IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

INVISTA NORTH AMERICA S.À.R.L. and AURIGA POLYMERS INC.,	)	
Plaintiffs,	)	
v.	)	Civ. No. 11-1007-SLR-CJB
M&G USA CORPORATION and M&G POLYMERS USA, LLC,	)	
Defendants.	)	

William J. Marsden, Jr., Esquire, Douglas E. McCann, Esquire, A. Martina Hufnal, Esquire, and Robert M. Oakes, Esquire of Fish & Richardson P.C., Wilmington, Delaware. Counsel for Plaintiff INVISTA North America S.à.r.l. Of Counsel: Jonathan E. Singer, Esquire of Fish & Richardson P.C.

John W. Shaw, Esquire, and Jeffrey T. Castellano, Esquire of Shaw Keller LLP, Wilmington, Delaware. Counsel for Plaintiff Auriga Polymers Inc. Of Counsel: William Cory Spence, Esquire, and Reid P. Huefner, Esquire of Kirkland & Ellis LLP.

Richard L. Horwitz, Esquire, David E. Moore, Esquire, and Bindu A. Palapura, Esquire of Potter Anderson & Corroon LLP, Wilmington, Delaware. Counsel for Defendants. Of Counsel: Megan D. Dortenzo, Esquire, and Arthur Licygiewicz, Esquire of Thompson Hine LLP.

MEMORANDUM OPINION

Dated: March 31, 2014
Wilmington, Delaware

ROBINSON, District Judge

I. INTRODUCTION

Plaintiffs INVISTA North America S.à.r.l. ("Invista") and Auriga Polymers Inc.[1] ("Auriga") (collectively, "plaintiffs") sued M&G USA Corporation and M&G Polymers USA, LLC (collectively, "defendants") for infringement of U.S. Patent Nos. 7,919,159 ("the '159 patent), 7,943,216 ("the '216 patent"), and 7,879,930 ("the '930 patent") (collectively, "the patents-in-suit"). (D.I. 1; D.I. 7) Defendants asserted counterclaims seeking declaratory judgment of non-infringement and invalidity of the patents-in-suit. (D.I. 42)

In a memorandum opinion and order dated June 25, 2013, the court resolved several summary judgment motions.[2] (D.I. 382; D.I. 383) The parties proceeded to trial on July 18, 2013 on infringement of claim 4 and on the validity of several asserted claims of the '216 patent. At the close of evidence, the court granted plaintiffs' motion for judgment as a matter of law ("JMOL") regarding infringement of claim 4. On July 24, 2013, the jury returned a verdict that the '216 patent was valid. Currently before the court are several motions: defendants' renewed motions for JMOL on invalidity and non-infringement (D.I. 470; D.I. 473); plaintiffs' motion for an injunction (D.I. 467); defendants' motion for leave to file amended pleadings (D.I. 365); defendants' motion for reargument of the court's July 16, 2013 oral order (D.I. 444); and the parties' motions for attorney fees (D.I. 451; D.I. 452; D.I. 455). The court has jurisdiction over

---

[1]Auriga Polymers was added as a plaintiff by a joint stipulation entered by the court on April 30, 2012. (D.I. 52)

[2]The court denied (D.I. 421) defendants' motion for reconsideration of the court's grant of summary judgment of indirect infringement for the asserted claims (except claim 4) of the '216 patent (D.I. 404).

these matters pursuant to 28 U.S.C. § 1338.

II. BACKGROUND

A. Technology Overview

Plastic polymers are commonly used for making food and beverage containers and offer several advantages over the use of glass or metal. They are lighter in weight, have less breakage, and can potentially lower costs. ('216 patent, 1:25-27) Polymers are synthesized by reacting monomers to form a larger polymer chain, and made into bottles by a method called stretch blow molding, wherein the polymer resin is typically dried, melted and extruded into preforms. (7:56-58) The preforms are then heated and blown-molded into bottles of desired shape and size. (7:62-64)

One type of polymer, polyester, has been widely used in the bottling industry for many years. Polyethylene terephthalate ("PET") is a common example of a polyester. (2:34, 8:16) Polyesters can be prepared by reacting diesters (e.g., dicarboxylic ester) or diacids (e.g., terephthalic acid) with ethylene glycol ("EG"). (3:27-31). Because of polyesters' inferior gas-barrier properties, these materials limit the shelf life of oxygen-sensitive foods, condiments, and beverages (such as juice, soda, or beer). (1:27-33)

In the prior art, it was known that the use of low-gas permeable polymers, known as partially aromatic polyamides (or "nylons"), with polyesters increases barrier properties. (1:31-38) Partially aromatic polyamides have non-scavenging, or "passive," barrier properties, meaning they restrict carbon dioxide leakage from, and oxygen intrusion into, a container by obstructing the paths of gas molecules. (1:21) However,

partially aromatic polyamides are not miscible with polyesters like PET, and they also give containers an undesirable yellow and hazy appearance. (1:44-46)

It was commonly known in the art that combining a thin layer of a partially aromatic polyamide, like MXD6,[3] with one or more layers of polyester in multilayer bottles increased barrier properties. (1:35-43) This multilayer system, however, produced bottles with undesirable haze. (1:33-35) It was also known in the art that the addition of a transition metal catalyst, such as cobalt salt, improved the gas barrier properties of polyamide multilayer containers and blends with PET by promoting active oxygen scavenging. (2:32-48)

B. The '216 Patent

According to the patentee, no prior art disclosed a monolayer container with a desirable balance of high gas barrier properties and low yellowness and haze, as taught by the '159 and '216 patents. ('216 patent, 2:55-61, 2:65-3:13) The invention is useful as packaging for oxygen-sensitive foods that require a long shelf life. (2:55-67) The '216 patent discloses a three component composition. Claim 1 of the '216 patent recites:

> A composition for containers comprising:
> a copolyester comprising a metal sulfonate salt;
> a partially aromatic polyamide;
> and a cobalt salt.

Dependant claim 4 recites "[t]he composition of claim 1, wherein said cobalt salt is present in a range from about 20 to about 500 ppm of said composition."

The "copolyester comprising a metal sulfonic salt" is termed a "compatibilizer." A

---

[3]MXD6 is the commercial name for poly(m-xylylene adipamide). (1:37-38)

metal sulfonate salt discussed in the '216 patent is 5-sulfoisophthalic acid ("SIPA"). (8:41)

III. STANDARDS OF REVIEW

A. Renewed Motion for Judgment as a Matter of Law

To prevail on a renewed motion for judgment as a matter of law following a jury trial, the moving party "'must show that the jury's findings, presumed or express, are not supported by substantial evidence or, if they were, that the legal conclusions implied [by] the jury's verdict cannot in law be supported by those findings.'" *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1348 (Fed. Cir.1998) (quoting *Perkin–Elmer Corp. v. Compute r vision Corp.*, 732 F.2d 888, 893 (Fed. Cir.1984)). "'Substantial' evidence is such relevant evidence from the record taken as a whole as might be acceptable by a reasonable mind as adequate to support the finding under review." *Perkin–Elmer Corp.*, 732 F.2d at 893. In assessing the sufficiency of the evidence, the court must give the non-moving party, "as [the] verdict winner, the benefit of all logical inferences that could be drawn from the evidence presented, resolve all conflicts in the evidence in his favor, and in general, view the record in the light most favorable to him." *Williamson v. Consol. Rail Corp.*, 926 F.2d 1344, 1348 (3d Cir. 1991); *Perkin–Elmer Corp.*, 732 F.2d at 893. The court may not determine the credibility of the witnesses nor "substitute its choice for that of the jury between conflicting elements of the evidence." *Perkin–Elmer Corp.*, 732 F.2d at 893. In sum, the court must determine whether the evidence reasonably supports the jury's verdict. *See Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 F.3d 1009, 1014 (Fed. Cir. 1998).

B. Motion for a New Trial

Federal Rule of Civil Procedure 59(a) provides, in pertinent part:

> A new trial may be granted to all or any of the parties and on all or part of the issues in an action in which there has been a trial by jury, for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States.

