

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA

PRECISION FABRICS GROUP, INC.,)	
)	
Plaintiff,)	
)	
v.)	7:17-cv-3037
)	
TIETEX INTERNATIONAL, LTD.,)	
)	
Defendant.)	
)	
)	
PRECISION FABRICS GROUP, INC.,)	
)	
Plaintiff,)	
)	
v.)	7:17-cv-3038
)	
TIETEX INTERNATIONAL, LTD.,)	
)	
Defendant.)	

MEMORANDUM ORDER

THOMAS D. SCHROEDER, District Judge.

These patent infringement actions are before the court on several pretrial motions filed by the parties. Precision Fabrics Group, Inc. ("PFG") alleges that Tietex International, Ltd. ("Tietex") infringed its U.S. Patents Nos. 8,796,162 ('162 Patent) and 8,501,639 ('639 Patent) for flame-retardant technology for fabrics.¹ The background has been set forth in multiple prior

¹ PFG's initial complaint claimed infringement of the '639 patent, and its later complaint claims infringement of the '162 patent, which is allegedly a continuation of the '639 patent. With respect to all pending

opinions and will not be repeated here. (Docs. 57 (claim construction) and 152 (summary judgment)).

The court has considered the briefing and attachments for all pending motions, which are extensive. An all-day hearing on the motions was held on February 23, 2018. To the extent the parties at the hearing raised specific evidentiary objections not addressed herein, the court relies on its rulings and reasons articulated during the hearing. The purpose of this memorandum is to resolve the bulk of the remaining objections, articulate the court's reasoning, and provide the parties sufficient information to resolve their disputes as to the crafting of proposed jury instructions. Any motion in limine not specifically addressed below will be addressed shortly by separate order.

A. Tietex Motion in Limine No. 1 (Exclude Opinion of Dr. Bhat) (Doc. 205)

The central dispute in this case relates to claims in PFG's patents that require the use of an "intumescent." The court has construed the term "intumescent" as describing "a substance that swells and chars upon exposure to heat or flame." (Doc. 57 at 20-21.) The parties have stipulated that Tietex's accused coating, SV-X41, chars under exposure. Thus, the disputed issue for trial as to this claim is whether it "swells" when so exposed.

motions, the docket filings are substantively identical in each case. All docket references are to case 1:17cv3037 unless otherwise noted.

Tietex moves to exclude the opinions of PFG's retained expert witness, Gajanan S. Bhat, Ph.D., on several grounds under Federal Rule of Evidence 702 and Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993). In short, Dr. Bhat opines that SV-X41 swells when exposed to heat or flame and does so in several applications, whether equal to or in excess of that claimed to be used by Tietex in its products. Tietex contends that Dr. Bhat is not an expert in chemistry and has "extremely limited experience with intumescent coatings," which renders his testing unreliable because he used a flawed methodology in testing to determine whether the SV-X41 coating of Tietex swells upon exposure to heat or flame. (Doc. 206 at 2.) Tietex faults Dr. Bhat for conducting his testing on what its expert, Dr. Richard Horrocks, contends is an excessive amount of SV-X41 and for using a substrate (namely, aluminum) that Dr. Horrocks contends is not inert but rather interacts with the coating to cause swelling. PFG responds that Dr. Bhat is well-qualified to measure the SV-X41 coating upon exposure to heat or flame, that the court has already addressed challenges to the amount of SV-X41 tested by permitting Dr. Bhat to conduct additional testing of lesser amounts of the coating, and that Tietex's challenge to the use of aluminum is tardy (not having been raised as to Dr. Bhat's earlier testing with aluminum, about which he was deposed without criticism) and insufficient to render the results unreliable.

The court has devoted significant time and resources issues arising out of the parties' fight over testing in this case. The court has previously found that when Tietex appeared to concede in the course of this litigation that Dr. Bhat's testing showed that SV-X41 swells when applied in certain (Tietex claims larger) doses, Tietex shifted the emphasis of its defense and claimed that lesser applications in the amount actually used on Tietex's products (what its expert, Dr. Horrocks, characterizes as "thermally thin" applications) do not swell when exposed. (Doc. 174 at 8.) In response, Dr. Bhat tested SV-X41 in amounts that PFG claims replicates those used by Tietex in its applications. In doing so, Dr. Bhat tested the coating on an aluminum foil substrate. Tietex now contends that aluminum is flawed as a substrate because it could interact with the SV-X41 to cause swelling.

The court need not engage in an extended Daubert analysis. Suffice it to say that Tietex's position is based on the opinion of Dr. Horrocks, which a jury may or may not find credible. It is also rebutted by Dr. Bhat's testing results. Moreover, as PFG notes, Dr. Horrocks's opinion is subject to criticism because he failed to challenge Dr. Bhat's previous use of an aluminum pan as a substrate in earlier testing.² Therefore, it is a factual matter

² And, as noted infra, the court is granting PFG's motion to limit Dr. Horrocks's opinions as to Dr. Bhat's use of an aluminum pan as a substrate in earlier testing.

for the jury. For these reasons, the court declines to find that this challenge renders Dr. Bhat's testing and results unreliable, and the motion to exclude Dr. Bhat and his opinions will be denied.

B. Tietex Motion in Limine No. 3 (Prior Court and IPR Proceedings) (Doc. 209)

Tietex moves to preclude PFG from introducing or using any evidence relating to (1) prior disputes in the litigation; (2) outcomes of prior proceedings in this case; and (3) the determinations of the Patent Trial and Appeal Board ("PTAB") during inter partes review ("IPR") proceedings. (Doc. 210 at 1.) PFG responds that it does not intend to offer evidence of prior disputes in the litigation or outcomes of prior proceedings in this case, as noted in grounds (1) and (2) above, except that it claims that the court's denial of Tietex's proposed claim construction should be admissible on the issue of willfulness. (Doc. 243 at 2-3.) Therefore, the court grants this motion as to grounds (1) and (2) above. For the reasons stated in PFG's motion in limine number 5, the court grants Tietex's motion as to ground (2) without prejudice to PFG's right to introduce evidence regarding the court's denial of Tietex's proposed claim construction for the limited purpose of establishing willfulness. Of course, the parties are not precluded from relying on their opponent's responses to discovery, absent other objection.

As to ground (3), PFG agrees that the determinations of the

IPR proceedings generally should not be admitted. (Doc. 243 at 4.) Tietex contends that while the PTAB proceedings and their outcome are irrelevant, the fact Tietex filed its IPR application for the '639 patent (and expended substantial resources doing so) is relevant to rebut claims that any alleged infringement was willful. (Doc. 249 at 4.) PFG responds that the IPR petition should be excluded because it is irrelevant and would be confusing to the jury due to the PTAB's standards for such proceedings. (Doc. 243 at 10.) Because Tietex's motion is directed to excluding the outcomes of the PTAB proceedings, the court need not address its contention that it should be able to introduce its IPR petition.³

³ Tietex did not file the petition until August 14, 2014, one day short of a year after PFG's lawsuit over the '639 patent was filed. But "timing does matter." See WBIP, LLC v. Kohler Co., 829 F.3d 1317, 1340 (Fed. Cir. 2016) (citing Halo Electronics, Inc. v. Pulse Electronics, Inc., 136 S. Ct. 1923, 1933 (2016)); cf. id. (finding that an infringer "cannot insulate itself from liability for enhanced damages by creating an (ultimately unsuccessful) invalidity defense for trial after engaging in the culpable conduct"). Thus, reliance on the IPR petition has limited value to Tietex. SSL Servs., LLC v. Citrix Sys., Inc., 769 F.3d 1073, 1092-93 (Fed. Cir. 2014) (finding that the actions of the Patent Trade Office have "limited value . . . to establish a good faith belief of invalidity"). If Tietex were to successfully seek the admission of its IPR petition, the court would require the outcome of the proceeding be made known to the jury so as to avoid undue confusion. Moreover, it would follow the lead of several district courts (that have admitted evidence from completed IPR proceedings) to require jury instructions that explain the different standards applicable to the IPR proceedings. See, e.g., StoneEagle Servs., Inc. v. Pay-Plus Solutions, Inc., No. 8:13-CV-2240-T-33MAP, 2015 WL 3824208, at *8 (M.D. Fla. June 19, 2015); Universal Electronics, Inc. v. Universal Remote Control, Inc., No. SACV 12-00329 AG, 2014 WL 8096334, at *7 (C.D. Cal. Apr. 21, 2014); Oracle America, Inc. v. Google, Inc., Civ. No. 10-03561, 2012 WL 1189898, *3 (N.D. Cal. Jan. 4, 2012).

The court therefore grants Tietex's motion as to ground (3). Unless permitted elsewhere in this order, the parties shall not, directly or through their witnesses, refer to or seek to introduce the PTAB proceedings, absent permission from the court.

