



1 of 3 DOCUMENTS

**GRAHAM YATES and BECKY YATES, Plaintiffs, v. FORD MOTOR COMPANY
and HONEYWELL INTERNATIONAL, INC., successor-in-interest to Bendix
Corporation f/k/a Allied-Signal, Inc., Defendants.**

NO. 5:12-CV-752-FL

**UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF
NORTH CAROLINA, WESTERN DIVISION**

2015 U.S. Dist. LEXIS 83991

June 29, 2015, Filed

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OPINION

[*1] ORDER

This matter comes before the court on motion of defendant Honeywell International Inc. ("Honeywell") to preclude evidence suggesting that brake dust causes pleural mesothelioma or that "every exposure counts," (DE 380), together with motion of defendant Ford Motor Company ("Ford") to exclude testimony of plaintiffs' experts Eugene Mark, M.D. ("Mark") and Arnold Brody, Ph.D. ("Brody"). (DE 382). Each defendant has joined in the motion of the other, (DE 384, 385), both of which are ripe for consideration. For the reasons that follow, these motions are granted in part and denied in part.

STATEMENT OF THE CASE

Plaintiffs bring claims for personal injury and loss of consortium related to allegations that plaintiff Graham Yates contracted mesothelioma from defendants' brake products. Remaining for

trial, scheduled to commence July 14, 2014, are plaintiffs' claims for negligence in putting asbestos or asbestos-containing products into the market (First Cause) and failure to warn (Fifth Cause).

On March 31, 2015, defendant Honeywell filed a motion in limine to preclude evidence suggesting that brake dust causes mesothelioma or that "every exposure counts," relying in part on Mark's March 16, 2015, [*2] deposition. Upon learning at conference of defendants' intent to continue Mark's deposition to a later date, and then to seek to exclude his trial testimony, the court struck defendant Honeywell's motion without prejudice to its renewal upon completion of Mark's deposition to avoid piecemeal litigation.¹

Upon conclusion of Mark's deposition in April, the instant motions were filed May 8, 2015.

Reliance was placed on plaintiffs' experts' reports and their depositions, and associated reports and studies, among other materials. Hearing on the motions was held June 2-3, 2015 ("Daubert hearing"), at which the court heard testimony from Mark and from defendant Honeywell's expert, David Garabrant, M.D. ("Garabrant").

DISCUSSION

A. Standard of Review

Rule 702 of the Federal Rules of Evidence provides that expert testimony is appropriate when it "will assist the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702(a). *Rule 702* further provides that a witness qualified as an expert may be permitted to testify where "(b) the testimony is based upon sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods

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Associated [*3] exhibits, however, were to remain of record and available for reference by any party with respect to the

anticipated future motion(s), also as ordered.

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to the facts of the case." *Id.* Courts have distilled the requirements of *Rule 702* into two crucial inquiries: 1) whether the proposed expert's testimony is relevant; and 2) whether it is reliable.

Kumho Tire Co., Ltd. v. Carmichael, 526 U.S. 137, 141 (1999); see *Daubert v. Merrell Dow*

Pharms., Inc., 509 U.S. 579, 589 (1993); *United States v. Forrest*, 429 F.3d 73, 80 (4th Cir. 2005).

The test of "relevance," also described as "fit," considers "whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute." *Daubert*, 509 U.S. at 591. " 'Fit' is not always obvious, and scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes." *Id.* For example, a scientific study must have "a valid scientific connection to the pertinent inquiry as a precondition to admissibility." *Id.* at 591-92.

In assessing whether expert testimony is "reliable," a court should consider

(1) whether the particular scientific theory can be (and has been) tested; (2) whether the theory has been subjected to peer review and publication; (3) the known or potential rate of error; (4) the existence and maintenance of standards controlling the technique's [*4] operation; and (5) whether the technique has achieved general acceptance in the relevant scientific or expert community.

United States v. Crisp, 324 F.3d 261, 266 (4th Cir. 2003) (quoting *Daubert*, 509 U.S. at 593-94) (quotation marks omitted). "The test of reliability is 'flexible,' and *Daubert's* list of specific factors neither necessarily nor exclusively applies to all experts or in every case." *Kumho Tire*, 526 U.S. at 141. The proponent of expert testimony must establish its admissibility by a preponderance of proof. *Cooper v. Smith & Nephew, Inc.*, 259 F.3d 194, 199 (4th Cir. 2001).

B. Ford's Motion (DE 382), Joined By Honeywell (DE 384)

Defendant Ford moves broadly to exclude any testimony from Mark or Brody, and adds in a footnote that certain causation opinions from plaintiffs' expert Steve Hays ("Hays"), an industrial

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hygienist, also should be barred. (Ford Memo. In Supp. 1). Defendant Ford asserts four grounds for exclusion: 1) plaintiffs' experts rely on the "each and every exposure" theory, 2) plaintiffs' experts lack facts or data showing exposure to chrysotile-containing automotive parts causes mesothelioma, 3) Mark's opinions lack an identifiable methodology, and 4) Mark lacks sufficient information to apply his methodology to the facts of this case. The court takes up the decried "each and every exposure" theory first, with respect [*5] to the opinions of each expert offered by plaintiffs. Then, the court turns to defendants' remaining arguments challenging Mark's opinion.

1. "Each and Every Exposure" Theory

The theory that "each and every exposure to asbestos products results in injury to the person so exposed" has made repeat appearances in the realm of asbestos litigation. *Krik v. Crane Co.*, ___ F. Supp. 3d ___, 2014 WL 7330901, at *1 (N.D. Ill. 2014); see William L. Anderson, "The 'Any Exposure' Theory Round II - Court Review of Minimal Exposure Expert Testimony in Asbestos and Toxic Tort Litigation Since 2008," 22 *Kan. J. L. & Pub. Pol'y* 1 (2012). Also referred to as "any exposure" theory, or "single fiber" theory, it represents the viewpoint that, because science has failed to establish that any specific dosage of asbestos causes injury, every exposure to asbestos should be considered a cause of injury. See *Krik*, ___ F. Supp. 3d ___, 2014 WL 7330901, at *1; *Anderson v. Ford Motor Co.*, 950 F. Supp. 2d 1217, 1225 (D. Utah 2013). Numerous courts have excluded expert testimony or evidence grounded in this theory, reasoning that it lacks sufficient support in facts and data. E.g., *Comardelle v. Pa. Gen. Ins. Co.*, - F. Supp. 3d -, 2015 WL 64279, at *3 (E.D. La. 2015); *Krik*, ___ F. Supp. 3d ___, 2014 WL 7330901, at *4, *Anderson*, 950 F. Supp. 2d at 1225; *Sclafani v. Air & Liquid Sys. Corp.*, No. 2:12-CV-3013, 2013 WL 2477077, at *5 (C.D. Cal. May 9, 2013); *Henricksen v. ConocoPhillips Co.*, 605 F. Supp. 2d 1142, 1166 (E.D. Wash. 4 2009). Likewise, applying the [*6] Daubert factors, courts have found that the theory cannot be tested, has not been published in peer-reviewed works, and has no known error rate. *Krik*, ___ F. Supp. 3d ___, at *5; *Anderson*, 950 F. Supp. 2d at 1224-25; *Sclafani*, 2013 WL 2477077, at *5; see *Wills v. Amerada Hess Corp.*, 379 F.3d 32, 49 (2d Cir. 2004) (affirming exclusion of theory that decedent's cancer was caused by a single exposure to toxic chemicals, regardless of dosage, based on Daubert factors).

