2020-1510

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

ARBMETRICS, LLC,

Plaintiff - Appellant,

v.

DEXCOM INC.,

Defendant - Appellee.

On Appeal from the United States District Court for the Southern District of California in Case No. 3:18-cv-00134-JLS-MSB, Hon. Janis L. Sammartino

DEFENDANT-APPELLEE'S RESPONSE BRIEF

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Claim 1 of U.S. Patent No. 6,343,225 (per Fed. Cir. R. 28(a)(12))

1. An implantable sensor for sensing a concentration of an organic substrate, the sensor comprising:

a conductive electrode; and

a stabilized enzyme emulsion in contact with the electrode, the enzyme emulsion comprising:

an oxidase enzyme that quantitatively oxidizes the organic substrate;

a water immiscible oxygen dissolving substance emulsified into intimate contact with the enzyme to provide oxygen; and

a protein crosslinking agent to crosslink and insolubilize the enzyme forming a stabilized gel comprising crosslinked protein and particles of said oxygen dissolving substance.

Appx00045 at 14:16-29.

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF INTEREST

Case Number 2020-1510

Short Case Caption Arbmetrics, LLC v. Dexcom Inc.

Filing Party/Entity Dexcom Inc.

Instructions: Complete each section of the form. In answering items 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance. **Please enter only one item per box; attach additional pages as needed and check the relevant box**. Counsel must immediately file an amended Certificate of Interest if information changes. Fed. Cir. R. 47.4(b).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Date: July 8, 2020

Signature: /s/ Richard Mulloy

Name: Richard Mulloy

1. Represented Entities. Fed. Cir. R. 47.4(a)(1).	**2. Real Party in Interest.** Fed. Cir. R. 47.4(a)(2).	**3. Parent Corporations and Stockholders.** Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities.	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities.
☐ None/Not Applicable	☑ None/Not Applicable	☑ None/Not Applicable
Dexcom Inc.	None	None

☐ Additional pages attached

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

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John Allcock	DLA Piper LLP (US)	
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5. Related Cases. Provide the case titles and numbers of any case known to be pending in this court or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal. Do not include the originating case number(s) for this case. Fed. Cir. R. 47.4(a)(5). See also Fed. Cir. R. 47.5(b).

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6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

☑ None/Not Applicable ☐ Additional pages attached

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STATUTES

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I. STATEMENT OF RELATED CASES

There have been no prior appeals in or from this proceeding. Counsel for Defendant-Appellee Dexcom Inc. ("Dexcom") is not aware of any other case pending in this Court or any other court that may directly affect or be directly affected by this appeal.

II. STATEMENT OF THE ISSUES

1. Did the district court correctly determine that the term "emulsion" has a well-established customary meaning of "a mixture of two or more immiscible liquids, in which one liquid is dispersed in another liquid," and correctly construe the claim term consistent with that customary meaning?

2. With both parties agreeing that the term "oxygen dissolving substance" cannot be merely any substance that dissolves oxygen, did the district court correctly construe the claim term to require oxygen solubility greater than water, as opposed to oxygen solubility greater than only certain substances disclosed in a prior art reference?

3. Did the district court correctly construe the claim term "in contact with" as "touching," consistent with the term's ordinary and customary meaning and its use throughout the '225 Patent's intrinsic record?

4. Given that "electrode" and "membrane" are separate elements recited in the claims, did the district court correctly conclude that an "electrode" is a separate element from a membrane?

5. Did the district court correctly construe the claim term "hydrocarbon oils or solids" as "oils or solids composed only of carbon and hydrogen," consistent with the term's customary meaning?

III. STATEMENT OF THE CASE

A. The Parties

Dexcom makes Continuous Glucose Monitoring ("CGM") systems. Appx00921 at ¶ 11. Dexcom's CGM systems allow patients suffering from diabetes to continuously monitor their glucose levels so they can adjust their insulin dosage and make other decisions to help them manage their disease. *Id*. at ¶¶ 11-12. Dexcom's CGM products are an advancement over the repeated finger-stick method of determining blood glucose levels that diabetes patients have used for decades. Appx00958.

Arbmetrics is the latest in a series of owners of the '225 Patent and is a non-practicing entity with no functioning commercial presence. Arbmetrics filed this lawsuit alleging that several of Dexcom's CGM products infringe the '225 Patent. Appx00057-00086.

B. The ’225 Patent

The ’225 Patent, entitled “Implantable Glucose Sensor,” names Leland C. Clark (“Dr. Clark”) as inventor. Appx00934. Its application was filed on September 14, 1999, and the patent expired on September 14, 2019. *Id*.

According to the ’225 Patent, the “present invention concerns the field for electrochemical devices for detection and measurement purposes and more specifically an enzyme emulsion for use in an implantable miniature polarographic glucose sensor.” Appx00039 at 1:4-7. The ’225 Patent describes the “most commonly used” chemical reaction by such glucose sensors as a process by which glucose, oxygen and water are reacted in the presence of an enzyme to produce, among other things, hydrogen peroxide. *Id*. at 2:43-50. That reaction is “commonly used” because it was well-known that “[i]n the presence of excess oxygen, the quantity of hydrogen peroxide produced will be a direct measure of the glucose concentration.” *Id*. at 2:52-54. The hydrogen peroxide is “measured by being reoxidized by an electrode (anode),” and the resulting measurements can be used to determine glucose levels. *Id*. at 2:54-58.

1. The Issue Addressed By The ’225 Patent

As the ’225 Patent states, these commonly used chemical reactions to measure glucose levels are only effective “in the presence of excess oxygen….” Appx00039 at 2:52-54. However, in a patient’s biological fluids (such as

interstitial or peritoneal fluids) where implantable glucose sensors make measurements, oxygen is limited. Appx00040 at 3:37-45. "Glucose is extremely soluble in biological fluids whereas oxygen is poorly soluble in these same fluids…." *Id*. at 3:35-36. The '225 Patent explains why the poor solubility of oxygen in biological fluids can result in poor sensor performance:

> Many tissues of the human body have an oxygen tension equivalent to between about 2-5% oxygen in nitrogen or lower. As a result, there may be a ratio of glucose to oxygen sometimes as high as 100 to 1 in subcutaneous interstitial and peritoneal fluids. This means that *at the electrode surface* there may be *only 1% of the oxygen required* for glucose oxidase to quantitatively oxidize the available glucose *for measurement purposes*.

Id. at 3:38-45 (emphasis added).

Thus, the '225 Patent recognizes that it was well-known that a glucose-oxygen imbalance "at the electrode surface," where glucose measurements are made, reduces a glucose sensor's accuracy. *Id*. at 3:35-45. "Because of a superabundance of glucose and a shortage of oxygen, an implanted glucose sensor will tend to be oxygen limited and, thus, effectively measure oxygen instead of, or together with, glucose." Appx00040 at 4:10-13. Thus, the "high glucose to oxygen ratio of human tissue" must be addressed for these glucose sensors to operate effectively. *Id*. at 4:23-24.

2. Prior Art Solutions To The Glucose-Oxygen Issue

The ’225 Patent acknowledges there were at least two well-known ways in the prior art to address this issue. Appx00040 at 4:24-36. One way is to reduce the concentration of glucose. *Id*. This is accomplished by using a semi-permeable membrane that substantially decreases the amount of glucose flow through the membrane, while still allowing oxygen to pass through the membrane. *Id*. at 4:28-29. This is *not* the ’225 Patent’s purported invention. Appx00041 at 5:20-34. In fact, this is how Dexcom’s products work.

The second known way to address the glucose-oxygen imbalance is to increase the amount or availability of oxygen. Appx00040 at 4:34-36. For example, the named inventor of the ’225 Patent developed a sensor with an oxygen-collecting chamber separated by an oxygen-permeable membrane. *Id*. at 4:36-43. That “chamber collects oxygen and delivers it by diffusion to the enzyme mixture near the measuring electrode.” *Id*. at 4:43-45. This prior art solution is also not the invention of the ’225 Patent.

3. The ’225 Patent Claims One Specific Way Of Addressing The Glucose-To-Oxygen Imbalance

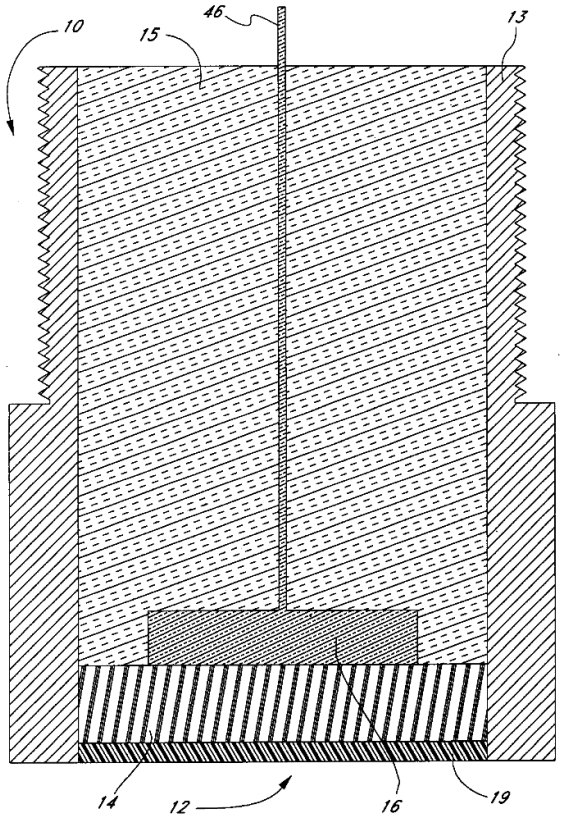
The ’225 Patent is directed to one specific way of increasing the amount of oxygen that reaches the enzyme and electrode. Appx00040-00041 at 4:34-53, 5:20-34. The ’225 Patent increases oxygen by using an “enzyme emulsion” where the enzyme is emulsified with an “oxygen dissolving substance,” which works as

an oxygen reservoir to provide oxygen to the enzyme and the electrode. Appx00045 at 14:16-29. The '225 Patent states that the "oxygen dissolving substance" is not just any substance that dissolves oxygen (as almost every substance will dissolve at least some oxygen), but rather, is a substance in which oxygen is "extremely soluble" in order to bring enough oxygen to the enzyme and the electrode where the reaction occurs: "This is achieved by making a stabilized emulsion of the enzyme and a compound in which oxygen is extremely soluble." Appx00041 at 5:23-26. The liquid emulsion is subsequently stabilized by chemically crosslinking the emulsion to form a gel. *Id*. at 5:25-29.

