UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF FLORIDA
JACKSONVILLE DIVISION

MARSHA K. DUGAS, as Personal Representative of the Estate of Darryl S. Dugas,

Plaintiff,

v. Case No. 3:14-cv-1096-J-39JBT

3M COMPANY, et al.,

Defendants.
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ORDER

THIS CAUSE is before the Court on Defendants' Henkel Corporation and Dexter-Hysol Aerospace, LLC's Motion to Exclude Dr. Longo's Opinions and Experimental Tests under Daubert (Doc. 553); Defendant United Technologies Corporation's Motion to Exclude MAS Work Practice Study (Doc. 536); and Defendant United Technologies Corporation's Amended Motion to Exclude Opinions of William E. Longo (Doc. 537) (collectively, the "Motions to Exclude").[1] Plaintiff responded with her responses in opposition (Docs. 551 and 561) and her Objections and Motion to Strike Defendant United Technologies Corporation's Motion to Exclude MAS Work Practice Study under Daubert (Doc. 550). The Court also heard argument on the Motions to Exclude. Accordingly, the matters are ripe for review.

[1] Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 582 (1993).

A. Plaintiff's Motion to Strike Defendant United Technologies Corporation's Motion to Exclude MAS Work Practice Study under Daubert (Doc. 550)

In light of ongoing discovery, the Court denied certain enumerated motions and allowed the parties to file amended versions of those motions. (Docs. 505 and 507). Among those enumerated motions was UTC's Motion to Exclude Opinions of William E. Longo, Ph.D, under Daubert (Doc. 347). (Doc. 505). The Court set the deadline for amended Daubert Motions for September 3, 2015. (Doc. 507 at 1). UTC filed two Daubert motions on September 3, 2016: one which addressed Dr. Longo's clamp study; and one that addressed Dr. Longo's surface sample analysis. (Docs. 536 and 537; collectively, the "Motions"). Plaintiff argues that one of UTC's Daubert motions should be stricken because the Motions inappropriately circumvent the page limit and because UTC failed to meet and confer with Plaintiff before filing the Motions. (Doc. 550 at 2-3).

Local Rule 3.01(a), United States District Court, Middle District of Florida ("Local Rule(s)"), limits the length of motions to twenty-five pages. Additionally, before the filing of Daubert motions, the moving party must certify that it conferred with opposing counsel and inform the Court of whether the parties could agree on a resolution of the motion at issue. See Local Rule 3.01(g). Even assuming UTC violated these rules, district courts have broad discretion in their application of local rules. See Fils v. City of Aventura, 647 F.3d 1272, 1283 (11th Cir. 2011) ("Although the Plaintiffs' submissions did not comply with the letter of the Local Rule, its submission was sufficient for the district court, which is good enough for this court.") (internal citation omitted).

Given the complex posture of this case, the Court will overlook UTC's failure to strictly adhere to the Local Rules. The Court's decision is, in part, due to the demanding and, at times, confusing discovery schedule which arose in order to accommodate Plaintiff's request to conduct discovery beyond the originally ordered discovery deadline. (See generally, Doc. 505). The Court also considers its role as a gatekeeper for the admission of expert testimony which "imposes a special obligation upon a trial judge to ensure that any and all scientific testimony is not only relevant, but reliable." Kumho Tire Co. v. Carmichael, 526 U.S. 137, 147 (1999) (internal alterations, quotations, and citation omitted). UTC's Daubert Motions assist the Court in meeting its obligation regarding Dr. Longo's expert testimony. Further, as UTC's Motions addressed two different aspects of Dr. Longo's opinions in two different motions, any benefit to UTC through the use of two motions inured to Plaintiff as well because it afforded Plaintiff two opportunities to respond.

B. Motions to Exclude Dr. Longo's Opinions

Rule 702 of the Federal Rules of Evidence provides that:

> A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
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> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
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> (b) the testimony is based on sufficient facts or data;
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> (c) the testimony is the product of reliable principles and methods; and
>
> (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Civ. P. 702.[2] In Daubert, the Supreme Court explained that Rule 702 imposes an obligation on a trial court to act as gatekeeper, to ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable. Daubert, 509 U.S. at 589.[3] In evaluating the admissibility of expert testimony, a trial court must consider if:

> (1) the expert is qualified to testify competently regarding the matters he intends to address;
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> (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in Daubert; and
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> (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue.

United States v. Frazier, 387 F.3d 1244, 1260 (11th Cir. 2004) (quoting City of Tuscaloosa v. Harcros Chems., Inc., 158 F.3d 548, 562 (11th Cir. 1998)); see also Quiet Tech. DC-8, Inc. v. Hurel-Dubois UK Ltd., 326 F.3d 1333, 1340-41 (11th Cir. 2003). "The burden of laying the proper foundation for the admission of the expert testimony is on the party offering the expert, and admissibility must be shown by a preponderance of the evidence." Cook ex. rel. Estate of Tessier v. Sheriff of Monroe Cnty., Fla., 402 F.3d 1092, 1107 (11th Cir. 2005) (internal quotation and citations

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[2] The language of Rule 702 was revised in 2011 for stylistic reasons only, with "no intent to change any result in any ruling on evidence admissibility." Fed. R. Evid. 702 advisory committee's notes 2011 Amendments. Thus, case law construing former Rule 702 remains viable and is applicable here.