C. PFG Motion in Limine No. 1 (Non-Infringing Alternatives) (Doc. 183) & Motion to Strike Tietex's Supplemental Interrogatory Response (Doc. 228)

PFG moves to preclude Tietex from introducing evidence regarding alleged non-infringing alternatives (to oppose PFG's lost-profits claim) on the grounds that Tietex failed to timely disclose them in response to PFG's interrogatories directed precisely to that subject. (Doc. 184 at 5.)⁴ PFG also moves to strike as untimely Tietex's second supplemental response to PFG's Interrogatory No. 7, which Tietex filed contemporaneously with its response to PFG's motion. (Doc. 228.)

This dispute begins with PFG's second set of interrogatories, which PFG served on Tietex on August 19, 2014. PFG specifically requested, among other things, that Tietex "[i]dentify and describe any fabrics that Tietex contends are actual or potential non-infringing alternatives to any inventions claimed by any of the claims of U.S. Patent 8,501,639 for use as filler cloth in the

⁴ PFG also notes that Tietex failed to verify its first amended responses, in violation of Federal Rule of Civil Procedure 33(b). (Doc. 184 at 4.) Tietex contends that its prior responses have been incorporated into its verified second amended responses such that both sets now constitute properly amended responses. (Doc. 190 at 11 n.5.) To this extent, the court deems the defect of lack of verification cured.

construction of a mattress or otherwise." (Doc. 184-1 at 7.)⁵ Nearly four months later, Tietex responded with objections to the scope of the interrogatory and a statement that its own accused products are non-infringing alternatives. (Id. at 7-8.) The Magistrate Judge properly found that by its delay, Tietex had waived its objections. (Doc. 90 at 6-7.)

Approximately one year later, on December 9, 2015, Tietex served an amended response. By then, fact discovery had been closed for approximately six months, and expert discovery had been closed over one month.⁶ In this updated response, Tietex stated:

The term "any fabrics that Tietex contends are actual or potential non-infringing alternatives" encompasses the entire universe of fabrics manufactured by Tietex or others which do not satisfy each and every claim limitation of at least one valid claim in the subject patent. For example, there are many different flame retardant fabrics that can be used in the environments in which the fabrics described in the patents-in-suit could be used. For example, each of Tietex's products that have been accused of infringing the patents-in-suit patent are non-infringing alternatives to the products

⁵ In addition, PFG requested that Tietex "[i]dentify and describe any plan, project, or attempt to design and/or redesign any Accused Product to avoid infringement or claims of infringement of the '639 Patent, and explain in detail the nature and description, dates of, and any costs associated with, any such plan, project, or attempt to design and/or redesign." (Doc. 184-1 at 8.) In its response, Tietex similarly objected to the interrogatory and stated "there has been no attempt to design and/or redesign any of Tietex's products in order 'to avoid infringement or claims of infringement' because none of Tietex's products infringe the '639 patent." (Id.) However, it is unclear from the record what response, if any, Tietex provided as to this interrogatory in its first amended response.

⁶ Fact discovery closed on June 1, 2016. However, the parties agreed to conduct the depositions of Tietex's 30(b)(6) designee and Martin Wildeman on June 5 and 9, 2015, respectively.

described and claimed in the patents-in-suit. As other examples, alternative fabrics also include those flame retardant fabrics made by competitors of Tietex and PFG for use in mattresses and for other products. Some of these alternative fabrics include fabrics sold by Hanes, PGI, PCC, DuPont, Soltex, Johnson Textiles, Performance Fabrics and Fiber, Precision Textiles, PCC, Freudenberg, and Pratrivero. PFG is aware of these fabrics as indicated by internal PFG documents produced to Tietex during the course of this action. In addition, there may be other alternative non-infringing fabrics that may be presented by Tietex to the Court, but those have not specifically been determined as of yet. Tietex reserves the right to supplement this interrogatory response as such decisions are made.

(Doc. 184-2 at 6.) This response fails to identify any specific fabric by any manufacturer. Prior to the filing of the present motion in limine, PFG never objected to Tietex's amended response or moved for an order to compel a further response. Nor did Tietex seek to amend its response with any further specificity.

Tietex now seeks to offer at trial evidence of several non-infringing alternatives: (1) fabrics sold by other competitors in the market; (2) a non-coated filler cloth fabric developed by Tietex during the course of the litigation; and (3) a needle-punch fabric sold by PFG. (Doc. 190-10 at 3-6.) Tietex offers a two-pronged defense. First, it contends that its discovery responses were proper and that the existence of all non-infringing alternatives were nevertheless "made known" to PFG through evidence disclosed in discovery. (Doc. 262 at 11-12.) Second, Tietex contends that acting "out of an abundance of caution," it has cured any notice problem because it served a lengthy second

supplemental interrogatory response on July 21, 2017, which, among other things, specifically identified "PFG's needlepunch flame retardant filler cloth" and Tietex's line of "stitchbonded, flame retardant filler cloth that does not use a flame retardant coating" as available non-infringing alternatives. (Doc. 190 at 11; Doc. 190-10 at 3-6.) This supplemental response indicates that Tietex intends to introduce evidence and testimony at trial of "these and all other non-infringing alternatives it has identified" through its damages expert, Dr. Alford. (Doc. 190-10 at 5.) Tietex contends that PFG was aware of the evidence of non-infringing alternatives since 2014 and that to grant PFG's motion would cause "the trial of this case [to] proceed based on invented 'facts' that bear no relation to reality." (Doc. 190 at 21.)

In order to recover lost profits, the patent owner must establish "a causal relation between the infringement and its loss of profits." Ericsson, Inc. v. Harris Corp., 352 F.3d 1369, 1377 (Fed. Cir. 2003) (quoting BIC Leisure Prods., Inc. v. Windsurfing Int'l, Inc., 1 F.3d 1214, 1218 (Fed. Cir. 1993)). The patentee must demonstrate "a reasonable probability that 'but for' the infringing activity, the patentee would have made the infringer's sales." Id. (quoting Crystal Semiconductor Corp. v. TriTech Microelecs. Int'l, Inc., 246 F.3d 1336, 1353 (Fed. Cir. 2001)). Once the patentee establishes the reasonableness of this inference, the burden shifts to the accused infringer to

demonstrate that the inference is unreasonable for some or all of the lost profits. Micro Chem., Inc. v. Lextron, Inc., 318 F.3d 1119, 1122 (Fed. Cir. 2003) (citing Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538, 1545 (Fed. Cir. 1995)). An accused infringer may oppose a lost-profits claim by establishing the existence of available non-infringing alternatives within the relevant market. See Grain Processing Corp. v. American Maize-Prods., 185 F.3d 1341, 1350-51 (Fed. Cir. 1999).

Interrogatories are governed by Federal Rule of Civil Procedure 33. "Contention interrogatories . . . serve an important purpose in helping to discover facts supporting the theories of the parties" and to "narrow and sharpen the issues thereby confining discovery and simplifying trial preparation." Woods v. DeAngelo Marine Exhaust, Inc., 692 F.3d 1272, 1280 (Fed. Cir. 2012) (citing Fed. R. Civ. P. 33 advisory committee's note (1970 Amendment, subdivision (b))). Courts have recognized that answers to contention interrogatories may evolve over time, id., and "an answer to an interrogatory does not conclusively bind the answering party in all instances," Marcoin, Inc. v. Edwin K. Williams & Co., 605 F.2d 1325, 1328 (4th Cir. 1979). See also Intellect Wireless, Inc. v. T-Mobile USA, Inc., 735 F. Supp. 2d 928, 935 n.5 (N.D. Ill. 2010) ("[C]ourts, particularly in patent suits, generally still do not treat responses to contention interrogatories as binding." (collecting cases)).

However, a party has an ongoing duty to supplement or correct its disclosure or response "in a timely manner if the party learns that in some material respect the disclosure or response is incomplete or incorrect, and if the additional or corrective information has not otherwise been made known to the other parties during the discovery process or in writing." Fed. R. Civ. P. 26(e)(1)(A); Woods, 692 F.3d at 1280. The collateral disclosure of information during the discovery process may satisfy this requirement, provided that the "information that would normally be contained in a supplemental discovery response [be] in such a form and of such specificity as to be the functional equivalent of a supplemental discovery response; merely pointing to places in the discovery where the information was mentioned in passing is not sufficient." L-3 Commc'ns Corp. v. Jaxon Eng'g & Maint., Inc., 125 F. Supp. 3d 1155, 1169 (D. Colo. 2015) (citing Jama v. City and County of Denver, 304 F.R.D. 289, 298-99 (D. Colo. 2014)).

Rule of Civil Procedure 37 provides that a party who fails to properly supplement its interrogatory response "is not allowed to use that information or witness to supply evidence on a motion, at a hearing, or at a trial, unless the failure was substantially justified or is harmless." Fed. R. Civ. P. 37(c)(1). In determining whether the party's failure to make the required disclosures was substantially justified or harmless, the court may consider the following factors:

(1) the surprise to the party against whom the evidence would be offered; (2) the ability of that party to cure the surprise; (3) the extent to which allowing the evidence would disrupt the trial; (4) the importance of the evidence; and (5) the nondisclosing party's explanation for its failure to disclose the evidence.