Fed. R. Civ. P. 59(a). The decision to grant or deny a new trial is within the sound discretion of the trial court and, unlike the standard for determining judgment as a matter of law, the court need not view the evidence in the light most favorable to the verdict winner. *See Allied Chem. Corp. v. Da i flon, Inc.*, 449 U.S. 33, 36 (1980); *Olefins Trading, Inc. v. Han Yang Chem. Corp.*, 9 F.3d 282 (3d Cir. 1993); *LifeScan Inc. v. Home Diagnostics, Inc.*, 103 F. Supp. 2d 345, 350 (D. Del. 2000) (citations omitted); *see also* 9A Wright & Miller, *Federal Practice and Procedure* § 2531 (2d ed. 1994) ("On a motion for new trial the court may consider the credibility of witnesses and the weight of the evidence."). Among the most common reasons for granting a new trial are: (1) the jury's verdict is against the clear weight of the evidence, and a new trial must be granted to prevent a miscarriage of justice; (2) newly-discovered evidence exists that would likely alter the outcome of the trial; (3) improper conduct by an attorney or the court unfairly influenced the verdict; or (4) the jury's verdict was facially inconsistent. *See Zarow–Smith v. N.J. Transit Rail Operations*, 953 F. Supp. 581, 584–85 (D.N.J.1997) (citations omitted). The court must proceed cautiously, mindful that it should not simply substitute its own judgment of the facts and the credibility of the witnesses for those of the jury. Rather, the court should grant a new trial on the basis

that the verdict was against the weight of the evidence only where a miscarriage of justice would result if the verdict were to stand. *See Williamson*, 926 F.2d at 1352; *EEOC v. Del. Dep't of Health & Soc. Servs.*, 865 F.2d 1408, 1413 (3d Cir. 1989).

C. Motion for Reconsideration or Amendment of the Judgment

A motion for reconsideration is the "functional equivalent" of a motion to alter or amend judgment under Federal Rule of Civil Procedure 59(e). *See Jones v. Pittsburgh Nat'l Corp.*, 899 F.2d 1350, 1352 (3d Cir. 1990) (citing *Fed. Kemper Ins. Co. v. Rauscher*, 807 F.2d 345, 348 (3d Cir. 1986)). The standard for obtaining relief under Rule 59(e) is difficult to meet. The purpose of a motion for reconsideration is to "correct manifest errors of law or fact or to present newly discovered evidence." *Max's Seafood Cafe ex rel. Lou-Ann, Inc. v. Quinteros*, 176 F.3d 669, 677 (3d Cir. 1999). A court should exercise its discretion to alter or amend its judgment only if the movant demonstrates one of the following: (1) a change in the controlling law; (2) a need to correct a clear error of law or fact or to prevent manifest injustice; or (3) availability of new evidence not available when the judgment was granted. *See id.* A motion for reconsideration is not properly grounded on a request that a court rethink a decision already made and may not be used "as a means to argue new facts or issues that inexcusably were not presented to the court in the matter previously decided." *Brambles USA, Inc. v. Blocker*, 735 F. Supp. 1239, 1240 (D. Del. 1990); *see also Glendon Energy Co. v. Borough of Glendon*, 836 F. Supp. 1109, 1122 (E.D. Pa. 1993).

IV. DISCUSSION

A. Defendants' Renewed JMOL Motion on Non-Infringement

1. Standard

A patent is infringed when a person "without authority makes, uses or sells any patented invention, within the United States . . . during the term of the patent." 35 U.S.C. § 271(a). To prove direct infringement, the patentee must establish, by a preponderance of the evidence, that one or more claims of the patent read on the accused device literally or under the doctrine of equivalents. *See Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 261 F.3d 1329, 1336 (Fed. Cir. 2001). A two-step analysis is employed in making an infringement determination. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995). First, the court must construe the asserted claims to ascertain their meaning and scope. *See id.* Construction of the claims is a question of law subject to de novo review. *See Cybor Corp. v. FAS Techs.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998). The trier of fact must then compare the properly construed claims with the accused infringing product. *See Markman*, 52 F.3d at 976. This second step is a question of fact. *See Bai v. L & L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998).

"Direct infringement requires a party to perform each and every step or element of a claimed method or product." *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1320 (Fed. Cir. 2009) (internal quotation marks omitted). "If any claim limitation is absent from the accused device, there is no literal infringement as a matter of law." *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000). If an accused product does not infringe an independent claim, it also does not infringe any claim depending thereon. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546,

1553 (Fed. Cir. 1989). However, "[o]ne may infringe an independent claim and not infringe a claim dependent on that claim." *Monsanto Co. v. Syngenta Seeds, Inc.*, 503 F.3d 1352, 1359 (Fed. Cir. 2007) (quoting *Wahpeton Canvas*, 870 F.2d at 1552) (internal quotations omitted). The patent owner has the burden of proving infringement and must meet its burden by a preponderance of the evidence. See SmithKline Diagnostics, Inc. v. Helena Lab. Corp., 859 F.2d 878, 889 (Fed. Cir. 1988) (citations omitted).

To establish indirect infringement, a patent owner has available two theories: active inducement of infringement and contributory infringement. See 35 U.S.C. § 271(b) & (c). To establish active inducement of infringement, a patent owner must show that an accused infringer "knew or should have known [their] actions would induce actual infringements." *DSU Med. Corp. v. JMS Co., Ltd.*, 471 F.3d 1293, 1306 (Fed. Cir. 2006). To establish contributory infringement, a patent owner must show that an accused infringer sells "a component of a patented machine ... knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use." *Golden Blount, Inc. v. Robert H. Peterson Co.*, 365 F.3d 1054, 1061 (Fed. Cir. 2004) (quoting 35 U.S.C. § 271(c)). Liability under either theory, however, depends on the patent owner having first shown direct infringement. *Joy Technologies, Inc. v. Flakt, Inc.*, 6 F.3d 770, 774 (Fed. Cir. 1993).

2. Analysis

A motion for JMOL will be granted when "a party has been fully heard on an

issue and there is no legally sufficient evidentiary basis for a reasonable jury to find for that party on that issue." Fed. R. Civ. P. 50(a). Defendants renew their motion for JMOL on the issue of non-infringement[4] (D.I. 473), arguing that the court improperly granted plaintiff's motion for JMOL at trial, as it was clear error of law to: (1) exclude the testimony of defendants' witness, Steven Ryba; (2) prohibit defendants from rebutting plaintiffs' expert, Dr. Turner's testimony; and (3) allow Dr. Turner to testify as to the FDA documents. Defendants also assert that plaintiffs did not introduce any evidence for a reasonable juror to find indirect infringement.

With respect to infringement of claim 4, plaintiffs sought to prove whether defendants' accused products satisfied the additional limitation of claim 4, that the cobalt salt be present in a range from about 20 to about 500 ppm of the composition. ('216 patent, 13:39-41) Plaintiffs' expert testified regarding the range of cobalt salt in the accused products. (D.I. 543 at 441:24-445:13, 447:4-449:3, 449:5-450:12) Defendants moved for JMOL of non-infringement, alleging that plaintiffs had not offered evidence (only conclusory statements) on the amount of salt. (D.I. 543 at 515:24-518:20) The court then heard argument and requested statements from the parties on the admissibility of defendants' anticipated defense and evidence. (D.I. 543 at 518:21-540:21) After reviewing the statements, the court excluded certain testimony and

---

[4]Plaintiffs contend this renewal is procedurally improper as there was no jury verdict. Defendants properly moved for JMOL during the course of the trial. The parties have not provided and the court has not found any clear direction in the case law that defendants are precluded from renewing the motion. *Cf. Stewart v. Walbridge, Aldinger Co.*, 882 F. Supp. 1441, 1443 (D. Del. 1995) (finding "[t]he fact that the jury was unable to reach a unanimous verdict does not in any way affect this Court's duty to rule on the [renewed JMOL]).

evidence. (D.I. 431; D.I. 432; D.I. 544 at 548:7-549:12) Pursuant to the exclusions, defendants' expert testified that he had no opinion as to the amount of cobalt salt in the final accused products. (D.I. 544 at 612:13-16)

At the close of evidence, the court granted plaintiffs' motion for JMOL, finding that defendants indirectly infringed claim 4. The court declines to revisit the evidentiary decisions made during the course of trial as to the evidence allowed or excluded. The court did not arrive at these decisions lightly, indeed, the court entertained both argument and briefing on these issues. The court reached its decision based on the admissible evidence described above. (D.I.545 at 977:8-978:23) Defendants now offer attorney argument to analyze plaintiffs' expert testimony at trial and argue that it does not support the conclusion that the cobalt salt is present in the specified range. However, plaintiffs' expert testified based on defendants' core technical documents, which defendants confirmed were accurate.

Defendants rely on the same arguments described above to move for reconsideration or amendment of the judgment. Defendants request that the court rethink its decisions on the evidentiary issues at trial, precisely the type of request that is not properly the grounds for such a motion. Neither have defendants shown a "manifest injustice." Defendants' renewed motion for JMOL of non-infringement is denied.