[3] Although the expert testimony at issue in Daubert was scientific, the Supreme Court held in Kumho Tire Co., Ltd., 526 U.S. 137, that the Daubert analysis and a trial judge's role as gatekeeper "applies not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge." Kumho Tire, 526 U.S. at 141.

omitted). With these standards in mind, the Court analyzes Dr. William Longo's opinions.

1. Dr. Longo's Opinion Regarding EPON 934

EPON 934 was an asbestos-containing, two-part adhesive— part A, "which was principally the resinous part"; and part B, "which [was] principally the curative part"— originally developed and sold by the Shell Chemical Company sometime before 1963. (Doc. 630.1 at 5 and 8). Its principal purpose was to bond metal substrates. Id. at 5. The user would need to mix both parts at a ratio of 100 parts of part A to thirty-three parts of part B, and then allow the mixed material time to set. Id. While Darryl Dugas served in the Navy, he inspected, maintained, and repaired the exterior of A-7 aircraft. (Doc. 615.1 at 29). The repair of the A-7 aircraft sometimes involved the use of EPON 934. Id. at 31. Once the EPON 934 was mixed, applied, and dried, Mr. Dugas would file the EPON 934 to keep the surface smooth and consistent, which created a "dusty [environment]—something that you didn't want to be breathing in." Id. at 32-33.

Dr. Longo initially opined that Mr. Dugas "would have been exposed to significant levels of airborne asbestos fibers" while Mr. Dugas was "sanding" and "filing" asbestos-containing adhesives such as EPON 934. (Doc. 553.2 at 10). Following his initial report, Dr. Longo created several work-practice experiments which involved Dr. Longo's attempts to recreate EPON 934 and to test his version of EPON 934 under work practices similar to those employed by Mr. Dugas. Defendants argue that Dr. Longo's opinion and results should be excluded because he failed to apply a reliable methodology, and he failed to rely on sufficient facts and data. Defendants' complaints focus on Dr. Longo's deviations from: (1) the EPON 934 formula card; (2) the manner in

which Mr. Dugas used EPON 934; and (3) the environmental conditions under which Mr. Dugas used EPON 934. (Doc. 553 at 2).

a. Remanufacture of EPON 934

At Plaintiff's request, Dexter-Hysol provided Dr. Longo with the "Manufacturing Instructions" for EPON 934 part A and part B. (Doc. 557.1). The instructions set out the type and amount of each material to be used as well as the procedures for their mixture in creating both part A and B. Id. Dr. Longo's efforts to replicate EPON 934 and test his results produced several new "work-studies" and supplemented expert reports. (E.g., Doc. 557.2); (Docs. 557.8 and 557.9). In reformulating EPON 934, Dr. Longo was unable to obtain the first two ingredients on the formula card (Doc. 639.1 at 89 and 90) so he purchased the non-asbestos-containing version of EPON 934 "off the shelf," stripped out the epoxy— thought to approximate the unavailable ingredients—and mixed that epoxy with the next two ingredients, aluminum and asbestos. Id. at 89. The final product was "a brownish, yellowish, like a honey color but a little bit more brown into it." (Doc. 553.8 at 6-7).

Dexter-Henkel's designated expert Dr. Reitman from Exponent Inc. created a batch of EPON 934 using Dr. Longo's method of extraction and compared it to a batch of EPON 934 using "either the named raw material or a raw material equivalent" identified on the formula card. (Doc. 557.14 at 10). In comparing the results, the extraction sample was darker and cloudier, while the formula sample was "lighter in color and much clearer." Id. at 11. Dr. Reitman explained that the appearance of the extraction sample was due in part to water being absorbed into the mixture, which affects viscosity and reactivity. Id.

Dr. Reitman also took issue Dr. Longo's use of aluminum particles that were between four and six times smaller than what the formula requires. (Doc. 557.14 at 12). Using the smaller aluminum particles results in an alteration in viscosity, which interferes with the ability of the mixture to retain asbestos when sanded. Id. While Dr. Longo concedes that he used different sized aluminum particles in his recreation of EPON 934 (Doc. 801 at 25), he denies that this process substantially altered the amount of asbestos released from his sample when compared to what Mr. Dugas used. Id.

Next, Dr. Reitman explains the difference between the two samples is due in part to Dr. Longo's use of a different grade of asbestos than that called for by the formula. (Doc. 557.14 at 12-13). This difference is significant because the asbestos Dr. Longo used was "coarser" which ultimately increased "the likelihood of free asbestos fiber release when sanded." Id. Dr. Reitman also explained that Dr. Longo's deviation from the manufacturing process by hand-mixing the components and by failing to monitor the temperature of mixture increased the chance of asbestos fiber release as compared to the formula method. Id. at 14. Dr. Reitman supports her assertions through both explanation and visual demonstrations of the extracted sample compared to the formula sample. (Doc. 557.14 at 15-17). Indeed, review of the visual depictions demonstrates that the extraction sample was "stiff, dull, grainy, and fibrous" when compared to the formula sample. Id.