Demonstrated reasoning for exclusion of evidence grounded in the "each and every exposure" theory is persuasive. In this case, the complainants have not shown that expert testimony and evidence espousing this theory has the sufficient support of facts or data, nor have they shown that it is testable, published in peer-reviewed works, or has any error rate. Accordingly, the court will exclude testimony as to this theory. The following discussion addresses the impact of this decision with respect to each of plaintiffs' experts.

a. Brody

Brody's report provides in part as follows:

Once a person develops an asbestos-related cancer, it is not possible to exclude any of the person's above-background exposures to asbestos from the causal chain. Each and every exposure to asbestos that an individual with mesothelioma experienced in excess of a background level [*7] contributes to the development of the disease.

(Brody Report, 21).

In support, Brody cites to a single article authored by Laura S. Welch entitled "Abestos

Exposure Causes Mesothelioma, But Not *This* Asbestos Exposure: An Amicus Brief to the Michigan Supreme Court" ("Welch Paper). 13 Int'l. J. Occup. Env't Health 318, 321 (2007). (DE 288-2).

The court has previously held that this document, which was initially prepared for purposes of 5

litigation, is not one that "experts in the particular field would reasonably rely on" for purposes of satisfying *Federal Rule of Evidence 703*. *Yates v. Ford Motor Co.*, No. 5:12-CV-752-FL, 2015 WL 3463559, at *9-11 (E.D.N.C. May 30, 2015). The particular statement that Brody's "each and every exposure" testimony is based upon is a bare statement that "[a]ccordingly, the consensus of the scientific community is that any occupational or para-occupational exposure to asbestos-even 'brief of low-level exposures'-must be considered causal in an individual with mesothelioma." (Welch Paper, 22). The report cites to no specific authority for this statement. Plaintiffs have failed to show that Brody's adherence to "each and every exposure" theory has sufficient supporting facts and data. Plaintiffs' response [*8] cites to a number of statements from regulatory agencies to the effect that asbestos may be harmful at low doses of exposure and the absence of a threshold for "safe" exposure levels. They include a statement from the United States Environmental Protection Agency ("EPA") for the principle that each exposure "increases the likelihood of developing an asbestos related disease." However, increasing the *likelihood* of disease is a different matter than actually causing such disease. See (Mark March 16 Depo. Tr. 46:13-20) ("The degree of risk is different than causation You have to consider [risk], but they are different items."). Furthermore, courts have recognized a distinction between evaluations made by regulatory agencies and the standard of causation necessary to show tort liability. See *Mitchell v. Gencorp Inc.*, 165 F.3d 778, 783, n.3 (10th Cir. 1999); see also *Yates v. Ford Motor Co.*, No. 5:12-CV-752, 2015 WL 2189774, at *23, n. 7 (May 11, 2015) (citing cases). Moreover, as discussed above, the failure to identify a threshold level

of exposure is different from showing that a given level of exposure is hazardous. See Krik, ___ F. Supp. 3d ___, 2014 WL 7330901, at *4 ("[T]he notion that it is theoretically possible that any
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amount of exposure could cause injury is different from an [*9] opinion that the particular level of dosage experienced by a plaintiff was sufficient to cause his or her particular injury.").

Plaintiffs also cite to the opinions of one of defendant Honeywell's experts, Victor Roggli ("Roggli"), offered in different cases. However, "the [c]ourt must base its opinion on the facts and testimony presented in this case, rather than on the testimony of experts in other cases." Krik, ___ F. Supp. 3d ___, 2014 WL 7330901, at *4 (quoting Anderson, 950 F. Supp. at 1225). Furthermore, the admissibility of Roggli's opinions are not at issue here, and those quotations at issue from Roggli's testimony elsewhere do not speak to the concerns noted above regarding a lack of evidence showing that the theory lacks sufficient data and facts, testing, publication in peer-reviewed works, or a known rate of error.

In fact, plaintiffs offer in defense no sustained argument that "each and every exposure" theory is admissible. Instead, they argue that Brody and Mark do not espouse the theory. As to Brody, the argument is plainly refuted by the statement from his expert report quoted above. His references to exposures "above background" do not meaningfully distinguish his theory from other "each and every exposure," theories, because the [*10] same shortcomings that plague the latter equally apply to the former. See Sclafani, No. 2:12-CV-3013, 2013 WL 2477077, at *5 (excluding Brody's "above background" opinion); *Henrickson*, 605 F. Supp. 2d at 1165-66 (excluding "above background" opinion). At any rate, "above background" is an amorphous concept. As plaintiffs admit, background levels vary widely between communities. (Hr'g Tr. 21:22-22:8); (March 16 Depo., 77:21-78:4) (providing Mark's testimony that "[t]here is no standard or universality to background. Background can change by the year, by the month, by the date, by the type of work, by the local circumstances and other issues."). Brody's opinion that "[e]ach and every exposure to
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asbestos that an individual with mesothelioma experienced in excess of a background level contributes to the development of the disease" will be excluded, and in this part, defendant Ford's

motion is granted.

However, the limits to which Brody testifies as to this theory must be taken into account.

Statements related to the "each and every exposure" theory appear in a mere paragraph of Brody's report. (Brody Report, ¶¶ 44). The remainder of the report describes the process by which asbestos works on the cellular level. Brody's testimony need not be excluded simply [*11] because a small section of his opinion espouses this inadmissible theory. Brody provides details about how asbestos affects cells that appear to be based in testing and peer-reviewed literature, and which are beyond the scope of Ford's motion. "Each and every exposure" theory is not so critical to his opinion to require his total exclusion. Thus, Ford's motion to exclude Brody's testimony is granted only with respect to those parts pertaining to "each and every exposure" theory. Because defendant Ford's arguments for the exclusion of Brody are centered on his espousal of "each and every exposure" theory, the court need not discuss the opinions of Brody any further for purposes of the court's consideration of this motion.

b. Hays

Hays's opinion has slight, but critical, differences from that of Brody. In his report,² Hays surveys a number of statements from regulatory agencies regarding the absence of a "safe" level of exposure, considers studies showing that mesothelioma has been caused by low lifetime doses, and

² Two different reports from Hays appear in the record. On July 16, 2013, he prepared a report which plaintiffs submitted with their response to defendant Honeywell's motion on summary judgment [*12]. Fifteen days later, he submitted a supplemental report reviewing additional materials related to dust from brake linings, also presented at summary judgment and again in connection with the instant motions. (DE 183-17).

