance said mass has moved with respect to said support structure in response to force applied to said support structure"
Function: "generating a displacement signal as a function of time which is representative of distance said mass has moved with respect to said support structure in response to force applied to said support structure." Dkt. No. 36 at 11.	Function: Generating a displacement signal as a function of time Dkt. No. 53, Exh. A at 7-8.	Structure: "operational amplifier OA1; capacitors C1 and C2; switches S1, S2, S3, S4, S5, S6, S7, S8, and S9; top and bottom conductive plates 50 and 52; reference voltages +VR and -VR; ground connections; and micro computer based switch controller 100; and equivalents thereof"

Plaintiffs stated that the structure related to the function is the "structure that generates the voltage on lead 97," which is the "circuitry comprising switches S6, S7, and S8, capacitors C1 and C2, and operational amplifier, or op-amp, OA1," in other words, a "conventional switched capacitor amplifier." Dkt. No. 36 at 11. Plaintiffs argued that one skilled in the art would recognize the circuit in Fig. 3 to belong to a "class of switched capacitor amplifiers that may employ a variety of different circuitry configurations." *Id*. at 12. Plaintiffs argued that the structures proposed by Sercel do not perform the stated function but only enable the function. *Id*. at 14-15 (citing Northrop Grumman Corp. v. Intel Corp., 325 F.3d 1346, 1352 (Fed.Cir.2003); Asyst, 268 F.3d at 1371).

Sercel responded that it is improper to generalize structures to possible structures not mentioned in the specification. Dkt. No. 39 at 15-16 (quoting Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193 (Fed.Cir.2002)). Sercel also agreed that the displacement signal is the voltage signal at node 97 generated by the structure in Figure 3, which Sercel proposed should include the switch controller 100, operational amplifier OA1 and capacitor C1 to generate the voltage representing the displacement of the mass." *Id*. at 16.

Plaintiffs conceded that the elements suggested by Sercel "cooperate" to make the circuit work, but Plaintiffs argued that the "correct legal standard is that only those structures necessary to perform the claimed function should be included as part of the corresponding structure for a means-plus-function claim element." Dkt. No. 43 a 8. Plaintiffs argued that "extraneous, merely enabling, elements" should not be incorporated. *Id*. at 9 (citing Asyst Techs., 268 F.3d at 1370).

Sercel replied that there are no references to a "switched capacitor amplifier" in the specification and that the Plaintiffs failed to identify a structure related to the "as a function of time" limitation. Dkt. No. 46 at 4. Sercel argues that the structures it identified in the specification are integral to performing the entire claimed function. *Id*. at 5 (citing Gemstar-TV Guide Int'l v. Int'l Trade Comm., 383 F.3d 1352 (Fed.Cir.2004)).

The Magistrate Judge construed the function to be the full functional language in the claim and noted that neither party briefed their reasoning regarding the difference in the functional language. Dkt. No. 68 at 30. Regarding the structure, the Magistrate Judge held that particular elements of a specific circuit of Figure 3 were disclosed, rather than a generalized class of circuitry. *Id*. The Magistrate Judge included the "top and bottom capacitor conductive plates 50 and 52" because they "are the very mechanisms through which displacement is detected, without which the claimed signal would not be a displacement signal." *Id*. at 31 (citing '242 Patent, Figure 3, 5:61-67, 8:22-9:17).

b. Parties' Positions in Objections Briefing

Plaintiffs object to the list of recommended corresponding structures as too broad. Dkt. No. 80 at 4 (citing B. Braun Med., Inc. v. Abbott Labs., 124 F.3d 1419, 1424 (Fed.Cir.1997); Acromed Corp. v. Sofamor Danek Group, inc., 253 F.3d 1371, 1382 (Fed.Cir.2001)). Plaintiffs focus on the structure that generates the displacement signal on node 97 of Figure 3. *Id*. at 4-5. Plaintiffs argue that the "specification explicitly states that the structure that generates the displacement signal as a function of time *includes the circuitry only* " and does not include conductive plates. *Id*. at 5 (citing ' 242 Patent, 1:44-47). Plaintiffs argue that the function of the plates cannot be a part of the structure because their function is to create a sense voltage proportional to the displacement of the mass. *Id*. (citing '242 Patent, 1:37-43). Plaintiffs state that the sense voltage is provided to the switched capacitor amplifier, which converts the input into the claimed displacement signal on node 97. *Id*. at 5-6. Plaintiffs agree that creating the sense electric field is required to enable the "generating a displacement signal," but contend that merely enabling the function does not mean the structure performs the function. *Id*. at 6 (citing Asyst, 268 F.3d at 1370-71).

Plaintiffs alternatively suggests that if the "structures for creating the sense electric field should be included, ... the corresponding structure still cannot be construed as 'plates' because the '242 patent specification routinely refers to 'conductive regions' instead of 'cover plates.' " Dkt. No. 80 at 7 (citing '242 Patent, 1:37-43, 7:66-8:5, 9:35-36, 8:53-55, 9:48-52). Plaintiffs argue that the Recommendation's rationale for using plates, which is that the specification uses the term "plate" in describing the sensing phase steps, is incorrect. *Id*. at 7 (citing Dkt. No. 68 at 31 n. 1). Plaintiffs argue that the specification also referred to "conductive regions" when describing the sensing phase. *Id*. (citing '242 Patent, 7:64-8:1).