B. Defendants' Renewed JMOL Motion on Invalidity

Defendants advance several arguments in support of the renewed motion for JMOL. Defendants assert that "a reasonable jury considering all of the evidence would find by clear and convincing evidence that each of the [a]sserted [c]laims are invalid

under 35 U.S.C. §103 as obvious in view of the cited prior art." Defendants also argue that each of the limitations was present in the prior art and a person of ordinary skill[5] would have been motivated to combine the prior art references. Further, according to defendants, plaintiffs did not "rebut [defendants] strong showing of obviousness," relying on expert testimony that was "conclusory, outside the scope of his expert report, or unsupported by the evidence." Finally, plaintiffs allegedly did not show any secondary considerations of nonobviousness, including a nexus between the claimed features and any unexpected results or commercial success. (D.I. 471 at 6)

Defendants' motion focuses on three combinations: (1) European Patent Application No. 0301719 (DTX 268, "the '719 reference") and Japanese Patent No. 2663578 (DTX 314, "the '578 patent"); (2) International Patent Application No. WO 98/13266 (DTX 109, "the '266 reference") and the '578 patent; and (3) International Application No. WO 91/17925 (DTX 9, the '925 reference") and International Application No. WO 03/080731 (DTX 107, "the '731 reference"). The prior art references were before the U.S. Patent and Trademark Office ("PTO") during prosecution, with the exception of the '925 reference. The full translation of the '578 patent was only provided to the PTO after the notice of allowance was received.

1. Obviousness

a. Standard

---

[5]In the case at bar, the parties agreed that a person of ordinary skill in the art at the relevant time is a person who has obtained at least a Bachelors of Science or Masters of Science degree in a chemistry, polymer science, chemical engineering, material science, or a related field and at least three years of experience or training in researching, studying, designing, or manufacturing polyester resins.

"A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a). Obviousness is a question of law, which depends on underlying factual inquiries.

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)).

"[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 550 U.S. at 418. Likewise, a defendant asserting obviousness in view of a combination of references has the burden to show that a person of ordinary skill in the relevant field had a reason to combine the elements in the manner claimed. *Id.* at 418-19. The Supreme Court has emphasized the need for courts to value "common sense" over "rigid preventative rules" in determining whether a motivation to combine existed. *Id.* at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 420. In addition to showing that a person of

ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, a defendant must also demonstrate that "such a person would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007).

A combination of prior art elements may have been "obvious to try" where there existed "a design need or market pressure to solve a problem and there [were] a finite number of identified, predictable solutions" to it, and the pursuit of the "known options within [a person of ordinary skill in the art's] technical grasp" leads to the anticipated success. *Id.* at 421. In this circumstance, "the fact that a combination was obvious to try might show that it was obvious under § 103." *Id.*

A fact finder is required to consider secondary considerations, or objective indicia of nonobviousness, before reaching an obviousness determination, as a "check against hindsight bias." *See In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1079 (Fed. Cir. 2012). "Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

"Because patents are presumed to be valid, *see* 35 U.S.C. § 282, an alleged infringer seeking to invalidate a patent on obviousness grounds must establish its obviousness by facts supported by clear and convincing evidence." *Kao Corp. v. Unilever U.S., Inc.*, 441 F.3d 963, 968 (Fed. Cir. 2006) (citation omitted). In conjunction

with this burden, the Federal Circuit has explained that,

> [w]hen no prior art other than that which was considered by the PTO examiner is relied on by the attacker, he has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job, which includes one or more examiners who are assumed to have some expertise in interpreting the references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents.

PowerOasis, Inc. v. T-Mobile USA, Inc., 522 F.3d 1299, 1304 (Fed. Cir. 2008) (quoting *Am. Hoist & Derrick Co. v. Sowa & Sons*, 725 F.2d 1350, 1359 (Fed. Cir. 1984)).

b. The combination of the '719 reference and the '578 patent

i. Evidence regarding the prior art combination

At trial, defendants' expert, Dr. Moore, testified that the combination of the '719 reference and the '578 patent disclosed each limitation of the asserted claims.[6] (D.I. 544 at 630:10-643:25) Specifically, the '719 reference describes a composition for containers (*id.* at 635:10-636:3), made using a partially aromatic polamide (MXD6) (*id.* at 636:8-637:1) and a cobalt salt (*id.* at 637:2-16). The '578 patent also describes a composition for containers (*id.* at 639:13-640:2) and provides a copolyester comprising a metal sulfonate salt element (*id.* at 640:3-18) and a partially aromatic polyamide (MXD6) element (*id.* at 640:19-641:2).

---

[6]Plaintiffs assert that Dr. Moore simply did a "word search" to find the information relevant to the elements for the combinations while testifying, however, Dr. Moore testified that although he "was basically doing a word search up here at the time . . . when [he] did this for [his] report, it was a very careful analysis." (D.I. 544 at 744:20-745:11)

As to motivation to combine,[7] Dr. Moore testified that:

> [T]he '719 reference is an active oxygen barrier. The oxygen scavenging process, there's significant teachings in this paper about how that, how that works. The oxygen scavenging effectiveness is found to depend on different types of fillers and additives. The only difference here is that it's not specifically using a, a copolyester including metal sulfonate salt. It's just -- in fact, this is just an active barrier composition. It would be better to have a more particularly, if you're interested in greatly reducing the haze in your -- in your blend of these two polymers, you would want to bring in a compatibilizer.
> And so the prior art reference of Yamamoto in the '578 deals with sulfonated PET for monolayer passive barriers. It doesn't have the cobalt salt as you can see there, so if you want to go into now a compatible active barrier, you would combine those two.

(*Id.* at 633:20-634:12) Dr. Moore also testified that "if someone wanted to create a homogeneous active oxygen barrier that has greatly reduced haze, they would bring in the sulfonated polyester from the '578 [patent] into the . . . active oxygen barrier technology taught by the '719."[8] (*Id.* at 644:5-9)

Plaintiffs' expert, Dr. Turner, testified that the '719 reference discloses the application of an oxygen scavenging system," and describes MXD6 and a cobalt salt. However, the '719 reference does not discuss or teach a compatibilizer, and does not

---

[7]Dr. Moore testified that he was unsure if there had to be a motivation to combine evident to a person of ordinary skill in order for a patent to be obvious. (D.I. 544 at 733:4-18) Plaintiffs' argument that Dr. Moore failed to perform a proper obviousness analysis is overreaching, as Dr. Moore explained his opinion on the motivation to combine to the jury.

[8]To bolster this testimony, defendants cite to the '578 patent, which states "[a]s can be clearly understood from Table 3, when polyester copolymerized with 5-sodium sulfolsophthalic acid is used as the component (C), the transparency is improved and the haze is notably reduced. ('578 patent at MG3928) However, defendants do not point to testimony in the record showing that this statement was presented to the jury.

further suggest the use thereof, as "[i]t proposes a solution without the compatibilizer . . . ." (D.I. 545 at 885:8-886:11) The '719 reference does not teach a copolyester containing a metal sulfonate salt or how to achieve a reduction in haze or yellowness. (*Id.* at 886:16-887:5) The '719 reference contains barrier data, which shows significant barrier improvement, however, Dr. Turner opined that the '719 reference did not "teach[] that this would give . . . the whole set of properties needed to be successful in the . . . packaging industry for oxygen sensitive foods." (*Id.* at 887:25-888:2) The '578 patent does not disclose cobalt salt nor does it suggest the use thereof, as it does not touch on color issues or yellowness. (*Id.* at 888:19-889:17)

Dr. Turner testified that there would be no motivation to combine, because

> the '719 [reference] doesn't teach compatibilizers or copolyesters with metal sulfonate salt. It doesn't teach reduction in haze or yellowness. And neither does the '578 patent teach that. So they really don't teach solutions to the major problems that have to be solved to meet this challenge to make a new container for beer.

(*Id.* at 889:20-890:6) Therefore, Dr. Turner concluded that the combination does not render the claims obvious. (*Id.* at 890:7-10)

ii. Evidence regarding secondary considerations[9]

Plaintiffs also offered evidence of secondary considerations of nonobviousness, including unexpected results, long-felt need, failure of others, and commercial success. Dr. Schiraldi, one of the four named inventors on the '216 patent, testified that bottles with multilayered walls came into the marketplace in the late 1990s, but had a "dull,

---

[9]The evidence of secondary considerations applies to every combination and will not be repeated below.

hazy look[]." (D.I. 542 at 269:3-20, 271:5-272:5) Using his manufacturing experience, Dr. Schiraldi experimented[10] using a combination of PET and SIPE,[11] focusing on improving the barrier properties. (*Id.* at 267:8-19, 282:19-283:3) He found that while nylon and polyester are not miscible, mixing an MDX6 nylon with PET resulted in an opaque material that was yellowish. (*Id.* at 272:8-273:8)

After reviewing the research of a Spanish professor, who described mixing two dissimilar polymers (not the ones used by Dr. Schiraldi) using a compatibilizer, which resulted in a material with good mechanical properties (*id.* at 277:15-22, 277:19-278:4), Dr. Schiraldi added a third material to the PET/MXD6 combination, to promote mixing. After further research, a mixture of PET/SIPE with MXD6 and PET made the resulting material "nice and crystal clear," but still yellow in color. (*Id.* at 281:6- 282:12, 284:10-14, 290:11-291:8; DTX 499 at INVISTA 871607)

Dr. Liu, another inventor on the '216 patent who worked with Dr. Schiraldi, realized the addition of cobalt resulted in a nearly sixty times increase in oxygen permeation. (D.I. 542 at 309:21-310-5, 354:16-355:4, 319:8-320:4; PTX 652) The scientists needed to resolve the clearness issue as the containers were still yellow. (D.I. 542 at 320:20-321:13; PTX 652) Dr. Liu incorporated Dr. Schiraldi's work and created copolymers with a formulation including PET, MXD6 and cobalt salt. (D.I. 542 at 326:17-329:5; PTX-577 at 9) Unexpectedly, the formulation resulted in reduced haze and reduced yellowness. (D.I. 542 at 329:18-331:2, 332:1-339:10, 342:6-15; PTX 313;

---

[10]Dr. Schiraldi also described two university projects funded from 1992 to 2002, which did not yield commercially viable products. (*Id.* at 268:14-269:2, 274:13-24)

[11]Used interchangeably to denote SIPA.