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concludes that "there is no basis for accepting any workplace or non-occupational exposure to asbestos above ambient background as 'safe.'" (Hays Report, 6). He also states that "any exposure above ambient background is to be avoided and any such exposure *may* contribute to disease in some individuals if there actually is a lifetime dose-response relationship for some diseases, any asbestos body burden added by workplace exposure above ambient contributes to *risk* of disease, regardless of the product types, manufacturers, worksites, or exposure averages. If no safe threshold exists for some asbestos-related conditions, such as mesothelioma, then the conclusion is the same."

(*Id.*, 8) (emphasis added). In his supplemental report, Hays opines that "the opening of boxes of brakes does produce an asbestos exposure that increases one's *risk* to an asbestos related disease." (Hays Supp. Report, 2) (emphasis added).

Hays speaks in terms of enhanced "risks" from [*13] certain activities. This does not purport to posit causation. See *McClain v. Metabolife Int'l, Inc.*, 401 F.3d 1233, 1249 (11th Cir. 2005) ("[P]roof of risk and proof of causation entail somewhat different questions.") (quoting Margaret A. Berger, "The Supreme Court's Trilogy on the Admissibility of Expert Testimony, in Reference Manual on Scientific Evidence, 33 (Federal Judicial Center, 2d ed. 2000)). (Mark March 16 Depo. 45:13-20). The court does not find Hays's opinion grounded in the "each and every exposure" theory of causation. Moreover, given the numerous statements in the record showing that scientists and relevant regulatory agencies have not established a threshold below which a health risk from asbestos is eliminated, the court finds these statements to have sufficient factual support and general acceptance in the relevant scientific community. As was the case with Brody, the "each and every exposure" theory is the only aspect of Hays's opinion targeted by defendant Ford's motion. Thus,

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the court need not discuss the opinion of Hays any further for purposes of the court's ruling on this motion.

c. Mark

Mark's opinion differs from Brody's on "each and every exposure" theory. Nowhere in either of his reports does he use the phrase "each and every exposure," [*14] or other equivalent phrases. Rather, as noted, Mark uses the terminology of "special exposures," which he defines as exposures "for which there is scientific evidence that the exposure increases the risk of developing diffuse malignant mesothelioma." (March 16 Depo., 48:7-12). As discussed above, Mark draws upon a number of disciplines to support his finding of whether an exposure is a "special exposure." (Mark Report, 9); (March 16 Depo., 55:21-56:16); (April 27 Depo., 18:4-17). He has testified that he does not believe that the mere presence of asbestos fibers in lungs is sufficient to increase one's risk of developing diffuse malignant mesothelioma. (March 16 Depo., 79:12-21), and distinguished "special exposures" from "trivial exposures," which are exposures for which there is no scientific

evidence to find an increased risk of disease. (March 16 Depo., 47:25-48:3). Mark has also offered examples of exposures he would find "trivial," including the cutting of an electrical cable on a couple of occasions. (Day 1 Hr'g Tr. 126:23-128:5). The court is satisfied from this testimony that Mark's opinions do not rely on the "each and every exposure" theory.

In sum, the court finds that expert testimony [*15] based upon the "each and every exposure" theory must be excluded, and grants defendant Ford's motion in that part. As a result, that part of Brody's testimony relying on "each and every exposure" theory is excluded. However, the court denies defendant Ford's motion with respect to Mark and Hays, to the extent the motion rests on their alleged adherence to "each and every exposure" theory. The court will not address Hays's 10

opinion further, where the arguments raised do not impact his opinion. The court turns next to analyzing defendant Ford's remaining arguments against Mark's opinion. The court addresses next whether Mark's testimony has a basis in sufficient facts or data, whether it is the product of reliable principles and methods, and whether Mark has reliably applied the principles and methods to the facts of this case.

2. Lack of Facts, Data, Reliable Methodology and Application of Methods In Mark's Opinion

Under *Rule 702*, the subject of a science expert's testimony "must be 'scientific knowledge.'" *Daubert*, 509 U.S. at 590 (quoting *Rule 702*) (ellipsis omitted). "The adjective 'scientific' implies a grounding in the methods and procedures of science." *Id.* (citations omitted). "Science is not an encyclopedic body of knowledge [*16] about the universe. Instead, it represents a *process* for proposing and refining theoretical explanations about the world that are subject to further testing and refinement." *Id.* (quoting Br. for Am. Assoc. for the Advancement of Sci. et al. as *Amici Curiae* 7-8). Moreover, "[p]roposed testimony must be supported by appropriate validation - i.e. 'good grounds,' based on what is known." *Id.* "The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." *Id.* at 595. Accordingly, "[t]he court need not determine that the expert testimony a litigant seeks to offer into evidence is irrefutable or certainly correct." *Westberry v. Gislaved Gummi AB*, 178 F. 3d 257, 261 (4th Cir. 1999). However, "given the potential persuasiveness of expert testimony, proffered evidence that has a greater

potential to mislead than to enlighten should be excluded." Id.

To prove that a given injury was "caused by exposure to a specified substance," a plaintiff must demonstrate "the levels of exposure that are hazardous to human beings generally," and "the

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plaintiff's actual level of exposure." *Westberry*, 178 F.3d at 263 (quotations omitted).³ Moreover, there must be a showing that the plaintiff's level of exposure is comparable to the levels of exposure that are hazardous [*17] as a general matter. See id., ("[S]cientific knowledge of the harmful level of exposure to a chemical, plus knowledge that the plaintiff was exposed to *such quantities*, are minimal facts necessary to sustain the plaintiffs' burden in a toxic tort case.") (emphasis added) (quoting *Allen v. Pa. Eng'g Corp.*, 102 F.3d 194, 199 (5th Cir. 1996)); see also *Zellers v. NexTech Northeast, LLC*, 895 F. Supp. 2d 734, 742 (E.D. Va. 2012) (" 'Ruling in' exposure to a particular substance as a possible cause of a patient's medical condition requires (1) a reliable determination of the level of exposure necessary to cause the condition and (2) a reliable determination that the patient was exposed to the substance at this level.").