Dr. Longo admits that his method of recreation of EPON 934 did not adhere to the EPON 934 formula card. (E.g., Doc. 639.1 at 53). However, Dr. Longo claims that there were not any substantial differences between the materials called for by the

formula and the materials which he actually used. Id. In support, Dr. Longo cites the similarity of the results between the Hysol Study[4] and his study, and concludes that the differences between his recreated EPON 934 and that used by Mr. Dugas are inconsequential. Id. at 74, 84 and 119-20.[5] Dr. Longo explains his deviations as being necessary in light of practical considerations. For example, Dr. Longo asserts that it would have been impractical to mix his smaller laboratory-created sample in a commercial mixer the same way one would with a commercial-sized quantity produced from following the formula. (Doc. 639.1 at 100).

b. Application and Usage

Dr. Reitman takes issue with Dr. Longo's method of curing the mixture of part A and part B. (Doc. 557.14 at 19). Dr. Longo cured his mixture for one hour at 200 degrees Fahrenheit.[6] Id. This was a deviation from the cure method employed by Mr. Dugas, which involved letting the mixture set at ambient air temperature for approximately twenty-four hours. Id. The distinction is crucial, because "curing epoxies at [a] higher temperature can alter the chemical structure and associated physical properties" which leads to a finished product with a "higher potential for free asbestos fiber release . . . ." Id. at 19 and 21. In response, Dr. Longo references a Dexter-Hysol description that claims EPON 934 maintains strength even after exposure to 400

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[4] Presumably Dr. Longo's reference to the Hysol Study is a reference to Dexter-Hysol's 1976 study on the amount of asbestos dust generated from dry sanding cured EPON 934 for 15 minutes with local exhaust on was .06 f/cc and 4.27 f/cc for minutes with no local exhaust. (Doc. 561.12 at 2).

[5] Dr. Longo explained the difficulties involved with obtaining the thousands of pounds of materials called for by the formula. (E.g., Doc. 639.1 at 28 and 53).

[6] Dr. Longo also tested Exponent's recreated batch of EPON 934. (See generally Doc. 557.9).

degrees Fahrenheit and recommends curing the product at either "[five] to seven days at 24°C (75°F), or 1 hour at 93°C (200°F) to obtain full strength." (Doc. 561.21 at 4); see also (Doc. 639.1 at 213).

Once Dr. Longo formed a cured sample, he subjected the sample to varying grits of sand-paper, none of which matched the grit used by Mr. Dugas. (Doc. 557.16 at 16). Instead, Dr. Longo used 120 grit, 220 grit, and 320 grit, which "would have generated elevated results of fine particulate" compared to the 60, 150, or 180 grit that Mr. Dugas used. Id.; see also (Doc. 632.1 at 10 (Mr. Emrich's testimony that he witnessed Mr. Dugas using a pneumatic sander with "60 grit, the heavier coarse [grit], then the 180 to smooth it out.")). Finally, Defendants take issue with Dr. Longo's failure to recreate similar airflow rates in his work-practice study which likely exaggerated Mr. Dugas's exposure to asbestos-fibers while working with EPON 934. Id. at 15.

Dr. Longo concedes that his work-practice study with EPON 934 would not necessarily replicate the level of asbestos exposure that Mr. Dugas encountered. (Doc. 639.1 at 137). For example, Dr. Longo says there may have been environmental differences between the work-practice study and Mr. Dugas's use of EPON 934 that could impact the levels of respirable asbestos fibers present. Id. Regardless, Dr. Longo concludes that the study was designed to show that the "disturbance of [EPON 934] will produce respirable size OSHA fibers . . . [and] is consistent with the Hysol study." Id. at 138. Further, Dr. Longo said it would be impossible to simulate and accurately replicate the variables associated with the environmental conditions Mr. Dugas faced. Id. at 139.

Dexter-Henkel also note that Dr. Longo mixed part A and part B at a ratio of 100 to twenty-eight instead of 100 to thirty-three (Doc. 553.9 at 16). Dexter-Henkel then

provide a one-page excerpt from *Interface Science and Technology* (2011) that speaks to the importance of mixing materials in the proper ratio, (Doc. 553.13 at 4), but other than inviting the Court to infer the effect of Dr. Longo's deviation, Dexter-Henkel do not orient the Court to evidence that Dr. Longo's deviation is material. Moreover, it is unclear whether Mr. Dugas ever measured precisely to ensure the recommended ratio of part A to part B.

Dexter-Henkel seeks to exclude Dr. Longo's opinions, and testing because of his myriad deviations from the formula card and his failure to replicate the work practices and conditions of Mr. Dugas. Admissible experimental and demonstrative evidence need not "be precisely reproduced, but they must be so nearly the same in substantial particulars as to afford a fair comparison in respect to the particular issue to which the test is directed" when such evidence is offered as a "recreation of the accident . . . ." Burchfield v. CSX Transp., Inc., 636 F.3d 1330, 1334, 1336-37 (11th Cir. 2011) (internal quotations and citations omitted). However, when evidence "is offered only as an illustration of general scientific principles, not as a reenactment of disputed events, it need not pass the substantial similarity test[,]" but the evidence should be presented without suggesting that it simulates the relevant conduct. Burchfield, 636 F.3d at 1334-35.