Bresler v. Wilmington Tr. Co., 855 F.3d 178, 190 (4th Cir. 2017) (quoting S. States Rack & Fixture, Inc. v. Sherwin-Williams Co., 318 F.3d 592, 597 (4th Cir. 2003)). The party that failed to disclose the information bears the burden of establishing that the nondisclosure was either harmless or substantially justified. Id. (citing Wilkins v. Montgomery, 751 F.3d 214, 222 (4th Cir. 2014)). With this legal landscape in mind, the court turns to the question at hand.

PFG's interrogatory asked Tietex to "identify and describe" all fabrics it contends were actual or potential non-infringing substitutes. (Doc. 184-1 at 7.) This contention interrogatory sought to learn whether Tietex would contend that PFG's alleged damages are limited, and if so, by what non-infringing products. Such a determination is fact-specific and not subject to generalities. SynQor, Inc. v. Artesyn Techs., Inc., No. 2:07-CV-497-TJW-CE, 2011 WL 3625036, at *10-11 (E.D. Tex. Aug. 17, 2011). Having waived any objection to the scope of this interrogatory as a result of its untimely response, Tietex had a duty to respond with specificity and to timely supplement. (Doc. 90 at 6-7.) Not until after the conclusion of both fact and expert discovery did

Tietex amend its original response, and then only to provide the names of several competitors that allegedly sell non-infringing alternatives. Tietex did not disclose any fabric with any specificity, nor did it cite to the record where any fabric had been identified. (See Doc. 190-10.) This response was clearly inadequate and failed to comply with the disclosure requirements of Rules 33 and 26(e). Yet, PFG did not seek judicial intervention to have the response declared inadequate or to compel a more complete description.

In light of the discovery history of this case, the court finds that as to fabrics sold by competitors that are referenced in the report of Tietex's damages expert, Dr. Alford, Tietex's failure to previously disclose such evidence was harmless, as PFG cannot reasonably claim surprise. Neither party disputes the existence of non-infringing alternatives within at least a portion of the relevant market.⁷ In his expert report and deposition testimony, Dr. Alford sought to respond to claims regarding market segmentation raised by PFG's damages expert. (Doc. 237-4 at 5-10.) Among other things, Dr. Alford testified that his opinions on damages rested on the conclusion that non-infringing alternatives were sold by several competitors within the market,

⁷ PFG's own damages expert, Joel Wacek, admits the existence of non-infringing alternatives sold by competitors within the segment of the market, which he contends excludes the national mattress manufacturers. (Doc. 190-1 at 4-5.)

including Dupont, Hanes, Inman Mills, Pratrivero, HDK, and PCC. (Doc. 190-3 at 3; Doc. 190-4 at 4-7.) PFG had ample opportunity to cross-examine Dr. Alford regarding the basis of this opinion. PFG failed to take any action to cure any prejudice arising from the disclosure, or lack thereof, of such information for over two years.

The evidence is important, as it relates directly to the calculation of damages at trial, which favors exclusion. See S. States, 318 F.3d at 598-99. Furthermore, Tietex was not substantially justified in failing to adequately respond to PFG's interrogatory request after the close of discovery. See id. Nevertheless, exclusion is not warranted where the evidence of non-infringing alternatives sold by other competitors remains a central dispute within this case and PFG has been aware of Tietex's intention to introduce this specific evidence for well over two years.⁸

Therefore, PFG's motion to exclude evidence of non-infringing alternatives sold by competitors in the market is denied as to any

⁸ There is a separate question whether Dr. Alford's failure to identify particular alleged non-infringing products dooms his opinions as lacking foundation. Dr. Alford testified that he did not have information regarding the individual products sold by the other market participants, apart from those sold by Tietex and PFG. (Doc. 217-4 at 36.) Indeed, Tietex admits that it remains unaware of the technical names of acceptable non-infringing alternatives sold by its competitors. (Doc. 190 at 9 n.3.) Whether this failure renders Dr. Alford's testimony fatally deficient will be addressed separately in connection with PFG's motion directed to that witness.

products whose sales are referenced in Dr. Alford's expert report or deposition testimony, but otherwise granted as to other available non-infringing alternatives sold by competitors apart from PFG and Tietex. See ZiiLabs Inc. v. Samsung Elecs. Co., No. 2:14-cv-203-JRG-RSP, 2015 WL 6690403, at *3 (E.D. Tex. Nov. 2, 2015) (granting in part motion to strike references to a non-infringing alternative not raised in expert's original report where the record indicated that the defendant could have disclosed the information within its interrogatory response, but declining to exclude other non-infringing alternatives disclosed in direct response to statements regarding the availability of those non-infringing alternatives in opposing party's expert report). To be sure, while Tietex is not precluded from relying on the alleged products represented by Dr. Alford's computations for alleged non-infringing products, it nevertheless retains the burden of establishing a factual predicate that those products are in fact non-infringing.

With regard to the two non-infringing alternatives disclosed in Tietex's second amended response served in response to PFG's motion in limine - PFG's needle-punch flame retardant filler cloth, and Tietex's line of stitchbonded, flame retardant filler cloth that does not use a flame retardant coating - Tietex cannot reasonably contend that its discovery responses were proper under the circumstances. Its contention that these alternatives were

covered by the general description contained in its first amended response is wholly without merit. (Doc. 262 at 9.) Disclosing generally the existence of potential non-infringing alternatives in deposition testimony during the final days of fact discovery or expert discovery does not "make known" to PFG that Tietex intends to contend these products constitute non-infringing alternatives. This is particularly true where neither was disclosed in any of Tietex's expert reports or in Tietex's first amended response. See Woods, 692 F.3d at 1282 (affirming exclusion of attempted supplement where defendant failed to answer and supplement responses to contention interrogatory and disclosed of prior art without additional explanation on the final day of the scheduled discovery period); cf. L-3 Commc'ns Corp. v. Jaxon Eng'g & Maint., Inc., 125 F. Supp. 3d 1155, 1168-69 (D. Colo. 2015) (holding that supplemental disclosure was not necessary, where information was disclosed in deposition testimony and the defendant's expert report). At a minimum, Tietex should have disclosed the existence of these non-infringing alternatives no later than in its first amended response after the close of discovery in December of 2015.

Therefore, the court must determine whether Tietex's failure to timely disclose these non-infringing alternatives was substantially justified or harmless. Fed. R. Civ. P. 37(c)(1). PFG points to the very late disclosure and argues that exclusion is proper because Tietex has taken a position inconsistent with

its prior discovery responses and its own damages analysis. (Doc. 202 at 11-15.)⁹ Accordingly, PFG contends, Tietex's failure to timely supplement cannot be considered either harmless or substantially justified. (Id.)

Tietex argues that even if the court finds its disclosure to be untimely, the evidence should not be excluded because PFG would not be prejudiced. (Doc. 190 at 21.) Tietex contends that PFG has been on notice that such evidence would be presented and slept on its rights to compel more complete responses or seek additional discovery, and Tietex says it remains willing to provide witnesses for testimony. (Doc. 190 at 13-14.) According to Tietex, PFG has been aware that Tietex's non-coated filler cloth is a non-infringing alternative since June 5, 2015, when Tietex's Rule 30(b)(6) deponent, Robert Wallace, testified that Tietex had developed the fabric and was in the process of commercializing it within the market for flame retardant filler cloth. (Doc. 190 at 6; Doc. 190-5 at 3-7.) In addition, Tietex notes that PFG questioned Tietex's Chief Executive Officer, Martin Wildeman, about this developmental product as well. (Doc. 190-6 at 3-4.) Tietex also claims it provided PFG with samples of this product in

⁹ PFG claims that Tietex disclosed its intention to present evidence that its own non-coated filler cloth constituted an available non-infringing alternative during the parties' negotiation of proposed jury instructions before trial. (Doc. 202 at 11-12.)

March of 2016 (Doc. 190-7), and regularly supplemented its sales information, per the parties agreement, which reflected that Tietex no longer sold the accused products and included figures for this new fabric (Doc. 190 at 7).¹⁰ Similarly, Tietex notes that PFG's damages expert, Joel Wacek, identified non-infringing alternatives during his deposition, including needle-punch fabric as well as woven and spun-lace fabrics. (Doc. 190-2 at 1-4, 10.) PFG responds in part that the records relating Tietex's product at issue were largely buried in Tietex's production of hundreds of thousands of pages, and that the production of sales records made no effort to direct any attention to the new product or the fact that Tietex would contend it was an available non-infringing alternative.

