IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

E. FRED SCHUBERT,	)	
	)	
Plaintiff and Counterclaim Defendant,	)	
	)	
v.	)	
	)	
LUMILEDS LLC,	)	
	)	C.A. No. 12-924 (MN)
Defendant and Counterclaim Plaintiff,	)	
	)	
v.	)	
	)	
TRUSTEES OF BOSTON UNIVERSITY,	)	
	)	
Counterclaim Defendant.	)	

MEMORANDUM ORDER

At Wilmington this 9th day of June 2020:

As announced at the hearing on May 18, 2020, IT IS HEREBY ORDERED that the disputed claim terms of U.S. Patent No. 6,294,475 ("the '475 Patent") are construed as follows:

1. "substrate" shall be given its plain and ordinary meaning, which is "support material for epitaxial layers" (claims 1, 11 & 13)

2. "exposing" shall be given its plain and ordinary meaning, which is "revealing and thus making accessible for etching" (claims 1 & 3)

3. "crystallographic etching" / "crystallographically etching" shall mean "etching (removal of material) that proceeds in directions dictated by the crystallographic planes of the material being etched at a rate which depends on the particular plane" and does not include defect-revealing etching (claims 1, 11 &13)

4. "non-c-plane" will not be construed at this time and the Court will address this term in connection with dispositive motions to the extent that the dispute remains (claims 1 & 11)[1]

[1] To the extent necessary, the parties may present additional claim construction arguments on this term in their dispositive motion briefing.

The parties briefed the issues (*see* D.I. 88) and submitted an appendix containing intrinsic evidence and extrinsic evidence, including expert declarations (*see* D.I. 89; *see also* D.I. 84).[2] Neither side provided a tutorial describing the relevant technology. The Court carefully reviewed all submissions in connection with the parties' contentions regarding the disputed claim terms, heard oral argument (*see* D.I. 136) and applied the following legal standards in reaching its decision:

I. LEGAL STANDARDS

"[T]he ultimate question of the proper construction of the patent [is] a question of law," although subsidiary fact-finding is sometimes necessary. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837-38 (2015). "[T]he words of a claim are generally given their ordinary and customary meaning [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc) (internal citations and quotation marks omitted). Although "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Id.* at 1314. "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted).

The patent specification "is always highly relevant to the claim construction analysis . . . [as] it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). It is also possible that "the specification may reveal a

[2] The parties also engaged in claim-construction briefing during an earlier stage of the case before the parties agreed to stay these proceedings pending resolution of the *inter partes* review. (*See* D.I. 43, 44, 45, 46, 48, 49, 50, 51; *see also* D.I. 52 (joint stipulation to stay)).

special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. "Even when the specification describes only a single embodiment, [however,] the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (internal quotation marks omitted) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)).

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

In some cases, courts "will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841. Extrinsic evidence "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. Expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a

particular term in the patent or the prior art has a particular meaning in the pertinent field." *Phillips*, 415 F.3d at 1318. Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, although extrinsic evidence "may be useful to the court," it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

I. THE COURT'S RULING

The Court's ruling regarding the disputed claim terms of the '475 Patent was announced from the bench at the conclusion of the hearing as follows:

> . . . At issue in this case, we have one patent, United States Patent No. 6,294,475 and four terms in dispute. I am prepared to rule on three of those disputes today. I will not be issuing a written opinion as to these three terms, but I will issue an order stating my rulings, and I will construe the fourth term – non-c-plane – at some point. I want to emphasize before I announce my decisions that while I am not issuing a written opinion, we have followed a full and thorough process before making the decisions I am about to state. I have reviewed the '475 Patent, the portions of the prosecution history and IPR submitted with the joint claim chart, and the material in the joint appendix, which includes multiple expert declarations.[3] There was full briefing on the disputed issues and there has been argument here today. All of that has been carefully considered.
>
> Now as to my rulings. I am not going to read into the record my understanding of claim construction law. I have a legal standard section that I have used earlier, including in my relatively recent

[3] In connection with the current briefing, Plaintiff submitted two declarations from Dr. James R. Shealy, a Professor at Cornell University, School of Electrical and Computer Engineering. Defendant submitted two declarations from Dr. Christian M. Wetzel, a Professor of Physics at the Department of Physics, Applied Physics, and Astronomy at Rensselaer Polytechnic Institute.

order in *Quest Diagnostics Investments LLC v. Laboratory Corporation of America Holdings*, C.A. No. 18-1436-MN. I incorporate that law and adopt it into my ruling today and will also set it in the order that I issue.

As to the person of ordinary skill in the art, there has not been any argument that proposed differences as to who that person may be are relevant to claim construction.