PTX 486A) At trial, Dr. Liu explained the synergistic effect of the cobalt and the SIPA, resulting in the noticeably reduced haze and yellowness. (D.I. 542 at 343:1-14, 346:2-351:1; PTX 749) The research resulted in the '216 patent and a commercial product, PolyShield® blended with MXD6 nylon. (D.I. 542 at 351:2-353:22; D.I. 545 at 924:14-23)

With respect to the '216 patent, Dr. Moore testified[12] that he disagreed with the synergistic effect and asserted that there were "many problems with the way that [the inventors] actually brought samples in to compare and too many unfixed variables." Specifically, run 8 (an experiment using a particular combination of materials) contained sodium acetate and a low molecular weight MXD6, which both contributed to the reduction in yellowness. (D.I. 544 at 685:18-688:9) Dr. Moore tried to replicate the experiments in the patent regarding the b* (a measure of yellowness, the larger the b* the more yellow), to determine the effect of sodium acetate. A bluing effect occurred as the amount of sodium acetate increased. Dr. Moore further testified that to set up the experiment, he had to go back to the inventor's laboratory notebooks and retrieve additional information not available in the patent. (*Id.* at 688:10- 691:1) Dr. Moore concluded that sodium acetate was not a controlled variable and, as a result, the synergistic effect was not proven. Dr. Moore also identified additional uncontrolled variables including the use of low molecular weight polyamide and low molecular weight

---

[12]Dr. Moore's testimony conflated the "unexpected results" of the synergistic effect, an indicia of nonobviousness, and "undue experimentation" as it applies to enablement, which is based on the invention as claimed. The synergistic effect was not claimed. As the review of the evidence focuses on whether the jury's verdict was supported by substantial evidence, the court recites the testimony as it was presented to the jury.

nylon, the use of different starting materials, changes in reaction conditions, the use of other additives, and the source of cobalt. (*Id.* at 691:17-695:25)

On cross-examination, Dr. Moore agreed that "if you change more than one variable or don't control for the others. That is, you don't control for all the variables except the one that you are testing, then you have a flawed test." He also agreed that because sodium acetate is a buffer, changing the amount of sodium acetate, would change how it buffered other components. (*Id.* at 763:20-765:9)

Dr. Turner testified that he was also engaged in research related to solving the yellowness and haziness issue in a PET bottle.[13] He "believes that the data in the patent show a clear synergy of the ingredients, of the color." Dr. Turner testified that Dr. Moore's testing was not controlled as "chang[ing] the level of [sodium acetate] in the . . . recipe, . . . change[s] the composition of those polymers, and so those polyesters from a very low sodium acetate level to a very high sodium acetate level will not be the exact same polymers." (D.I. 545 at 836:19-837:6) He further opined that Dr. Moore was changing the amount of SIPA, which would "lead to some variation in the final structure of the products that are formed." (*Id.* at 920:2-9) He concluded that the claimed invention yielded a strong synergistic effect in reduction of yellowness, which was both surprising and unexpected. (*Id.* at 906:24-907:16) Dr. Turner explained that table 3 of the '216 patent showed the b* of several different material compositions, illustrating the synergistic effect. (*Id.* at 910:9-914:12) He testified that his conclusion was not changed by the addition of sodium acetate, used as a buffer, in some of the

---

[13]Dr. Moore agreed the industry was aiming to "find a high barrier, active passive barrier, that also wasn't hazy and was clear, not yellow." (D.I. 544 at 735:13-21)

runs. (*Id.* at 915:15-916:23) He also disagreed that run 8 used a low molecular weight MXD6, although this could be determined by consulting the inventors' notebooks. However, the molecular weight of MXD6 used would not change his opinion on the existence of a synergistic effect. (*Id.* at 916:20-918:1) Dr. Turner also testified that the data in table 7 supports the synergistic effect. (*Id.* at 918:2-10)

As to commercial success, Dr. Embs, director of new business development for Auriga Polymers,[14] testified that PolyShield customers were most interested in "glass light clarity with an excellent oxygen barrier and a good carbonation retention in a PET container that protects the beer throughout the entire shelf life." Further, PolyShield has advantages over other options in the market which are more expensive to produce. (*Id.* at 816:11-817:7) Mr. Francois, head of Invista's specialty materials business, testified that the sales of PolyShield "through the first quarter of 2013 [were] . . . above $200 million." (D.I. 542 at 242:21-23) After receiving food contact clearance, the first commercial quantity of PolyShield was sold in Europe in January 2005 and in the United States in 2009. (D.I. 545 at 812:24-813:6) Dr. Embs testified that the sales of PolyShield in the US were sample quantities. (*Id.* at 822:2-10) "Polyshield has been most successful" in Eastern Europe, particularly Russia and Romania, due in part to the container size, installation of new filling lines, and in small part to Russia's negative view of glass. (*Id.* at 820:15-821:21) Dr. Embs did not know how many customers add nylon to the purchased PolyShield. (*Id.* at 827:3-15) However, he testified that the global sales of PolyShield from January 2005 to end of 2010 were intended for blending

[14]Invista sold off its North American business, which became Auriga. (D.I. 382 at 2; D.I. 545 at 813:16-21)

with MXD6. (*Id.* at 818:17-20) Mr. Francois testified that PolyShield is one of the most successful products across its six specialty materials businesses. (D.I. 542 at 242:24-243:2) PET bottles have been sold in Europe. (D.I. 545 at 813:4-6) The bottles are "qualified at the brewers," and plaintiffs are "confident" that a beer will be available in a PET container in the next year. (*Id.* at 823:5-825:19)

Defendants' ActiTUF product was sold as an active barrier resin before the introduction of PolyShield. (*Id.* at 801:7-24) However, ActiTUF had problems with clarity and appearance. (*Id.* at 802:15-806:2) Mr. Fenoglio, defendants' global director of manufacturing for its PET business, testified[15] that ActiTUF had poor appearance to certain customers and was in need of improvement. (*Id.* at 805:1-806:2) Further, to compete with Invista's PolyShield, which provided a better appearance, defendants needed to use a product with lithium SIPA. (*Id.* at 807:19-808:21) Mr. Fournier, defendants' global director of sales and marketing, testified that to combat the complaints regarding ActiTUF, including difficulty in processing the resin and clarity of the product, defendants developed the PoliProtect products ("PoliPorotect"). (D.I. 544 at 569:4-16; D.I. 545 at 808:8-22) Mr. Fournier testified that sales of PoliProtect in the United States were over $23 million, with an increasing trend since 2009. (*Id.* at 577:1-18)

ii. Analysis

The jury was asked to consider whether defendants presented clear and convincing evidence of invalidity. Both parties presented to the jury the "problem to be

---

[15]In part using Mr. Bolcheni's (corporate director responsible for the strategic development of barrier market) notes. (D.I. 545 at 803:14-804:17)

solved" as reducing haze and yellowness in the final container. Therefore, a person of ordinary skill would be seeking to improve these two properties of a container material. *KSR*, 550 U.S. at 420. Defendants did not present evidence that the combination was "obvious to try," i.e., that there existed only a finite number of solutions. *Id.* at 421.

As to motivation to combine, the parties' experts gave competing testimony. The jury's job was to decide which testimony was more credible and they were also instructed to take into account secondary considerations. The jury found that the claims of the '216 patent were not obvious in view of the combination presented. Viewing the record in the light most favorable to plaintiffs, the court concludes that the jury credited the testimony of plaintiffs' expert regarding motivation to combine above that of defendants' expert. While defendants seek to minimize any impact of plaintiffs' testimony on secondary considerations, the court concludes that plaintiffs presented evidence of secondary considerations, including unexpected results, long felt need and commercial success. Plaintiffs' PolyShield product is characterized as providing better clarity and less yellowness. These properties are sought by the container industry. Plaintiffs have shown a nexus between the unexpected results and commercial success evidence and the merits of the invention. The jury's verdict is supported by substantial evidence.[16]

c. The combination of the '266 reference and the '578 patent

i. Evidence

---

[16]For each combination, the parties focused their arguments on independent claim 1. The analysis as to motivation to combine and secondary considerations applies to both independent claim 1 and the asserted dependent claims.