Having carefully considered the Southern States factors, the court concludes that the failure to disclose these two products as allegedly non-infringing alternatives is neither harmless nor substantially justified. While it may be one thing to say that PFG may have been on notice of the existence of these two alternatives, it is quite another for Tietex to seek to incorporate it into its damages analysis as a non-infringing alternative well after the close of all fact and expert discovery and on the eve of

¹⁰ While Tietex maintains that it no longer sells the accused products, it previously represented to this court that it continued to sell them at least until October of 2016. (Doc. 178 at 13.)

trial. This is especially so where Tietex itself concedes it was aware of its intention to rely on these two products as non-infringing alternatives for over two and one-half years yet made absolutely no effort to seek to amend its damages expert's report or its interrogatory responses, or even write a letter to opposing counsel to provide such notice.

As noted above, establishing the existence of available non-infringing alternatives involves a highly fact-specific inquiry into the product and relevant market at issue. The relevant question in determining prejudice is not "whether [a] plaintiff[] knew of the existence of the [non-infringing alternatives] and should have guessed they would be put forth as an alternative," but rather "whether [a] plaintiff[] will be prejudiced by defendant's failure to disclose them as such during discovery." Parker-Hannifin Corp. v. Champion Labs., Inc., No. 1:06-CV-2616, 2008 WL 1843922, at *8 (N.D. Ohio Apr. 22, 2008) (emphasis added), modified on clarification, No. 1:06-CV-2616, 2008 WL 3166318 (N.D. Ohio Aug. 4, 2008). See also SynQor, 2011 WL 3625036, at *10-11 (denying motion for new trial based on exclusion evidence of non-infringing alternatives that were disclosed after the close of fact discovery, relying in part on the fact the party was deprived of the opportunity to conduct the "highly technical discovery" required to assess the alleged non-infringing alternatives).

Here, Tietex's failures are evident with respect to its attempt to introduce this testimony through its damages expert, Dr. Alford. Dr. Alford issued his expert report on August 27, 2015, nearly three months after the close of fact discovery. (Doc. 202-3 at 2.) In that report, he opined that PFG and the other competitors in the market would have captured all of Tietex's alleged infringing sales based on their respective market shares. (Id. at 8.) While Dr. Alford explicitly relies on the existence of non-infringing alternatives provided by competitors within the market, he assumes Tietex would have completely exited the market. (Id.) Tietex has provided no evidence that Dr. Alford considered these two non-infringing alternatives in reaching his opinion, nor does the court find any evidence in the record to support his contention. Tietex attempts to explain this omission by claiming that "Dr. Alford had not fully developed his opinions concerning non-infringing alternatives" at the time of the report and characterizing this opinion as a "secondary" calculation designed to demonstrate the flaws within Wacek's analysis. (Doc. 262 at 17 n.6.)¹¹ Neither explanation is credible or acceptable. If PFG was

¹¹ Tietex claims that "[a] staple of Dr. Alford's opinion is that non-infringing alternatives exist for the entire market for [flame retardant] filler cloth, and thus PFG is entitled to no lost profits." (Doc. 262 at 17 n.6.) However, as Tietex acknowledges in a related brief (Doc. 248 at 11), the existence of non-infringing alternatives does not preclude a patentee from recovering lost profits based on its market share, BIC Leisure Prods., Inc. v. Windsurfing Int'l, Inc., 1 F.3d 1214, 1218 (Fed. Cir. 1993).

in fact placed "on notice" of Tietex's intention to raise such contentions at the conclusion of fact discovery, surely Tietex's own expert would have been aware of such contentions as well. If not, he should have been made aware of it.¹² Tietex offers no explanation for its failure to seek to supplement Dr. Alford's report. See Fed. R. Civ. P. 26(a)(2)(D), (E).

At this late stage in the litigation, PFG has limited ability to cure the surprise arising from this violation. Even though Tietex disclosed this information several months in advance of the trial, the only available cure to PFG at this point would be to permit PFG to conduct additional discovery on the eve of trial, which would cause significant burden and disruption, or for the court to continue trial, which would result in a significant disruption. See S. States, 318 F.3d at 598 (noting granting a continuance "would have significantly disrupted the trial, because witnesses from distant places had testified and if the case were continued and tried again, much of the parties' trial preparation would be rendered obsolete"). This prejudice is exacerbated by Tietex's contention at the hearing that it seeks to present evidence that it could have commercialized its allegedly non-infringing alternative earlier in the infringement period so as to

¹² Dr. Alford was deposed approximately one week after Wacek's deposition, and there was apparently no effort to incorporate consideration of Wacek's mention of PFG's own products as non-infringing alternatives (or not) into Dr. Alford's opinions at that time.

reduce or eliminate its damages. Such a showing involves additional proof that was never properly disclosed.

For these same reasons, Tietex has failed to meet its burden of demonstrating it was substantially justified in not disclosing these alleged non-infringing alternatives at the time of its first amended response. See Baltimore Aircoil Co., Inc. v. SPX Cooling Techs. Inc., No. CV CCB-13-2053, 2016 WL 4426681, at *18-19 (D. Md. Aug. 22, 2016) (granting motion to exclude evidence of "design-around alternatives" where party failed to provide "any documents specifying design-around alternatives, notwithstanding multiple discovery requests to which [such alternative] would have been responsive" until the final day of fact discovery).

Therefore, as to the alleged non-infringing products by PFG and Tietex, the court grants PFG's motion to preclude Tietex from incorporating either into Dr. Alford's damages analysis. However, because PFG's damages witness, Wacek, opined that he did not consider PFG's own product as a non-infringing alternative, Tietex will be permitted to cross examine him as to the reasons he did not do so.¹³ PFG has also moved to strike Tietex's second supplemental interrogatory response. But motions to strike apply

¹³ At the hearing, counsel for PFG contended that its product at issue cannot be considered a non-infringing alternative because, although not patented, it was proprietary. Because to prevail on this issue PFG would have to demonstrate that customers would not have obtained the product from a third party, Rite-Hite, 56 F.3d at 1548, this factual issue remains for proof at trial.

to pleadings. See Fed. R. Civ. P. 12(f); 5C Charles A. Wright et al., Federal Practice & Procedure § 1380 & n.8.50 (3d ed. 2004 & Supp. 2014). Rather than strike Tietex's interrogatory response, which is not a pleading, and except as provided above as to cross examination of Wacek, the court will preclude Tietex from presenting evidence of non-infringing alternatives excluded in this order. See Fed. R. Civ. P. 37(c)(1). This response was served only in response to PFG's motion in limine, was grossly out of time, lacks substantial justification, and imposes prejudice that is not harmless.

D. PFG Motion in Limine No. 2 (Post-Discovery Document Production) (Doc. 185)

PFG seeks an order precluding Tietex from relying at trial on any documents it produced after the close of discovery but permitting PFG to rely on any that are relevant. PFG claims that Tietex purposefully misled it and the court when it earlier represented it had fully responded to previous discovery, but subsequently produced almost 2 million pages of unorganized documents that contain "thousands of wholly irrelevant, nonresponsive pages (such as novels and spam e-mails)." (Doc. 186 at 2, 13.) By and large, many of these documents pre-date the patents in suit. Tietex responds that it has sought to comply with overly-broad discovery requests, PFG should not be surprised at the breadth of the production given the expansive scope of the

search terms it suggested (Doc. 191 at 10), and this is all moot because Tietex does not intend to rely at trial on any of the documents in dispute (Doc. 203 at 1-2). PFG responds that Tietex should have quality-checked the search terms to further narrow the production and that, in any event, this is not a valid explanation because the vast majority of the documents produced are not responsive to those terms. (Doc. 200 at 15-17.)

This discovery dispute has been the subject of prior proceedings before the Magistrate Judge. Because Tietex represents that it does not intend to use any of the post-discovery documents, it appears that PFG will obtain the relief it seeks. Therefore, the motion in limine is granted. Tietex shall not rely on any document produced for the first time after the close of discovery, absent prior agreement with PFG, prior approval by the court, or prior use at trial by PFG that opens the door.

E. PFG Motion in Limine No. 3 (Dr. Horrocks's Aluminum Opinion) (Doc. 213)

PFG moves to exclude the opinion of Tietex's retained expert witness, Dr. Horrocks, to the extent it challenges supplemental testing of SV-X41 by PFG's expert, Dr. Bhat, conducted on an aluminum substrate. PFG argues that Dr. Horrocks's opinion is untimely and violates the court's order permitting supplemental reports. It also seeks to exclude Dr. Horrocks's opinion under Federal Rule of Evidence 703 and Daubert, as unreliable and

speculative. Tietex opposes the motion.