The Fourth Circuit and other courts have applied these principles not only to assess the sufficiency of the evidence supporting plaintiff's case, but also to consider whether expert testimony on causation is reliable. See *Westberry*, 178 F.3d at 263; *Zellers v. NexTech Northeast, LLC*, 533 F. App'x 192, 198 (4th Cir. 2013) (affirming exclusion of expert for failure to demonstrate plaintiff's actual level of exposure); *Roche v. Lincoln Property Co.*, 278 F. Supp. 2d 744, 754 (E.D. Va. 2003) (excluding expert on finding that he "lack[ed] any knowledge of the levels of exposure to mold required to manifest any symptoms."); *Cavallo v. Star Enterprise*, 892 F. Supp. 756, 772 (E.D. Va. 1995) (excluding opinion when expert "could cite no studies or published [*18] literature to support

³ Temporal relationship may absolve the need to follow this procedure in certain "compelling" circumstances, involving a short period of time between exposure to a substance and occurrence of symptoms. See *Westberry*, 178 F.3d at 265 ("A temporal relationship between exposure to a substance and the onset of a disease or a worsening of symptoms can provide compelling evidence of causation."); *Cavallo v. Star Enterprise*, 892 F. Supp. 756, 772 (E.D. Va. 1995), aff'd in relevant part, 100 F.3d 1150 (4th Cir. 1996) ("[T]here may be instances where the temporal connection between exposure to a given chemical and subsequent injury is so compelling as to dispense with the need for reliance on standard methods of toxicology."). Such circumstances are not present here.

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adverse effects *from that level* of exposure to [the specific toxic agent]."), *aff'd* in relevant part, 100 F.3d 1150 (4th Cir. 1996).⁴ Such standards consistent with a "central tenet" in the science of the harmful effects of chemical and physical agents on organisms - "the dose makes the poison," i.e. "all chemical agents are intrinsically hazardous, whether they cause harm is only a question of dose." Bernard D. Goldstein and Mary Sue Henifin, "Reference Guide on Toxicology," in Federal Reference Manual on Scientific Evidence, 636 [*19] (3d ed. 2011).

In assessing whether expert testimony regarding levels of exposure is reliable, it is important to note that

only rarely are humans exposed to chemicals in a manner that permits a quantitative determination of adverse outcomes. Human exposure occurs most frequently in occupational settings where workers are exposed to industrial chemicals like lead or asbestos; however, even under these circumstances, it is usually difficult, if not impossible, to quantify the amount of exposure.

Westberry, 178 F.3d at 264 (brackets and ellipsis omitted) (quoting Federal Judicial Center, Reference Manual on Scientific Evidence 187 (1994)). Accordingly, "qualitative" evaluations of asbestos exposures may also be used to establish the appropriate levels which science has shown to be hazardous, and which plaintiff has experienced. See *id.*⁵ In *Westberry*, for example, the qualitative evidence used to show "plaintiff's actual level of exposure" consisted of plaintiff's

⁴ See also *McClain*, 401 F.3d at 1241-44 (11th Cir. 2005) (applying *Allen* to exclude plaintiffs' expert who failed to testify as to the dose or level of exposure at which drug caused harm); *Mancuso v. Consol. Edison Co. of New York*, 967 F. Supp. 1437, 1445 (S.D.N.Y. 1997) ("[T]he expert must establish 'general causation,' by demonstrating that, according to scientific literature, levels of [*20] the toxin comparable to those received by the plaintiff can cause the specific types of injuries he alleges.").

⁵ See also *In re: Zicam Cold Remedy Mktg., Sales Pracs., and Prods. Liab. Litig.*, 797 F. Supp. 2d 940, 946 (D. Ariz. 2011) (applying *Westberry* and noting "[a] qualitative, rather than quantitative, analysis can suffice."); Joseph V. Rodricks, "Reference Guide on Exposure Science," in Federal Reference Manual on Scientific Evidence, 512-513, n.

26(citing *Westberry* as example to support that "[o]n occasion, qualitative evidence of exposure is admitted as evidence that the magnitude was great enough to cause harm.").

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testimony that his workstation and clothing were coated in talcum powder each day. See *id.* at 263-64.

As another principle to consider, the general level of hazardous exposure need not be expressly established by a particular scientific study, so long as the expert is able to establish that

he uses a scientifically reliable method to extrapolate the results from scientific literature. In *City of Greenville v. W.R. Grace & Co.*, 827 F.2d 975 (4th Cir. 1987), for example, the city sued a manufacturer of asbestos fireproofing that had been installed in the city hall. *Id.* at 976. On appeal, defendant argued that expert testimony which drew inferences from studies involving exposure to asbestos at high levels could not support a finding that the relatively [*21] low levels of asbestos contamination in the city hall posed a health risk. *Id.* The court rejected the argument, noting the expert's testimony that "one technique accepted in the scientific community for predicting the risks associated with low-level exposures is to extrapolate the risk downward from results obtained in studies involving high-level exposures." *Id.* It held that "expert testimony based on this accepted scientific technique could reasonably support a jury finding that the levels of asbestos contamination in the Greenville City Hall posed significant health risks for the building's occupants." *Id.*

Importantly, however, in such cases an expert should explain the methodology for transferring the results from the relative studies. See *Cavallo*, 892 F. Supp. At 766 (requiring expert to "explain why the dose-response figures found in [studies identifying a different chemical-illness relationship than the chemicals at issue] . . . can reliably be transferred to the case at bar."); *Arias v. DynCorp*, 928 F. Supp. 2d 10, 22-23 (D.D.C. 2013) (requiring expert relying on extrapolations to "explain his methodology, such as how he 'extrapolate[d] the risk downward.' ") (citing *W.R. Grace*, 827 F.2d [*22] at 980 n. 2).

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Thus, the caselaw provides that plaintiffs have flexibility in establishing the "levels of exposure that are hazardous to human beings generally" and drawing comparisons with the levels of exposure experienced by the plaintiff. Yet the flexibility afforded to plaintiffs does not relieve them of the burden to establish these levels and comparisons through application of methodologies meeting the standards for reliable testimony. *Zellers*, 533 F. App'x at 198 ("While it is true, as Ms. Zellers⁶ argues, that precise information regarding a plaintiff's level of exposure is not always available, or necessary, it is also true that a plaintiff must demonstrate the levels of exposure that are hazardous to human beings generally as well as the plaintiff's actual level of exposure.") (quotation marks and citation omitted).

As detailed below, plaintiffs have failed to show that Mark reliably followed such methodology. He has not reliably established a level at which chrysotile is hazardous, generally, nor has he reliably compared plaintiff Graham Yates's exposures to levels established as hazardous.

a. Mark's Purported "General Levels" of Hazardous Exposure

Mark's report and declaration summarizes his opinions as including [*23] the following:

C Mr. Graham Yates developed a diffuse malignant mesothelioma of the pleura;

C According to the depositions, work history sheets, and medical records, Mr. Graham Yates was exposed to asbestos-containing dust from working with and around brakes, including Ford brakes and Bendix7brakes, as well as thermal insulation while decommissioning a ship during his time in the Navy.