In the '225 Patent's invention, it is important that the enzyme emulsion touch the measuring electrode in order to transfer large quantities of hydrogen peroxide generated by the enzyme to the electrode's surface where the reaction occurs, and the patent describes various ways to do that. *Id*. at 5:29-31 ("Thin layers of the emulsion ideal for *placing into contact with a noble metal electrode* can be fabricated by *spreading a layer of the emulsion* prior to crosslinking." (emphasis added)); *see also* Appx00043 at 9:55-60; Appx02236-02237 at ¶¶ 117-119 ("[T]ouching between the electrode and the enzyme emulsion is very important…. The rate at which hydrogen peroxide is eliminated (oxidized) at the electrode … is determined mostly by the time it takes for the hydrogen peroxide to diffuse from … the enzyme-containing layer to the electrode surface…. And the

way to keep this distance as small as possible is to ensure that the enzyme emulsion is touching the electrode ….").

In addition, the patent lists a number of different oxygen dissolving substances, which it describes as "excellent oxygen solvents," for use in the emulsion. Appx00042 at 8:13-17. Because these substances "dissolv[e] oxygen" and act as an "oxygen reservoir," the oxygen dissolving substances "act as stepping stones for *oxygen to reach the electrode surface*" to address the glucose-oxygen imbalance. *Id*. at 8:21-22. Figure 2 of the '225 Patent shows each of the claimed sensor's components, and shows the enzyme emulsion (14) touching the electrode (16):



Appx00936; *see also* Appx00041 at 6:40-46.

Asserted claim 1 likewise reflects the key elements of the invention described throughout the '225 Patent. Claim 1—with the disputed claim terms underlined the first time they appear—reads:

> 1. An implantable sensor for sensing a concentration of an organic substrate, the sensor comprising:
>
> a conductive electrode; and
>
> a stabilized enzyme emulsion in contact with the electrode, the enzyme emulsion comprising:
>
> an oxidase enzyme that quantitatively oxidizes the organic substrate;
>
> a water immiscible oxygen dissolving substance emulsified into intimate contact with the enzyme to provide oxygen; and
>
> a protein crosslinking agent to crosslink and insolubilize the enzyme forming a stabilized gel comprising crosslinked protein and particles of said oxygen dissolving substance.

Appx00045 at 14:16-29.

C. The District Court's Claim Construction Ruling And Judgment

Arbmetrics filed its initial Complaint in this case on January 19, 2018, and subsequently filed two amended complaints. Appx00057-00102; Appx00918-00932. Pursuant to the district court's Patent Local Rules, the parties exchanged claim construction disclosures, and identified seven disputed terms for

construction. Appx00879. Following initial and responsive claim construction briefing from both sides, the district court held a three-hour claim construction hearing on October 31, 2019 to address the parties' respective arguments regarding each of the disputed claim terms. Appx03652-03770.

On December 30, 2019, the district court issued its Order on Claim Construction regarding each of the disputed terms identified by the parties. Appx00009-00027. Based on that Order, the parties stipulated that the Dexcom accused products do not infringe any claims of the '225 Patent because they do not include either an "emulsion" or an "oxygen dissolving substance," as those terms were construed by the district court. Appx00001-00006. On January 28, 2020, the district court entered final judgment in favor of Dexcom. Appx00007-00008. On appeal, Arbmetrics challenges the district court's constructions of five of the seven disputed claim terms.

Although the Final Judgment is based on the terms "emulsion" and "oxygen dissolving substance," Arbmetrics has previously acknowledged that the district court's construction of "in contact with" and "electrode" are also case-dispositive on the issue of non-infringement for all asserted claims of the '225 Patent. *See* Appx00880. Similarly, Arbmetrics has acknowledged that the district court's construction of "hydrocarbon oils or solids" is dispositive with respect to non-infringement of claim 5 of the '225 Patent. *Id*.

IV. SUMMARY OF ARGUMENT

This is a case where nearly every significant claim element is missing from Dexcom's accused products. For that reason, Arbmetrics needs a reversal of the constructions of several claim terms of the '225 Patent to resume its lawsuit. Among other things, Dexcom's CGM products do not include an enzyme emulsion, an enzyme emulsion in contact with an electrode, or any oxygen dissolving substance emulsified with an enzyme.

Recognizing as much, Arbmetrics seeks to expand the scope of the claims well beyond their ordinary and customary meaning to try and capture Dexcom's products. But words "mean exactly what they say." *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1373 (Fed. Cir. 2004). That is why claim construction begins with the ordinary and customary meaning of the words in the patent claims. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (*en banc*). The district court's claim construction order adopts those customary meanings, all of which mirror the way in which the terms are used throughout the '225 Patent's claims, specification and prosecution history.

First, the district court correctly determined that "emulsion" has a customary meaning of "a mixture of two or more immiscible liquids, in which one liquid is dispersed in another liquid." The district court based this conclusion on the use of that term throughout the claims and the specification, and the fact that "all of the

dictionaries and texts relied on by both parties define emulsion as a dispersion of two or more liquids." Appx00017. Neither Arbmetrics' misreading of dictionary definitions nor its misunderstanding of dependent claim 5 and the specification is sufficient to deviate from the term's ordinary and customary meaning.

Second, the district court correctly construed the term "oxygen dissolving substance." The '225 Patent specification and prosecution history state that the issue being addressed is the poor solubility of oxygen in biological fluids (which consist essentially of water), and that the solution is providing an emulsion with an oxygen dissolving substance where oxygen is "extremely soluble" or "preferentially soluble" in order to provide more oxygen. The district court's conclusion that the claimed oxygen dissolving substance must therefore have greater oxygen solubility than water aligns with the intrinsic record and the purpose of the invention. Arbmetrics' argument that the claimed substance can have oxygen solubility that is lower than water or biological fluids makes no sense and would undermine the purpose of the invention. Arbmetrics' secondary argument that the claim term can also include substances with a certain oxygen "permeability" is contrary to both the plain meaning of the claim term "dissolving" and the patent's repeated statements that an oxygen dissolving substance is one where oxygen is extremely or preferentially "soluble."

Third, the district court correctly construed the term "in contact with" to mean "touching." "Contact" is consistently used in this customary sense throughout the patent claims and specification. The district court properly rejected Arbmetrics' construction, which includes ambiguous concepts like "indirect or diffusional communication." Arbmetrics' position is based primarily on dictionary definitions that concern communications between people. These definitions are inapplicable to the '225 Patent's subject matter and contrary to the manner in which "contact" is used throughout the patent's claims and specification.

Fourth, the district court correctly rejected Arbmetrics' attempt to expand the ordinary meaning of an "electrode" to also include what Arbmetrics characterizes as an "optional" membrane. The claims, the specification and the inventor's own prior art (incorporated by reference) repeatedly confirm that a an "electrode" and a "membrane" are different elements. Nothing in the inapplicable dictionary definition that Arbmetrics relies upon supports deviating from the term's plain meaning. Nor does it justify ignoring the intrinsic record's clear guidance that an "electrode" and a "membrane" are separate elements.

Finally, the district court correctly construed "hydrocarbon oils or solids" in a manner consistent with the customary meaning of "hydrocarbon." Neither Arbmetrics' misinterpretation of a dictionary definition nor its inappropriate

reliance on an obvious typographical error in the specification supports deviating from the plain meaning.

The district court correctly construed the disputed claim terms in a manner consistent with their well-established customary meanings and the '225 Patent's intrinsic record. The final judgment of non-infringement in Dexcom's favor therefore should be affirmed.

V. ARGUMENT: THE DISTRICT COURT CORRECTLY CONSTRUED EACH OF THE DISPUTED CLAIM TERMS

A. An "Emulsion" Is A Liquid In A Liquid

The district court correctly construed "emulsion" to be "a mixture of two or more immiscible liquids, in which one liquid is dispersed in another liquid." Appx00017. Arbmetrics' argument that an emulsion can be any type of dispersion, such as a gel or a suspension, is contrary to the customary meaning of "emulsion" and the '225 Patent's intrinsic record.

1. An "Emulsion" Is Universally Defined As A Liquid In A Liquid

The Court has made clear that the "words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips*, 415 F.3d at 1312. The "ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art at the time of the invention." *Id.* at 1313. Where a claim term has an ordinary and customary meaning, the only exceptions to this general rule are: (1) when a patentee acts as his own

lexicographer by clearly setting forth a definition of the disputed claim term other than its plain and ordinary meaning; or (2) when the patentee disavows the full scope of a claim term in the specification or during prosecution. *See Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

Here, "emulsion" has a customary meaning that is well-recognized and confirmed by multiple sources. As the district court correctly noted, the dictionaries relied on by *both* parties define an "emulsion" as a dispersion of one liquid in another liquid. Appx00017. These definitions include:

- Appx02977 (defining "emulsion" as "a stable dispersion of one liquid in a second immiscible liquid");
- Appx02984 ("an emulsion is a disperse system in which both phases are liquids");
- Appx02990 (defining "emulsion" as "a colloidal suspension of one liquid dispersed within another");
- Appx02998 ("Emulsions are colloidal dispersions of liquids in liquids.");
- Appx03010 ("An emulsion is a colloidal dispersion of one liquid in another.");

- Appx03393 (defining "emulsion" as "a fluid colloidal system in which liquid droplets and/or liquid crystals are dispersed in a liquid"); and
- Appx03397 (defining "emulsion" as "mixture of two or more liquids in which one is present as droplets ...").)

The evidence presented to the district court proves that the term "emulsion" has a well-established customary meaning: a liquid dispersed in another liquid. Notwithstanding the evidence, Arbmetrics incorrectly criticizes the district court's reference to the term's plain and ordinary meaning on two grounds.

First, Arbmetrics claims the district improperly relied on dictionary definitions and ignored intrinsic evidence. Appellant's Brief ("Br.") at 8-9. But the district court's order explains how the patent claims, the specification, and dictionary definitions are all consistent with the term's plain meaning. Appx00015-00017.

Arbmetrics' argument is also contrary to the law. This Court has repeatedly held that claim construction should start with the ordinary and customary meaning of the claim terms—just as the district court did here—and that dictionary definitions are useful tools to determine that customary meaning: "Because dictionaries, and especially technical dictionaries, endeavor to collect the accepted meanings of terms used in various fields of science and technology," they are

"properly recognized as among the many tools that can assist the court in determining the meaning of particular terminology to those of skill in the art of the invention." *Phillips*, 415 F.3d at 1318. Indeed, when multiple dictionaries support a construction, dictionaries can be particularly useful to show the customary meaning of a claim term. *See Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382-83 (Fed. Cir. 2008) (affirming construction where "[a]ll three dictionaries cited by the district court support its construction"); *Starhome GmbH v. AT&T Mobility LLC*, 743 F.3d 849, 855-56 (Fed. Cir. 2014).