Plaintiffs argue that "conductive regions" are appropriate over "cover plates" due to the doctrine of claim differentiation. Dkt. No. 80 at 7-8 (citing Acumed LLC v. Stryker Corp., 483 F.3d 800, 806 (Fed.Cir.2007)). Plaintiffs contend that this doctrine applies even for different independent claims. *Id*. at 8 (citing Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374, 1381 (Fed.Cir.2006)). Plaintiffs conclude that because independent claims 2 and 3 each include the "plates" limitation, the presumption must be that claim

1 does not include this structure. *Id*.

Sercel responds that although Plaintiffs agreed to the function adopted by the Magistrate Judge, Plaintiffs' objections are based on a different function. Dkt. No. 85 at 2. Sercel argues that the focus should not be on the displacement signal on node 97, but rather "the function is not limited to generating **any** displacement signal-but rather generating a displacement signal *'representative of distance said mass has moved* with respect to said support structure in response to force applied to said support structure.' " *Id*. at 3. Sercel reasons that the displacement signal is representative "of the distance said mass has moved," which would require the inclusion of conductive plates 50 and 52, which sense the displacement of the mass. *Id*. at 3-4. Sercel states that Plaintiffs' argument that the plates create a sense voltage corroborates the function identified by the Magistrate Judge. *Id*. at 4-5 (citing Recommendation, Dkt. No. 68 at 31).

Sercel avers that a "switched capacitor sensing amplifier" is not mentioned in the specification, and corresponding structures are limited to those described in the specification. *Id*. at 5 (citing Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193, 1213 (Fed.Cir.2002); J & M Corp. v. Harley-Davidson, Inc., 269 F.3d 1360, 1367 (Fed.Cir.2001); Medtronic, Inc. v. Advanced Cardiovasuclar Sys., Inc., 248 F.3d 1303, 1311-13 (Fed.Cir.2001)). Relating back to the cover plates, Sercel avers that Plaintiffs' expert witness, Dr. Buckman, opined that the "cover plates" were part of the structure of a "switched capacitor sensing amplifier." *Id*. at 5-6 (citing Buckman Decl., Dkt. No. 36, Exh. B para.para. 12-15).

Sercel states that the use of "conductive regions" rather than "cover plates" was "soundly rejected" by the Magistrate Judge. *Id*. at 6 (citing Dkt. No. 68 at 31 n. 1). With reference to the invocation of the doctrine of claim differentiation, Sercel argues that *Curtiss-Wright Flow Control Corp*. stands for the proposition that claim differentiation is rarely applied between two independent claims. Dkt. No. 85 at 7 (citing Curtiss-Wright Flow Control Corp., 438 F.3d at 1380). Sercel also states that different terms were involved as claims 2 and 3 identified "cover plates" while claim 1 referred to "conductive plates." *Id*. Sercel argues that claim differentiation does not require a difference in scope for each limitation, rather only one limitation must differ, and states that claims 2 and 3 have additional limitations of "conductive surfaces" and "means for applying a voltage difference" that are not found in claim 1. *Id*. at 7-8 (citing Kraft Foods, Inc. v. International Trading Co., 203 F.3d 1362, 1368 (Fed.Cir.2000)).

Plaintiffs respond that Sercel had previously agreed that the displacement signal is the voltage signal occurring at node 97 in Figure 3. Dkt. No. 89 at 1 (citing Sercel's Claim Construction Brief, Dkt. No. 39 at 16). Plaintiffs note that the specification provides that the signal on node 97 is the displacement signal as a function of time. *Id*. at 1-2. Plaintiffs state that the forward circuit generates the signal from the charge, while other structures, such as a "forward displacement signal circuit for measuring displacements of the mass" ('242 Patent, 3:33-38) help to generate the displacement signal. Id. (summarizing that "The forward circuit generates the signal from the charge on the conductive regions, which serves as an input to the circuit."). Plaintiffs alternatively request that "conductive regions," and not "cover plates," are the structures that create the "sense electric field." Dkt. No. 89 at 2.

c. Discussion

The Court first determines that the function is the phrase following the "for." Unlike the means-plus-function term above, the Court does not determine that the language "which is representative of distance said mass has moved with respect to said support structure in response to force applied to said support structure" is descriptive of the "means" or merely stating the result. *See Lockheed Martin Corp. v. Space*

Systems/Loral, Inc., 324 f.3d 1308, 1319 (Fed.Cir.2003). Rather, the Court recognizes that the phrase is related to an aspect of the function. Both parties do not contest the Recommendation's identification of the function. Therefore, the Court construes the function to be "generating a displacement signal as a function of time which is representative of distance said mass has moved with respect to said support structure in response to force applied to said support structure."

Having determined the function, the Court next looks to the written description to find a corresponding structure. *Lockheed Martin,* 324 F.3d at 1320. The primary dispute between the parties is whether to include the "conductive region" or "cover plates" as part of the corresponding structure. The corresponding structure is provided in the section identified as "State 3: Sensing Phase: Sense position of mass 16' between top and bottom plates 50." ' 242 Patent, 8:22-24. The result of that phase is the displacement signal that appears at node 97 in Figure 3 of the '242 Patent. '242 Patent, 9:14-16. Therefore, the question the Court must answer is which corresponding structures are necessary to perform the function identified above such that there is a clear link or association between the function and the structure.

The question of which corresponding structures actually perform the function is one that has been addressed by the Federal Circuit frequently, and often the Federal Circuit had to distinguish between structures that merely enabled the function versus those that actually performed the function. *See* Epcon Gas, 279 F.3d 1022, 1031 (Fed.Cir.2002) (determining the corresponding structure of a "control means" with a function of injecting gas into the mold to increase, decrease, or maintain the gas, was not limited to the disclosed components for the function of varying gas pressure but included the components for supplying gas, e.g. the "bulk supply system."); *see also Lockheed Martin,* 324 F.3d at 1319-20; Asyst, 268 F.3d at 1369-72.