The first disputed term is "substrate" in claims 1, 11 and 13. Plaintiff asserts that it means "support material for epitaxial layers" or, alternatively, "support material for epitaxial layers, including but not limited to material on which the epitaxial layer system is grown."

Defendant proposes that it means "material on which the epitaxial layer system is grown."

Here, the crux of the dispute is whether the "substrate" must be the material that the epitaxial layer system is grown on, rather than simply a supporting material. Here, I agree with Plaintiff and will not read in the limitation proposed by Defendant.

Plaintiff argues that the focus of invention is on the epitaxial system, not the substrate, and the substrate itself is "irrelevant" to the claimed invention. I largely agree. The claimed invention is directed to the processing of epitaxial layer systems that reside on that "substrate."[4] And the specification does not explicitly define "substrate" and certainly never limits the term to mean only the material on which the system is grown.

As used in this plain and ordinary sense, the term "substrate" is simply the material on which the epitaxial layer system resides when the etching process occurs. Defendant nevertheless argues that the specifications limits "substrate" to the material on which the system is grown, relying on language from the specification that states "[t]he samples used were grown on c-plane sapphire substrates . . . ."[5] The sentence leading into the section, however, begins with "[i]n accordance with one embodiment of the process of the invention . . . ."[6] This language is referring to a preferred embodiment. The same is true of the language Defendant cites in

4 ('475 Patent at 2:17-18).

5 ('475 Patent at 3:9-10).

6 ('475 Patent at 3:3-4).

column 5, which describes one of the figures in which the III-Nitride system is "configured" on a sapphire substrate.[7] Even if "configured" means "grown on" in that context, that is not a sufficient reason to limit the meaning of "substrate" as used in the claims because that language is referring to a preferred embodiment for a bipolar transistor.[8] As the Federal Circuit has made plain, preferred embodiments rarely limit the meaning of claim terms. And there is no reason for doing so here.

Additionally, there is no indication in the prosecution history or in the IPR proceedings that the patentee intended to limit this term from its plain and ordinary meaning.

Finally, as to Plaintiff's alternative definition that clarifies [that] the substrate may be – but need not be – the material on which the epitaxial layer system is grown, I find that additional language unnecessary. Construing the term to mean "support material for epitaxial layers" already encompasses this concept – *i.e.*, the support material can be what the system was grown on, as well as a material that the layer system was transferred to prior to etching processes.

Therefore, I will not add this superfluous language to the construction, instead construing this term to have its plain and ordinary meaning, which is "support material for epitaxial layers."

The second disputed term is "exposing" in claims 1 and 3. Plaintiff asserts that it means "making accessible" or, alternatively, "revealing and thus making accessible for etching." Defendant proposes that it means "revealing by proceeding downward."

The dispute here is whether there is a directionality limitation in the exposing process that reveals certain plane surfaces. Here, the Court agrees with Plaintiff and will not read in the limitation advanced by Defendant.

The '475 Patent does not define "exposing" and there is no limitation in the directionality of the exposing step of the claims. In the context of the invention, the "exposing" step reveals a non-c-plane surface in III-Nitride epitaxial layer systems. Defendant's attempt to limit this term to require downward movement comes from statements made during prosecution of the '475 Patent, where the Applicants described their invention in an attempt to swear behind the Kim prior art and an Examiner's rejection followed. The

7 (*See* '475 Patent at 5:8-12).

8 (*See* '475 Patent at 5:9).

Examiner found that the Applicants' disclosure did not adequately describe the "exposing" step – *i.e.*, it did not describe a step that exposed the non-c-plane surfaces as recited in the claims. In response, the Applicants pointed the Examiner to the invention disclosure form, which stated that the first step in the process "is performed by any common processing method" and that crystallographic etching follows after that step is performed.[9] The Applicants then went on to say that "the first etching step etches downward through the c-plan[e], inherently exposing the non-c-plane, such as the vertical m-planes," which "must be done before attempting crystallographic etching."[10] When reading the Applicants' response to the Examiner in conjunction with the invention disclosure submitted by the inventors, I am unable to find a "clear and unmistakable" disclaimer here.

The inventors stated in their invention disclosure form that the first step – the exposing step – could be performed by any common processing methods, but that this step must be done before crystallographic etching can be performed. In the Court's view, the Applicants' statement describing an exposing step that proceeds downward was an illustrative example of one of those common techniques, not a "clear and unmistakable" disclaimer of any technique that proceeds in a direction other than downward. Although the prosecution history is relevant to a term's meaning even in the absence of a disclaimer, the Court finds that the portions cited by Defendant shed little light on the meaning of "exposing" here, especially when the specification demonstrates that various techniques can be used in the "exposing" step.