This issue is related to Tietex's motion in limine number 1 above. Late in the litigation, after Tietex shifted its focus of its defense to the levels of SV-X41 Dr. Bhat applied to his testing samples, the court granted PFG's motion to supplement Dr. Bhat's report to address this new emphasis. In doing so, the court also permitted Tietex to "supplement the report of Dr. Horrocks - limited to any direct response to the material contained in Dr. Bhat's supplemental report at issue." (Doc. 174 at 9-10 (emphasis added).) In his supplemental report, Dr. Horrocks criticized Dr. Bhat's supplemental testing (which concludes that a 50-micron thick coating of SV-X41 swelled when exposed to heat or flame) as unreliable because Dr. Bhat applied the SV-X41 to an aluminum foil substrate, which Dr. Horrocks contends is not inert. (Doc. 214-1 at 26.) Drawing from scientific literature regarding the chemical characteristics of aluminum and SV-X41, Dr. Horrocks opined that the aluminum substrate would cause aluminum oxide on the aluminum foil substrate to increase in size. (Id. at 19-26.) Relying on his previous testing of SV-X41 on what he contends is an inert surface and which he says resulted in no swelling, Dr. Horrocks concluded that any swelling of SV-X41 observed by Dr. Bhat in his supplemental report was attributable to the reaction of the coating

with the non-inert aluminum surface. (Id. at 26.)¹⁴ Dr. Horrocks went further, however, to state that this opinion applied to Dr. Bhat's previous testing on aluminum pans set forth in his earlier reports, even though Dr. Horrocks did not previously provide this criticism. (Id. at 20.)

PFG first argues that Dr. Horrocks never criticized Dr. Bhat's previous use of aluminum pans during his deposition in November 2015 and therefore should be precluded from offering any opinion now. PFG contends that Dr. Horrocks's new opinion is untimely, in violation of Federal Rule of Civil Procedure 26 and its delay is neither substantially justified nor harmless. Fed. R. Civ. P. 37(c)(1). PFG further contends that the opinions exceed the scope of this court's order that limited Tietex's response to Dr. Bhat's last expert report. Tietex responds that Dr. Horrocks was never "invited" to criticize the aluminum pans during his previous deposition. (Doc. 214-2 at 9, 11-12; Doc. 236 at 5-6.) It also contends that Dr. Horrocks's criticism is not a "new opinion" but is consistent with his prior testimony regarding the proper experimental protocol in his original deposition, which required that testing be conducted on inert surfaces. (Doc. 236 at 7-8.)

The court finds that, at least as it relates to Dr. Bhat's

¹⁴ To the extent Dr. Horrocks claims to rely on his visual observations of swelling on the SV-X41 tested on steel plates, the court has previously excluded this opinion as unreliable. (Doc. 152 at 23-24.)

supplemental report, Dr. Horrocks's aluminum opinion is responsive to Dr. Bhat's supplemental testing on aluminum foil and should not be excluded, particularly in light of Dr. Horrocks's November 2015 deposition testimony as to the need to use an inert substrate. (See Doc. 145-11 at 12, 113.) However, Dr. Horrocks's criticisms of the substrate used in Dr. Bhat's prior testing (that is, apart from the supplemental report) clearly exceeds the scope of the court's order, and it would be unfair to allow them now. Dr. Horrocks was specifically asked in a previous deposition about his criticisms of all of Dr. Bhat's earlier testing and did not criticize use of the aluminum substrate used:

Q. And other than disagreeing with the thickness that he used for his testing do you disagree with any of the other parameters that he used in his testing?

A. No, I cannot criticise the results. The results are as he has produced. I have no reason to suspect that they were other than the true results.

(Doc. 145-11 at 191 (emphasis added).)¹⁵

¹⁵ During Dr. Bhat's deposition, Tietex's counsel similarly accepted Dr. Bhat's statement that the aluminum pan was an inert substance and declined to question him further on this topic:

Q. Okay. So you used--So you used two surfaces [aluminum and steel pans] that were inert; is that correct?

A. That's correct.

Q. Okay, let's exclude those

(Doc. 252-1 at 110.) Tietex's counsel contended at the hearing he was merely baiting the expert. While counsel's statements are not the basis for the court's ruling, the court is not so persuaded. In addition, Tietex's counsel referred to aluminum pans as an inert surface in a statement made to the court during the motion for partial summary judgment, where counsel referenced the need to test the coating "separately on an inert substrate, inert being something like aluminum pans or steel or the glass fibers that Dr. Horrocks used." (Doc. 154 at 59.) While this statement may not constitute a judicial admission,

In addition, Tietex had an ongoing duty to supplement its expert's report. Fed. R. Civ. P. 26(e). Given that Dr. Horrocks admitted to holding this opinion at the time of his deposition in November of 2015 (Doc. 214-2 at 11-12), as well as in his supplemental report two years later, it cannot be considered timely and clearly violates Rule 26. See Akeva LLC v. Mizuno Corp., 212 F.R.D. 306, 310 (M.D.N.C. 2002) ("To construe supplementation to apply whenever a party wants to bolster or submit additional expert opinions would [wreak] havoc in docket control and amount to unlimited expert opinion preparation."); MJC Am., Ltd. v. Gree Elec. Appliances, Inc. of Zhuhai, No. CV1304264SJOCWX, 2015 WL 12747825, at *3 (C.D. Cal. Apr. 27, 2015) (granting motion in limine to exclude expert testimony regarding "those subject areas about which [plaintiff's experts] claimed to have no opinion at their depositions").

Tietex has also failed to establish that this violation was either "substantially justified" or "harmless" to avoid exclusion under Rule 37(c)(1). See S. States, 318 F.3d at 597. The surprise resulting from the presentation of such evidence over two years

it does suggest a significant shift in Tietex's litigation strategy. See Fraternal Order of Police Lodge No. 89 v. Prince George's Cty., MD, 608 F.3d 183, 190 (4th Cir. 2010) ("Although a lawyer's statements may constitute a binding admission of a party, any such statement must be 'deliberate, clear, and unambiguous' before we will afford it preclusive effect." (quoting Meyer v. Berkshire Life Ins. Co., 372 F.3d 261, 265 n. 2 (4th Cir. 2004))).

after the issuance of Dr. Bhat's rebuttal report would be substantial. The court permitted supplemental testing, well after discovery closed, only as a matter of fairness to PFG in light of what the court viewed was Tietex's shifted defense. For Tietex to use a supplemental report - whose sole purpose was to respond to Dr. Bhat's supplemental testing - as an opportunity to reach back to challenge earlier testing on grounds not previously raised, particularly where the earlier deposition questioning of Dr. Bhat suggested that there would be no challenge to use of an aluminum pan as a substrate, would be grossly unfair. Tietex thus lacks any substantial justification for not having earlier provided this opinion.

It is also not harmless. After narrowing its defense of the case to what Dr. Horrocks terms Dr. Bhat's "thermally thick" application of the SV-X41, Tietex now seeks to attack PFG's testing on applications of the coating that Dr. Bhat contends are comparable to Tietex's use of it. See Russell v. Absolute Collection Servs., Inc., 763 F.3d 385, 398 (4th Cir. 2014) (holding that district court did not abuse its discretion in excluding untimely disclosure of evidence two months before trial where "belated discovery materials presented an entirely new factual basis" for defendant's affirmative defense); Osunde v. Lewis, 281 F.R.D. 250, 258 (D. Md. 2012) ("[T]he rules of expert disclosure are designed to allow an opponent to examine an expert opinion for

flaws and to develop counter-testimony through that party's own experts." (quoting S. States, 318 F.3d at 498)).

Trial is one week away. It would be terribly disruptive to grant a continuance or to reopen discovery (yet again) to allow PFG to respond to Dr. Horrocks's claims, especially considering it was a reopening of discovery that led to Dr. Horrocks's present report. The parties have had more than ample time to narrow the dispute in this case. See Hill v. Coggins, 867 F.3d 499, 508 (4th Cir. 2017) (noting disruption to trial would arise where untimely disclosed evidence would "substantially change the character of the case and render obsolete much of the parties' trial preparation" (quoting Rambus, Inc. v. Infineon Techs. AG, 145 F. Supp. 2d 721, 730 (E.D. Va. 2001))). Even though the evidence may be important, the court finds that exclusion is proper in this instance, particularly where Tietex has failed to provide sufficient justification for this violation and exceeded the scope of this court's order. See Silicon Knights, Inc. v. Epic Games, Inc., No. 5:07-CV-275-D, 2012 WL 1596722, at *6 (E.D.N.C. May 7, 2012) (noting that the importance of the evidence is only one of several factors and does not "tilt the scale" where the party asserting the evidence's importance "alone is to blame for creating this situation" (quoting MicroStrategy Inc. v. Bus. Objects, S.A., 429 F.3d 1344, 1357 (Fed. Cir. 2005))).

PFG further argues that Dr. Horrocks aluminum opinion should

be excluded entirely under Rule 702 and Daubert. Under Rule 702, expert testimony is admissible if it "rests on a reliable foundation and is relevant." E.E.O.C. v. Freeman, 778 F.3d 463, 466 (4th Cir. 2015) (quoting Westberry v. Gislaved Gummi AB, 178 F.3d 257, 260 (4th Cir. 1999)). This court must "ensure that the proffered expert opinion is 'based on scientific, technical, or other specialized knowledge and not on belief or speculation, and inferences must be derived using scientific or other valid methods.'" Nease v. Ford Motor Co., 848 F.3d 219, 229 (4th Cir. 2017) (quoting Oglesby v. Gen. Motors Corp., 190 F.3d 244, 250 (4th Cir. 1999)). The district court has "broad latitude" to take into account any "factors bearing on validity that the court finds to be useful." Freeman, 778 F.3d at 466 (quoting Westberry, 178 F.3d at 260).