In *Asyst,* the Federal Circuit considered the corresponding structure for the "second microcomputer means" limitation. Asyst, 268 F.3d at 1370. The district court had held that the "second microcomputer means for receiving and processing digital information communicated with said respective second two-way communication means" included "communication line 51" which served to transmit information between the microcomputer and the second two-way communication means. *Id.* The Federal Circuit identified corresponding structures that performed the "receiving and processing," specifically a local control processor 20. *Id.* While the Federal Circuit noted that line 51 carried data between the local processor 20 and the communicating means 50, the Federal Circuit stated that line 51 was a separate structure and "although line 51 enables the second microcomputer means to perform its recited functions, it does not actually perform any of those functions." *Id.* The Federal Circuit further explained that "[a]n electrical outlet enables a toaster to work, but the outlet is not for that reason considered part of the toaster." *Id.* Here, the Court does not determine that the plates are a separate structure, rather, they are integral to performing the function.

The Court finds that *Gemstar-TV* may be analogous to the situation here. In *Gemstar-TV,* the Court determined the function to be "displaying the television schedule on the television screen as a grid." Gemstar-TV, 383 F.3d at 1361. Gemstar argued that only the CPU and the video display generator comprised the corresponding structure and a video switcher was not included because it did not "affect the function of how the schedule will be displayed." *Id.* The Federal Circuit cited to the written description and found that "the combination of a CPU, video display generator, and video switcher is required to perform the function of displaying" and "[w]ithout the transmission of electrical signals by the video display generator to enable the video switcher, the television schedule would not be selectively displayed on the television screen and would not be displayed in a grid format, as are required by the functional statement of the claim limitation." *Id.* at 1362. Thus the video switcher was integral to performing the claimed function.

Id. at 1363.

Another analogous case is *Lockheed Martin,* where the Federal Circuit first determined that the function of a means-plus-function term was "rotating said wheel in accordance with a predetermined rate schedule which varies sinusoidally over the orbit at the orbital frequency of the satellite." *Lockheed Martin,* 324 F.3d at 1319. The Federal Circuit determined that the corresponding structure was not only the wheel electronics, which actually control the rotation or "signal to the yaw wheel" but also the sine generator, which produces the rate schedule. *Id*. Similarly, the Court determines that the while the voltage signal at node 97 is generated by the various other structures indicated as the corresponding structure, the conductive plates are essential to the function because they are directly related to "distance said mass has moved" aspect of the function. Exclusion of this structure would make the latter portion of the function superfluous. Therefore, the Court concludes that the plates are integral to performing the function. One way to view the corresponding structure is to imagine a "black box" structure that performs the function and to see which elements must be included to perform the function. Here, as explained by the Magistrate Judge, the conductive plates "are the very mechanisms through which displacement is detected, without which the claimed signal would not be a displacement signal." Dkt. No. 68 at 31. Therefore, the conductive plates must be included in the black box in order to perform the claimed function.

Plaintiffs argue that the word region should be used instead of plates because independent claims 2 and 3 contain the "plates" limitation and, under the doctrine of claim differentiation, claim 1 should not include this structure. Dkt. No. 80 at 8. The Federal Circuit has explained that while the doctrine of claim differentiation works best between an independent and dependent claim, it is also possible for different terminology in different claims can define the same subject matter. Curtiss-Wright, 438 F.3d at 1380-81. Specifically, the Federal Circuit observed that "two considerations generally govern this claim construction tool when applied to two independent claims: (1) claim differentiation takes on relevance in the context of a claim construction that would render additional, or different, language in another independent claim superfluous; and (2) claim differentiation 'can not broaden claims beyond their correct scope.' " Id. at 1381 (quoting Fantasy Sports Props. v. Sportsline.com, 287 F.3d 1108, 1115-16 (Fed.Cir.2002)). However, as this specifically refers to the structure of a means-plus-function term, the Federal Circuit's decision in *NOMOS Corp. v. BrainLAB USA, Inc*. also explained the interpretation of a corresponding structure comes from the written description, not from other dependent claims, and "claim differentiation, which is a 'guide, not a rigid rule,' does not override the requirements of s. 112, P 6 when the 'claim will bear only one interpretation.' " NOMOS, 357 F.3d 1364, 1368 (Fed.Cir.2004) (quoting Autogiro Co. of Am. v. United States, 181 Ct.Cl. 55, 384 F.2d 391, 404 (Ct.Cl.1967)). As explained in the Magistrate Judge's Recommendation, the associated elements are 50 and 52, which are described as plates within the state 3 of the sensing phase related to this function. ' 242 patent, 8:25-65; *see* Dkt. No. 68 at 31 n. 1. Further, the figures illustrate plate-like structures 50 and 52 and where the term "region" is used in the specification, the regions in question are the plate-like structures 50 and 52. Therefore, the corresponding structure is a "plate."

Plaintiffs assert that the component parts should be referred to as a "switched capacitor sensing amplifier" while Sercel avers that the corresponding structure should be limited to only those mentioned in the specification. As explained in *Texas Digital Systems, Inc.,* the corresponding structure of a means-plus-function term must have basis in the specification. Tex. Digital Sys., 308 F.3d at 1213. The scope of the means is limited to the structure disclosed in the specification and its equivalents, wherein the extent of the equivalents is also interpreted in light of the disclosure and prosecution history. J & M Corp., 269 F.3d at 1367. Here, the "switched capacitor sensing amplifier" is not specifically disclosed in the specification. If

Plaintiffs seek to show that they are the same or equivalents, then this may be done at a later stage, such as in proving validity or infringement; however, during the claim construction stage, the corresponding structure must have some basis in the specification. *See On* Demand Mach. Corp. v. Ingram Indus., 442 F.3d 1331, 1341 (Fed.Cir.2006) (stating that the determination of equivalents under s. 112, para. 6 is a question of fact). Therefore, the Court does not replace the structures disclosed in the specification with the purportedly generic circuit of a "switched capacitor sensing amplifier." Rather, the Court agrees with the Recommendation and "looks to the corresponding disclosed structure rather than mere generalizations of the structure." Dkt. No. 68 at 30.