In this case, Plaintiff intends to offer Dr. Longo's work-practice study as one which demonstrates the effect of applying an abrasive material such as sand paper to an asbestos-containing adhesive similar to the one with which Mr. Dugas worked. (Doc. 561 at 16). Plaintiff does not seek to offer Dr. Longo's work-practice study as

reenactment evidence.[7] Id. Plaintiff's approach finds support from Heath v. Suzuki Motor Corp., 126 F.3d 1391, 1396 (11th Cir. 1997), a case in which the Eleventh Circuit affirmed the district court's admission of "evidence involving rollovers of three dissimilar vehicles [that] was offered by Suzuki to explain how rollovers occur." The Eleventh Circuit reasoned that the evidence, though distinguishable from the plaintiff's accident, was properly admitted to show the "physical principles behind rollover accidents." Id.

Similar to the defendant's evidence in Heath, Dr. Longo's study is offered to demonstrate the physical principles behind the release of respirable asbestos fibers and his work-practice study is sufficiently reliable to demonstrate these principles. To be sure, Dr. Longo's extraction sample, the manner in which Dr. Longo applied the sample, and the manner in which Dr. Longo tested the sample deviate from what Mr. Dugas encountered. While these deviations may have inflated the concentration of the respirable asbestos fibers that Dr. Longo detected, "vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." Rosenfeld v. Oceania Cruises, Inc., 654 F.3d 1190, 1193 (11th Cir. 2011) (internal citation and quotations omitted). Moreover, many of Dexter-Henkel's complaints about Dr. Longo's replication of EPON 934 are mooted when Dr. Longo found above-background levels of asbestos even when he used the formula sample prepared by

[7] It is not enough for Plaintiff to disclaim that the work-practice study is simply to demonstrate physical principles. See Birchfield, 636 F. 3d at 1334 (finding that despite the defendant's insistence that the video-demonstrative evidence of an accident recreation was not a reenactment, the evidence was presented and argued to the jury to be representative of what actually happened and was therefore subject to the substantial similarity requirement.).

Exponent. Dr. Longo's opinion assists the jury regarding the release of respirable asbestos fibers, and to the extent Dexter-Henkel challenge Dr. Longo's opinions, they are free to make those points to the jury.

In admitting Dr. Longo's opinions from his work-studies, the Court is mindful "that demonstrative exhibits tend to leave a particularly potent image in the jurors' minds." See United States v. Gaskell, 985 F.2d 1056, 1061 (11th Cir. 1993) (internal citations omitted). In turn, this leads to the potential that Dr. Longo's video demonstration may unfairly prejudice Dexter-Henkel.[8] For this reason, Plaintiff will be limited to presenting Dr. Longo's work-studies as illustrative of physical principles and not as reenactment evidence replicating the actual levels of asbestos Mr. Dugas encountered.

Dr. Longo's many deviations make it clear that his work-studies are not substantially similar to those Mr. Dugas encountered. Showing Dr. Longo's video runs too high of a risk that the jury would be unfairly influenced by the misleading similar conditions between the work-study and Mr. Dugas's work conditions. The product tested appears to be the same as the one with which Mr. Dugas worked—but it is not. The sander used in the testing appears to be the same as the one Mr. Dugas used, but Mr. Dugas utilized a different RPM sander with different grits of sand paper on a product which was cured in a manner different from the way Dr. Longo cured the product. Finally, the video does not capture or consider the environmental conditions which may have affected the manner in which the asbestos fibers were released. Accordingly, the video offers little probative evidence, but invites a plethora of unfair

[8] Unfair prejudice is more than "simply adverse to the opposing party[,]" it is also "unfair." Dollar v. Long Mfg., N.C., Inc., 561 F.2d 613, 618 (5th Cir. 1977).

inferences. Accordingly, Dr. Longo's demonstrative evidence is due to be excluded for being unfairly prejudicial.

2. United Technologies Corporation's Motions

a. Clamp Blowdown Study

UTC addresses Dr. Longo's opinions which were formed on the basis of the Materials Analytical Services ("MAS") (1) work-practice study on the application of compressed air to asbestos-containing clamps from Pratt and Witney TF30 and JT3D jet engines ("Clamps Study") and on the basis of (2) Dr. Longo's study on Mr. Dugas's potential exposure to respirable asbestos from the application of compressed air inside the engine bay of an A-7 aircraft. The Court begins its analysis with Dr. Longo's clamp study.

Dr. Longo's clamp study was based on forty-five clamps and two wire insulation samples. Thirty-nine of the clamps were "new" clamps of unknown origin, while the remaining materials were collected from a commercial JT3D aircraft engine. (Doc. 536.9 at 10 and 14). UTC claims that Dr. Longo's clamp study failed to simulate the conditions Mr. Dugas faced while serving in the Navy and that Dr. Longo failed to apply a reliable methodology in interpreting the results of the Clamp Study.

Dr. Longo conceded that the clamp study did not replicate Mr. Dugas's working environment, but that it could demonstrate whether the clamps would release measurable amounts of respirable asbestos fibers. (Doc. 536.9 at 42). UTC disagrees. UTC claims that Dr. Longo's clamp study "utilized unrealistic settings, non-representative materials, and overly aggressive techniques." (Doc. 536 at 9). For example, UTC represents to the Court that "there is no evidence that Mr. Dugas used

compressed air to blowdown aircraft engines or any in-place asbestos-containing clamps . . . ." (Doc. 536 at 9-10). However, lay witness Wray Emrich testified that Mr. Dugas used compressed air to clean engine bays (Doc. 632.1 at 14-15). He also testified that other people used compressed air on the engines and in Mr. Dugas's presence. Id. at 15.[9] This testimony is sufficient to justify Dr. Longo's application of compressed air to the engine clamps.