Dr. Horrocks seeks to offer several opinions related to Dr. Bhat's use of an aluminum-based substrate for his supplemental testing. Although his most recent report is some 37 pages, the opinions in dispute generally fall into one of the following categories: first, aluminum is not chemically inert but rather "highly reactive" (Doc. 214-1 at 11); second, SV-X41 will react chemically to non-inert aluminum surfaces (id. at 10); third, Dr. Bhat employed coatings with highly reactive substrates in his first round of testing by using coated Tietex fabrics, his third round of testing by using aluminum pans, and his fourth round of

supplemental testing by using aluminum foil (id. at 20); fourth, the aluminum substrates in the third and the supplemental rounds of testing would react with the coating to create chemical compounds that would "add to an increase in the thickness of the SV-X41-coated aluminum foil (and pans) when heated," (id. at 24); and fifth, "[t]he aluminum foil (as well as the aluminum pans in the third round of testing and the stainless steel pans in the second round of testing) does not simulate the coated fabric that results from the application of the SV-X41 coating to the Tietex Accused Fabrics," (id. at 25). As a result of these opinions, Dr. Horrocks concludes as a sixth opinion: "because I used a proper test protocol, employing a properly-sized coating on an inert surface, replicative of the Tietex fabrics and observed no swelling of the SV-X41 coating when it was exposed to heat or flame, it is my opinion that all of the swelling observed by Dr. Bhat on his roughly 50 micron-thick coatings in his Samples 1 and 2 is attributable solely to the reaction of the coating components with the non-inert aluminum foil substrate." (Id. at 26.)

PFG does not challenge Dr. Horrocks's qualifications to evaluate the chemical reaction between SV-X41 and an aluminum substrate. However, PFG does challenge the reliability of his opinions due to his failure to conduct any testing to support them. Tietex responds that Dr. Horrocks need not have tested SV-X41 on foil because he accepts that Dr. Bhat's reported swelling but

concludes that his (Dr. Horrocks's) testing on an inert substrate, combined with his experience in the field of chemistry and relevant scientific literature, fully explain the result.

"[A] key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested." Nease, 848 F.3d at 231 (quoting Daubert, 509 U.S. at 593). That is the essence of the scientific method. Dr. Horrocks's opinions offering quantitative results are precisely the type of scientific opinion that can be proved or disproved by testing. Both parties' experts have conducted endless competing tests.

Dr. Horrocks's opinions regarding the general chemical principles and reactivity of aluminum is well supported by scientific literature. Dr. Horrocks supports his opinion as to PFG's testing on an aluminum foil substrate with his separate, previous testing on what he contends is an inert, glass fiber substrate that he contends revealed no swelling.

PFG contends that Dr. Horrocks never tested his opinion on any aluminum foil, citing Nease, 848 F.3d at 232 (4th Cir. 2017) ("Although Sero's theory is plausible and "may even be right[,] . . . it is no more than a hypothesis, and it thus is not knowledge, nor is it based upon sufficient facts or data or the product of reliable principles and methods applied reliably to the facts of the case." (quoting Tamraz v. Lincoln Elec. Co., 620 F.3d

665, 670 (6th Cir. 2010)). It is true that Dr. Horrocks did not perform any additional testing to support his opinion regarding the interaction between aluminum, aluminum oxide, and intumescence. (214-2 at 5-7.) But this is not necessary in that he claims to have the proper scientific background and accepted Dr. Bhat's test results for that purpose. The question is whether Dr. Horrocks's testing on his allegedly inert substrate of glass fibers as a control was conducted under the same or similar conditions as Dr. Bhat's aluminum testing so that the comparison is valid and reliable. This would include parameters that experts deem important, including most prominently here, the highly disputed question of the amount of coating tested. In other words, one important question is whether Dr. Horrocks's testing on glass fibers was of a coating layer substantially similar to that used by Dr. Bhat. The parties have not fully addressed this. Therefore, because the record does not establish that Dr. Horrocks's testing was not conducted under substantially similar conditions, the motion on this ground will be denied without prejudice to its being raised at trial.¹⁶

¹⁶ In PFG's reply brief, PFG requested the alternative relief to "seek leave to offer additional evidence that will demonstrate that Dr. Horrocks's new opinion is objectively incorrect." (Doc. 252 at 17.) At the hearing, PFG's counsel stated that if Dr. Horrocks were permitted to opine as to the result of Dr. Bhat's aluminum testing, it should be permitted to introduce additional testing it says Dr. Bhat has conducted in response. Tietex's counsel stated that no such additional testing had been shared with it, and that no motion to further supplement Dr.

In summary, the court grants PFG's motion to exclude Dr. Horrocks's aluminum opinions as to all of Dr. Bhat's testing in the first three rounds for failure to have properly disclosed it during discovery. The court denies the motion as to Dr. Horrocks's opinions as to aluminum insofar as they describe criticisms of the aluminum foil substrate used in Dr. Bhat's supplemental testing. To the extent PFG's motion seeks to exclude Dr. Horrocks's opinion that the quantum of swelling Dr. Bhat observed in his foil-based testing resulted from the interaction of the SV-X41 with the aluminum foil, it is denied without prejudice to PFG demonstrating that Dr. Horrocks's testing was not under substantially similar conditions to serve as a proper control.

F. PFG Motion in Limine No. 5 (Preclude Evidence or Argument in Contradiction of the Court's Claim Construction Ruling) (Doc. 220)

PFG moves to preclude Tietex from offering into evidence or otherwise mentioning any evidence that contradicts the court's claim construction. PFG contends this breaks down into three categories of evidence: (1) Tietex's "four-component" chemistry construction it proposed during the claim construction proceedings; (2) any attempt to add limitations to the court's claim construction; and (3) any statement that implies that

Bhat's report was requested or filed. The court need not decide this issue in light of the fact that no motion or proffer is before it to allow such additional testing.

knowledge and understanding of chemistry is required to determine whether SV-X41 swells. (Doc. 221 at 1.) Tietex responds that chemistry evidence is relevant to the question of how SV-X41 functions, whether swelling occurs must be determined by the perspective of one of ordinary skill in the art, its evidence is admissible for impeachment purposes, and chemistry evidence is nevertheless admissible on the issue of willfulness. (Doc. 238 at 1-3.)

The parties each cite to extensive portions of the record and expert opinions in support of their arguments. Given the detailed nature of the evidence, the court will address the areas of evidence more generally, which should provide the parties adequate notice of the admissible evidence consistent with the court's statements during the hearing.

In adopting the court's claim construction, the court viewed the claim terms in light of one of ordinary skill in the art. (Doc. 57 at 4 (citing Phillips v. AWH Instruments, Inc., 415 F.3d 1303, 1312 (Fed. Cir. 2005).) Within the context of this litigation, neither party disputes that one of ordinary skill in the art may, but need not, be a chemist. (Doc. 145-11 at 239-41; Doc. 133-4 at 13-14.) Now that the court has construed the claim term "intumescent" to describe "a substance that swells and chars upon exposure to heat or flame" (Doc. 57 at 20), Tietex may not attempt to add further limitations to the claim. Exergen Corp. v.

Wal-Mart Stores, Inc., 575 F.3d 1312, 1321 (Fed. Cir. 2009) (stating that the parties may not seek to contradict the court's claim construction to a jury). And, any expert or person of ordinary skill in the art qualified to measure swelling by proper scientific methods may testify. See SEB S.A. v. Montgomery Ward & Co., 594 F.3d 1360, 1372-73 (Fed. Cir. 2010) (finding district court did not abuse its discretion in admitting expert testimony in a patent dispute involving the insulated skirt of a deep fryer, despite the fact that the expert admitted he was "not skilled in designing deep fryers" because the expert's testimony "established an adequate relationship between his experience and the claimed invention"). Tietex may not contend that an expert is not a person of ordinary skill in the art if he or she is not a chemist.¹⁷

Finally, PFG seeks to preclude Tietex from offering evidence that the proper construction of "intumescent" is its four-component claim construction that the court rejected. (See Doc. 256 at 10.) But Tietex does not appear to seek to offer its unsuccessful claim construction for this purpose. Rather, it seeks to offer it as a possible defense to PFG's claim of willful infringement on the grounds that Tietex entertained an alternative claim construction that was reasonable.

¹⁷ As discussed in connection with PFG's motion in limine number 6, to the extent PFG's motion seeks to preclude Tietex's expert from testifying as to what "swell" means as a person of ordinary skill in the art for purposes of literal infringement, the court will address this contention by separate order.