The Court construes the corresponding structure to be "operational amplifier OA 1; capacitors C1 and C2; switches S1, S2, S3, S4, S5, S6, S7, S8, and S9; top and bottom conductive plates 50 and 52; reference voltages +VR and -VR; ground connections; and micro computer based switch controller 100; and equivalents thereof."

5. "small positive difference" (claims 1-3)

a. Original Briefing Before Magistrate Judge

Plaintiff's Original Proposed Construction	**Sercel's Original Proposed Construction**	**Magistrate Judge's Construction**
No construction necessary (plain and ordinary meaning). Dkt. No. 53, Exh. A at 5.	Indefinite and incapable of construction under 35 U.S.C. s. 112. Dkt. No. 53, Exh. A at 5.	Indefinite. Dkt. No. 68 at 58.
Alternative Construction from Plaintiff's Original Reply Brief: "a person of ordinary skill in the art would understand in light of the specification of the '242 patent that the small positive difference between K_e and K_m should be selected so that the sensitivity is as high as possible without allowing the transfer function to become unstable in view of the tolerances inherent in any manufacturing process" Dkt. No. 43 at 26.		
Alternative Construction by Plaintiff's Expert Dr. Martin Schmidt: "A person of skill in the art would understand that "small" refers to the amount of positive difference necessary to avoid instability while keeping the sensitivity as high as reasonably possible and at least high enough to limit the natural frequency of the accelerometer to the upper end of the frequency band of interest." Declaration of Dr. Martin Schmidt, Dkt. No. 43, Exh. H para. 15.		

Sercel argued that the '242 Patent does not provide guidance as to a "small positive difference" between the mechanical spring constant and electric spring constant. Dkt. No. 39 at 30. Sercel noted that while the ' 242 Patent discloses that the sensitivity increases as K_e approaches K_m, the '242 patent did not disclose how to identify "whether the actual ***magnitude*** of the difference (K_m-K_e) is sufficient to be 'small.' " Id. (emphasis in original). Sercel argued that the inventors confirmed that a "small positive difference" involved a subjective determination. Id.

Plaintiffs responded that the '242 Patent teaches that maximum sensitivity is achieved when K_{eff} is zero, but the patent also teaches that "the small positive difference is selected to result in high sensitivity at low frequencies." Dkt. No. 43 at 26 (citing '242 Patent, 3:22-26). Plaintiffs concluded that a "small positive difference between K_e and K_m should be selected to that the sensitivity is as high as possible without allowing the transfer function to become unstable in view of the tolerances inherent in any manufacturing process." Id. Plaintiffs cited to the inventors' testimony stating that zero is a theoretical difference and the goal is to "take into account the tolerances of values used in the silicon processing process." *Id*. at 27 (citing Mayo Deposition, Dkt. No. 43, Exh. F at 158:16-161:6, 165:2-11). Plaintiffs stated that this is reflected in the patent, which teaches that a small positive difference is required because otherwise the sensor becomes unstable. *Id*. (citing '242 Patent, 13:27-30). Plaintiffs argued that a specific numerical value or mathematical precision is not required to be definite, rather only a reasonable degree of particularity. *Id*. at 28 (citing Modine Mfg. Co. v. U.S. Int'l Trade Comm'n, 75 F.3d 1545, 1557 (Fed.Cir.1996); Moore USA, Inc. v. Standard Register Co., 229 F.3d 1091, 1111 (Fed.Cir.2000)). Plaintiffs focused on inventors' testimony providing that a "small positive difference" is "self-explanatory" to someone designing sensors. *Id*. at 28-29 (citing DeVolk Depo, Dkt. No. 43, Exh. G at 87:21-22).

Plaintiffs stated that there is a relationship between the positive difference between the mechanical and electrical spring constant. Dkt. No. 43 at 29. As the difference increases, the sensitivity decreases in proportion (citing ' 242 Patent, 14:1-26) to the bandwidth natural frequency, and in turn the bandwidth of the sensor, increases. Id. Plaintiffs argued that it "would run contrary to the entire object of the invention to needlessly lower sensitivity in exchange for additional bandwidth if the frequencies in the additional bandwidth are not of interest." *Id*. Plaintiffs explained that for seismic frequencies, the frequencies that are not of interests are those over 250 Hz. *Id*. Plaintiffs analogized the explanation of the '242 Patent to that of the term "essentially free of alkali metal" in *In re Marosi,* where the Federal Circuit determined that one skilled could "draw the line between unavoidable impurities and essential ingredients." *Id*. at 29-30 (citing In re Marosi, 710 F.2d 799, 802-03 (Fed.Cir.1993)).