Second, Arbmetrics disputes the district court's factual finding that the dictionaries proffered by both parties support the court's construction. Br. at 17-19. As Arbmetrics recognizes, the district court's factual findings in this regard are reviewed for clear error. *Id*. at 7. But there is no error in the district court's analysis because each of the dictionaries cited by the district court is clear on its face and defines an emulsion as a liquid within another liquid. *See* Appx02977, Appx02984, Appx02990, Appx02998, Appx03010, Appx03393, Appx03397.

Arbmetrics relies heavily on the New Encyclopaedia Britannica's discussion of a "photographic emulsion" (*id*. at 17-18), but Arbmetrics neglects to mention that this same source defines an "emulsion" as a "mixture of two or more liquids in which one is present as droplets, of microscopic or ultramicroscopic size, distributed throughout the other." Appx01810. That same source further

undermines Arbmetrics' position by stating that the term "emulsion" is sometimes erroneously "applied to mixed systems that should better be characterized as solutions, suspensions, or gels," and explaining that in photography, "the *so-called* photographic emulsion" is actually a gel, not an emulsion. *Id.* (emphasis added). The '225 Patent is not a photography-related patent; the patent states that the relevant field is electrochemical devices. *See* Appx00039 at 1:4-8; Appx02359 at ¶ 34. Arbmetrics' advocacy for a construction that its own dictionaries call an incorrect use of "emulsion" should be rejected. The district court's construction is based on the well-established customary meaning of the term.

2. The Claims, Specification, and Prosecution History Demonstrate That An "Emulsion" Is A Liquid Within A Liquid

The patent claims use "emulsion" in a manner consistent with its ordinary and customary meaning. Specifically, the claims recite both a "gel" and an "emulsion," and require an insolubilized "gel" to be formed from the "emulsion" *after* a cross-linker is added. Appx00045 at 14:26-29; Appx03201 at 141:7-17 (Arbmetrics' expert explaining that the "gel" is formed after the cross-linker is added to the emulsion). It is well-established that a gel, unlike an emulsion, is a liquid dispersed in a solid. Appx03201 at 141:12-17. But under Arbmetrics' proposed construction, the separate claim term "gel" would also be an "emulsion." *Id.* at 141:18-22. Arbmetrics makes this argument despite the fact that the

applicant explained during prosecution that "gels are known in the art" but "the stabilized gel of the instant invention also contains an emulsion," Appx03482, thus further clarifying that a "gel" and an "emulsion" have different meanings. "Where a claim lists elements separately, 'the clear implication of the claim language' is that those elements are 'distinct component[s]' of the patented invention." *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010); *see also HTC Corp. v. Cellular Commc'ns Equip., LLC*, 701 F. App'x 978, 982 (Fed. Cir. 2017) ("The strongest evidence for this separation is the claim language itself, which plainly recites two different structures …. The separate naming of two structures in the claim strongly implies that the named entities are not one and the same structure.") (nonprecedential).

Other patents issued to the named inventor, which are incorporated by reference in the '225 Patent, likewise distinguish emulsions from gels and suspensions. Appx02518 at 12:18-22 ("said perfluorocarbon … is in a physical state selected from the group consisting of neat liquid, emulsion, gel, solution and suspension"). This further confirms the named inventor understood that emulsions are different from gels and suspensions. Appx02375-02376 at ¶¶ 79-84. Arbmetrics' construction blurs that distinction and should be rejected.

The specification also confirms the customary meaning of "emulsion" requires two liquids. The specification consistently describes only emulsions

composed of two liquids: a non-aqueous liquid dispersed in an enzyme aqueous solution. *See, e.g.*, Appx00041 at 5:23-32 ("This is achieved by making a stabilized emulsion of the enzyme and a compound which oxygen is extremely soluble. For example, an aqueous oxidase solution can be emulsified with a perfluorocarbon liquid …."); Appx00040 at 4:49-57 ("an emulsion of perfluorocarbon liquid and the enzyme solution"); *see also* Appx00042 at 8:23-25 ("stable emulsions can be produced using perfluorocarbon liquids and aqueous solutions"); Appx00043 at 10:55-59. Consistent with the term's plain meaning, every embodiment of an emulsion described in the '225 Patent is a liquid in a liquid.

The prosecution history provides additional confirmation that an "emulsion" requires a liquid in a liquid. Specifically, the applicant explicitly distinguished prior art (U.S. Patent No. 5,431,160 to Wilkins) on grounds that Wilkins used a suspension with "particles suspended in fluid," instead of the claimed "emulsion":

> *Wilkins* discloses a miniature glucose electrode wherein *glucose oxidase is immobilized on and bonded to the surfaces of a plurality of tiny particles*—i.e., bulk powder material.… Col. 6, lines 23-38 [of Wilkins] explain that the active enzyme material consists of *particles suspended in fluid* so that the mixture can be readily replaced in situ. . . .
>
> In the present invention the oxygen consuming enzyme (e.g., glucose oxidase) is stabilized in a cross-linked gel. *Such gels are known in the art and are used by Wilkins.* However, the stabilized gel of the instant invention also

> contains an *emulsion of an immiscible oxygen dissolving substance*….

Appx03481-03482 (emphases added).

In contrast, the applicant explained that the claimed emulsion of the '225 Patent is comprised of "droplets" of the oxygen dissolving substance that serve as an oxygen reservoir:

> When the oxidase enzyme consumes oxygen, it readily draws oxygen from the surrounding *droplets of the emulsion*…. The emulsion serves as an oxygen reservoir to ensure linear response, and because there is close contact between *droplets of the oxygen dissolving substance* and the enzyme, the lag due to slow oxygen diffusion through water is avoided….

Appx03482 (emphases added).

There is no dispute among the parties or their experts that the word "droplets" refers to liquid. Appx02379 at ¶ 90; Appx03383 at ¶ 99. Thus, the applicant described the claimed invention as two liquids, *i.e.*, an emulsion.

The applicant further explained that the "present invention" is different because Wilkins lacked an emulsion. Appx03483. While Arbmetrics now argues that the applicant distinguished Wilkins based only on the presence of an oxygen dissolving substance, and not based on the existence of an emulsion (Br. at 16), Arbmetrics' expert disagreed with this position under oath and confirmed that Wilkins was distinguished from the claims for two reasons, one being the lack of any emulsion:

> Q: … Is the distinction that Wilkins didn't have an emulsion and that Wilkins didn't have an oxygen dissolving substance? Or are you saying no, the sole distinction is that Wilkins didn't have an oxygen-dissolving substance? What is your opinion?
>
> A: *Wilkins* did not disclose an oxygen-dissolving substance and it also *did not disclose an emulsion* of an oxygen-dissolving substance. And that, to me, is very clear from pages 103 and 104 of the prosecution history.
>
> Q: Okay. So that's *two things, right*? *There's no emulsion in Wilkins* and no oxygen-dissolving substance in Wilkins?
>
> A: *Right*.

Appx03210 at 177:17-178:7 (emphases added).

In short, the intrinsic record is consistent with the ordinary and customary meaning of "emulsion": a liquid dispersed in another liquid. That is why the applicant described the claimed emulsion as "droplets" of one liquid dispersed in another liquid. And it is also why the applicant confirmed that "particles suspended in fluid," such as the gel in Wilkins, are not an emulsion. There is no basis to deviate from emulsion's ordinary and customary meaning.

3. Arbmetrics' Arguments Do Not Support Deviating From The Plain Meaning Of "Emulsion"

Arbmetrics' arguments cannot support deviating from the customary meaning of emulsion. Arbmetrics relies heavily on dependent claim 5 and its reference to "solids" to support its argument that an "emulsion" includes solid particles dispersed in liquids. Br. at 9-13. Arbmetrics' argument is wrong

because, as the district court correctly recognized based on the '225 Patent's specification, dependent claim 5's reference to "solids" is describing solids that are first dissolved in solution—in other words, liquids. Appx00016; *see also* Appx02380 at ¶¶ 95-98.

For example, the oxidase enzyme in the claimed emulsion is a solid, but the '225 Patent consistently explains that the enzyme is dissolved into an aqueous solution for the emulsion. *See, e.g.*, Appx00041 at 5:25-29 ("an aqueous glucose oxidase solution can be emulsified with perfluorocarbon liquid"); Appx00042 at 8:23-29 ("emulsions can be produced using perfluorocarbon liquids and aqueous solutions. When glucose oxidase … [is] incorporated into the aqueous phase of such an emulsion …."). This is because it is not possible for the enzyme to form an emulsion without first being dissolved in a solution. Appx02379 at ¶ 94.

Similarly, Arbmetrics notes that claim 5 refers to "steroids" (such as cortical steroids, which are solids) to argue that an emulsion must therefore include solids. Br. at 10. But the '225 Patent explains that steroids are used at low concentrations *in solution* "at about 0.1 to 1.0% by weight," and "[t]hese steroids gradually *dissolve* in the aqueous phase of the enzyme mixture." Appx00044 at 12:63-67 (emphasis added). Thus, the specification is clear that the steroids referenced in claim 5 are dissolved into liquids in the claimed emulsion. Even Arbmetrics' expert conceded that solid oxygen dissolving substances can be dissolved to form

the emulsion. Appx03208 at 171:20-172:1. The district court's construction of "emulsion" is consistent with the term's plain meaning and dependent claim 5's reference to "solids."

That these solids are dissolved in solution before being incorporated into the claimed emulsion is further confirmed by the named inventor's other patents, which are incorporated by reference into the '225 Patent's specification. *See Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 907 (Fed. Cir. 2018). For example, U.S. Patent No. RE33,451 states that when solid perfluorocarbons are used as an oxygen dissolving substance, they are first dissolved in liquids to form a solution called "DAWN." Appx02695 at 5:26-30 ("perfluoro-1-3,-dimethyl adamantine is normally a solid but in a mixture with perfluoro-trimethylbicyclo[3.3.1.]nonane a liquid is formed and this mixture is sometimes referred to simply herein as 'DAWN'"). The DAWN solution is then emulsified with water. Appx02696 at 8:7-18. Thus, while the emulsion described in the '225 Patent can contain oxygen dissolving substances that were at one point "solid," the intrinsic record proves that such substances must first be dissolved in solution to form a liquid that can be emulsified. Appx02380-02381 at ¶¶ 97-98.