Indeed, the '475 Patent itself describes the use of "cleaving" in the "exposing" step to make non-c-plane surfaces available for etching. The summary of invention states that the invented process "includes exposing non-c-plane surfaces of the III-Nitride epitaxial layer system, for example by etching to a selected depth or cleaving," followed by crystallographic etching.[11] Cleaving is never described with any directionality component. And the juxtaposition of "selected depth" with "cleaving" suggests that cleaving does not have any requirement that it proceed by moving downward even if etching to a certain depth does. This is further reason to reject Defendant's attempt to read a directionality requirement into "exposing."

---

9 (D.I. 84, Ex. B at EFS00000166; *see also id.* at EFS00000150).

10 (D.I. 84, Ex. B at EFS00000166).

11 ('475 Patent at 2:19-21; *see also id.* at 2:25-27).

Finally, unlike as was the case for the previous term, the Court will adopt Plaintiff's alternative proposed construction here. In the Court's view, Plaintiff's initial construction – "making accessible" – does not fully capture the plain and ordinary meaning, which is the meaning to a person of ordinary skill in the art in light of the intrinsic evidence. "Making accessible" could mean any number of things in the abstract and even in the context of this invention, and this definition does not seem like much of a definition at all. The claimed invention is about crystallographic etching of certain planes in an epitaxial layer system, and construing "exposing" to mean "revealing and thus making accessible for etching" is less generic and more tethered to a POSA's understanding of the term in light of the intrinsic evidence. Therefore, I will construe "exposing" to mean "revealing and thus making accessible for etching."

The third disputed term is "crystallographic etching"/"crystallographically etching" in claims 1, 11 and 13. Plaintiff asserts that it means "etching that proceeds in directions dictated by the crystallographic planes of the material being etched" or, alternatively, "etching (removal of material) that proceeds in directions dictated by the crystallographic planes of the material being etched at a rate which depend on the particular plane (defect-revealing etching is not crystallographic etching)." Defendant asserts that it means "etching (removal of material) that proceeds in directions dictated by the crystallographic planes of the material being etched at a rate which depends on the particular plane, revealing a smooth surface. (For clarification, this excludes etches, *e.g.*, photoenhanced wet etches and reactive ion etches, leaving a rough surface, as well as defect-revealing etching.)"

The crux of this dispute – as revealed by Plaintiff's "alternative" construction – is two-fold, *i.e.*, whether the etching must reveal a smooth surface and whether the claimed etching excludes etches such as photoenhanced wet etches and reactive ion etches, that leave a rough surface" as proposed by Defendant.

Here, I agree with Plaintiff that those additional limitations should not be part of the construction. And I construe "crystallographic etching"/"crystallographically etching" to mean "etching (removal of material) that proceeds in directions dictated by the crystallographic planes of the material being etched at a rate which depends on the particular plane." And for clarification, as all parties agree, defect-revealing etching is not crystallographic etching.

There is no specific definition in the specification of crystallographic etching, but there is a statement of the ordinary meaning of the term in the prosecution history. For example, the Donnelly patent, which is prior art cited on the face of the '475 Patent and is part of the intrinsic evidence, defined crystallographic etching as I am doing here, *i.e.*, "etching that proceeds in directions dictated by the crystallographic planes of the material being etched at a rate which depends on the particular plane."[12]

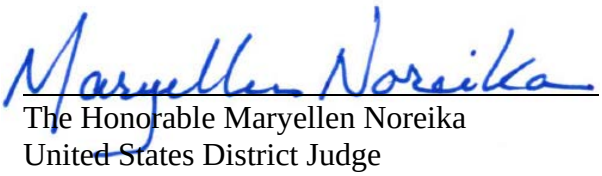
Defendant does not dispute the aspects of the definition in Donnelly, but asserts that in the '475 Patent, the definition must be further limited because "the specification disparages rough surfaces and distinguishes the alleged invention as producing smooth surfaces" in arguing that smooth surfaces are required to result from the claimed crystallographic etching.[13]

In support of that, Defendant points to a number of citations to embodiments as well as statements in the background of the invention regarding prior art.

I do not, however, find any of those statements to be definitional, nor do I find them to be a limitation of etching that results in a smooth plane and does not include rough surfaces. For example, in discussing Figure 3, the patent states: "This etching step can produce smooth crystallographic surfaces . . . ." The use of the word "can" does not support that the etching must produce such a surface.

And I am also concerned that reading in references to smoothness and roughness injects some ambiguity into the meaning of the term – particularly given that Defendant's position when I asked about what those terms mean was something akin to "we'll know it when we see it."

And finally, as I said earlier, I am not prepared to rule on the non-c-plane term today on the phone and I will address that in due course.



The Honorable Maryellen Noreika
United States District Judge

12 (U.S. Patent No. 4,397,711 at 3:7-12).

13 ('475 Patent at 3:61-62).