C The presence of visible dust released from asbestos-containing products, including asbestos brake friction products, is of the type that has been scientifically shown to increase the risk of diffuse malignant mesothelioma.

6 The case caption of the Fourth Circuit's opinion in Zellers appears to have misspelled the plaintiff's name.

7 As noted in the caption, defendant Honeywell is the successor-in-interest to Bendix Corporation.

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C All of the exposures to asbestos described here which took place prior to the occurrence of the malignancy are the types that have been proven by scientific evidence in their accumulation to cause diffuse malignant mesothelioma; and

C All of the exposures to asbestos described here were a substantial contributing factor and a medical cause of Mr. Graham Yates's diffuse malignant [*24] mesothelioma.

(Mark Report, 1-2).

These statements appear to offer two different suggestions for the "levels of exposure that are hazardous to human beings generally." *Westberry*, 178 F.3d at 263. First, Mark suggests that a generally hazardous level is equivalent to the level of asbestos that would be present in "visible dust" emitted from asbestos products. (Mark Report, 1). Second, he suggests that a generally hazardous exposure level is equivalent to the "types [of exposures] that have been proven by scientific evidence in their accumulation to cause diffuse malignant mesothelioma." (Id.).

i. "Visible Dust"

Mark's first suggestion for a general level of hazardous exposure, "visible dust," fails for multiple reasons. First, Mark only opines that visible dust "increase[s] the *risk* of diffuse malignant mesothelioma." (Mark Report, 1) (emphasis added). However, while admittedly related, the terms

"risk" and "hazardous" have critical differences in meaning. See *Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 642 (1980) ("There are many activities that we engage in every day - such as driving a car or even breathing city air - that entail some risk of accident or material health impairment; nevertheless, few people would consider these activities 'unsafe.'"). [*25] The primary definition of a "risk" is simply a "possibility of loss or injury." Merriam-Webster Dictionary, available at <http://www.merriam-webster.com/dictionary/risk> (last visited June 25, 2015). As noted

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above, plaintiffs (and experts) must show that a given level of exposure to a specified substance is "hazardous." *Westberry*, 178 F.3d at 263. "Hazardous" is, of course, derived from the word "hazard," which, aside from referring to a particular game of dice, is primarily defined as "a source of danger." Merriam-Webster Dictionary, available at <http://www.merriam-webster.com/dictionary/hazard> (last visited June 25, 2015); see also Black's Law Dictionary (10th ed. 2014) (defining "hazard" as "[d]anger or peril"). "HAZARDOUS implies great and continuous risk of harm or failure." Merriam-Webster Dictionary, (emphasis added) available at <http://www.merriam-webster.com/dictionary/hazardous> (last visited June 25, 2015). Accordingly, Mark's opinion that visible dust may "increase the risk" of mesothelioma is not sufficient to establish that visible dust rises to the level of being "hazardous to human beings generally" for purposes of establishing causation. *Westberry*, 178 F.3d at 263.

Second, even assuming that asbestos is generally hazardous to humans when it reaches the level of visible dust, the opinion still fails because it does not take into account [*26] that not all asbestos is the same. "Asbestos" is a generic term used to describe certain naturally-occurring minerals. See *Mine Safety and Health Administration, Asbestos Exposure Limit, Final Rule*, 73 Fed. Reg. 41, 11284, 11285 (Feb. 29, 2008) ("MSHA Asbestos Rule"); see also *In re Garlock Sealing Techs., LLC*, 504 B.R. 71, 74 (W.D.N.C. 2014). There are different forms of asbestos, including chrysotile, crocidolite, cummingtonite-grunerite (also known as amosite), actinolite, anthophyllite, and tremolite asbestos. MSHA Asbestos Rule, 11285. "Amphibole" asbestos includes amosite, crocidolite and tremolite. (Mark March 16 Depo., 33:19-34-14). "Amphiboles" are classified in a mineralogical family separate from chrysotile asbestos. (Day 1 Hr'g Tr. 192:7); (Mark March 16 Depo., 33:25-34-

14). The parties agree that amphibole asbestos is more potent than chrysotile asbestos, and that
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higher levels of exposure to chrysotile asbestos than amphibole asbestos are necessary to cause mesothelioma. (March 16 Depo. 61:10-14).

It is undisputed that automobile brakes during the relevant time period were manufactured from chrysotile asbestos. See Michael A. Kelsh, et al., "Mesothelioma in vehicle mechanics: is the risk different for Australians?," *Occupational Medicine*, 3 (2007) (DE 410-13); Welch Paper, 318 (assuming chrysotile asbestos is [*27] the relevant type of asbestos for analyzing the hazards of brake products); (Rogli Aff., 2) (DE 332-1).⁸ Thus, given that chrysotile asbestos is less potent than other forms, it is *chrysotile* asbestos, not merely asbestos as a whole, for which Mark should have established a "level of exposure that [is] hazardous to human beings generally." Westberry, 178 F.3d at 263. To the extent that Mark's causation opinions address "visible dust" from *all* asbestos-containing products, without distinguishing between fiber types, or at least offering a reliable explanation for why it is proper to do so, he has not reliably applied the methods of demonstrating toxicological causation to the facts of this case.

Moreover, to the extent Mark's opinion is that *any* visible dust from *any* asbestos-containing product rises to a hazardous level, he fails to note sufficient facts or data to support such a broad proposition. He does not identify a scientific study that stands for the proposition that any visible

⁸Some issue has been raised as to whether the chrysotile asbestos used to manufacture defendants' brake products includes some contamination of tremolite asbestos. In response to the instant motions, plaintiffs [*28] have submitted an affidavit from defendant Honeywell's expert Roggli, suggesting that the chrysotile asbestos used in United States products consisted of "some degree" of contamination from tremolite asbestos. (Rogli Aff., 2) (DE 332-1). However, the amount of tremolite that may have been incorporated into chrysotile asbestos in these products, or specifically into brake products, is not established. Moreover, Mark's report does not discuss the possibility that chrysotile asbestos products contain tremolite, or any estimate of how much tremolite might be contained in a brake product. Rather, Mark himself seems to have assumed that chrysotile asbestos was the relevant type of asbestos at issue, because he devotes six pages of his report to studies supporting the proposition that chrysotile asbestos causes mesothelioma. (Mark Report, 12-16). An expert report is to include "a complete statement of all opinions the witness will express and the basis and reasons for them." Under *Rule 702*, Mark's opinion must be a "*product* of reliable principles and methods." *Fed. R. Evid. 702(c)*. The tremolite asbestos argument reads more as a *post hoc* attempt to justify Mark's methods, rather than a consideration that Mark took [*29] into account. *Fed. R. Civ. P. 26(a)(2)(i)*.

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dust from any asbestos product causes mesothelioma, or adequately explained how a combination

of studies establishes this proposition. Rather, Mark's opinion as to the hazardous nature of visible dust clouds appear to be grounded in his own calculations regarding the levels of asbestos found in such dust.