Sercel noted that the '242 Patent did not discuss or provide any support for tolerances in silicon processing or their affect on the effective spring constant. Dkt. No. 46 at 12. Sercel summarized the Schmidt opinion provided in Plaintiffs' reply as defining the limit of a small positive difference to be between the ideal goal of zero and "the amount of positive difference necessary to avoid instability while keeping sensitivity as high as reasonably possible and at least high enough to limit the natural frequency of the accelerometer to the upper end of the frequency band of interest." *Id*. at 13. Sercel argued that this self-serving declaration provides that any reduction in the effective spring constant makes use of the invention. *Id*. Sercel also noted that the formula identifying the relationship between the effective spring constant, the natural frequency of the structure, and the mass does not disclose the value of mass, thus one cannot calculate a "small positive difference." *Id*. at 14.

While the Recommendation recognized that mathematical precision was not required, the Recommendation also determined that the specification should provide a standard for measuring that degree. Dkt. No. 68 at 47 (quoting Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371, 1381 (Fed.Cir.2001)). The Magistrate Judge understood Plaintiff's briefing to allow two possible constructions, as shown in the table above. One definition required the difference to be as small as possible to allow as high a sensitivity as possible subject to manufacturing tolerances, but the Magistrate Judge determined that this was not disclosed in the specification. Dkt. No. 68 at 47. The Magistrate Judge understood the reference in the specification regarding instability to be related to "when Ke is too large compared to Km and does not

provide any framework to determine when a difference Km-Ke is considered small enough." *Id*. at 47 (citing '242 Patent, 13:27-30; Dkt. No. 43 at 21-22).

With regard to the second definition, relating to the frequency band of interest, the Magistrate Judge stated that the specification does not provide support for this definition. Dkt. No. 68 at 48. The Magistrate Judge held that the specification "does not suggest that 'small' should be evaluated from the frame of reference of the natural frequency and the frequency band," rather the patent generally taught that a small difference yields high sensitivity. *Id*. (citing '242 Patent, 3:22-25, 13:50-52). The Magistrate Judge concluded that "small positive differences" could not be construed and claims 1-3 were invalid. *Id*.

b. Parties' Positions in Objections Briefing

Plaintiffs' Proposed Construction	Sercel's Proposed Construction
"the amount of positive difference necessary to avoid instability while keeping the frequency band of interest (in this case, 0-250 Hz) within the natural frequency of the accelerometer" Dkt. No. 89 at 7.	Adopt the Magistrate Judge's recommendation that the "small positive difference" claim phrase is indefinite. Dkt. No. 85 at 8.

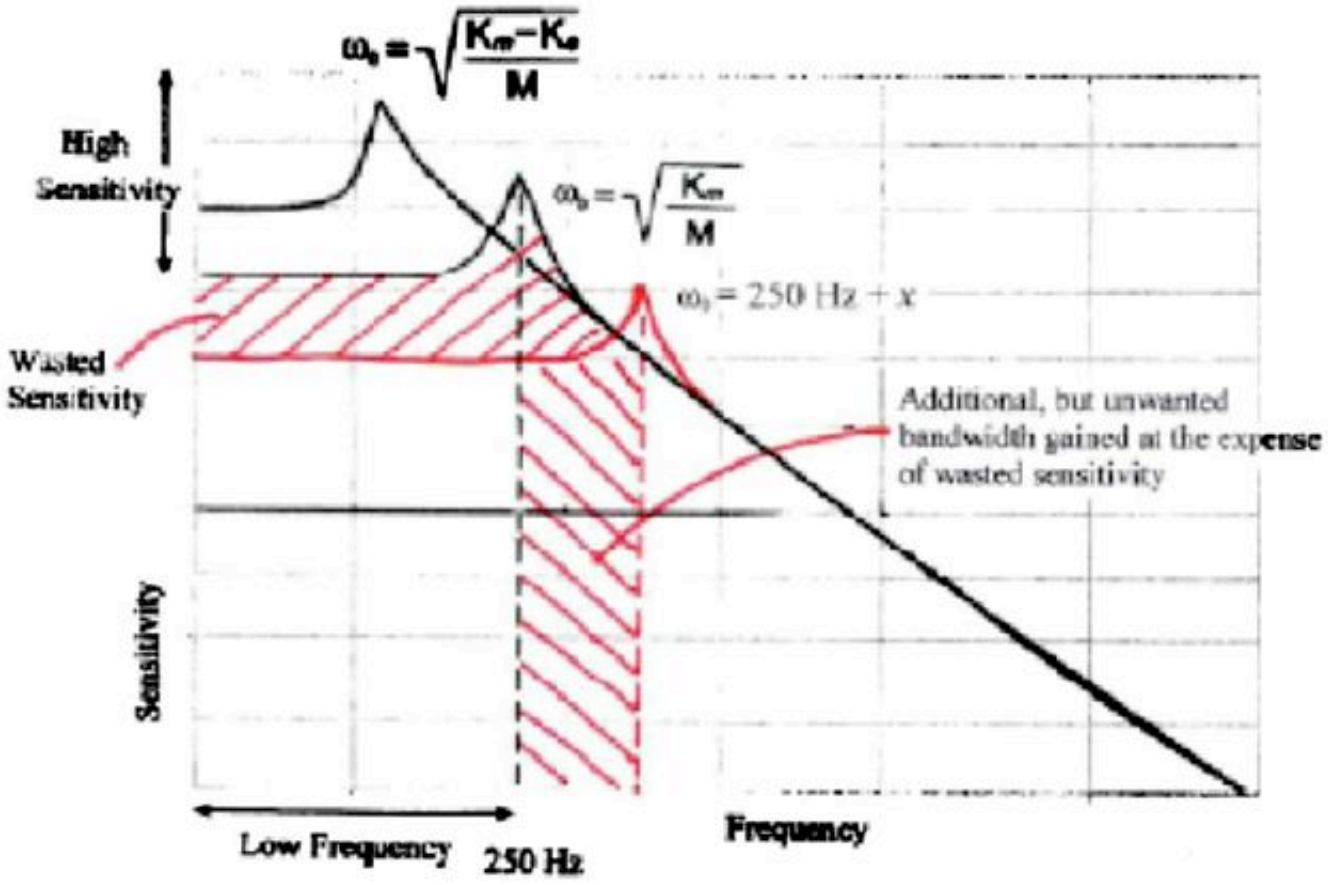
Plaintiffs argue that given that the Report and Recommendation determined that "low frequency" refers to frequencies between 0 and 250 Hz and there is a specific relationship between this frequency and the accelerometer's sensitivity, a "small positive difference" must be capable of construction. Dkt. No. 80 at 9. Plaintiffs state that the sensitivity and frequency are related by a "sensitivity" equation ('242 Patent, 13:43) and a "ratio" equation ('242 Patent, 13:50). Plaintiffs argue that setting a limit on the natural frequency to be between 0 and 250 Hz also sets a limit on the sensitivity, and in turn, sets a limit on the maximum difference between K_e and K_m. *Id*. at 10-11. Plaintiffs criticize the Recommendation for giving insufficient weight to the expert testimony of Dr. Schmidt who testified that a person of skill in the art would understand the term "small positive difference" to "mean the amount of positive difference necessary to avoid instability while keeping the sensitivity as high as reasonably possible and at least high enough to limit the natural frequency of the accelerometer to the upper end of the frequency band of interest." *Id*. at 12-13 (citing K-2 Corp. v. Salomon S.A., 191 F.3d 1356, 1365 (Fed.Cir.1999); Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1378 (Fed.Cir.1999)). Plaintiffs argue that a finding of invalidity is tantamount to summary judgment, and under the summary judgment standard, facts and inferences, such as Dr. Schmidt's declaration, should be construed in favor of the Plaintiffs. *Id*. at 14. Plaintiffs distinguish this situation from *Datamize* because in *Datamize,* Plaintiff's expert admitted that the term "aesthetically pleasing" was indefinite. *Id*. at 15. Plaintiffs argue that the term "small positive difference" is defined in terms of the relationship between the small positive difference, the frequency, and the sensitivity. *Id*. (citing '242 Patent, 14:15-24).