After Halo Electronics, Inc. v. Pulse Electronics, Inc., 136 S. Ct. 1923, 1933 (2016), the willfulness inquiry is one of subjective reasonableness. Subjective willfulness has been described as proof that the defendant acted despite a risk of infringement that was known or so obvious that it should have been known to the accused infringer. WesternGeco L.L.C. v. ION Geophysical Corp., 837 F.3d 1358, 1362 (Fed. Cir. 2016) (citing Halo, 136 S. Ct. at 1932), cert. granted sub nom. WesternGeco LLC v. ION Geophysical Corp., No. 16-1011, 2018 WL 386561 (U.S. Jan. 12, 2018). Enhanced damages are reserved for those cases of “egregious infringement behavior” not found in the typical infringement case. Halo, 136 S. Ct. at 1932 (“The sort of conduct warranting enhanced damages has been variously described in our cases as willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or—indeed—characteristic of a pirate.”). Factors relevant to a willfulness determination include “(i) whether or not defendants intentionally copied a product of plaintiff; (ii) whether or not defendants acted in accordance with the standards of commerce for its industry; (iii) whether or not defendants made a good faith effort to avoid infringing the asserted claims; (iv) whether or not there is a reasonable basis to believe that defendants did not infringe or had a reasonable defense to infringement; and (v) whether or not defendants tried to cover up any infringement.” Adrea, LLC v.

Barnes & Noble, Inc., 227 F. Supp. 3d 303, 312 (S.D.N.Y. 2017) (citing WesternGeco, 837 F.3d at 1362).

Generally, in determining whether conduct was willful, the evidence is restricted to the defendant's pre-litigation conduct, but in certain cases it can be appropriate to look to the post-litigation conduct as well. In re Seagate Tech., LLC, 497 F.3d 1360, 1374 (Fed. Cir. 2007), abrogated on other grounds by Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923 (2016); see Synqor, Inc. v. Artesyn Techs., Inc., 709 F.3d 1365, 1374 (Fed. Cir. 2013) (holding district court did not abuse its discretion in finding willful infringement for post-verdict infringing sales). Evidence that an infringing party held a good faith belief that an infringed patent was invalid can be a defense to willfulness. i4i Ltd. P'ship v. Microsoft Corp., 598 F.3d 831, 858 (Fed. Cir. 2010), aff'd, 564 U.S. 91 (2011).

Tietex argues that it should be permitted to defend against a willfulness charge with evidence of its proposed (but rejected) alternative claim construction for "intumescent." The question of the admissibility of Tietex's claim construction appears to be settled by the parties. As best the court can tell, both parties seek to offer it as a basis to offer competing arguments on willfulness. In any event, Tietex's unsuccessful construction of the claim at issue provides some basis for it to argue it had a subjective, good faith belief it was not infringing, and thus is

admissible on the issue of willfulness. The admission will be conditioned on a proper instruction to the jury to explain the limited purpose of the evidence and to ensure it is not considered by the jury to undermine the court's claim construction.

G. PFG Motion in Limine No. 6 (Inapplicability of the "Person of Ordinary Skill in the Art" Standard) (Doc. 222)

PFG moves to preclude Tietex from introducing any testimony or evidence relating to, or otherwise discussing at trial, the "person of ordinary skill in the art" standard. PFG contends that now that the court has construed the only contested claim, it is for the jury to determine whether SV-X41 is an "intumescent," and in doing so, the jury need not consider discussion of a person of ordinary skill in the art. To permit otherwise, PFG argues, would unduly prejudice PFG by permitting Tietex to distort the court's claim construction, waste time, and mislead the jury. (Doc. 223 at 1.) Tietex responds that the court's claim construction must be "viewed through the eyes of one of ordinary skill in the art in the context of PFG's alleged invention." (Doc. 239 at 3 n.3.) Otherwise, Tietex contends, absurd results obtain, leading to conclusions that ordinary substances such as pancakes, marshmallows, and other starchy materials would be identified as "intumescents." (Id. at 2.) Thus, it contends, "the determination of infringement should be made in light of the purpose of PFG's claimed invention as would be recognized by one of ordinary skill

in the art which is to use 'intumescent' coating on a fabric that swells to a sufficient degree to act as a thermal barrier to lessen the effects of heat or flame on the underlying fabric." (Id. at 2-3.)

The determination of whether infringement occurred requires a two-step analysis: first, the court must construe the claims to determine their meaning and scope; second, the claims as construed must be compared to the allegedly infringing device. Texas Instruments, Inc. v. Cypress Semiconductor Corp., 90 F.3d 1558, 1563 (Fed. Cir. 1996) (citations omitted). Infringement may be literal, which requires that the accused product contain every limitation of the asserted claim. Id. Even if there is no literal infringement, a product may infringe under the "doctrine of equivalents." Id. at 1563-64. In this case, the parties agree that the "function, way, result" test for the doctrine of equivalents applies. To demonstrate this, there must be particularized testimony and linking argument on a limitation by limitation basis. AquaTex Indus., Inc. v. Techniche Solutions, 479 F.3d 1320, 1328 (Fed. Cir. 2007) (citing Texas Instruments, 90 F.3d at 1567).

Both parties point to previous inconsistent positions taken by the other to support their contentions. For example, Tietex points out that PFG's expert himself repeatedly opined in his reports on what a person or ordinary skill in the art would

conclude as to infringement. Tietex also notes that in its initial proposed jury instructions, PFG included language requiring testimony from one of ordinary skill in the art, but retracted it more recently. PFG responds that the expert reports were prepared at an earlier time in the case and that it does not matter what legal instructions it initially proposed because an incorrect statement of the law cannot be imposed on it by estoppel. These competing contentions are beside the point.

As to literal infringement, the court defers consideration of whether under the facts of this case the perspective of one of ordinary of skill in the art may be relevant in the context of literal infringement, which will be addressed in a separate order.

As to the doctrine of equivalents, the case law is clear that evidence of equivalence must be from the perspective of one of ordinary skill in the art. The Federal Circuit has expressly said:

Both the Supreme Court and this court have made clear that the evidence of equivalents must be from the perspective of someone skilled in the art, for example "through testimony of experts or others versed in the technology; by documents, including texts and treatises; and, of course, by the disclosures of the prior art." But, while many different forms of evidence may be pertinent, when the patent holder relies on the doctrine of equivalents, as opposed to literal infringement, the difficulties and complexities of the doctrine require that evidence be presented to the jury or other fact-finder through the particularized testimony of a person of ordinary skill in the art, typically a qualified expert, who (on a limitation-by-limitation basis) describes the claim limitations and establishes that those skilled in the art would recognize the equivalents.

AquaTex, 479 F.3d at 1329 (quoting Graver Tank & Mfg. Co., 339 U.S. at 609 and citing Texas Instruments, 90 F.3d at 1566); see also Amgen, Inc. v. F. Hoffmann-La Roche, Ltd., 580 F.3d 1340, 1382 (Fed. Cir. 2009); Lighting World, Inc. v. Birchwood Lighting, Inc., 382 F.3d 1354, 1357 (Fed. Cir. 2004) ("Contrary to Lighting World's contention, the requirement that equivalence be evaluated from the perspective of one of ordinary skill in the art applies whether equivalence is measured by the 'function-way-result' test or by the 'insubstantial differences' test." (citing Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1518 (Fed. Cir. 1995))), rev'd on other grounds, 520 U.S. 17 (1997). PFG fails to acknowledge these cases. Therefore, PFG's motion to preclude Tietex from providing expert testimony from one of ordinary skill in the art on the issue of infringement via the doctrine of equivalents will be denied.¹⁸

H. PFG Motion in Limine No. 7 (To Limit Evidence Related to the Doctrine of Equivalents) (Doc. 224)

PFG moves to preclude Tietex from introducing evidence or making arguments relating to the doctrine of equivalents in three areas: (1) that which is inconsistent with what PFG characterizes as the court's previous holding as to the doctrine as applied in

¹⁸ Tietex does not contend that testimony from one of ordinary skill in the art is necessary for any other issue. (Doc. 239 at 3 (noting that "[w]illful infringement and damages have nothing to do with ordinary skill").)

this case; (2) that which is not based on the claims of PFG's patents in suit; and (3) testimony of its expert, Dr. Horrocks, on the doctrine. (Doc. 225 at 1-2.) Tietex responds that (1) PFG has mischaracterized the court's prior proceedings; (2) PFG seeks to ignore the court's construction of the claim terms; and (3) Dr. Horrocks properly disclosed opinion testimony as to the doctrine of equivalents. (Doc. 240 at 4-5.) Each argument will be addressed in turn.