Next, UTC contends that the clamps tested were not representative of the clamps which would have been present on the engines with which Mr. Dugas worked. Dr. Longo used three categories of clamps: (1) Clamp Set 1, which were removed from two engines at the Pratt and Witney plant; Clamp Set 2, which included thirty-nine new asbestos-containing clamps; and Clamp Set 3, which consisted of six "old or aged" clamps taken from a JT-3D engine. (Doc. 536.12 at 22-23). Dr. Longo opined that testing Clamp Set 1 would be futile because the residue coating the clamps would prevent the release of any detectable levels of airborne asbestos fibers Id. at 23. For Clamp Sets 2 and 3, Dr. Longo applied compressed air at 80 pounds per square inch ("psi") for approximately one minute. Id. The testing of both samples yielded significant levels of airborne asbestos. Id.

UTC challenges the results from Dr. Longo's testing of Clamp Sets 2 and 3 because Mr. Dugas would have most likely worked with clamps similar to those found in Clamp Set 1. Even assuming Mr. Dugas would have worked with clamps similar to Clamp Sets 2 and 3, UTC challenges how Dr. Longo arranged the clamps for the study,

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[9] It is unclear whether Mr. Emrich's testimony supports the proposition that Mr. Dugas himself used the compressed air. (See Doc. 632.1 at 15).

and the psi Dr. Longo utilized. Regarding the positioning of the clamps, UTC cites to the deposition of Dr. Lee for the proposition that Dr. Longo's "arrangement of the clamps . . . are not in any way related to what would have been present on the aircraft . . . ." (Doc. 536 at 11 (citing Doc. 613.2 at 12)). The testimony of Charles Blake also supports UTC's contention. (Doc. 536.2 at 32).

The arrangement of the clamps is significant because the more clamps involved the higher the chance that airborne asbestos fibers are found. (Doc. 536.1 at 8; Blake Report). Dr. Longo responds that the study was only designed to test whether the clamps could release measurable amounts of asbestos fibers. (Doc. 536.9 at 42). Similar to Dr. Longo's response, Plaintiff does not dispute UTC's position, but argues that it is a deviation which should be addressed on cross-examination. (Doc. 551 at 17).

Dr. Lee also testified that Dr. Longo tested clamps that had a surface area subject to compressed air which was two to five times larger than the clamps with which Mr. Dugas worked owing to the geometry of the tested clamps. (Doc. 536.4 at 32). Dr. Lee explains that the larger surface area is relevant because it presents a greater likelihood for asbestos release. Id. UTC also notes that the clamps removed from the JT3D engine were in disrepair unlike the clamps removed from the TF-30 engine in Connecticut. (Doc. 536.2 at 32; Blake Depo). However, Mr. Blake admitted that it is possible that the clamps with which Mr. Dugas worked more closely resembled the condition of the clamps from the JT3D. Id. (acknowledging that combat damage to the planes could have caused the clamps with which Mr. Dugas worked to break-down). A quick review of the record justifies Dr. Longo's inclusion of deteriorated engine parts as Mr. Emrich testified that parts of the engines would break down and were "brittle" which

created a lot of dust. (Doc. 632.1 at 14). As to the larger surface area, Plaintiff does not dispute UTC's position, but argues that it is a deviation which should be addressed on cross-examination. (Doc. 551 at 17).

UTC also takes issue with the distance at which Dr. Longo applied the compressed air and that Dr. Longo used 80 psi of compressed air while OSHA limits the psi to 30 when used for cleaning purposes. (Doc. 536 at 16). While Mr. Blake opines that using 80 psi for cleaning purposes would be dangerous and above the limits set by OSHA (Doc. 536.1 at 8; Blake Report), he also testified that OSHA was not in existence at the time Mr. Dugas served in the Navy. (Doc. 536.2 at 7; Blake Depo.). Moreover, Dr. Longo explained that he used 80 psi because it requires at least that much pressure to run a grinder of 10,000 rpm or higher. (Doc. 536.12 at 13). Witness Robert Ganey testified that Mr. Dugas would have both hand-sanded the EPON 934 and used a pneumatic sander at 25,000 RPM. (Doc. 561.5 at 14). Thus, there is support for the idea that Mr. Dugas may have used compressed air with at least 80 psi.

Regarding the distance with which Dr. Longo held the nozzle through which the compressed air flew, Dr. Lee opines that Dr. Longo erred by placing the nozzle "immediately up adjacent to the, to the clamp, and literally destroyed at least one of them." (Doc. 536.5 at 13). UTC contends that there is no evidence that servicemen working in the vicinity of Mr. Dugas would have applied compressed air in a way that would destroy clamps, and, thus Dr. Longo's testing conditions exaggerated his results. Again, Plaintiff does not dispute UTC's position, but she argues that it is a deviation which should be addressed on cross-examination. (Doc. 551 at 17).