Dr. Moore testified that the combination of the '266 reference and the '578 patent discloses each limitation of the asserted claims. (D.I. 544 at 642:5-651:11) Specifically, Dr. Moore testified that the '266 reference discussed "packaging for oxygen sensitive products, such as beer . . . ." (*Id.* at 648:1-13) A partially aromatic polyamide (MXD6) and the cobalt salt elements were also described in the patent. (*Id.* at 648:14-25, 649:1-22) As discussed above, Dr. Moore testified that the '578 patent also covered a composition for containers (*id.* at 639:13-640:2) and provided the copolyester comprising a metal sulfonate salt element (*id.* at 640:3-18) and the partially aromatic polyamide (MXD6) element (*id.* at 640:19-641:2).

In discussing combining the '266 reference with a different patent in order to provide the copolyester,[17] Dr. Moore observed that the '266 reference described

> an active oxygen barrier system that was actually working very well. . . .
> There is a tremendous amount of fundamental information inside of this, this particular reference, too, that talks a lot about blend components and how they must be compatible for improved transparency. It teaches the fundamental science that we polymer scientists use to understand why two different polymers don't mix together, and if you want them to mix together, what do you need to do?
> So it almost was a roadmap saying pointing over to prior art references like '731, to go get those compatibilizers to help, to help bring in MXD6 to be compatible with PET, for example.

(*Id.* at 647:2-17) Dr. Moore further testified:

---

[17]Defendants argue that this discussion also applies to the combination at bar, as the '578 patent also provides the copolyester and Dr. Moore states below "for reasons that I mentioned earlier." While plaintiffs disagree that this section applies to the combination at bar, Dr. Moore did state "prior art references like '731," which arguably could include the '578 patent.

> Well, because for reasons that I mentioned earlier. If you were working on a passive barrier and you wanted an active barrier, you would bring in the cobalt, or if you wanted to have, if you wanted to have, as taught by Schmidt, a very compatible blend component, you would need to bring in a, a sulfonated polyester, for example, that would give a homogeneous micro dispersion to greatly reduce the haze of that system.

(*Id.* at 653:2-9)

Dr. Turner discussed the '266 reference, pointing out that the patent addressed making a plastic beer container, which could be hot filled, withstand some pressure and meet gas permeability requirements for the shelf life of the product. The patent did not discuss haze or yellowness. (D.I. 545 at 855:16-856:5, 856:11-18, 857:10-12) He described the patent as directed towards "a total polyester system" using "an aromatic ester scanning polymer, not a polyamide." Further, the patent did not use a compatibilizer. (*Id.* at 857:25- 859:3) Dr. Turner described the patent as identifying a list of other high barrier polymers, including MXD6, that could be used to make a multilayer bottle. He opined that the patent "points you towards a possible monolayer solution, that's all polyester solution. It certainly doesn't suggest that MXD6 . . . could be put into a monolayer to solve this or to meet this great need that's out there." (*Id.* at 859:9-860:22)

Dr. Turner testified that the '266 reference did not evidence a motivation to combine with a reference teaching "a copolyester comprising a metal sulfonate or containing a metal sulfonate salt." (*Id.* at 861:25-862:2) The '578 patent does not describe or present a motivation to add cobalt salt, nor does it discuss yellowness reduction. Dr. Turner concluded that the combination does not "teach someone skilled

in the art to put the ingredients together that are in the '216 patent that leads to the invention and the discovery that led to solving the huge challenge of making a suitable composition for packaging beer and fruit juice." (*Id.* at 903:21-904:5)

ii. Analysis

Defendants argue that where the technologies from the two prior art references are so interrelated, active barrier solutions and passive barrier solutions, there must be a motivation to combine. *Belden Techs. Inc. v. Superior Essex Commnc'ns LP*, 802 F. Supp. 2d 555, 572 (D. Del. 2011). The parties' experts again discussed the prior art and testified in opposing fashion, with defendants' expert concluding that there was a motivation to combine and plaintiffs' expert concluding that there was not. The jury is the finder of fact and is tasked with weighing the evidence and credibility. The jury found that the asserted claims of the '216 patent were not obvious in view of this combination, a finding that is supported by substantial evidence, including Dr. Turner's expert testimony and the evidence of secondary considerations.

d. The combination of the '925 and the '731 references

i. Evidence

Dr. Moore testified that the combination of the '925 reference and the '731 reference disclosed each limitation of the asserted claims. (D.I. 544 at 626:10-628:6) Specifically, the '925 reference describes a composition for containers and a partally aromatic polyamide, as well as a cobalt salt. (*Id.* at 624:12-22) Table 1 of the '925 reference lists container compositions containing MDX6. (*Id.* at 626:10-14) The '731 reference also describes a composition for containers, with a copolyester, including a

metal sulfonate salt. It also describes a partially aromatic polyamide, however, this is a passive barrier and the '731 reference does not disclose using a cobalt catalyst. (*Id.* at 621:5-9, 628:8-18)

Dr. Moore testified that, although the '925 reference was missing a "metal sulfonate salt . . . [, a person of ordinary skill] would understand that compatibilization is a good thing and it's best to have, as taught in this patent, a container that consists of one layer that's homogeneous." (D.I. 544 at 619:6-18) Dr. Moore testified that a person of ordinary skill wanting "to make an active barrier that was homogeneous, . . . would look at the current literature at the time and find compatibilizers that were effective and . . . may bring over a copolyester, including a metal sulfonate salt." (*Id.* at 621:16-22) Dr. Moore summarized:

> So that's just what a person of ordinary skill in the art would be thinking, I guess, at having these two prior art references and what would cause one person to say, let's substitute in sulfonated PET because it's compatible with the MXD6 and greatly reduces the haze.
> It also has teachings from another preferred compatibilizer Surlyn, so they'd be looking at the '925 reference and say, well, they were talking about Surlyn, so I can bring those -- it's interchangeable. They're functional equivalents. '731 reference deals with a yellow color from processing can be masked with a blue dye. Cobalt is blue, brings that blue in. That's how the combinations are brought in my motivation.

(*Id.* at 623:8-21)

Dr. Turner testified that the '925 reference taught a complicated system to form a uniform polyamide product using an activated polyamide reacting with a nucleophilic reagent. (D.I. 545 at 891:2-18) "The active barrier is not described in the simple forms of just MXD6 and, and the cobalt salt." (*Id.* at 891:19-25) The '925 reference also did

not teach reducing yellowness or haze, or a copolyester containing a metal sulfonate salt. (*Id.* at 892:13-24) Further, Dr. Turner testified that the '925 reference suggests using "a compatibilizer like Surlyn type, a polyethylene methacrylic acid, . . . not a metal sulfonate salt copolyester." (*Id.* at 893:12-17) Surlyn would not work for a polyester and partially aromatic polyamide blend.[18] (*Id.* at 893:23-894:2) On cross-examination, Dr. Moore agreed that Surlyn was not a copolyester containing a metal sulfonate salt. (D.I. 544 at 738:8-22) Dr. Turner described the '731 reference as listing "an infinite number" of individual compatibilizers and did not disclose cobalt salt. (D.I. 545 at 878:11-879:3) While the '731 reference discloses some haze data, it does not discuss yellowness date. (*Id.* at 880:18-21)

Dr. Turner opined that the '731 reference would not have motivated a person of ordinary skill to select and use a particular polyester ionomer, listed in a huge laundry list of possible compatibilizers. (*Id.* at 880:6-14) Further, a person of ordinary skill would have no motivation to combine the two references as

> the '925 has no MXD6 and cobalt salt. There's no teaching to reduce the yellowness, no copolyester with a metal sulfonate salt, and no motivation to use that.
> And '731 has this long laundry list, infinite number of compatibilizers. Just, you know, that's -- we do not know which ones of those to choose. There's no cobalt salt. So there would be no expectation that you have success in doing this. There's no yellowness taught. There's no reduction in yellowness.