Sercel responds that the Recommendation rejected both of Plaintiffs' theories advanced by the expert testimony of Dr. Schmidt. Dkt. No. 85 at 8. Sercel states that the Magistrate Judge defined "low frequency forces" to mean "0 to 250 Hz forces" but note that Plaintiffs argue that the natural frequency must be higher and also lower than the frequency band of interest. *Id*. at 9-10 (citing Plaintiffs' Objections, Dkt. No. 80 at 10). Sercel avers that this inconsistency demonstrates that the term is indefinite. *Id*. at 10. Sercel argues that "Plaintiffs do not describe how to choose the applicable resonant frequency for a particular device" or, once the resonant frequency is determined, how "one should choose a specific value (or even a range of values) that would constitute a 'small positive difference.' " *Id*. Sercel's expert, Dr. Neikirk, provides that once one of ordinary skill chooses the desired sensitivity and resonant frequency, such design choices dictate only the

"**ratio** of the **effective spring constant** to the **mass** used in the device." *Id*. at 10 (emphasis in original) (citing Neikirk Depo., Dkt. No. 85, Exh. A at 4-5). Specifically, once the ratio is determined, "[a]ny value of an effective spring constant can be used for a desired resonant frequency, and the mass can be adjusted accordingly to match the desired resonant frequency." *Id*. at 11. Sercel notes that no exemplary values are given for mass or a "small positive difference" and no description on how to select the ratio is provided. *Id*.

Sercel also notes that Plaintiffs' reliance on Dr. Schmidt fails because Dr. Schmidt has a relationship with Plaintiffs' research and development program and failed to review the prosecution history of the '242 Patent prior to offering his declaration. Dkt. No. 85 at 11-12 (citing Schmidt Depo., Dkt. No. 85, Exh. B at 4-5; Dkt. No. 64 at 11). Sercel argues that Plaintiffs' reliance on *Atmel* was misplaced because the expert in *Atmel* was not rebutted, whereas here Dr. Schmidt's testimony is contradicted by Dr. Neikirk. *Id*. at 11 n. 5.

Plaintiffs reply that the focus is on one of skill in the art, such as Dr. Schmidt, to understand the disclosure and determine how to set the bandwidth relative to the low frequencies of interest in seismic applications. Dkt. No. 89 at 4 (citing Bancorp Servs., L.L. C. v. Hartford Life Ins. Co., 359 F.3d 1367, 1376 (Fed.Cir.2004)). Plaintiffs aver that one of ordinary skill would understand that there is "is no need to reduce sensitivity in a trade off for additional bandwidth covering frequencies beyond those of interest, approximately 250 Hz or lower." *Id*. (citing Schmidt Dec. para. 15). Plaintiffs point to a graph that illustrates that one skilled would chose a small positive difference resulting in high sensitivity in the frequency range of interest. *Id*. at 5.



Plaintiffs indicated that the shaded region occurs where the natural frequency is greater than 250 Hz, resulting in additional bandwidth at the expense of wasted sensitivity. Dkt. No. 89 at 5. Plaintiffs argue that one of ordinary skill would understand that a "small positive difference should be chosen such that no sensitivity is wasted to obtain additional bandwidth in a frequency range that is not of interest." *Id.* at 6.

c. Discussion

The Court first notes that, unlike the "desired characteristic" above, where one using the method would provide the "desired characteristic," a "small positive difference" requires one skilled to derive the amount from the equations and frequencies. However, as will be explained below, one skilled in the art would not know from the specification, the values to determine whether he would infringe the patent. In other words, a "desired characteristic" is not indefinite because it is an input that one skilled would be able to determine; whereas, a "small positive difference" is a derived value which requires guidance for one skilled in the art to determine.