Mark's report states that "visible dust creates exposures of at least 5 million particles per cubic foot. Therefore, the presence of visible dust in brake boxes would indicate exposures of over 5 million particles per cubic foot." (Mark Report, 6). Amidst the library of materials submitted in opposition to the instant motions, however, the sources he cites for this proposition were never entered into the record. Moreover, Mark's calculations are patently incorrect. As he admitted in his deposition, 5 million particles per cubic foot assesses the *total* amount of dust, and does not differentiate between asbestos dust and other types of dust. (Apr. 6 Depo., 155:4-17).

At hearing, Mark converted 5 million particles per cubic foot to a concentration of 30 to 50 fibers of asbestos per milliliter. (Day 1 Hr'g Tr. 65:3-9). The basis of this conversion rate is unclear, and it did not appear [*30] in Mark's report. His report *does* reference the Hays report for the proposition that "the presence of visible dust released from asbestos-containing product represents an asbestos exposure that is at least hundreds of times above background/ambient exposure levels," (Mark Report, 6), although the Hays's report itself does not cite authority specific to this statement. (Hays Report, 8).

Further consideration reveals major inconsistencies between the calculations of visible dust concentration between the number that Hays provided in his report (which Mark relied upon) and the number which Mark testified to at hearing. Hays's report notes the relevant background level as being 0.0004 fibers per cubic centimeter. (Id.). Thus, an asbestos exposure "hundreds of times

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above" a background level of 0.0004 fibers per centimeter would only rise to approximately 0.04-0.4 fibers per cubic centimeter. And, because one cubic centimeter is the equivalent of one milliliter, the amount of asbestos fibers in a visible dust cloud would only be 0.04-0.4 fibers per milliliter - an amount approximately 100 to 1000 times less than the numbers Mark provided at hearing.

Further flaws in the "visible dust" theory undermine [*31] its reliability in establishing a generally hazardous level of exposure. Both Mark and Hays relies on a study regarding dust releases from an

"asbestos containing product," without detailing the specific type of product used for these studies, or explaining why it is reasonable to use dust levels for just any "asbestos containing product" as a proxy for dust from brakes. See *Henricksen v. Conoco Phillips Co.*, 605 F. Supp. 2d 1142, 1156 (E.D. Wash. 2009) ("If it is possible to extrapolate from studies of benzene or other benzene-containing products conclusions regarding gasoline, then it will be incumbent upon [plaintiff] to explain and demonstrate why the extrapolation is scientifically proper."); *Juni v. A.O. Smith Water Prods.*, No. 190315/12, 2015 WL 184006, at *19 (N.Y. Sup. Ct. Apr. 13, 2015) (finding plaintiffs' evidence of exposures to visible brake dust insufficient to support causation, where "the evidence they offered is insufficient to prove that the dust to which Juni was exposed contained any asbestos or enough to cause his mesothelioma.").

At any rate, there is no context for the quantifications that Mark provides with respect to asbestos concentrations in visible dust. Despite devoting roughly three pages of his report to calculating particles in dust clouds and fibers released when certain [*32] tasks involving asbestos products are performed, Mark testified that he had no mathematical cutoff point for when a "trivial" exposure becomes a "special" exposure that should be considered causal. (Day 1 Hr'g Tr., 140:7-8). He does cite to studies purporting to establish statistically significant associations between mesothelioma

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cumulative asbestos exposures as low as 0.15-1.5 "fiber years,"⁹ (which studies are further discussed below), but fails to offer any guidance for how a jury might convert the exposures seen in visible dust clouds to fiber years.

"Scrutiny of expert testimony is especially proper where it consists of an array of figures conveying a delusive impression of exactness in an area where a jury's common sense is less available than usual to protect it." *E. Auto Distribs., Inc. v. Peugeot Motors of Am., Inc.*, 795 F.2d 329, 338 (4th Cir. 1986) (quotation marks omitted); see also *McClain*, 401 F.3d at 1241 (finding expert's vague testimony as to dose-response of product "leaves a muddle of ambiguity that undermines his opinions"). The inconsistencies, inaccuracies, logical gaps, and absence of clearly cited authorities for fundamental aspects of Mark's "visible dust" theory are deeply troubling. The effect [*33] of Mark's opinions is to deluge the trier of fact with a storm of questionable statistics, without

guidance as to how these statistics establish a generally hazardous level of exposure to the forms of asbestos found in brake products. The opinion is lacking in sufficient factual support as to this aspect of causation, and is not helpful in understanding evidence or determining a fact. Thus, on this basis, the court is compelled to exclude Mark's opinions.

ii. "Types" of Exposure "Proven by Scientific Evidence In Their Accumulation to Cause Diffuse Malignant Mesothelioma"

As noted above, the second candidate for a generally hazardous level of exposure in Mark's report is found in his opinion that "[a]ll of the exposures to asbestos described here which took place

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"Fiber-year/mL: Epidemiologic studies of groups of asbestos-exposed workers commonly express exposure in cumulative exposure units of fiber-year/mL. This exposure measure is calculated by multiplying a worker's duration of exposure (measured in years) by the average air concentration during the period of exposure (measured in number of fibers/mL of air)." At hearing, Mark stated that a "good definition" of the time component of one [*34] "fiber year" would be "eight hours a day, five days a week for an entire year." (Tr. 121:2-4).

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prior to the occurrence of the malignancy are the types that have been proven by scientific evidence in their accumulation to cause diffuse malignant mesothelioma." (Mark Report, 1). For purposes of quantitatively or qualitatively identifying a particular level of exposure at which a dosage of chrysotile asbestos becomes hazardous, the statement is entirely circular and conclusory, and will not assist the jury. However, acknowledging that this statement is presented as a "summary" opinion, the court's analysis will continue to consider the "scientific evidence" that Mark has identified in his report, and whether it establishes any particular "type" of exposure that demonstrates a level of exposure that is hazardous to human beings generally. Here, the court finds Mark's report draws upon a vast array of "scientific evidence," but fails to present this evidence in a manner establishing any level at which exposure to chrysotile asbestos becomes hazardous to human beings generally.

First, as noted above, Mark discusses a number of studies quantifying the amount of fibers released by particular tasks concerning [*35] asbestos products, such as opening brake boxes or sweeping garages. As discussed, these studies do not, in themselves, allow one to determine whether any level of exposure to these fibers is hazardous to human beings generally.