(*Id.* at 904:15-905:11) "[T]he inventors would not look to these two patents and see the

---

[18]Dr. Turner also pointed out that Dr. Moore's paper (DTX 433) disclosed using an aqueous polyester, not a sulfonated PET proven to be compatible with polyamides. (D.I. 545 at 894:23-895:15)

necessary things that would lead to solving this huge challenge in the bottle area." (*Id.* at 905:4-11) On cross-examination, Dr. Turner did agree that the '731 reference disclosed several preferred compatibilizers, including a copolyester containing metal sulfonate salt and Surlyn polymer. (*Id.* at 946:19-948-16) Dr. Turner further stated that the option of using "one of those preferred compatibilizers with the copolyester containing metal sulfonate salt that's disclosed expressly" couldn't be ruled out. (*Id.* at 950:23-951:12)

ii. Analysis

Defendants argue that Dr. Turner's admission on cross-examination that the option of using the preferred compatibilizer (a copolyester containing metal sulfonate salt) in the '731 reference with a copolyester constitutes clear and convincing evidence of obviousness. Dr. Moore characterized the '731 reference as describing a passive barrier and concluded that a person of ordinary skill would look at the '925 reference, which uses a Surlyn type compatibilizer, and substitute in the copolyester containing metal sulfonate salt from the '731 reference as they are "interchangeable." However, he agreed that Surlyn was not a copolyester containing a metal sulfonate salt, and Dr. Turner explained that Surlyn would not work for a polyester and partially aromatic polyamide blend. Dr. Turner described the references and their teachings, concluding that there would be no motivation to combine. The jury had the opportunity to hear from both experts. Some of Dr. Moore's opinions regarding the motivation to combine were conclusory and the jury found that the asserted claims were not rendered obvious by the combination. While defendants may disagree with the jury's decision, the record

at bar does provide substantial evidence to support such a verdict.

2. Written description and enablement

a. Standard

The statutory basis for the enablement and written description requirements, § 112 ¶1, provides in relevant part:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same . . . .

"The enablement requirement is met where one skilled in the art, having read the specification, could practice the invention without 'undue experimentation.'" *Streck, Inc. v. Research & Diagnostic Systems, Inc.*, 665 F.3d 1269, 1288 (Fed. Cir. 2012) (citation omitted). "While every aspect of a generic claim certainly need not have been carried out by the inventor, or exemplified in the specification, reasonable detail must be provided in order to enable members of the public to understand and carry out the invention." *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997). The specification need not teach what is well known in the art. *Id.* (citing *Hybritech v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384 (Fed. Cir. 1986)). A reasonable amount of experimentation may be required, so long as such experimentation is not "undue." *ALZA Corp. v. Andrx Pharmaceuticals, Inc.*, 603 F.3d 935, 940 (Fed. Cir. 2010).

"Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual

considerations." *Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1378 (Fed. Cir. 2009) (citing *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). The Federal Circuit has provided several factors that may be utilized in determining whether a disclosure would require undue experimentation: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance disclosed in the patent; (3) the presence or absence of working examples in the patent; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability of the art; and (8) the breadth of the claims. *In re Wands*, 858 F.2d at 737. These factors are sometimes referred to as the "Wands factors." The fact finder need not consider every one of the Wands factors in its analysis, rather, a fact finder is only required to consider those factors relevant to the facts of the case. *See Streck, Inc.*, 655 F.3d at 1288 (citing *Amgen, Inc. v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200, 1213 (Fed. Cir. 1991)).

The enablement requirement is a question of law based on underlying factual inquiries. *See Green Edge Enterprises, LLC v. Rubber Mulch Etc., LLC*, 620 F.3d 1287, 1298-99 (Fed. Cir. 2010) (citation omitted); *Wands*, 858 F.2d at 737. Enablement is determined as of the filing date of the patent application. *In re '318 Patent Infringement Litigation*, 583 F.3d 1317, 1323 (Fed. Cir. 2009) (citation omitted). The burden is on one challenging validity to show, by clear and convincing evidence, that the specification is not enabling. *See Streck, Inc.*, 665 F.3d at 1288 (citation omitted).

A patent must also contain a written description of the invention. 35 U.S.C. §

112, ¶ 1. The written description requirement is separate and distinct from the enablement requirement. *See Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2011). It ensures that "the patentee had possession of the claimed invention at the time of the application, i.e., that the patentee invented what is claimed." *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1344-45 (Fed. Cir. 2005). The Federal Circuit has stated that the relevant inquiry – "possession as shown in the disclosure" – is an "objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed." *Ariad*, 598 F.3d at 1351.

This inquiry is a question of fact; "the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology." *Id.* (citation omitted). In this regard, defendants must provide clear and convincing evidence that persons skilled in the art would not recognize in the disclosure a description of the claimed invention. *See PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306-17 (Fed. Cir. 2008) (citation omitted).

b. Evidence

Dr. Moore opined on the lack of written description and enablement.[19] After explaining his difficulty in duplicating the synergistic effect testing described in table 3,

[19]This testimony is set out in more detail above in part IV.B.b.ii, evidence regarding secondary considerations.

Dr. Moore concluded that "it certainly gave [him] a very strong opinion that [the '216] patent is not enabled." (D.I. 544 at 686:6-695:25) Dr. Moore clarified that his opinion on lack of enablement was not based on the lack of disclosure of sodium acetate. (*Id.* at 715:8-10) Dr. Moore also concluded that "[t]here was not enough detail in the written description to allow a person of ordinary skill in the art the opportunity to reproduce and practice that art." (*Id.* at 683:22-684:1)

Dr. Turner disagreed with Dr. Moore's opinion regarding the data in table 3 and the experimentation regarding the synergistic effect.[20] As to the lack of written description and enablement, he testified that the patent was enabled and a person of ordinary skill would be able to "make and use a composition for containers containing a partially aromatic polyamide, a cobalt salt, and a copolyester containing a metal sulfonate salt," in a reasonable time without undue experimentation. (D.I. 545 at 928:7-929:16) "[A]ll the elements that are necessary. . . to get to this . . . composition are defined in the specification." (*Id.* at 929:17-25) In reaching his opinion, Dr. Turner considered what was involved in making the claimed compositions and the fact that polymer chemistry is not unpredictable and the reactions are reproducible. Further, "[t]he specifications that are written describe the catalyst systems, describe ratios of sulfonated monomer to include, and give the characteristics of the polymer, or the polymer -- the polymers are made. They're solid stated to high molecular weight, so model polymers." (*Id.* at 935:9-937:19)

Dr. Turner also testified that there was sufficient written description as the patent

---

[20]Set out in more detail above in part IV.B.b.ii, evidence regarding secondary considerations.

"describes a copolyester containing a metal sulfonate salt. It describes MXD6 as being added to that, partially aromatic polyamide, and it describes the cobalt salt that's added to the, to the, to this composition." Dr. Turner considered Dr. Moore's testimony regarding uncontrolled variables, however, this did not alter his opinion regarding enablement and written description. (*Id.* at 930:1-11, 937:23-938:17) Dr. Turner did not try to make the composition in his lab, but avers his students could do so. (*Id.* at 968:15-969:5)

c. Analysis

Dr. Moore's opinion that the patent was not enabled and lacked written description conflicts with his opinion regarding obviousness, that "[t]hese sulfonated polyesters were used . . . all over the place," his graduate students could have figured out the invention of the '216 patent, and "[i]t could be a number of other companies . . . shied away from it because it was obvious." (D.I. 544 at 762:14-24; 737:7-9) Defendants' enablement arguments focused on Dr. Moore's difficulty in duplicating the synergistic effect data.[21] Dr. Turner explained why, in his opinion, the asserted claims were enabled, i.e., the claimed compositions could be made. The jury concluded that the asserted claims were not invalid for lack of written description or enablement. This verdict is supported by substantial evidence. For these reasons, defendants' renewed motion for JMOL is denied.

---

[21]At trial, outside the presence of the jury, the court questioned whether the difficulty in duplicating the synergistic effect data was actually an enablement defense as opposed to an obviousness defense, as no synergistic effect was claimed. (D.I. 544 at 707:2-16; *see also* D.I. 382 at 39-42 (pointing out that the synergistic effect was not claimed and enablement focuses on the invention as claimed)

In the alternative, defendants requested a new trial should the court deny the motions for JMOL on non-infringement and invalidity. Defendants' request is premised on the same arguments as its renewed motion for JMOL. For the same reasons discussed above, the jury's verdict is not against the clear weight of the evidence, therefore, the court denies defendants' request for a new trial.

V. PLAINTIFFS' MOTION FOR A PERMANENT INJUNCTION

Plaintiffs move for a permanent injunction (D.I. 467) requesting that the court "enjoin [defendants] from manufacturing, using, offering for sale, selling and/or importing . . . PoliProtect APB and PoliProtect JB products until the expiration of" the '216 patent. (*Id.* at 1) Defendants disagree. Although plaintiffs' complaints listed permanent injunctive relief among the sought remedies, plaintiffs have not previously requested an injunction and waited "nearly two years since first accusing [defendants] of infringement" to present the request. (D.I. 481 at 2-3, 13)

A. Standard of Review

In *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006) (vacating and remanding *MercExchange, L.L.C. v. eBay Inc.*, 401 F.3d 1323, 1339 (Fed. Cir. 2005)) (hereinafter " *eBay* "), the Supreme Court overruled the Federal Circuit's longstanding "general rule that courts will issue permanent injunctions against patent infringement absent exceptional circumstances." Permanent injunctions in patent cases must be based on a case-by-case assessment of the traditional equitable factors governing injunctions. *Id.* at 1839. That is, to be awarded a permanent injunction, a plaintiff must demonstrate: "(1) that it has suffered an irreparable injury; (2) that remedies available at

law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction." *Id.* "[T]he decision whether to grant or deny injunctive relief rests within the equitable discretion of the district courts, and that discretion must be exercised consistent with traditional principles of equity, in patent disputes no less than in other cases governed by such standards." *Id.* at 1841.