Arbmetrics' argument is also wrong on the law because it overstates the importance of a dependent claim, which this Court has made clear does not trump the ordinary and customary meaning of a claim term. *See Regents of Univ. of Cal.*

v. Dakocytomation Cal., Inc., 517 F.3d 1364, 1375 (Fed. Cir. 2008) ("[W]hile it is true that dependent claims can aid in interpreting the scope of claims from which they depend, they are only an aid to interpretation and are not conclusive…"). In *Dakocytomation*, the Court held that the disputed independent claim term "unique sequence nucleic acid fragments" could not be construed to include "repetitive sequences" based on the customary meaning of the independent claim term, even though "repetitive sequences" were recited in the dependent claims. *Id.* at 1375-76. Indeed, the Court has repeatedly made clear that dependent claims should not alter the ordinary and customary meaning of a claim term. *See, e.g.*, *Starhome GmbH v. AT & T Mobility LLC*, 743 F. 3d 849, 856 (Fed. Cir. 2014) ("The term 'gateway' had a well-understood meaning in the art at the time the patentees filed the application that led to the '487 patent. As evidenced by technical dictionaries, one of ordinary skill in the art would have understood a 'gateway' to be a connection between different networks."); *Enzo Biochem Inc. v. Applera Corp.,* 780 F.3d 1149, 1156-57 (Fed. Cir. 2015) ("However, dependent claims cannot broaden an independent claim from which they depend…. Thus, as claim 1 is limited to indirect detection by its own plain meaning, it would be inappropriate to use the doctrine of claim differentiation to broaden claim 1 to include a limitation imported from a dependent claim, such as direct detection."). Here, the claim term

"emulsion" likewise cannot be construed contrary to its customary meaning based on a reference to "solids" in one dependent claim.

Arbmetrics also relies on the specification's reference to "tiny solid or liquid particles of a material" to support its argument that emulsions must include solids. Br. at 14 (citing Appx00042 at 8:56-59). As with its arguments regarding dependent claim 5, Arbmetrics' arguments are legally and factually meritless. This statement does not rise to the level of lexicography, which the Court has stated is required when using the specification to deviate from the ordinary meaning of a claim term. *Luminara Worldwide, LLC v. Liown Elecs. Co. Ltd.*, 814 F.3d 1343, 1353 (Fed. Cir. 2016) ("Absent lexicography or disavowal, we do not depart from the plain meaning of the claims…To act as a lexicographer, a patentee must clearly set forth a definition of the disputed claim term and clearly express an intent to redefine the term."). The fleeting reference to "solid" on which Arbmetrics relies is not sufficient to alter the term's customary meaning. *See Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 738 (Fed. Cir. 2014) ("To begin with, the terms at issue have so clear an ordinary meaning that a skilled artisan would not be looking for clarification in the specification.… Under our claim-construction law, a clear ordinary meaning is not properly overcome (and a relevant reader would not reasonably think it overcome) by a few passing references that do not amount to a redefinition or disclaimer."); *Abraxis Bioscience, Inc. v. Mayne Pharma (USA)*

Inc., 467 F.3d 1370, 1378 (Fed. Cir. 2006) ("[T]he passing reference to silicone derivatives fails to overcome our conclusion that the patentees narrowly defined edetate 'derivatives' to mean EDTA and its salts.").

Arbmetrics is also wrong because this passage of the specification describes a gel created *after* the enzyme emulsion has already been "insolubilized" by the claimed cross-linker ("in an insoluble form"). Appx02382 at ¶ 100. Arbmetrics' brief improperly divorces this statement from its context by limiting its quotation to the language "solid or liquid particles." Br. at 14. However, the surrounding language proves that the specification does not support Arbmetrics' argument: "tiny solid or liquid particles of a material that readily dissolve oxygen are held in intimate contact with an oxygen utilizing enzyme which is preferably in an insoluble form…." Appx00042 at 8:56-59. The district court correctly recognized that the complete text and the reference to "insoluble form" confirms that this sentence is describing the "gel" that is formed *after* cross-linking, and does not support deviating from the plain meaning of "emulsion." Appx00016. Indeed, Arbmetrics' expert agreed that this passage may be describing solid particles generated after the emulsion has been cross-linked and converted into a gel. Appx03208-03209 at 172:17-173:15. Similarly, the '225 Patent's statement that after the gel is formed and some of the emulsion disappears, the oxygen dissolving substance may be turned into "tiny gas bubbles" (Appx00043 at 9:7-15) does not

detract from the requirement that the emulsion must be a liquid before a gel is formed. As with dependent claim 5, nothing in the specification supports deviating from the ordinary and customary meaning of "emulsion."

4. Arbmetrics' Remaining Arguments Are Meritless

Arbmetrics' final efforts to prop up its construction are also unavailing. First, Arbmetrics argues the opinions of Dexcom's expert, Dr. Weber, should be given "little weight" because he is purportedly unqualified. Br. at 18 n. 5. Specifically, Arbmetrics criticizes Dr. Weber for opining that a person of ordinary skill could have a degree in electrochemistry, among several other subjects. Of course, the '225 Patent itself states that "[t]he present invention concerns the field of electrochemical devices," and even Arbmetrics' brief acknowledges that the sensor claimed in the '225 Patent uses an "electrochemical process." *See* Appx00039 at 1:4-7; Br. at 34. Arbmetrics' attacks on Dr. Weber's qualifications are also contrary to the record, as he testified that he had worked on sensor development and even advised ten Ph.D. students before 1999 who earned their degrees in sensor design. Appx03548-03551 at 25:8-26:22, 31:1-17, 36:2-37:16. Moreover, there is no indication in the claim construction order that the district court gave any particular weight to Dr. Weber's testimony. And even if it did, "[i]t is well within the district court's discretion to credit one expert's competing

testimony over another." *Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1324 (Fed. Cir. 2017).

Second, Arbmetrics argues that the district court did not consider Arbmetrics' expert's testimony. Br. at 19-20. But the lack of an explicit reference to that testimony does not mean the district court did not consider it. *Advanced Magnetic Closures, Inc. v. Rome Fastener Corp*., 607 F.3d 817, 830-31 (Fed. Cir. 2010) ("The district court … did not commit clear error by failing to state that it did not consider [the evidence]," and that "it would be contrary to our standard of review to second guess how the district court weighed the evidence here"). In fact, the claim construction order does not refer to the testimony of *either* expert.

Third, Arbmetrics argues that the district court's construction of "emulsion" is inconsistent with the construction of "immiscible." Br. at 20-21. But that is only true under Arbmetrics' interpretation of claim 5, which the district court correctly rejected. In fact, the district court addressed Arbmetrics' inconsistency argument and explained why it is wrong: "While the Court agrees that the oxygen dissolving substance is part of the emulsion, which does require liquids, *see supra* Section II.A, it is not the term 'water immiscible' that mandates that the emulsion is liquids. Instead, it is the ordinary meaning of emulsion in conjunction with the specification." Appx00020. There is no inconsistency between the district court's constructions of the two terms.

B. An "Oxygen Dissolving Substance" Is A Substance In Which Oxygen Is More Soluble Than It Is In Water

Both parties, their experts, and the district court all agree that the claimed "oxygen dissolving substance" cannot be just *any* substance that dissolves oxygen. Appx01727-01728; Appx01772-01773 at ¶¶ 88-89, 92; Appx02339-02340; Appx02406-02409 at ¶¶ 172-176. This is because the '225 Patent states that the claimed oxygen dissolving substance is one where oxygen is "extremely soluble," and a substance where oxygen is "extremely soluble" is critical to the invention in order to address the glucose-oxygen imbalance described in the patent. *See* Appx00041 at 5:23-29. The parties also agree that this term requires preferential or higher oxygen solubility. Appx00898. The primary dispute between the parties is whether the "oxygen dissolving substance" should be preferentially soluble as compared to water, or preferentially soluble as compared to certain polymers or graphite where oxygen is barely soluble, if at all. Br. at 22-24. Based on the specification and the prosecution history, the district court correctly construed the term to be a substance "in which oxygen is preferentially soluble in comparison to water." The court also correctly rejected Arbmetrics' effort to conflate solubility and permeability. The district court's construction, and hence the judgment of non-infringement, should be affirmed for this additional, independent reason.

1. The Specification And The Purpose Of The Invention Both Support The District Court's Construction

The '225 Patent explains that one of the problems with implantable glucose sensors is that oxygen is poorly soluble in biological fluids (which are essentially water), which results in an extreme imbalance of the glucose-oxygen ratio in those fluids where implantable glucose sensors are used:

> *Glucose is extremely soluble in biological fluids whereas oxygen is poorly soluble in these same fluids* … As a result, there may be a ratio of glucose to oxygen sometimes as high as 100 to 1 in subcutaneous interstitial and peritoneal fluids. This means that at the electrode surface there may be only 1% of the oxygen required for glucose oxidase to quantitatively oxidize the available glucose for measurement purposes.

Appx00040 at 3:35-45 (emphasis added); *see also* Appx00042 at 7:33-40 ("oxygen is relatively poorly soluble in biological fluids"; "oxygen is not very soluble in biological fluids"). Unless corrected, the glucose-oxygen imbalance can cause implantable glucose sensors to be inaccurate. Appx00040 at 4:10-14.

The '225 Patent describes and claims a specific way of increasing the amount of oxygen to address the glucose-oxygen imbalance. Specifically, the invention is directed to an emulsion that includes an "oxygen dissolving substance" where oxygen is "extremely soluble." Appx00041 at 5:23-25 (Summary of Invention: "This is achieved by making a stabilized emulsion of the enzyme and a compound in which oxygen is extremely soluble."); *see also* Appx00045 at 14:16-

29 (claim 1). Because the oxygen dissolving substance is an "excellent oxygen solvent," it acts as a "stepping stone[] for oxygen to reach the electrode surface" where the chemical reactions needed to measure glucose levels take place. Appx00042 at 8:12-22.

Because the '225 Patent is concerned with increasing the amount of oxygen for the sensor implanted in a patient's biological fluids that are made primarily of water, the patent specification consistently compares the oxygen dissolving substance to water. *See* Appx00045 at 13:2-4 ("An advantage is that steroids, like perfluorocarbons, are much better at dissolving oxygen than is water."); Appx00043 at 10:28-32 ("This limits the distance that oxygen must diffuse through a poor oxygen carrier such as water."). Thus, it is critical that the "oxygen dissolving substance" provide oxygen solubility that is higher than that of water. Appx02406-02408 at ¶¶ 172-174. Indeed, the '225 Patent does not offer any other comparison or baseline for the oxygen dissolving substance's oxygen solubility aside from water or biological fluids.[1] Even Arbmetrics' expert recognizes that

[1] The district court also noted that its construction "describing the solubility as compared to water instead of biological fluids" avoids any potential ambiguity. Appx00022. For example, blood is a bodily fluid where oxygen is very soluble due to the presence of hemoglobin in red blood cells. Appx00042 at 7:37-45. However, implantable sensors like those claimed in the '225 Patent are implanted to contact bodily fluids that are essentially water (such as interstitial fluids), not blood, and thus the high oxygen solubility in blood is not relevant to the claimed invention. Appx00041 at 6:58-67.