"When a word of degree is used the district court must determine whether the patent's specification provides some standard for measuring that degree." Seattle Box Company, Inc. v. Industrial Crating * Packing, Inc., 731 F.2d 818, 826 (Fed.Cir.1984). For example, in *BJ Services Co.,* the patentee proved that "about 0.06" was not indefinite because the expert's experiments resulted in values "all of which were slightly above or below 0.06 for an average of 0.0596." BJ Servs. Co. v. Halliburton Energy Servs., Inc., 338 F.3d 1368, 1372 (Fed.Cir.2003). Here, on the other hand, Plaintiffs' expert's attempts to define a "small" difference fail because the amount of "smallness" is subjective. There can be no standard of measurement because none was provided in the patent. The primary purpose of definiteness FN1 is "to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent, so that interested members of the public, *e.g.,* competitors of the patent owner, can determine whether or not they infringe." Oakley, Inc. v. Sunglass Hut Int'l Lenscrafters, Inc., 316 F.3d 1331, 1340 (Fed.Cir.2003) (quoting All Dental Prodx, LLC v. Advantage Dental Prods., 309 F.3d 774, 779-80 (Fed.Cir.2002)); Honeywell Int'l, Inc. v. International Trade Commission, 341 F.3d 1332, 1338-39 (Fed.Cir.2003).

The Court recognizes that mathematical precision is not required. Oakley, 316 F.3d at 1340. However, mathematical examples, which are not provided in the '242 Patent, could have provided guidance or a standard of measurement. For example, in *Oakley,* the defendant argued that the term "vivid colored appearance" was indefinite. *Id.* at 1340. The Federal Circuit explained that "vividness" is based on the "differential effect" and the specification provided a formula and a range of values (5.45% to 405%) that produced a "vivid colored appearance" range and a value (2.3%) where no vivid effect was produced. *Id.* at 1341. The Federal Circuit construed the term "vivid colored appearance" to require the maximum differential effect qual or exceed about 5.45%, though the court recognized that the defendant could still prove indefiniteness after the record was further developed. *Id.* at 1341-42. Here, there is not only no guidance or standard for measuring or functionally describing "small," but there are also no numerical examples that could allow one skilled in the art to interpret or infer an appropriate range or value that could suffice. Therefore, the Court agrees with the Magistrate Judge's assertion that some standard (though not necessarily a numerical standard) should be provided to determine when something is "small." Dkt. No. 68 at 47; Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371, 1381 (Fed.Cir.2001).

Moreover, not only does the specification not provide a standard of measuring "small", but also Plaintiffs'

proposed construction does not have support from the specification. The currently proposed definition is similar to that of the second alternative construction in the original briefing. As the Magistrate Judge already explained, there is no support for the idea that " 'small' should be evaluated from the frame of reference of the natural frequency and the frequency band." Dkt. No. 68 at 48. The Plaintiffs assert that the definition of low frequencies describes the frequencies of interest and that one skilled in the art would know that the resonance frequency (or natural frequency), $(omega)_{o,}$ would not be placed any higher than the top of the frequencies of interest, asserted here to be 240 Hz. Plaintiffs note that $(omega)>_o = ((K_m-K_e)/M)^{1/2}$, where M is the mass weight and K_m-K_e is K_{eff}. Under Plaintiff's construction, a "small" K_m-K_e is any difference that would place $(omega)_o$ at less than or equal to 250 Hz. In other words, Plaintiffs provide that "small" K_m-K_e must be a value such that $(omega)_o$ is in a certain range, but other values of K_m-K_e that are not "small" must also be a subset of these values. Without a standard for determining the extent of "small," one of skill in the art would not understand the scope of the claims.

Another problem with Plaintiffs' construction is its reliance on graphs and formulas that, while explaining the interrelatedness of the values, does not provide the necessary information to close the gaps of understanding necessary to determine a "small positive difference." Under the Court's understanding, K_{eff} should be greater than zero but otherwise must be "small." The Court does not fault the specificiation merely because the boundary is variable. In *Exxon Research* the Federal Circuit determined that the term "for a sufficient period" was definite, even though the period would "vary with changes in the catalyst," because the court was able to determine that a sufficient period was "about 0.25 hours, and preferably 0.5" hours and the specification further provided various factors that would affect this period. Exxon Research, 265 F.3d at 1379. Here, the Plaintiffs argue that the difference may vary while keeping the frequency band of interest within the natural frequency of the accelerometer. However, the amount "necessary" is itself vague and does not provide one of skill to determine when one is not infringing. Therefore, where Plaintiffs' constructions of "small positive difference" further include subjective terms, it indicates that the claim is indefinite. *See* Halliburton Energy Services, Inc. v. MI, LLC, 456 F.Supp.2d 811, 816-17 (E.D.Tex.2006).

Another example where Plaintiffs' definitions result in further subjectiveness is the use of the ratio formula above, where mass is also a variable in this formula. Under Plaintiffs' construction, the entire range of $(omega)_o$, without any further explanatory limitation, could potentially be captured. Moreover, the value of K_{eff} (or K_m-K_e) could vary greatly, from "large" to "small" depending on the value of the mass. Therefore, the Court is unable to salvage the term by finding a narrower meaning. *See* Athletic Alternative, Inc. v. Prince Manufacturing, Inc., 73 F.3d 1573, 1581 (Fed.Cir.1996).