The eBay Court specifically cautioned against the application of categorical rules, classifications and assumptions in these analyses. *Id.* at 1840. Nevertheless, courts, presumably struggling to balance the absence of a presumption of irreparable harm with a patentee's right to exclude, have frequently focused upon the nature of the competition between plaintiff and defendant in the relevant market in the context of evaluating irreparable harm and the adequacy of money damages. *See TruePosition Inc. v. Andrew Corp.*, 568 F. Supp. 2d 500, 531 (D. Del. 2008).

Courts awarding permanent injunctions typically do so under circumstances in which the plaintiff practices its invention and is a direct market competitor.[22] Plaintiffs

---

[22]*See, e.g., Muniauction, Inc. v. Thomson Corp.*, 502 F. Supp. 2d 477, 482 (W.D. Pa. 2007) ("Plaintiff and defendants are direct competitors in a two-supplier market. If plaintiff cannot prevent its only competitor's continued infringement of its patent, the patent is of little value.") (granting permanent injunction); *Johns Hopkins Univ. v. Datascope Corp.*, 513 F. Supp. 2d 578, 586 (D. Md. 2007) (granting permanent injunction where infringing product was plaintiffs' "only competition" and "thus, its sale reduce[d] the [p]laintiffs' market share"); *Transocean Offshore Deepwater Drilling, Inc. v. GlobalSantaFe Corp.*, Civ. No. 03–2910, 2006 WL 3813778, *4 (S.D. Tex. Dec. 27, 2006) (granting permanent injunction requiring structural modifications to infringing deepwater drilling rigs where "the customer base for deep water drill rigs is small, and [defendant] has not only used [its] rigs equipped with the infringing structure to compete for the same customers and contracts as [plaintiff], but also to win contracts over

also frequently succeed when their patented technology is at the core of their business, and/or where the market for the patented technology is volatile or still developing.[23]

B. Analysis

1. Irreparable harm

Plaintiffs[24] and defendants are direct competitors, offering the only "high barrier" monolayer polyester barrier resins available in the market, PoliProtect and PolyShield.[25]

---

competing bids from [plaintiff]").

[23]*See Martek Biosciences Corp. v. Nutrinova Inc.*, 520 F. Supp. 2d 537, 558–59 (D. Del. 2007) (granting permanent injunction where plaintiff was a direct competitor "likely to lose market share that it may not be able to recapture," as plaintiff's patented technology was its primary revenue source, and defendant was plaintiff's only competitor and was "targeting [plaintiffs] customers in that industry"); *TiVo, Inc. v. EchoStar*, 446 F. Supp. 2d 664 (E.D. Tex. 2006) (granting permanent injunction where: (1) parties were direct competitors; (2) "plaintiff [was] losing market share at a critical time in the market's development;" (3) the parties agreed that customers in the relevant market tend to remain customers of the company they first purchased from; and (4) as a "relatively new company with only one primary product," plaintiff's "primary focus is on growing a customer base specifically around the product" competing with the infringing product).

[24]Auriga is the exclusive licensee of the '216 patent, and the only company with rights to practice the '216 patent in the United States. Invista is the only company authorized to sell the PolyShield resin in Europe and the rest of the world. (D.I. 468 at 2-3)

[25]Plaintiffs introduce arguments (and sales figures) related to its Oxyclear barrier PET product. Plaintiffs argue that *Broadcom Corp. v. Qualcomm, Inc.*, 543 F.3d 683 (Fed. Cir. 2008), permits them to present this evidence of irreparable harm, as "Broadcom provided evidence of irreparable harm, despite the fact that it does not currently practice the claimed inventions." *Id.* at 703. However, the Federal Circuit noted that the accused products "implement[ed] Broadcom's patented features." *Id.* By plaintiffs' admission, this product is not a commercial embodiment of the '216 patent, therefore, the court does not address plaintiffs' arguments related to Oxyclear. (D.I. 468 at 3-4; D.I. 481 at 12; D.I. 489 at 8)

The parties dispute what the relevant market is.[26] For the purposes of this analysis, the court considers the relevant market as the barrier polyester market, which includes monolayer, multilayer and coated containers. This market is a subset of the container market, which includes glass and metal containers. While the parties currently have the only monolayer products, each competes against other manufacturers of multilayer and coated products. The parties do not dispute that the monolayer products offer distinct advantages for the container industry.

Relying on *Apple, Inc. v. Samsung Electronics Co.*, 678 F.3d 1314 (Fed. Cir. 2012), defendants argue that the bi-component pellet feature of its PoliProtect products drives customer demand, as it makes the products more cost-effective for customers. *Id.* at 1325 (finding an insufficient nexus between competitor's design patent covering smartphone screen design and smartphone purchases to grant a preliminary injunction). However, the monolayer product sales are also driven by customers' need for high barrier properties, low yellowness and haze, which properties result from the claimed composition. Therefore, plaintiffs have evidenced a sufficient nexus between the alleged harm and infringement.

As a direct competitor, plaintiffs aver that they "will suffer irreparable injuries including lost sales and market share, the loss of research and development activities, a loss of goodwill in the market, and a forced loss of their patent exclusivity." (D.I. 468

---

[26]Plaintiffs define the market as limited to monolayer PET containers or the barrier polyester market, which includes monolayer, multilayer and coated containers. (D.I. 468 at 3-4; D.I. 481 at 2) Defendants define it as including "businesses that sell glass containers, metal containers, coated containers, and multi-layer PET containers," as these businesses compete for the same customers. (D.I. 481 at 10-11)

at 5-6) Plaintiffs allege that the customer base for barrier polyester products in the United States is small, and the parties are competing for the developing beer market. Further, the major beer brewers in the United States "are beginning to transition to polyester beer bottles for the first time," and this market is poised for significant growth. (*Id.* at 9-10) Moreover, plaintiffs "cannot presently be price-competitive" with ddefendants, because plaintiffs must pay royalties on PolyShield resin sold, under a license to certain of defendants' patents. (D.I. 468 at 10-11) Customers could not readily switch to PolyShield at a later time, as customers would have to qualify[27] the resin for their products and purchase additional equipment. Plaintiffs apply the same arguments to the exportation of PoliProtect products manufactured in the United States and destined for export.[28, 29] (*Id.* at 11-12)

While plaintiffs identify several examples of direct competition with defendants, including beer packaging in the U.S. and Europe (D.I. 489 at 2), both parties have presented evidence that customers must qualify the monolayer products and purchase

---

[27]Such qualification is costly and takes about a year.

[28]The court does not address plaintiffs' arguments regarding its European litigation or that its "European business would be significantly and irreparably harmed if [defendants] were permitted an end-run around an injunction in Italy by exporting the PoliProtect products from the United States." (D.I. 468 at 12) Therefore, the court does not take judicial notice of the Milan Court's opinion as requested by defendants. (D.I. 525)

[29]Defendants argue that they were not put on notice that plaintiffs intended to plead a count of § 271(f) with respect to the '216 patent, and, therefore, should not be able to enjoin the exportation of PoliProtect. (D.I. 481 at 13-14) However, plaintiffs' amended complaint specifically requests a permanent injunction against, inter alia, "exporting out of the United States any products that infringe any claims of the patents-in-suit, including the PoliProtect APB and PoliProtect JB resins and food packaging articles. . . ." (D.I. 7 at 9)

specialized equipment in order to switch to using monolayer containers. (D.I. 468 at 10-11) Moreover, defendants argue that plaintiffs' current minimal United States sales are not due to the competition from PoliProtect, rather to other factors, such as plaintiffs' "refin[ing] the recipe for PolyShield ever since 2003 . . . and that [p]laintiffs have been unable to figure out how to make the base PolyShield resin in commercial volumes in the U.S. . . . , thus requiring them to purchase it from Invista in Europe and incur additional costs." (D.I. 481 at 9)

Plaintiffs also allege collateral harm resulting from defendants' infringing sales due to losses in its research and development program, inability to recoup its investment in its South Carolina manufacturing plant and loss of goodwill among its customers. (D.I. 468 at 12-13) A plaintiff's willingness to forego its patent rights for compensation, though certainly not dispositive, is one factor to consider with respect to whether plaintiff will suffer irreparable harm. *eBay*, 547 U.S. at 392-93 (rejecting categorical rule that patentee licensors can not demonstrate irreparable harm). Here, the parties dispute whether plaintiffs offered to license defendants to practice the '216 patent, with plaintiffs stating that the evidence reflects preliminary discussions in 2006 regarding two European patent applications. (D.I. 481 at 14-15; D.I. 489 at 8)

The parties' ongoing battle in the press regarding this action and another lawsuit is confusion of their own making. (D.I. 489 at 5-6; D.I. 502) The parties' arguments that each has made misstatements in the press and plaintiffs' subsequent claim that the press exchange damaged their goodwill does not ring true in this litigious era, and certainly cannot be the basis for a permanent injunction.