"the solubility of oxygen in water is often used as a convenient reference measurement" by those of skill in the art. Appx03378-03379 at ¶ 87. The '225 Patent's discussion of the problem being solved, the solution to that problem, and the benefits of the claimed invention all confirm that an "oxygen dissolving substance" is one in which oxygen is more soluble than it is in water.

2. The Prosecution History Supports The District Court's Construction

The prosecution history further confirms that the district court's construction is correct, and that an "oxygen dissolving substance" is one in which oxygen is more soluble than it is in water. Specifically, the Examiner rejected the claims based on the Wilkins prior art discussed above, which included an oxidase enzyme bonded to bulk powder material. Appx03481. In response, the applicant argued that Wilkins did not "disclose or suggest the key elements of the present invention" because it did not include an emulsion with an "oxygen dissolving substance." *Id.* Specifically, the applicant argued that the oxygen dissolving substance is one where oxygen is "preferentially soluble" such that the substance could "hold a large number of oxygen molecules" even in areas with low amounts of available oxygen. Appx03482. The applicant argued that Wilkins did not disclose any such substance because the materials used in Wilkins were those where oxygen is "barely soluble if at all" or "not particularly soluble":

> However, the stabilized gel of the instant invention also contains an emulsion of an immiscible oxygen dissolving substance. The preferred oxygen dissolving substance is a perfluorocarbon although other organic substances (e.g. silicone oils) also show favorable properties. *Oxygen is preferentially soluble in these materials so that even at low oxygen tensions, these materials hold a large number of oxygen molecules.* When the oxidase enzyme consumes oxygen, it readily draws oxygen from the surrounding droplets of the emulsion.
>
> ***** ***** *****
>
> Applicant contends that Wilkins does not teach the formation and use of an [*sic*] stabilized enzyme emulsion containing an immiscible oxygen dissolving substance. The fine particles of graphite used by Wilkins are immiscible but do not constitute an oxygen dissolving substance. *Oxygen is not preferentially soluble in graphite—it is barely soluble if at all. Nor is oxygen particularly soluble* in nylon, polyethylene or polystyrene…

Appx03482-03483 (emphases added).

The applicant also explained *why* the emulsion with an "oxygen dissolving substance" is critical to the '225 Patent invention: "The emulsion serves as an oxygen reservoir to ensure linear response, and because there is close contact between droplets of the oxygen dissolving substance and the enzyme, the lag due to slow *oxygen diffusion through water is avoided*." Appx03482 (emphasis added). This reference to the solubility of oxygen in water is entirely consistent with the discussion in the specification. *See* Appx00043 at 10:28-32 ("This limits the distance that oxygen must diffuse through a poor oxygen carrier such as

water."); Appx00045 at 13:2-4 ("An advantage is that steroids, like perfluorocarbons, are much better at dissolving oxygen than is water.").

Arbmetrics nonetheless advocates construing the disputed claim term as any substance where oxygen solubility or permeability is higher than graphite, nylon, polyethylene or polystyrene, which are some of the specific materials described in the preferred embodiment of the Wilkins prior art. This argument should be rejected for at least two reasons.

First, Arbmetrics' argument that an "oxygen dissolving substance" can include any substance having a higher solubility than graphite, polyethylene, polystyrene and nylon is contrary to the purpose of the invention and would render this claim limitation meaningless for all practical purposes. Indeed, the applicant acknowledged that oxygen is "barely soluble if at all" in graphite, and that oxygen is likewise "not particularly soluble" in substances like polyethylene, polystyrene, or nylon. Appx03483. Under Arbmetrics' view, however, any substance that exceeds these extremely low or non-existent oxygen solubility levels would nonetheless satisfy the "oxygen dissolving substance" claim limitation. That is contrary to statements in the '225 Patent describing the oxygen dissolving substance as one where oxygen is "extremely soluble," as well as the applicant's statements during prosecution that the oxygen dissolving substance is one where oxygen is "preferentially soluble." Appx00041 at 5:20-25; Appx03482-03483.

Arbmetrics' position would undermine the fundamental purpose of the invention, which uses the oxygen dissolving substance to address the glucose-oxygen imbalance by providing an oxygen reservoir. Appx00041 at 5:20-25. Indeed, even Arbmetrics' expert acknowledges that the point of the '225 Patent is to provide a "material that readily dissolves oxygen … in order to provide" more oxygen to the enzyme. Appx02176 at 169:1-5. However, all of the substances identified in Arbmetrics' construction have substantially lower oxygen solubility than water and other biological fluids (which are essentially water). *See* Appx02406 at ¶¶ 170-174. If the oxygen dissolving substance can have an even lower oxygen solubility than water or other biological fluids (where oxygen is already "poorly soluble," *see* Appx00040 at 3:35-37) as Arbmetrics contends, then one is better off just leaving water in the emulsion, rather than replacing it with substances that would have an even lower oxygen solubility. This is why the '225 Patent compares the properties of the "oxygen dissolving substance" to that of water and other biological fluids. *See* Appx00040 at 3:33-40, Appx00042 at 7:38-40, Appx00043 at 10:28-32, Appx00045 at 13:2-4; Appx03481-03483. Adding a substance with an even lower oxygen solubility than water would defeat the purpose of the invention, and Arbmetrics' proposed construction should be rejected for this additional reason. *See, e.g., Apple Computer, Inc. v. Articulate Sys., Inc.*, 234 F.3d 14, 25 (Fed. Cir. 2000) ("[T]he claim must be interpreted in light of the

teachings of the written description and purpose of the invention described therein."); *World Class Tech. Corp. v. Ormco Corp.*, 769 F.3d 1120, 1125 (Fed. Cir. 2014) (rejecting construction that was "out of keeping" with the "statement of purpose" of the disputed claim limitation and other language in the specification).

Second, Arbmetrics' argument misstates the legal significance of the prosecution history. The scope of the claim is not governed by the specific prior art materials mentioned during prosecution, but rather by the meaning of the claim language in view of the intrinsic record. Here, the specification is clear that the oxygen dissolving substance is one where oxygen is "extremely soluble" and an "excellent oxygen solvent." Appx00041 at 5:23-25; Appx00042 at 8:12-22. Similarly, the applicant stated during prosecution that the oxygen dissolving substance is one where oxygen is "preferentially soluble" such that it can "hold a large number of oxygen molecules" even in an environment with "low oxygen tensions" (such as in biological fluids). Appx03482. The applicant's statement identifying certain materials with very poor oxygen solubility like graphite and certain polymers cannot *expand* the scope of the claim term to capture any substance with greater oxygen solubility than those specific materials, which would sweep into the claims materials where oxygen is *not* extremely soluble, and would even include substances where oxygen solubility is worse than that of biological fluids or water where oxygen is already "poorly soluble." *See, e.g.*,

Biogen, Inc. v. Berlex Labs., Inc., 318 F.3d 1132, 1140 (Fed. Cir. 2003) ("Representations during prosecution cannot enlarge the content of the specification...."); *see also Norian Corp. v. Stryker Corp.*, 432 F.3d 1356, 1361-62 (Fed. Cir. 2005) ("[T]here is no principle of patent law that the scope of a surrender of subject matter during prosecution is limited to what is absolutely necessary to avoid a prior art reference that was the basis for an examiner's rejection . . . . "). Arbmetrics' proposed construction is inconsistent with the purpose of the invention and cannot be correct.

3. Arbmetrics' "Alternative" Construction Should Also Be Rejected

In its brief, Arbmetrics incorrectly states that it "proposed that the term 'oxygen dissolving substance' should be construed to mean: 'a substance having a higher oxygen solubility or higher oxygen permeability than particles of graphite, polyethylene, polystyrene, and nylon'" at the district court level. Br. at 28. This was not Arbmetrics' proposed construction. Rather, both the Joint Claim Construction statement and Arbmetrics' briefs confirm that Arbmetrics' proposed construction was: "a substance (a particular kind of matter with uniform properties) having a higher oxygen solubility or higher oxygen permeability than at least one of a hydrocarbonaceous polymer and an oxyhydrocarbon polymer." Appx01727; Appx00898. Although Arbmetrics' opening brief in this appeal now characterizes this as its "alternative" construction (Br. at 28 n.8), Arbmetrics' rewriting of the

procedural history does not bolster its case. To the contrary, Arbmetrics' own inability to advance a consistent claim construction for this term only underscores that both of its positions lack merit.

Moreover, whether viewed as its principal position or its alternative position, Arbmetrics' "hydrocarbonaceous polymer" and "oxyhydrocarbon polymer" construction should be rejected. The district court correctly observed that neither of these terms appears in the '225 Patent intrinsic record, and that Arbmetrics instead plucked these terms from two of Dexcom's own patents. Appx00022. Arbmetrics' transparent attempt to inject language from Dexcom's own, later-filed patents into the '225 Patent claim construction was rightly rejected by the district court.[2] But even if those Dexcom patents are considered, they actually support the district court's construction by confirming that persons of skill in the art understand that high oxygen solubility in the context of implantable glucose sensors is a comparison to aqueous media (*i.e.*, water):

> The phrases "high oxygen solubility" and "high oxygen soluble" as used herein are broad phrases and are used in their *ordinary sense*, including, without limitation, a

[2] Arbmetrics now contends that its goal in proposing this construction was to simply "capture the substances disclaimed during prosecution of the '225 Patent." Br. at 28 n.8. That is not correct. Arbmetrics' expert noted that the "hydrocarbonaceous polymer" and "oxyhydrocarbon polymer" terms in Arbmetrics' construction were from Dexcom's patents, not the '225 prosecution history. Appx01771 at ¶ 87. Moreover, graphite—which Arbmetrics now contends should be used as a comparison point for the "oxygen dissolving substance"—is not a polymer.

> domain or material property that includes *higher oxygen solubility than aqueous media*."

Appx02602 (U.S. Patent No. 7,379,765) at 12:7-18 (emphasis added).

Thus, the evidence that Arbmetrics and its expert initially identified as support for their proposed construction only reinforces the district court's conclusion that an "oxygen dissolving substance" requires "higher oxygen solubility than water." Appx02411 at ¶¶ 187-188. The '225 Patent reflects this same concept and likewise compares the oxygen solubility of the "oxygen dissolving substance" to water. *See* Appx00043 at 10:28-32; Appx00045 at 13:2-4.

4. The District Court's Construction Correctly Focuses On Solubility, Not Permeability

Finally, Arbmetrics criticizes the district court's opinion for incorporating only oxygen "solubility" into the construction, and not oxygen "permeability." In doing so, Arbmetrics contradicts the plain language of the claims, which require an "oxygen *dissolving* substance." "Dissolving" refers to solubility, not permeability. Appx02411 at ¶ 189. The specification explains that the purpose of the invention is to provide an emulsion that includes an oxygen dissolving substance in "which oxygen is extremely *soluble*," not extremely "permeable." Appx00041 at 5:23-32 (emphasis added). The applicant's arguments during prosecution likewise confirm that an "oxygen dissolving substance" is one in which oxygen is "preferentially *soluble*," not preferentially "permeable." Appx03482-03483 (emphasis added).