UTC next references OSHA Method ID-160 and alleged Dr. Longo's failure to follow the guidelines for collecting air samples. (Doc. 536 at 17). Method ID-160 recommends a minimum air volume of 25 L, with a maximum of 2400 L. (Doc. 536.17 at 2). Dr. Longo failed to follow OSHA Method ID-160. Plaintiff does not address UTC's argument.

After noting the alleged deviation from OSHA recommendations in the amount of air sampled, UTC also faults Dr. Longo's analysis of the air samples for failing to follow NIOSH 7400 and 7402 protocols. (Doc. 536 at 18). Dr. Longo testified that NIOSH 7400 and 7402 are the "only approved standards for assessing occupational exposure to asbestos." (Doc. 551.14 at 10). Dr. Longo explained that NIOSH 7400 requires that the analysis look to the first "100 fibers or 100 openings, whichever comes first," but Dr. Longo counted 200 openings instead. (Doc. 536.9 at 40). Dr. Longo explained that his deviation altered the detection limits to improve accuracy, id., a notion that UTC disputes. Dr. Longo testified that his modification altered his results from an asbestos level below the detection limit to one where the results were above the detection limit. (Doc. 626.1 at 23). Dr. Longo also deviated from NIOSH 7402 by counting sixty grid openings instead of forty. (Doc. 536.13 at 8). This deviation caused asbestos to be detected where strict adherence to protocol previously produced no detection of asbestos. Id.

Plaintiff admits that Dr. Longo deviated from NIOSH 7400 and 7402 but cites to Dr. Longo's testimony that his deviations merely increased the accuracy of his results. (Doc. 551 at 13 (citing Doc. 551.11 at 10)). Moreover, Dr. Longo testified that his method is used by researchers, including Exponent Laboratories (the lab that critiqued

Dr. Longo's recreation of EPON 934), id., because low concentrations of asbestos fibers may not be evenly distributed, and the additional grids allow for a more accurate picture of whether asbestos is present. Id.

For support, Plaintiff cites to a case from an Ohio State Court of Appeals case, Shesler v. Consol. Rail Corp., 151 Ohio App. 3d 462, 471 (Jan. 24, 2003). The Shesler court affirmed the trial court's admission of Dr. Longo's abrasion study and discounted his deviations from the plaintiff's actual exposure. Id. The court's justification was that Dr. Longo's study was relevant to the issue of asbestos release, even though it did not necessarily and accurately recreate the conditions of the plaintiff's actual exposure. Id. This case is not particularly helpful either in fact or law. As to the facts, the abrasion study is completely different from the issues raised in UTC's motion. As to the law, this Court is bound by the holding in Burchfield, 636 F.3d 1330, which sets-forth the standards for admission experimental evidence.

However, even setting aside the requirements for the introduction of demonstrative and experimental evidence that purportedly recreates an incident at issue in trial, the record in this case supports exclusion of Dr. Longo's clamp studies. The Court is mindful of Dr. Longo's opinion—that Mr. Dugas was exposed to significant levels of asbestos which arose from UTC's engines— and how Dr. Longo supports that conclusion. Dr. Longo's clamp study deviated significantly from the only accepted scientific protocols, such that Dr. Longo admits that his deviations altered his results. While "the proponent of the testimony does not have the burden of proving that it is scientifically correct [she must show] . . . by a preponderance of the evidence, it is reliable." Allison v. McGhan Med. Corp., 184 F.3d 1300, 1312 (11th Cir. 1999) (internal

citation omitted). Applying this standard to Dr. Longo's clamp studies, the Court first considers his admission that NIOSH 7400 and 7402 are the only two accepted standards for determining occupational exposure to asbestos. In accordance with the accepted standards for applying NIOSH 7400 and 7402, the clamp studies failed to yield detectable amounts of asbestos fibers. Undeterred, Dr. Longo modified the detection criteria to the level wherein asbestos is detectable.

In reviewing Dr. Longo's deviation, the Court is mindful of the four guiding factors for district courts to consider when evaluating an expert's methodology, namely:

> (1) whether the expert's methodology has been tested or is capable of being tested; (2) whether the theory or technique used by the expert has been subjected to peer review and publication; (3) whether there is a known or potential error rate of the methodology; and (4) whether the technique has been generally accepted in the relevant scientific community.

Chapman v. Procter & Gamble Distrib., LLC, 766 F.3d 1296, 1305 (11th Cir. 2014), cert. denied, 135 S. Ct. 2312, 191 L. Ed. 2d 1000 (2015). In this case, Plaintiff fails to establish that any of these factors weigh in favor of admitting Dr. Longo's opinion. "Failure to satisfy any of the four reliability factors recognized in Daubert is sufficient to preclude the testimony of any of the general causation experts from testifying at trial." Chapman, 766 F.3d at 1307 (internal citation omitted).