With only two manufacturers of monolayer products in the market, the court

concludes that "a sale to defendant is the loss of a sale to plaintiff." *TruePosition*, 568 F. Supp. 2d at 531. On the record at bar, irreparable harm has been established.

2. Remedies at law

Plaintiffs contend that legal remedies are not adequate compensation due to the irreparable injuries described above, "including lost sales and market share, lost market opportunities, loss of research and development activities, a loss of goodwill and reputation in the market, and a forced loss of their patent exclusivity," as each of these harms would be difficult to accurately quantify. (D.I. 468 at 15-16) Defendants disagree and aver that a loss of market share is measurable. (D.I. 481 at 9-10)

In March of 2011, plaintiffs sold the North American assets of Invista's Polymers and Resins business, which included "the exclusive right to manufacture, use, offer for sale, and sell PolyShield® resin and Oxyclear® barrier PET in the United States and the Americas, and the exclusive right to practice the '216 patent in those territories." This evidences that monetary damages may be measurable. However, in a head-to-head competition for any market share, plaintiffs are at a disadvantage. *Martek Biosciences Corp. v. Nutrinova Inc.*, 520 F. Supp. 2d 537, 558-59 (D. Del. 2007), rev'd on other grounds, 579 F.3d 1363 (Fed. Cir. 2009) (granting permanent injunction where plaintiff and defendant were direct competitors, supply agreements in the food and beverage industry are long-term, and plaintiff was "likely to lose market share that it may not be able to recapture"). The court concludes that this factor favors an injunction.

3. Balance of hardships

Plaintiffs argue that without an injunction, defendants will become plaintiffs' compulsory licensee. In light of defendants' infringement and the irreparable harm described above, plaintiffs argue that the balance of hardships weighs in their favor. (D.I. 468 at 15-16) Defendants respond that their business will be greatly harmed by an injunction, as it was found to not directly infringe. Therefore, defendants argue that they have a right to continue to manufacture their products. (D.I. 481 at 17) Defendants were found to indirectly infringe all of the asserted claims, as their customers mix the PoliProtect products, and thereby necessarily practice the '216 patent. The court concludes that the balance of hardships favors plaintiffs.

4. Public interest

As the asserted claims have been found valid and infringed, plaintiffs argue that the public interest in upholding plaintiffs' patent rights is significant and well recognized. (D.I. 468 at 17) Defendants argue the public interest will be hurt by the removal of an innovative competitive product, referencing their bi-component pellet. Customers will suffer the costs associated with qualifying a new product and the downtime associated with such qualification. (D.I. 481 at 17-18) Taking all factors into account, the court concludes that this factor is neutral.[30]

For the aforementioned reasons, plaintiffs have demonstrated irreparable injury, as well as the inadequacy of money damages. Further, the hardship to plaintiffs outweighs that of defendants. Plaintiffs' motion for a permanent injunction is granted.

---

[30]The court does not address defendants' argument related to unclean hands, as its motion for leave to file amended pleadings, on which the argument is based, is denied below. (D.I. 481 at 18-19)

VI. OTHER MOTIONS

A. Motion to Amend the Pleadings

The Federal Rules of Civil Procedure require courts to freely give leave to amend "when justice so requires." Fed. R. Civ. P. 15(a)(2). The court may exercise its discretion to deny leave to amend in situations in which the moving party has delayed seeking leave and the delay "is undue, motivated by bad faith, or prejudicial to the opposing party." *Bjorgung v. Whitetail Resort, LP*, 550 F.3d 263, 266 (3d Cir. 2008) (citation omitted). After a pleading deadline has passed, courts have required the movant to also satisfy the more rigorous "good cause" standard of Federal Rule of Civil Procedure 16(b)(4).[31] *See, e.g.*, *ICU Med. Inc. v. RyMed Techs., Inc.*, 674 F. Supp. 2d 574, 577-78 (D. Del. 2009); *Cordance Corp. v. Amazon.com, Inc.*, 255 F.R.D. 366, 371 (D. Del. 2009).

Defendants filed a second motion to amend the pleadings on June 19, 2013, less than one month before trial. (D.I. 365) As the motion was filed so close to trial, the parties agreed to suspend briefing until after trial. Defendants seek to add claims and defenses asserting that the three patents-in-suit are unenforceable based on inequitable conduct. Defendants' first motion to amend the pleadings, filed August 6, 2012 (the last day to amend the pleadings) accused patent attorney Craig Sterner of perpetrating a fraud on the patent office. (D.I. 91) The court adopted Magistrate Judge Burke's Report & Recommendation denying amendment for failure to state a claim for inequitable conduct. (D.I. 339; D.I. 350)

---

[31]Rule 16(b)(4) provides that a scheduling order "may be modified only for good cause and with the judge's consent."

In this motion, defendants accuse a different person, Dr. Scantlebury, Invista's Patent Liaison for the asserted patents, of inequitable conduct. Plaintiffs' production was substantially complete in May 2012 with Invista producing documents as late as September 28, 2012 and Auriga as late as October 11, 2012. (D.I. 366 at 2; D.I. 367 at ¶ 3; D.I. 449 at 1) Defendants deposed Dr. Scantlebury in August 2012 and all of the inventors were deposed by October 2012. "'Good cause' exists when the [s]chedule cannot reasonably be met despite the diligence of the party seeking the extension." *ICU Med.*, 674 F. Supp. 2d at 577. Defendants argue that the motion was timely because of the volume of plaintiffs' production and the "complex factual allegations" involved in determining the inequitable conduct. Further, defendants aver that they worked diligently between the time of the issuance of the report and recommendation denying the first motion to amend on April 30, 2013 and the date of filing of this motion, June 19, 2013.

The court finds that defendants have not met the good cause requirement, as defendants have not offered sufficient explanation for their undue delay, filing their second round of inequitable conduct challenges a year after both the amendment deadline and Dr. Schantlebury's deposition. Moreover, defendants' allegations in its second motion were not vetted through the discovery process; therefore, allowing defendants to proceed would prejudice plaintiffs by requiring discovery, preparations, and additional costs. Defendants' motion to amend the pleadings is denied.

B. Motion for Reargument

Defendants request reconsideration of the court's oral order of July 16, 2013 overruling Magistrate Judge Burke's memorandum order which had granted

defendants' motion to compel certain Auriga produced documents. This motion was filed on July 30, 2013, a week after the jury trial. While defendants argue that the court "made an error not of reasoning but of apprehension," the court disagrees. Defendants have failed to demonstrate any of the appropriate grounds to warrant reconsideration. As such, the motion is denied.

C. Motions for Attorney fees

As the parties stipulated to stay briefing on the motions for attorney fees (D.I. 451; D.I. 452; D.I. 455) until such time as all of the issues were resolved (D.I. 476, so ordered), the court denies these motions without prejudice to renew at a later time.

VII. CONCLUSION

For the aforementioned reasons, defendants' renewed motions for JMOL on invalidity and non-infringement (D.I. 470; D.I. 473) are denied. Plaintiffs' motion for an injunction (D.I. 467) is granted. Defendants' motions for leave to file amended pleadings (D.I. 365) and reargument of the court's July 16, 2013 oral order (D.I. 444) are denied. The parties motions for attorney fees (D.I. 451; D.I. 452; D.I. 455) are denied without prejudice to renew. An appropriate order shall issue.

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

INVISTA NORTH AMERICA S.À.R.L. and AURIGA POLYMERS INC.,	)	
Plaintiffs,	)	
v.	)	Civ. No. 11-1007-SLR-CJB
M&G USA CORPORATION and M&G POLYMERS USA, LLC,	)	
Defendants.	)	

ORDER

At Wilmington this 31st day of March, 2014, consistent with the memorandum opinion issued this same date;

IT IS ORDERED that:

1. Defendants' renewed motion for JMOL on invalidity (D.I. 470) is denied.

2. Defendants' renewed motion for JMOL on non-infringement (D.I. 473) is denied.

3. Plaintiffs' motion for an injunction (D.I. 467) is granted.

4. Defendants' motion for leave to file amended pleadings (D.I. 365) is denied.

5. Defendants' motion for reargument of the court's July 16, 2013 oral order (D.I. 444) is denied.

6. Invista's motion for attorney fees (D.I. 451) is denied without prejudice to renew.

7. Auriga's motion for attorney fees (D.I. 452) is denied without prejudice to renew.

8. Defendants' motion for attorney fees (D.I. 455) is denied without prejudice to renew.

United States District Judge