Indeed, the patent states that the purpose of the invention is to address poor oxygen solubility in biological fluids, not poor oxygen permeability: "Glucose is extremely soluble in biological fluids whereas oxygen is poorly soluble in these same fluids and must be carried by specialized biomolecules such as hemoglobin." Appx00040 at 3:35-37. The intrinsic record is crystal clear that an oxygen dissolving substance is one where oxygen is extremely soluble. The district court's construction correctly reflects the '225 Patent's emphasis on solubility.

Arbmetrics points to a few references to permeability in the specification, but they do not support its claim that the '225 Patent views "oxygen permeability as another measure of a substance's oxygen dissolving properties." Br. at 26. For example, Arbmetrics relies extensively on Appx00042 at 7:46-54, which refers to the "speed of oxygen diffusion through a barrier" to support its argument regarding permeability. Br. at 26-27. However, that portion of the specification describes the permeability of oxygen through a physical membrane that covers the opening of the glucose sensor (*see* item 19 in Figure 2 of the '225 Patent, Appx00106), not the permeability of oxygen in the claimed oxygen dissolving substance. Appx00042 at 7:33-54. The passage Arbmetrics relies upon simply teaches one to make the membrane thinner so oxygen does not have to travel as far through the membrane to get into the sensor, not that the claimed oxygen dissolving substance has any particular level of oxygen permeability. If anything, this portion of the

specification underscores that the patentee considered solubility and permeability to be different properties by using both terms in the same sentence to describe different phenomena—"soluble" to describe the degree to which oxygen can be dissolved in biological fluids, and "permeable" to describe the speed with which oxygen can move through a membrane into the glucose sensor. "As already mentioned, oxygen is relatively poorly *soluble* in biological fluids, and the membrane 19 that covers the opening 12 of the glucose sensor 10 is generally not very *permeable* to oxygen." Appx00042 at 7:32-36 (emphasis added). However, the claim term at issue is "oxygen dissolving substance," which confirms the claim is directed to solubility, not permeability. Arbmetrics' argument based on the specification lacks merit.

It is not disputed that solubility and permeability are different properties to persons of ordinary skill. Appx03224 at 233:3-7; Appx02411 at ¶ 189. Nonetheless, Arbmetrics suggests that the patentee redefined permeability by using it "interchangeably" with solubility. *See* Br. at 27. Arbmetrics again overreaches. While the specification includes passing references to permeability of the oxygen dissolving substance, that is not surprising because solubility and permeability are related mathematically: permeability = diffusivity x solubility. Appx03223 at 232:18-22. Thus, substances that have a high solubility can have a high permeability in some circumstances. However, that is not always true. If the level

of diffusivity is very high, even a substance with high permeability can have low solubility. *See id*. Such a substance with low solubility could still satisfy Arbmetrics' construction of "oxygen dissolving substance" due to its high permeability. However, the '225 Patent specification and file history prove that the oxygen dissolving substance is one in which oxygen is "extremely soluble" or "preferentially soluble," and thus Arbmetrics' construction cannot be correct. Moreover, the patentee chose the term "dissolving," which refers to solubility, for the claims. Appx02411 at ¶ 189. The district court's construction and the judgment against Arbmetrics should be affirmed.

C. "In Contact With" Means Touching

The district court correctly construed "in contact with" to mean "touching." The claims and the specification of the '225 Patent show that the patent uses the term "contact" in a manner consistent with its ordinary and customary meaning, which is touching. Arbmetrics' proposed constructions for the claim terms "in contact with" and "electrode" seek to expand the scope of the claims to capture Dexcom's products, which include a separate membrane between the electrode and an enzyme layer that *prevents* the contact between the electrode and the enzyme that is required by the '225 Patent claims. Appx02322. Recognizing as much, Arbmetrics tries to eliminate the "contact" requirement by proposing an ambiguously broad construction for that term that finds no support in the '225

Patent intrinsic record. For the same reason, Arbmetrics tries to merge a membrane and an electrode into one definition by proposing that a membrane can "optionally" be part of an electrode, notwithstanding the descriptions of a membrane and an electrode as separate components throughout the claims, the specification, and the named inventor's own prior art. Arbmetrics' attempt to expand the scope of the claims by improperly broadening "contact" and "electrode" should be rejected for several reasons.

1. The Claims Of The '225 Patent Confirm That "In Contact With" Means Touching

The '225 Patent claims confirm that "in contact with" is used in its ordinary and customary way to mean "touching." Claim 1 provides for a sensor where the enzyme emulsion is "in contact with" an electrode. Appx00045 at 14:19-20. Dependent Claim 2 provides additional guidance regarding the meaning of "contact" by claiming a "semipermeable membrane covering the electrode with the enzyme emulsion *sandwiched between* the membrane and the electrode." *Id*. at 14:30-33 (emphasis added). Similarly, independent claim 14 uses the same language as claim 1 requiring the emulsion to be "in contact with" the electrode. Appx00046 at 15:14-15. Dependent claim 15 additionally provides:

> The implantable glucose sensor of claim 14 further comprising a semipermeable membrane covering the electrode with the enzyme emulsion *in contact with* a *first surface* of the membrane and *sandwiched between* the membrane and the electrode and with body fluids or

> cells *in contact with a second surface* of the semi-permeable membrane.

Id. at 15:26 - 16:5 (emphasis added).

This claim language, which requires the enzyme emulsion to be "in contact with" a physical "first surface" of a membrane, and "sandwiched between" the membrane and the electrode, proves that "in contact with" can only refer to touching. As additional confirmation, claims 2 and 15 use a different claim term—"covering"—when communicating a relationship between two objects (the membrane and the electrode) that are *not* touching one another. *See* Appx00045 at 14:30-33, Appx00046 at 15:26 – 16:5. However, under Arbmetrics' construction of "in contact with," the membrane and the electrode (which do not touch one another because the enzyme emulsion is "sandwiched between" them; *see* Appx00936) would also still be "in contact with" one another because they would be in "direct, indirect or diffusional communication" with each other. The district court correctly rejected Arbmetrics' construction. *See Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008) ("Our precedent instructs that different claim terms are presumed to have different meanings.").

Even Arbmetrics' expert acknowledges that claim 15 sets the physical "sequence of these materials as the analyte approaches the electrode…" Appx03179 at 55:22-56:4; *see also* Appx02386-02387 at ¶¶ 112-114. But that physical sequence of materials in the sensor only makes sense if "in contact with"

means touching. Under Arbmetrics' construction, the physical positioning of the surfaces of each of these elements "in contact with" one another is irrelevant because each of those materials would still be in some sort of "indirect" or "diffusional communication" with each other.

Arbmetrics' opening brief never addresses the language in claims 2 and 15 confirming that "in contact with" requires touching. Instead, Arbmetrics argues that the claims support its construction by distinguishing between "contact" and "intimate contact," and that the district court's construction of "contact" is inconsistent with the claim language. Br. at 32. Arbmetrics is wrong for several reasons.

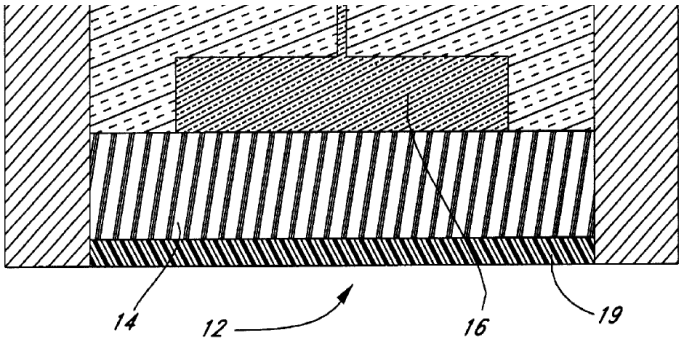
First, Arbmetrics' argument ignores that the claim terms "contact" and "intimate contact" are directed to different relationships between different claim elements—"contact" in the claims describes a physical relationship between the emulsion and electrode (touching), whereas "intimate contact" in the claims describes the molecular relationship between the components of the emulsion. The specification recognizes that difference. *Compare* Appx00041 at 5:29-31 (placing "thin layers" of emulsion "into contact" with electrode) *with* Appx00042 at 8:60-63 (oxygen dissolving substance "holds oxygen and brings it into intimate contact with the enzyme to accept electrons from the enzyme"). Arbmetrics' conflation of these two separate terms should be rejected.

Second, the district court specifically recognized the distinction between contact and intimate contact in its claim construction order, and construed those terms differently. Appx00018-00019, Appx00023. Those constructions are not inconsistent with one another.

Third, to the extent Arbmetrics objects to the district court's construction of "intimate contact" as "close contact," the proper way to address that issue is to appeal the district court's construction of "intimate contact." Arbmetrics did not do so, and its complaints regarding the district court's construction of that term cannot change the customary meaning of the claim term "contact."

2. The Specification Further Confirms That "In Contact With" Means Touching

The specification also proves that "in contact with" means "touching." Indeed, Figure 2 of the '225 Patent (excerpted below)—which shows a cross-sectional view of what the patentee described as the "current invention"—shows the enzyme emulsion (14) "in contact with" (touching) the electrode (16):



Appx00936.

In addition to Figure 2, the '225 Patent specification consistently uses the term "contact" to mean touching. For example, in the Summary of Invention, the patent states: "Thin layers of the emulsion ideal for *placing into contact with a noble metal electrode* can be fabricated by *spreading a layer of the emulsion* prior to crosslinking." Appx00041 at 5:29-31 (emphasis added). The reference to "spreading a layer" of the enzyme emulsion onto the electrode further demonstrates that "contact" means that the emulsion is touching the electrode. This is consistent with the customary meaning of "contact," and the district court properly looked to "the specification [] to understand what the patentee has claimed… ." *SafeTCare Mfg., Inc. v. Tele-Made, Inc.*, 497 F.3d 1262, 1270 (Fed. Cir. 2007). Indeed, the '225 Patent does not disclose any embodiment where the enzyme emulsion is not touching the electrode.

Arbmetrics relies heavily on text in the '225 Patent at 6:62-67 to argue for its proposed "direct, indirect or diffusional communication" construction. Br. at 30. Arbmetrics' arguments fail for at least two reasons. First, that portion of the specification describes the relationship between the glucose sensor and the patient's circulatory system (the blood), *not* the claimed "contact" between the enzyme emulsion and the electrode. Appx00041 at 6:65-67 (noting "that placement of the device in contact with the blood is not really required."). It thus cannot alter the plain meaning of the claim term "contact." *See Thorner*, 669 F.3d

at 1365. The specification's statement that contact between the sensor and the blood is not required does not support the leap to Arbmetrics' conclusion that the claimed "contact" between the enzyme emulsion and the electrode is not required. Br. at 30.