Even beyond Dr. Longo's method of detection, Dr. Longo's clamp study pose other issues. For example, Dr. Longo fails to explain why he failed to follow OSHA guidelines in obtaining a representative air sample. Moreover, Dr. Longo nor Plaintiff dispute the testimony from Dr. Lee and Mr. Blake regarding Dr. Longo's clamp studies engaging in practices that inflated the amount of asbestos released. While the Court might be inclined to leave some of Dr. Longo's questionable tactics for the jury to

resolve through cross-examination and competing expert testimony, in this case, it is clear from Dr. Longo's deviations both in the development of the clamp study and his subsequent failure to follow any generally accepted, peer-reviewed, substantiated, or published methodology for interpreting his results that his opinion's underpinnings are unreliable. This conclusion is reinforced by the fact that all of Dr. Longo's deviations in the study resulted in significant increases in the amount of asbestos released—from the arrangement of the clamps to the 200%-500% increase in surface area tested—combined with the fact that Dr. Longo still could not detect asbestos without modifying the only acceptable methods for occupational exposures to make the asbestos detectable.

b. Surface Sample Extrapolation

UTC's final attack comes against Dr. Longo's method of analysis of a surface sample of dust taken from the engine bay of an abandoned airframe in the California desert. In addition to the obvious issues associated with using a dust sample from an abandoned airframe from the desert as representative of what Mr. Dugas cleaned fifty years ago, UTC challenges Dr. Longo's use of the American Society for Testing and Materials D5755 ("D5755") to analyze the surface sample. Further, UTC challenges Dr. Longo's extrapolation of the amount of asbestos found in the surface sample to predict a range of airborne asbestos which lead to the surface sample's origin—which he then argues approximates the asbestos exposure to Mr. Dugas during his time in the Navy.

UTC raises several issues with the A-7 airframe from which the dust sample was taken, including:

> (1) Disparity in the conditions accompanying the abandoned airframe may make it a poor comparator to the airframe with which Mr. Dugas worked
>
> (2) Dr. Longo did not know how long the airframe had been retired
>
> (3) Dr. Longo did not know what engines had been inside of it
>
> (4) Dr. Longo did not know the last time an engine had been inside the airframe
>
> (5) Dr. Longo did not know what components may have come with the airframe
>
> (6) Dr. Longo did not know whether those components contained asbestos
>
> (7) Dr. Longo did not know whether the doors to the engine compartment had been open or closed
>
> (8) Dr. Longo could not eliminate the possibility of environmental contamination.

(Doc. 537.8 at 36-47; Longo Depo.). UTC contends that these unresolved questions severely undermine Dr. Longo's conclusions, and certainly highlight distinctions among the engine bays of the abandoned airframe and the ones in service during Mr. Dugas's Navy tenure. Yet, the biggest concern about Dr. Longo's surface sample comes from the mode of analysis itself.

In his expert report, Dr. Lee claims that Dr. Longo's use of D5755 to analyze the surface sample "is not a reliable, tested, and generally accepted analytical method for assessing occupation exposure to airborne asbestos . . . ." (Doc. 537.3 at 7). Dr. Longo's deposition testimony corroborates Dr. Lee's opinion. (Doc. 551.14 at 10; Longo Depo. (NIOSH 7400 and 7402 are the "only approved standards for assessing occupational exposure to asbestos.")). Dr. Lee, in a peer-reviewed publication, explained his opinion for D5755's unreliability is that D5755 is unable to consistently

provide quantitative results, but that the test is suitable for a qualitative determination of whether asbestos was present in the surface sample. (Doc. 537.13; Lee, et al., *Interlaboratory Evaluation of the Breakup of Asbestos-Contain Dust Particles by Ultrasonic Agitation*, Environ. Science & Tech., Vol. 30, No. 10, p. 3010-15).

Despite Dr. Lee's publication and testimony, Plaintiff responds by citing Dr. Longo's testimony that he's never seen any data that supports the idea that sonication would inflate or change the size distribution of the asbestos bundles and fibers that are present. (Doc. 551 at 10 (citing Doc. 551.14 at 6)). On the other hand, Dr. Lee's position finds support in other peer-reviewed published articles. E.g., Doc. 537.17. The gist of the critique is that the preparation involved with the D5755 requires that the sample be "homogenized" through sonication. Id. at 2. The sonication breaks down larger complex asbestos structures into more numerous and separate structures which can exponentially increase the detectable levels of asbestos from the direct method of testing. Id.; see also In re Armstrong World Indus., Inc., 285 B.R. 864, 869 (Bankr. D. Del. 2002) ("The data from the indirect method may also suffer from significant variability in the size and number of structures reported by different laboratories preparing and analyzing identical samples. One study reported that the range of results for each sample type revealed a 1000-fold difference between the highest and lowest concentrations.") (internal quotations and citation omitted).

Bolstering the case that Dr. Longo's indirect method of preparation was unreliable for quantifying the concentration of asbestos is Dr. Lee's expert report which opines that not a single "regulatory body has approved the use of indirect preparation with sonication as used by Dr. Longo . . . ." (Doc. 537.3 at 7). Given the weight of

scientific authority and the availability of an alternate and historically utilized "direct transfer" method, id., it is hard to rationalize Dr. Longo's use of D5755 for quantifying the amount of asbestos dust present in the surface sample. However, even assuming D5755 was appropriate for use in this case, Dr. Longo admittedly did not follow the D5755 protocol because he only took a single sample from the tested airframe. (Doc. 537.3 at 9). Plaintiff responds by arguing that Dr. Longo's "knowledgeably and reliably applied the ASTM protocol [] because he was an author of the protocol." (Doc. 551 at 10 (citing (Doc. 551.14 at 9)). Yet, nothing about being an author of a protocol makes one infallible in the protocol's application.