"An accused device that does not literally infringe a claim may still infringe under the doctrine of equivalents if each limitation of the claim is met in the accused device either literally or equivalently." Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1459 (Fed. Cir. 1998) (en banc) (citations omitted). "An element in the accused product is equivalent to a claim limitation if the differences between the two are 'insubstantial' to one of ordinary skill in the art." Amgen, 580 F.3d at 1382 (citing Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 40 (1997)). "Insubstantiality may be determined by whether the accused device performs substantially the same function in substantially the same way to obtain the same result as the claim limitation." Id. (citing Graver Tank, 339 U.S. at 608).

A patent holder must provide "particularized testimony and linking argument as to the 'insubstantiality of the differences' between the claimed invention and the accused device or process,

or with respect to the function, way, result test when such evidence is presented to support a finding of infringement under the doctrine of equivalents." Texas Instruments, 90 F.3d at 1567. "Generalized testimony as to the overall similarity between the claims and the accused infringer's product or process will not suffice," id., and "evidence and argument on the doctrine of equivalents cannot merely be subsumed in plaintiff's case of literal infringement," Lear Siegler, Inc. v. Sealy Mattress Co., 873 F.2d 1422, 1425 (Fed. Cir. 1989) (citation omitted). Under the "all-elements rule" for assessing equivalency, "a patentee may not assert a 'theory of equivalen[ce] [that] would entirely vitiate a particular claim element.'" Trading Technologies, International, Inc. v. eSpeed, Inc., 595 F.3d 1340, 1355 (Fed. Cir. 2010) (quoting Warner-Jenkinson, 520 U.S. at 38 n.8).

PFG's first argument is that during the hearing on the parties' summary judgment motions, counsel for Tietex conceded the "function-way-result" test for the doctrine of equivalents as the proper test for evaluating equivalency, and that counsel agreed that only the "way" was disputed. PFG contends that this precludes Tietex's reliance on an "alternative test" referred to as the "known interchangeability" test. (Doc. 225 at 5.) PFG relies on the following colloquy:

THE COURT: Let me stop you just to interrupt right there on that issue and the doctrine of equivalents. Do you agree that the question is if you apply the function-

way-result test - first of all, is that an appropriate test?

MR. JONES: Yes, Your Honor.

THE COURT: So, if I apply [the function-way-result test], would you agree that the *function results* seem to be the same, but the way is different? Is that your position?

MR. JONES: Yes, Your Honor, they are in every single patent case I've ever litigated. The function - otherwise, we wouldn't be here. From the function-way-result test, no product ever gets brought in to a patent infringement suit unless it functions in the same way or the result is not the same; otherwise, no one is going to sue you on it.

(Doc. 154 at 77-78 (emphasis added).) PFG also points to the court's ruling on the motions, which states that the parties agreed that the function-way-result test was the proper test and that only the "way" was disputed. (Doc. 152 at 40.)

Tietex properly points out, as is clear above, that its counsel only agreed that the function-way-result test was "an" appropriate test. As a result of the hearing on this motion, however, the question whether some other test might apply is resolved. PFG represented that it does not intend to offer proof of known interchangeability, and Tietex conceded it does not intend to put on evidence of a lack of known interchangeability. Thus, to the extent Tietex's response rested on its statements to the contrary, it is withdrawn. Evidence of known interchangeability will not be relevant. PFG's motion to preclude evidence of known interchangeability will be granted by agreement of the parties.

As to PFG's contention that Tietex's counsel conceded substantial equivalency as to "function" and "result," leaving determination of only the "way" for trial, the record is less clear. As Tietex points out, its counsel clearly conceded that the "result" was the same but denied the "way." In the end, the court denied PFG's motion for summary judgment altogether because there was at least one disputed issue as to the doctrine of equivalents. Had the court meant to limit the case, however, it would have granted PFG partial summary judgment. It did not do so. Therefore, the court will not task Tietex's counsel with a concession as to "function" where it is not sufficiently clear. See Fraternal Order of Police Lodge No. 89 v. Prince George's Cty., MD, 608 F.3d 183, 190 (4th Cir. 2010).

Next, PFG contends that Tietex seeks to defend against equivalency by arguing that its product does not swell in a sufficient amount or in an equivalent manner. (Doc. 225 at 6.) PFG seeks an order that Tietex's arguments and evidence related to the doctrine of equivalents be based on the actual language of the claims of PFG's patents. (Id. at 8.) According to PFG, the question under the doctrine of equivalents is: "even if Tietex's SV-X41 coating does not swell, does it nevertheless perform its function (flame retardant capabilities) in a way that is equivalent to an intumescent." (Id.) Tietex contends that "the single liability issue in this case is whether the SV-X41 swells" and

that it "defies logic" to conclude that a coating that does not swell could nevertheless infringe under the doctrine of equivalents. (Doc. 240 at 14.)

During the hearing, Tietex's counsel stated that it intended to show the jury that this aspect of its product functions as a chemical fire retardant, and that PFG's product functions as a "thermal barrier." It is not entirely clear how this differs from the "way" Tietex's product functions, which counsel contended was by acting as a chemical reaction that "snuffs out" flame. Nevertheless, as to the issue before the court, the court concludes that Tietex is incorrect. Its construction of the doctrine of equivalents - requiring that SV-X41 swell - is no different from the question for literal infringement. If that were the case, there could be no liability under the doctrine of equivalents because it would be rendered superfluous upon a finding of no literal infringement. Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp., 149 F.3d 1309, 1317 (Fed. Cir. 1998) (rejecting argument that the "All Elements" rule can "swallow the doctrine of equivalents, reducing the application of the doctrine to "nothing more than a repeated analysis of literal infringement").

It is true, as Tietex argues, that the doctrine does not apply to the invention as a whole but to the individual elements. Here, it will require a jury to compare the claim term "intumescent" - which the court has defined as a substance that chars and swells

upon exposure to heat or flame - to the element of SV-X41 that allegedly forms the thermal barrier for flame retardancy. If the jury determines that "every limitation of the asserted claim, or its 'equivalent,' is found in the accused subject matter, where an 'equivalent' differs from the claimed limitation only insubstantially," the jury may find infringement under the doctrine. Ethicon, 149 F.3d at 1315-16. "Whether a component in the accused subject matter [SV-X41] performs substantially the same function as the claimed limitation [intumescent, by charring and swelling] in substantially the same way to achieve substantially the same result [flame retardancy] may be relevant to this determination." Id. Thus, PFG's motion is granted to this extent.

Finally, PFG contends that Dr. Horrocks should be precluded from offering any opinion related to the doctrine of equivalents because he has failed to disclose one to date. PFG notes that no portion of Dr. Horrocks's expert reports is labeled as such. Tietex points to the substance of the expert's opinions as to how he believes an intumescent performs and, in contrast, how the accused product performs differently. (Docs. 240-5, 240-6.)

The court concludes that the substance of Dr. Horrocks's opinions, which he offers as one of ordinary skill in the art, are sufficient notice to PFG that they serve as a defense against alternate liability under the doctrine of equivalents. For

example, in his first report, Dr. Horrocks provided an opinion regarding how the coating performs as a flame retardant based on his analysis of the chemical components. (Doc. 132-2 at 17-23; id. at 23 (“In conclusion, it is my considered opinion that the SV-X41 coating formulation, when either applied to an inert surface alone or to a fabric, may promote char formation from the resin component and, in the context of application to a fabric, from some underlying fibres in the coated fabric (e.g., viscose rayon), but any such char would not be inflated or swollen.”).) In his November 2015 deposition, he attempted to distinguish Tietex’s product on the basis that the underlying fabric may have “thermal characteristics” and because of the underlying chemical composition of SV-X41. (Doc. 145-11 at 213.) With regard to the coating, he noted that SV-X41 contains “a high percentage of aluminum trihydrate which gives off lots of moisture which has an insulating effect, a flame-diluting effect, and it also has a potential ceramic barrier effect.” (Id.) He further opines that the use of aluminum trihydrate was “not in many standard [sic] what you might call intumescent formulations.” (Id.) Finally, he further explained his theory regarding how SV-X41 performs at “thermally thin” applications. (Id. at 215-20). While acknowledging the scope of the court’s claim construction, he claimed that the chemical composition of the coating prevents it from swelling at thin applications because it lacks a “carbonific

source.” (Id. at 219-20 (“The Tietex coating, whatever it is, is not designed to [swell], because there is no carbonific source. If it has every component of an intumescent except the carbonific source.”)).¹⁹

For these reasons, PFG’s motion in limine to exclude Dr. Horrocks from testifying as to infringement under the doctrine of equivalents on the basis that he failed to disclose such opinions is denied.

I. CONCLUSION

For the reasons stated above,

IT IS THEREFORE ORDERED that the parties’ motions in limine are granted in part and denied in part, as set forth above. Any motion not specifically resolved, in whole or in part, in this opinion or during the hearing will be addressed shortly in a separate order. The parties are directed to instruct their witnesses in conformance with this court’s order.

/s/ Thomas D. Schroeder
United States District Judge

February 25, 2018

¹⁹ Because PFG’s motion seeks to preclude only the testimony of Dr. Horrocks, the court does not address the evidence from any other witness or source.