Second, this portion of the specification actually supports the district court's construction. The specification states that "[a]ll of the body tissues come into glucose equilibrium with the blood fairly rapidly so that placement of the device *in contact with* the blood is not really required." Appx00041 at 6:65-67 (emphasis added). This sentence makes sense only if "in contact with" means touching. Appx02387 at ¶ 115. As the district court correctly observed, substituting Arbmetrics' proposed "direct, indirect, or diffusional communication with" construction for "in contact with" in this portion of the specification would make no sense because the sensor must be in some sort of "direct, indirect or diffusional communication" with the patient's blood in order to determine blood glucose levels. Appx00019. However, as the specification states, the sensor need not be "in contact with"—touching—the patient's blood to do so. *See id.* (noting that construing "in contact with" as touching is necessary to "give[] meaning to the entire passage" cited by Arbmetrics). The use of "contact" throughout the specification, including the portion Arbmetrics relies upon, supports the district court's construction.

3. Extrinsic Evidence Confirms That The Ordinary Meaning Of "In Contact With" Is Touching

The extrinsic evidence cited by both parties further confirms that "touching" is the customary meaning of "contact." That customary meaning is reflected in many dictionary definitions, including those identified by Arbmetrics. Appx03024 ("The act or state of touching; a touching or meeting, as of two things or people"); Appx03029 ("A coming together or touching, as of objects or surfaces"); Appx03033 ("the state or condition of physical touching"); Appx03038 ("A coming together or touching, as of objects or surfaces"). Simply put, it is well-understood by those of skill in the art that "contact" means touching.

Arbmetrics' reference to secondary dictionary definitions defining "contact" in the context of interpersonal "communication" is misplaced. Br. at 33-34. While "contacting" somebody via telephone refers to communicating with another person, that is not the type of "contact" claimed in the '225 Patent. The '225 Patent is directed to the physical arrangement of elements in a glucose sensor, not interpersonal communications. Not surprisingly, the '225 Patent never refers to communication, much less "indirect" or "diffusional communication." Arbmetrics' attempt to shoehorn an inapplicable definition into the claims should be rejected.

Moreover, Arbmetrics' proposed construction injects ambiguity into the claims and raises significant validity issues that would not otherwise exist. *See* 35

U.S.C. § 112 ¶¶ 1 & 2. By trying to erase the claims' "touching" requirement, Arbmetrics makes "in contact with" meaningless: virtually any component arrangement in an electrochemical sensor—including arrangements nowhere described in the patent—would place those components "in contact with" each other if only "directly, indirect or diffusional communication" among those components were required.

Arbmetrics' proposed construction is similar to the proposed construction for "connected to" that was rejected in *Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp.*, 93 F.3d 1572, 1578 (Fed. Cir. 1996). In *Ethicon*, the plaintiff similarly proposed to add "directly or indirectly" to its claim construction, but the Court rejected the addition: "If, as Ethicon argues, 'connected to' should be read broadly to include elements which are connected directly or indirectly, … the 'connected to' limitation would be meaninglessly empty." *Id.* Similarly, adding "direct, indirect, or diffusional communication" would render the "in contact with" limitation meaningless. Arbmetrics' overly broad construction should be rejected.

Arbmetrics' expert, Dr. Smith, has also testified outside of this case that "contact" means "touching." Specifically, in other cases concerning Dexcom's glucose sensing technology, he opined that "in contact with" has an ordinary and customary meaning of "touching." Appx03179-03180 at 56:17-57:13. In separate proceedings, both the International Trade Commission (Appx03266), and the

PTAB (Appx03311) determined that "in contact with" means touching in the context of glucose sensors, consistent with Dr. Smith's opinion and the customary meaning of the term. There is no reason that "contact" should have a different meaning here. Dr. Smith's basis for deviating from the opinions he gave in prior cases is his contention that the '225 Patent "implicitly redefines" the term contact, though he could not identify where in the '225 Patent that implicit redefinition occurred. Appx03172-03173 at 28:22-29:4, 29:19-30:24. Even if there were any support for Dr. Smith's view in the specification, this Court has rejected such "implicit" redefinitions. *See Thorner*, 669 F.3d at 1365. The district court's construction should be affirmed.

D. An "Electrode" And A "Membrane" Are Separate Elements

Arbmetrics' arguments regarding the claim term "electrode" are part and parcel of its strategy regarding "contact." Arbmetrics understands that Dexcom's products include a separate membrane that prevents contact between the electrode and any enzyme (*see* Appx02322), and because the plain meaning of "contact" requires touching, Arbmetrics seeks to expand the meaning of an electrode to include an "optional" membrane. While Arbmetrics challenges the district court's reasoning, it does not take issue with the district court's construction aside from the rejection of Arbmetrics' "optional membrane" language. Thus, the only issue

regarding this term is whether an electrode and a membrane should be defined as separate elements, or merged into a single component.

This does not mean—as Arbmetrics now suggests—that the district court's construction somehow excludes electrodes with membranes from the scope of the term "electrode." Br. at 35-36. The court's construction does no such thing. Rather, the question is whether an electrode is properly defined to also include separate components like a membrane such that contacting a membrane barrier positioned between an enzyme layer and the electrode (which is not claimed) is the same as an enzyme emulsion touching the electrode (which is claimed).

Arbmetrics' arguments regarding "electrode" fail for many of the same reasons as its arguments regarding "contact." Specifically, the claims, the specification, and the inventor's own prior art prove that an "electrode" and a "membrane" are separate elements. The district court's construction of "electrode"—"a solid electric conductor through which an electric current enters or leaves a substance"—tracks the term's customary meaning, and should be affirmed.

1. The Claims Of The '225 Patent Require An "Electrode" and "Membrane" To Be Two Separate Elements

"Electrode" has a well-known meaning in the art, recognized by both sides' experts. Appx02390 at ¶ 130; Appx03358-03360 at ¶¶ 21-22, 25-26. Even Arbmetrics' expert acknowledges that an electrode is a solid electric conductor

through which current enters. Appx03358-03360 at ¶¶ 21-22, 25-26. And the '225 Patent claims emphasize that the electrode must be conductive. Appx00045 at 14:16-18. A person of ordinary skill would understand that "an electrode" is a solid conductor through which electric current enters or leaves, just as the district court construed the term. Appx02391 at ¶ 133; Appx02394 at ¶ 138.

The claims also distinguish an "electrode" from a "membrane" as separate elements. Claims 2 and 15 both claim a "membrane covering the electrode…." Appx00045 at 14:31, Appx00046 at 15:26 to 16:1. This claim language confirms that an electrode and a membrane are *separate* elements, and proves that a membrane is not just a part of an electrode as Arbmetrics suggests. Appx02393 at ¶ 137. "Where a claim lists elements separately, 'the clear implication of the claim language' is that those elements are 'distinct component[s] of the patented invention.'" *Becton, Dickinson*, 616 F.3d at 1254; *see also SandBox Logistics LLC v. Proppant Express Investments LLC*, -- F. App'x -- , 2020 WL 2517113, at *5 (Fed. Cir. May 18, 2020) ("That the 'structural support members' are recited separately from the 'end walls' and 'side walls' implies that the 'structural support members' are a structurally distinct component.") (nonprecedential).

2. The Specification Of The '225 Patent Also Proves That An "Electrode" and "Membrane" Are Two Separate Elements

Like the claims, the '225 Patent specification confirms that an electrode is a solid conductor that touches the enzyme emulsion: "Thin layers of the emulsion

ideal for placing into contact with a noble metal electrode can be fabricated by spreading a layer of the emulsion prior to crosslinking." Appx00041 at 5:29-32. Indeed, many passages throughout the '225 Patent emphasize that the electrode must be a solid electric conductor through which electric current enters or leaves a substance. *See*, *e.g.*, Appx00039 at 2:35-38, 2:61-64; Appx00040 at 3:26-32; Appx00043 at 9:55-60.

The specification likewise emphasizes that an "electrode" and a "membrane" are separate components, and that a membrane is not simply part of an "electrode" as Arbmetrics argues. For example, the specification states: "To use the gel prepared as above a small piece is placed over a *platinum electrode* and covered with a piece of a *Cuprophan® (brand regenerated cellulose) membrane*. Alternatively, the gel can be divided into numerous small particles, and a slurry of these particles can be placed on the *electrode surface and covered by the membrane*." Appx00043 at 9:55-60 (emphasis added). Thus, the specification distinguishes between the "electrode surface" of the "platinum electrode" on the one hand, and the covering "membrane" on the other hand. Similarly, in describing the named inventor's prior art, the '225 Patent distinguishes between a "platinum anode" and a "silver reference electrode" (electrodes) on the one hand, and a "cellophane or cellulose acetate membrane" on the other. Appx00039 at

2:35-38. The '225 Patent never suggests that a "membrane" is an element of the "electrode," optionally or otherwise.

The prior art incorporated by reference into the '225 Patent likewise demonstrates that an "electrode" and a "membrane" are separate components. U.S. Patent No. 4,680,268, which issued to the '225 Patent's named inventor and is incorporated by reference into the '225 Patent (Appx00040 at 4:36-39), describes an electrode that is in contact with a membrane, and confirms that the "electrode" and a "membrane" are distinct elements:

> … [T]he sensors of the present invention may include a "third' *membrane* placed over *anode* 8 to separate *enzyme* 7 from *anode* 8. This is commonly referred to as the "sandwich' concept … exemplified in … Clark, L. C., Jr., …: Implanted Electroenzymatic Glucose Sensors, Diabetes Care, 5(3):174-180 (May-June 1982) which are incorporated in their entirety herein by reference.

Appx02530 at 7:1-12 (emphasis added). An "anode" is a type of "electrode." Appx03212 at 185:21-23. This text confirms that the named inventor understood and intended that a membrane and an electrode are separate elements that are referred to separately, even when they are touching one another as in the prior art sensor configuration.

Arbmetrics' argument that its construction should be adopted because this patent shows an "electrode…having a membrane" misses the mark for two reasons. First, there is nothing in the district court's construction that excludes electrodes attached to membranes. Rather, the issue is whether the language of the

claim—which requires an enzyme emulsion "in contact with" an electrode—can be expanded beyond its plain meaning to include circumstances where the enzyme is contacting a barrier membrane instead of the electrode. The district court properly recognized these are separate components and rejected Arbmetrics' alteration of the plain meaning of "electrode" to accommodate its infringement theory.