D5755 calls for the collection of at least three dust samples at a specific location. Id. Dr. Longo failed to collect three samples. Dr. Longo explained that his deviation does not invalidate his conclusion because the three sample sizes are not needed for such a small area. (Doc. 551.14 at 4). He relies on no peer-reviewed, published, or tested evidence in support.[10] Given the length of time that the airframe from which the sample was taken had been decommissioned, more samples would have been needed to allow for identification of the source of dust to confirm that it originated from the engine. (Doc. 537.3 at 9). Moreover, the D5755 protocol itself explicitly states that "large asbestos containing particle(s) dispersed during sample preparation may result in anomalously large asbestos surface loading results . . . [i]t is, therefore, recommended that multiple independent samples are secured from the same area, and that a minimum of three samples be analyzed by the entire procedure." (Doc. 537.12 at 3). Finally, when using

[10] Though Dr. Longo generally references Dr. Millette's book on settled dust for support of only taking a single sample, he fails to explain how Dr. Millette's book is relevant to the discussion at hand. (Doc. 551.14 at 4).

NIOSH 7400 and 7402 for the determining if and how many asbestos fibers were present, none of the structures that Dr. Longo found in the sample would be generally accepted to count as asbestos fibers for assessing occupational exposure. (Doc. 537.3 at 9).

Even assuming Dr. Longo could use D5755 for quantifying asbestos fibers in surface dust, the next step Dr. Longo must take to establish Mr. Dugas's exposure to asbestos is to extrapolate the results from his surface sample to create a range of airborne asbestos exposure that existed during the cleaning in-service engine bays of A-7 airframes. Setting aside the questions surrounding the circumstances around how the surface sample was acquired and why Dr. Longo used an indirect method of analysis, the D5755 standard specifically disavows any appropriateness for use in establishing a relationship between asbestos-containing dust measured by the test and the potential for exposure to airborne asbestos. (Doc. 537.12 at 3). Indeed, the Court in Armstrong held that that

> Even if the indirect method met the first branch of the *Daubert* test, the evidence is clear and convincing that it does not meet the second part of that test. Because there is no statistical correlation between surface dust and airborne dust, and because airborne dust is what poses the risk of harm, the indirect method has no valid scientific connection to the pertinent inquiry. In other words, the indirect method simply doesn't fit. Any attempt to estimate airborne asbestos levels from measurements of surface dust would be based on nothing more than subjective belief and sheer speculation.

In re Armstrong World Indus., Inc., 285 B.R. at 871 (internal citation omitted) (citing Oddi v. Form Motor Co., 234 F.3d 136, 145-46 (3d Cir. 2000)).

Dr. Longo's response is that he has conducted work-studies wherein he could verify the airborne asbestos and the amount of asbestos present in surface dust. (Doc.

551.14 at 6-7). Using that comparison, he believes he can correlate the levels of surface dust to airborne dust present on the abandoned airframe, which would approximate Mr. Dugas's exposure. (Doc. 551.14 at 5-6); (Doc. 537.9 at 18). When pressed to explain his calculations however, Dr. Longo struggled to explain his method. (Doc. 537.9 at 21 ("[I]f you're looking for me to tell you exactly how I take the concentration off the surface and it gets in the air and how to do that, I can't tell you specifically, other than what I've already stated, that I haven't done the research."). Dr. Longo also testified that his previous studies on surface-to-air exposures were never peer-reviewed, published, or otherwise professionally replicated or tested. Id. at 18. Thus, Dr. Longo has failed to: support his use of D5755 to quantify the levels of asbestos present in the surface sample at issue; to follow the D5755 protocol; to account for variables associated with using an abandoned A-7 airframe; and to explain how he extrapolated his surface sample results to the airborne exposure Mr. Dugas would have encountered.

Accordingly, after due consideration, it is

ORDERED:

1. Plaintiff's Motion to Strike Defendant United Technologies Corporation's Motion to Exclude MAS Work Practice Study under Daubert (Doc. 550) is **DENIED**.

2. Defendants' Henkel Corporation and Dexter-Hysol Aerospace, LLC's Motion to Exclude Dr. Longo's Opinions and Experimental Tests under Daubert (Doc. 553) is **DENIED in part** and **GRANTED in part**.

a.) Dr. Longo may opine that the sanding and filing of EPON 934 releases significant levels of respirable asbestos fibers.

b.) Plaintiff shall not introduce videos of Dr. Longo sanding EPON 934 on direct examination.

c.) Dr. Longo shall not opine on the quantity of asbestos fibers Mr. Dugas encountered while working with EPON 934.

3. Defendant United Technologies Corporation's Motion to Exclude MAS Work Practice Study (Doc. 536) is **GRANTED.**

4. Defendant United Technologies Corporation's Amended Motion to Exclude Opinions of William E. Longo (Doc. 537) is **GRANTED to the extent that** all of Dr. Longo's opinions regarding or deriving from the surface sample taken from the abandoned A-7 airframe are **EXCLUDED**.

DONE and **ORDERED** in Jacksonville, Florida this 21st day of June, 2016.

BRIAN J. DAVIS
United States District Judge

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Copies furnished to:

Counsel of Record