Second, Mark recites a litany of evidence to support the proposition that "all types of asbestos can cause mesothelioma," including: 1) "reports of diffuse malignant mesotheliomas in miners, and individuals living in the areas around mines that only contain chrysotile;" 2) "person's [sic] that have worked in occupations that have essentially been only exposed to chrysotile have developed diffuse malignant mesothelioma;" 3) "epidemiological studies that involve individuals only exposed to chrysotile that develop diffuse malignant mesothelioma;" 4) "animal studies" that "demonstrate that chrysotile can cause diffuse malignant mesothelioma;" 5) "cellular molecular 22 experiments" that "demonstrate that chrysotile can create the cellular damage and show the premalignant changes that are a precondition for the development of diffuse malignant mesothelioma;" 6) "studies of spouses who would have been expected to be exposed only to chrysotile;" 7) "fiber burden studies that have [*36] found only chrysotile in patients with diffuse malignant mesothelioma;" and 8) governmental and other official bodies that "have found that chrysotile is capable of causing diffuse malignant mesothelioma." (Mark Report, 12). However, the mere proposition that these studies support that chrysotile asbestos may cause mesothelioma does not provide any quantitative or qualitative measure to establish any particular level at which chrysotile asbestos becomes hazardous. Certain of the referenced studies might help illuminate the levels that are hazardous, but Mark himself draws no such conclusions.

As a third form of "scientific evidence," Mark cites to numerous studies and statements to the effect that "there is no safe level" of asbestos exposure. Close consideration of the statements cited reveals shortcomings similar to those noted above, with respect to "each and every exposure" theory. Many of these studies are based on the *absence* of evidence of a "threshold" level of asbestos exposure, rather than affirmative evidence of any particular hazardous level of exposure. A number of the documents cited are statements from regulatory and official agencies, which, as discussed above, are not bound by [*37] standards for causation found in toxic tort law. Some studies report adverse health effects at "brief" or "low level" exposures, but without details as to what kind of exposures meet these criteria. Moreover, the materials relied upon do not distinguish among asbestos fibers. Fourth, Mark's report and his testimony at the Daubert hearing refer to epidemiological

studies showing that cases of mesothelioma can occur at low levels of asbestos. See (Mark Report, 22-23). A study from France found that mesothelioma cases occurred at exposure levels "below a 23 cumulative exposure of 5 [fiber years per milliliter], and perhaps below 0.5 [fiber years per milliliter]." Y. Iwatsubo, et al., "Pleural Mesothelioma: Dose-Response Relation at Low Levels of Asbestos Exposure in a French Population-based Case Control Study," 148 Am. J. of Epidemiology, 133, 141 (1998) ("Iwatsubo Study") (DE 332-19). A German study found statistically significant associations between asbestos exposure and mesothelioma at levels as low as 0-0.15 fiber years per milliliter. Klaus Rödelsperger, et al., "Asbestos and Man-Made Vitreous Fibers as Risk Factors for Diffuse Malignant Mesothelioma: Results from a German Hospital-Based Case-Control [*38] Study," 39 Am. J. Indus. Med. 262, 262 (2001) ("Rödelsperger Study") (DE 332-20). As Mark testified at the Daubert hearing, however, neither of these studies separated out fiber types. (Day 1 Hr'g Tr., 99:11-12). The Iwatsubo Study itself acknowledged that it "could not examine mesothelioma risk according to fiber types because our study design . . . did not allow us to identify those subjects whose exposure was only to chrysotile fibers." Iwatsubo Study, 141. Other courts have recognized that these studies are insufficient to establish the level at which chrysotile asbestos is hazardous. *Butler v. Union Carbide Corp.*, 310 Ga. App. 21, 27 (2011); *Smith v. Kelly-Moore Paint Co., Inc.*, 307 S.W. 3d 829, 838-39 (Tex. App. 2010).

At hearing, Mark testified concerning a recent additional study from France which purported to find a dose-response relationship for asbestos at levels less than 0.1 fiber years per milliliter. A. Lacourt, "Occupational and non-occupational attributable risk of asbestos exposure for malignant pleural mesothelioma," Thorax (2014) (DE 415-2). This study likewise failed to distinguish chrysotile asbestos from other forms. Moreover, its publication post-dated Mark's opinion and 24

report. He could not have relied on it when he reached the opinion that plaintiff Graham Yates's [*39] mesothelioma resulted from brake asbestos.10

A fifth potential source of "scientific proof" establishing a level at which chrysotile asbestos is hazardous appears in plaintiffs' joint response to the instant motions. Plaintiffs cite to one study

to support the proposition that "exposure to chrysotile asbestos, 'even at the relatively low levels expected in household exposures, can cause malignant mesothelioma.'" (Pls'. Resp. 18) (quoting Allan H. Smith and Catherine C. Wright, "Chrysotile Asbestos is the Main Cause of Pleural Mesothelioma," 30 Am. J. Indus. Med., 252, 255 (1996) (DE 333-3) ("Smith Study"). The Smith Study involved three cases of mesothelioma reported among children of chrysotile mine employees, presumably exposed through dusty clothing brought home by their parents. *Id.* at 255. Yet Mark's expert report does not discuss the Smith Study's particular finding that "low levels" of chrysotile asbestos exposure could cause mesothelioma, and Mark did not provide any testimony regarding this finding from the study. Plaintiffs have not shown that Mark, in reaching his opinion, relied on this study to establish the levels of causation at which chrysotile asbestos is hazardous to human beings.¹¹ [*40] Furthermore, a showing that a few people contracted mesothelioma from a certain exposure level

¹⁰ In fact, significant portions of plaintiffs' response to the instant motions, along with Mark's testimony at hearing, consisted of materials not found in his report, including documents that predated his report. Again, as noted above, an expert report is to include "a complete statement of all opinions the witness will express and the basis and reasons for them." *Fed. R. Civ. P. 26(a)(2)(i)*. The court does not consider these materials to support that Mark's opinion was a "product of reliable principles and methods." *Fed. R. Evid. 702(c)* (emphasis added). Indeed, this *post hoc* collection of materials suggests just the opposite: that Mark reached his opinion and then collected (or relied on counsel to collect) the literature that would support it.

¹¹ Furthermore, as discussed below, plaintiffs have not shown that Mark has appropriately compared plaintiff Graham Yates's exposures to the types of exposures described in these studies.

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is not sufficient to show the "level[] of exposure that are hazardous to human beings *generally*."

See *Westberry*, 178 F.3d at 263 (emphasis added).