The Court also seeks to distinguish "small positive difference" from "substantially zero." The parties had agreed that "substantially zero" was not indefinite. *See* Dkt. No. 46 at 20-21. Moreover, the response to the examiner in the prosecution history also indicates that the terms "small" and "zero," though both referring to the effective spring constant, are distinguishable where "small" is used in claims 1 and "zero" is used in claim 5. See Response to Office Action (May 12, 1998), Dkt. No. 46, Exh. C at I-O-00216. As explained above, the term "small" can potentially refer to an wide range of values' however, there is no standard of measurement that would provide one skilled with the value sought that would be considered "small. On the other hand, the term "substantially zero" is anchored by the value "zero" and provides guidance to one skilled in the art as to the value that is sought. Again, while not necessarily requiring a numerical value and although both refer to the difference in K_m and K_e, the terms are distinguishable because one provides one skilled in the art with a method to measure the degree.

The Court determines that there is no "objective anchor" for determining a "small positive difference"; therefore, notice is not provided to potential infringers. Datamize, LLC v. Plumtree Software, Inc., 417 F.3d 1342, 1350-51. The term "small positive difference" is found to be indefinite FN2 and the corresponding claims are invalid pursuant to 35 U.S.C. s. 112, para. 2.

"high sensitivity" (claims 1-3)

a. Original Briefing Before Magistrate Judge

Plaintiff's Original Proposed construction	Sercel's Original Proposed construction	Magistrate Judge's Construction
No construction necessary (plain and ordinary meaning). Dkt. No. 53, Exh. A at 6.	Indefinite and incapable of construction under 35 U.S.C. s. 112. Dkt. No. 53, Exh. A at 6.	Indefinite. Dkt. No. 68 at 59.

Sercel argued that, like "small positive difference," the phrase "high sensitivity" lacks an objective standard. Dkt. No. 39 at 31. Sercel stated that "high sensitivity" was determined with respect to "high mechanical spring constant" and at "low frequencies," terms that also did not have an objectively defined standard in the '242 patent. Id. at 32; *see also* Dkt. No. 89 at 7.

Plaintiffs responded that the '242 Patent teaches that sensitivity is inversely proportion to the effects of spring constant. Dkt. No. 43 at 31 (citing '242 Patent, 13:1-64). Plaintiffs stated that "high sensitivity would be considered to be of value at least at [sic] high as the sensitivity at which the natural resident frequency of the sensor was located at the upper end of the frequency band of interest," which for seismic application is approximately 250 Hz. *Id*. at 32 (citing '242 Patent, 15:25-26).

Sercel stated that "frequency band of interest" is also undefined and the Plaintiffs were again attempting to correlate the term to another term that cannot be correlated to any objective standard. Dkt. No. 46 at 17.

The Magistrate Judge stated that "high sensitivity" resulted from "small positive differences." Dkt. No. 68 at 51. The Magistrate Judge concluded that "high sensitivity" was indefinite and invalid for the same reasons as "small positive difference." *Id*. at 52.

b. Parties' Positions in Objections Briefing

Plaintiffs argue sensitivity is fixed by the small positive difference. Dkt. No. 80 at 16 (citing Schmidt Dec. para. 17). Plaintiffs otherwise refer to their arguments relating to "small positive difference." *Id*. at 17.

Sercel responds that merely providing an equation for sensitivity is inadequate as the '242 Patent does not explain how to determine whether sensitivity is high, low or somewhere in-between. Dkt. No. 85 at 13.

c. Discussion

Plaintiffs agree with the Magistrate Judge's determination that "high sensitivity" and "small positive difference" are defined in relation to each other. The Court recognizes that, like the term "small positive difference" above, had the patentee provided some guidance or standard so as to provide notice to potential

infringers or for one skilled in the art to understand the scope of the claims,FN3 then this term would not be indefinite. BJ Servs., 338 F.3d at 1372.

Therefore, having determined that "small positive difference" is invalid for indefiniteness, the Court concludes that "high sensitivity" is likewise invalid for indefiniteness.

III. CONCLUSION

Accordingly, the Court hereby **ORDERS** the disputed claim terms construed consistent herewith.

It is so **ORDERED.**

FN1. The language of section 112, paragraph 2 states: "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

FN2. Plaintiffs argue that a finding of indefiniteness is inappropriate at this stage and should be addressed in a summary judgment motion. However, the Court notes that definiteness has been considered in claim constructions by district courts, and the Federal Circuit, reviewing the issue *de novo,* has not held that the definiteness test is inappropriate for claim construction. *See* Halliburton Energy Servs. Inc. v. MI, LLC, 456 F.Supp.2d 811, 813 (E.D.Tex.2006) (evaluating both the claim construction and the motion for summary judgment of invalidity), *aff'd,* 514 F.3d 1244 (Fed.Cir.2008); AllVoice Computing PLC v. Nuance Commc'ns, Inc., 504 F.3d 1236, 1240 (Fed.Cir.2007) (reversing the district court's claim construction finding of indefiniteness on grounds that the claims were definite). A determination of whether a patent satisfies the definiteness requirement, like claim construction, is a matter of law. Glaxo Group Ltd. v. Apotex, Inc., 376 F.3d 1339, 1345 (Fed.Cir.2004).

FN3. The scope of definiteness is different than the vagueness such that one skilled in the art would be unable to perform the invention. The latter issue is one of enablement under 35 U.S.C. s. 112, para. 1. Process Control Corp. v. Hydreclaim Corp., 190 F.3d 1350, 1358-59 (Fed.Cir.1999).