Second, to the extent Arbmetrics is arguing that a configuration in the prior art is necessarily covered by the '225 Patent claims, Arbmetrics' argument reflects a misunderstanding of the law. "[I]ncorporation by reference does not convert the invention of the incorporated patent into the invention of the host patent." *Modine Mfg. Co. v. Int'l Trade Comm'n*, 75 F.3d 1545, 1553 (Fed. Cir. 1996); *e.Digital Corp. v. Futurewei Techs., Inc.*, 772 F.3d 723, 726-27 (Fed. Cir. 2014) ("While the '108 patent may incorporate by reference the '774 patent as prior art, …[t]he '108 patent discloses a separate invention, … [and] claims of unrelated patents must be construed separately."). Indeed, the whole point of describing the prior art is to *distinguish* the '225 Patent claims from the prior art, not to try and capture prior art inventions. The prior art incorporated by reference undermines Arbmetrics' suggestion that a membrane is "optionally" just part of the electrode.

A second publication by the named inventor in the journal "Diabetes Care," which is also incorporated by reference in the '225 Patent (Appx02530 at 7:1-12), further emphasizes that the "electrode" and "membrane" are separate elements.

Appx02703 at Fig. 1. In particular, Figure 1 of that publication shows each of the components of the glucose sensor described in the publication, and shows that membranes and electrodes are regarded as *different* components, even where the membrane is physically touching the electrode:

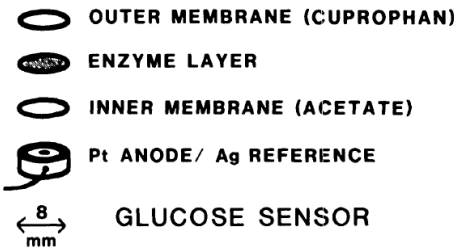


FIG. 1. Exploded diagram of implantable sensor. This shows the configuration of a two-electrode oxidase-based sensor. The outer membrane allows passage of the glucose to the immobilized enzyme layer, where it is oxidized to hydrogen peroxide. The hydrogen peroxide diffuses to the platinum surface, where it is oxidized. The silver reference electrode is preferably located near the platinum anode, as shown above, but in all the experiments reported, the silver electrodes were located remotely from the anode.

Appx02396 at ¶ 141; Appx03216 at 201:1-8.

The function of electrochemical sensors also supports Dexcom's construction. In the above figure, "the hydrogen peroxide is oxidized at the platinum surface," which is the electrode. Appx03216 at 201:9-19. Arbmetrics' expert conceded that hydrogen peroxide (the product of the glucose reaction described in the '225 Patent; Appx00039 at 2:50) can only be oxidized at the metallic electrode surface, not at any membrane surface or in a polymer covering the electrode. Appx03174 at 35:7-24, Appx03212 at 186:25-187:6, Appx03216 at 201:20-202:10. The invention's purpose also requires that the enzyme emulsion touches the metallic electrode's surface because a membrane "would decrease

signal and increase the sensor's response time." Appx02236 at ¶ 119. This further confirms that a membrane is not a component of an electrode, but a separate element with different properties and different functions.

3. Arbmetrics' Arguments That "Electrode" and "Membrane" Should Be Merged Into One Component Are Without Merit

Arbmetrics' proposal that the definition of an electrode should "optionally" include a membrane should be rejected for several additional reasons.

First, Arbmetrics' proposed "optional" language only reinforces that these are separate elements, and that a membrane is not part of an electrode. Just because a mattress can "optionally" be covered with a blanket, that does not make the blanket a component of a mattress. And, contrary to Arbmetrics' suggestion (*see* Br. at 35-36), the district court did not exclude electrodes that are covered with a membrane from its construction. Rather, the district court simply held that a membrane is a *separate* component from an electrode, which is consistent with the customary meaning of both of those terms.

Second, without any support from the intrinsic evidence, Arbmetrics relies heavily on a single dictionary that defines "electrode" as "any conductor, such as a piece of metal, metal covered with one of its salts, carbon, or a thin glass or other membrane, used to establish electric contact with a solution …." Br. at 41 (citing Appx03060). But this definition only suggests that an electrode can be covered with a separate membrane or piece of glass, not that a membrane or piece of glass

is part of an electrode as Arbmetrics proposes. Moreover, this molecular biology and biochemistry definition is not applicable to electrochemical glucose sensors because it refers to an electrode used for potentiometric measurements, which are very different from the amperometric measurements of the '225 Patent. Appx02358 at ¶ 34, Appx02398-99 at ¶¶ 147-149. Even Arbmetrics' expert concedes that "a thin glass or other membrane" is not suitable in an electrode for amperometric measurements. Appx03169 at 14:10-25; 15:1-11. And even if this one dictionary definition from an unrelated field can be interpreted as Arbmetrics suggests, it is inconsistent with the language of the claims, specification, and the prior art incorporated by reference, all of which confirms that an electrode and a membrane are separate components. *Phillips*, 415 F.3d at 1318 (court should discount extrinsic evidence "that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.").

Finally, Arbmetrics argues that there is something called a silver chloride electrode, which is not discussed anywhere in the '225 Patent, that consists of silver coated with silver chloride, and thus supports its position. Br. at 40. This argument fails for several reasons too. First, Arbmetrics does not explain why an electrode made of silver and silver chloride supports its leap to the conclusion that a membrane—which is described throughout the '225 Patent's intrinsic record as a

separate component from an electrode—is part of an electrode. Second, it is not even clear why Arbmetrics contends that a silver chloride electrode is not covered by the district court's construction—"a solid electric conductor through which an electric current enters or leaves a substance"—and even if it is, why that means a membrane is part of an electrode. Third, as with the dictionary definition Arbmetrics cites, this type of electrode is not the type used in the amperometric measurements discussed in the '225 Patent, and both sides' experts agree that amperometric measurements are the only ones relevant to the '225 Patent. Appx03169 at 14:10-25, 15:1-11. At best, Arbmetrics' argument is based on extrinsic evidence that should be disregarded because it is inconsistent with the '225 Patent's intrinsic evidence.

In short, the district court's construction is consistent with the ordinary and customary meaning of electrode, which is reinforced by the claims, the specification and the prior art incorporate by reference. The district court correctly rejected Arbmetrics' proposed construction because the intrinsic record proves that an electrode and a membrane are separate things.

E. "Hydrocarbon Oils or Solids"

The issue addressed by the district court is whether "hydrocarbon oils and solids" are oils or solids composed only of carbon and hydrogen, or whether they can include any oil or solid that includes just one group or side chain composed of

only hydrogen or carbon. The district court correctly construed this term to mean "oils or solids composed only of carbon and hydrogen."

1. "Hydrocarbon" Means Hydrogen And Carbon Only

Each of the dictionaries relied on by both sides defines a hydrocarbon as being composed *only* of carbon and hydrogen. *See, e.g.,* Appx03138 ("[o]ne of a very large group of chemical compounds composed only of carbon and hydrogen"); Appx03145 ("Chemical compounds that consist of only hydrogen and carbon atoms"); Appx03152 ("This term includes all compounds of carbon and hydrogen only"). The district court's construction is consistent with this customary meaning.

Arbmetrics cites another dictionary (Br. at 43-44), but that dictionary also defines "hydrocarbon" as "any organic compound composed exclusively of hydrogen and carbon." Appx03158. Arbmetrics instead relies on the second definition from this dictionary, which states "of, pertaining to, or being a hydrocarbon (def 1) or a chemical group or side chain composed of hydrogen and carbon only." *Id*. In other words, this definition states that a chemical group or sidechain can be described as a hydrocarbon group or sidechain if it consists only of hydrogen and carbon. Appx02423 at ¶¶ 227-228. But that is a far cry from stating—as Arbmetrics does in this case—that any molecule that contains one group or side chain consisting of only hydrogen and carbon atoms is itself a

hydrocarbon. Appx02423-02424 at ¶¶ 228-231. Indeed, such a definition would turn any complex molecule into a hydrocarbon just by virtue of having a short chain composed of hydrogen and carbon, which would capture an incredibly large volume of molecules that are not hydrocarbons. The district court's construction captures the term's plain meaning.

2. The Claim Language Supports The District Court's Construction

The '225 Patent claims support the district court's construction. Claim 5 recites "the group consisting of perfluorocarbons, silicone oils, fluorosilicone oils, aromatic and aliphatic hydrocarbon oils or solids, carotenoids, and steroids." Appx00045 at 14:40-43. Under Arbmetrics' construction, however, a "hydrocarbon" would include the silicone oils, fluorosilicone oils, carotenoids, and steroids claimed elsewhere in claim 5, because these chemical classes include a "chemical group or side chain composed of hydrogen and carbon only." Appx02423 at ¶ 229. Listing these chemical groups separately from "hydrocarbon oils and solids" would be redundant under Arbmetrics' proposed construction, which further confirms that Arbmetrics' construction is wrong. *See Power Mosfet Techs., L.L.C. v. Siemens AG*, 378 F.3d 1396, 1409-10 (Fed. Cir. 2004).

3. Arbmetrics' Inappropriate Use of An Obvious Typographical Error In The Specification Should Be Rejected

Because neither the ordinary meaning of the term nor the claims support Arbmetrics' position, Arbmetrics relies entirely on a typo in Column 8 of the patent: "Besides perfluorocarbons hydrocarbon drugs (e.g., cortical steroids) silicones, silanes, … are useful in the present invention." Appx00042 at 8:12-17. Arbmetrics' argument is that "hydrocarbon drugs (e.g., cortical steroids)" indicates that the patentee viewed steroids as a hydrocarbon. However, examining the entire sentence (as opposed to the cropped quote included in Arbmetrics' opening brief) reveals that the beginning of the sentence is missing commas—the term "perfluorocarbons hydrocarbon drugs" makes no sense. Appx03561 at 76:12-77:4. The sentence was clearly meant to include commas separating those terms: "Besides perfluorocarbons[,] hydrocarbon[,] drugs (e.g., cortical steroids)[,] silicones … are useful in the present invention." This aligns with the text of claim 5, which confirms that a hydrocarbon is just one of several options for the oxygen dissolving substance. "Hydrocarbon" does not modify "drugs," as Arbmetrics contends. The district court correctly recognized the error and rejected Arbmetrics' argument.

VI. CONCLUSION

The district court correctly construed the disputed claim terms based on their well-established and customary meanings, all of which closely track the use of

those terms throughout the claims, specification and prosecution history of the '225 Patent. In contrast, Arbmetrics' proposed constructions are divorced from the plain meaning of the terms, their use in the intrinsic record of the '225 Patent, and the purpose of the invention. The district court's claim constructions should be affirmed, along with the judgment in favor of Dexcom.

Dated: July 8, 2020

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FORM 19. Certificate of Compliance with Type-Volume Limitations **Form 19**
July 2020

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATIONS

Case Number: 2050-1510

Short Case Caption: Arbmetrics, LLC v. Dexcom Inc.

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