A sixth form of scientific evidence found in Mark's report consists of his reliance on epidemiological [*41] studies of brake mechanics which have contracted mesothelioma. Such evidence might be considered to provide a qualitative assessment of hazardous exposure levels, in that these studies support that the levels of chrysotile asbestos exposure experienced in this work, as a general matter, may be hazardous. Yet Mark himself does not state that he used the studies for this purpose. Furthermore, even assuming these studies were used to establish a level at which chrysotile asbestos is hazardous, Mark's method of selecting them is too unreliable to be considered to satisfy this step of establishing causation. "An expert's opinion may be unreliable if he fails to account

for contrary scientific literature and instead 'selectively chooses his support from the scientific landscape.'" *Eghmayem v. Boston Sci. Corp.*, 57 F. Supp. 3d 658, 676 (S.D.W. Va. 2014) (quoting *In re Rezulin Prods. Liab. Litig.*, 369 F.Supp.2d 398, 425 (S.D.N.Y.2005) (quotations omitted). "[I]f the relevant scientific literature contains evidence tending to refute the expert's theory and the expert does not acknowledge or account for that evidence, the expert's opinion is unreliable." *Rezulin*, 369 F. Supp. 2d at 425; see also *Norris v. Baxter Healthcare Corp.*, 397 F.3d 878, 886 (10th Cir. 2005) (affirming exclusion of expert testimony that failed to account for epidemiological evidence); *In re Zoloft (Sertraline Hydrochloride) Prods. Liab. Litig.*, 26 F. Supp. 3d 449, 460-61 (E.D. Pa. 2014) ("The Court finds that the expert report prepared by [*42] Dr. Bérard does selectively discuss studies most supportive of her conclusions, as Dr. Bérard admitted in her deposition, and fails to account adequately for contrary evidence, and that this methodology is not reliable or scientifically sound."); *Pooshs v. Phillip Morris USA, Inc.*, 287 F.R.D. 543, 546 (N.D. Cal. 2012) ("A methodology may

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not be reliable if an expert fails to address and exclude alternative explanations for the data on which he bases his findings or rejects studies reporting contrary empirical findings.") (quotation marks and brackets omitted).

Plaintiffs have produced four epidemiological studies in support of Mark's report. Cora R. Roelofs, et al., "Mesothelioma and Employment in Massachusetts: Analysis of Cancer Registry Data 1988-2003," *Am. J. Indus. Medicine* (2013) (DE 333-7) ("Roelofs Study"); Soon Hee Jung, et al., "A Decade of Malignant Mesothelioma Surveillance in Korea," *Am. J. Indus. Medicine*, (2012) (DE 338-2) ("Jung Study"); Eero Pukkala, et al., "Occupation and cancer - follow-up of 15 million people in five Nordic countries," 48 *Acta Oncologica* 646 (2009) (DE 392-26; 392-27; 392-28; 392-29) ("Pukkala Study"); James Leigh, et al., "Malignant Mesothelioma in Australia, 1945-2000," *Am. J. Indus. Medicine*, 188 (2002) (DE 337-9) ("Leigh [*43] Study"). However, plaintiffs have failed to show that Mark engaged in a reliable process to select these studies for any assessment of general exposure levels.

Only the Roelofs Study and the Leigh Study appeared in Mark's report. The other two studies were produced in response to the instant motions, and thus do not support that Mark considered them

in arriving at his opinion. Furthermore, against Mark's studies, defendants' experts have referred to approximately 30 epidemiological studies which find no association between brake work and mesothelioma. (Def. Ford's Mot. for Summ. J., Ex. D., Mowat Report, 19-20) (DE 175-4); (Def. Honeywell's Resp. to Order on Summ. J., Ex. D, Garabrant Report, 7) (DE 198-4).

Prior to the Daubert hearing, the court put plaintiffs on notice that Mark's methods of selecting these epidemiological studies were under scrutiny, noting that "Mark's explanation of his rationale for not taking these contrary epidemiological studies into consideration figures to be an

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issue in the admissibility of his testimony." *Yates v. Ford Motor Co.*, 5:12-CV-752, at 2-3 (May 29, 2015) (DE 406). At hearing, Mark was asked how he selected the particular epidemiological studies upon which [*44] he relied for his opinion. He responded "I like to look at the spectrum, but some of the issues might be the size of the study, the location of the study, the University or academic affiliation and the degree of detail." (Hr'g Tr. 146:11-14). This general assertion is inadequate to address the mass of epidemiological studies presented by defendants, a number of which appear to be of comparable size to the Jung or Roelofs study, and/or have university or academic affiliation, and nearly all of which appear to study more germane subject matter than the Pukkala Study (which only assembles data for "mechanics" rather than "automobile mechanics"), and the Leigh Study (which conflated the occupation brake repair with brake manufacturing, which would presumably involve dealing with higher levels of raw asbestos). When specifically asked why he used the Roelofs Study rather than a study of comparable size from Great Britain that supported the association between brake asbestos and mesothelioma, Mark answered "I selected the Roelofs study in part because it was local . . . because it appeared in a journal I otherwise get and it had to do with a local situation, so it caught my eye." (Day 1 Hr'g Tr. 150:8-11). [*45] This fails to meet the plaintiffs' burden of showing that Mark undertook a reliable scientific process in selecting which studies to consult for the proposition that the levels of exposure experienced in brake mechanic work are sufficient to cause mesothelioma. Thus, Mark's reference to these studies cannot be considered to meet the requirement of establishing the levels of exposure to chrysotile asbestos that are hazardous to human beings generally.

Plaintiffs devote considerable portions of their response to attacking the funding of the epidemiological studies on brake mechanics. Specifically, plaintiffs cite to six studies which they

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argue were funded by defendant Ford. (Pls' Resp., 29). But plaintiffs have not shown that the methodology of these studies was flawed. See *Smith v. Ford Motor Co.*, No. 2:08-CV-630, 2013

WL 214378, at *5 (D. Utah Jan. 18, 2013) (rejecting similar attack on alleged biases of studies of mesothelioma among auto mechanics). Furthermore, Mark himself did not offer this as his reason for rejecting these studies.

For all these reasons, the "scientific evidence" which Mark cites does not establish a general level at which chrysotile asbestos becomes hazardous. Because [*46] Mark does not otherwise establish such a level, his testimony as to causation is not a product of reliable principles or methods.

b. Failure to Show That Plaintiff's Level of Exposure Was Comparable to Hazardous Levels of Chrysotile Asbestos

Even assuming that Mark's "scientific evidence" was sufficient to show that a given level of exposure is hazardous, Mark's testimony fails to compare plaintiff Graham Yates's level of exposure to any generally hazardous level.

As noted, the Smith Study asserted that chrysotile asbestos had been shown to cause mesothelioma "even at the relatively low levels expected in household exposures." Smith Study, 255. The specific evidence that the Smith Study relied upon to support this statement was a study reporting three cases of mesothelioma in the children of chrysotile mine employees, presumably exposed through dusty clothing brought home by their parents. *Id.* The record does not indicate that Mark has compared the quality of exposures experienced by children of mine workers with the quality of plaintiff Graham Yates's exposures.

Nor does the record indicate that Mark compared plaintiff Graham Yates's exposures to the quality of exposures experienced by the brake [*47] mechanics in the studies he references. For instance,

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the Roelofs Study considered occupational exposures from those whose "usual" occupations were as automobile mechanics. Roelofs Study, 7. However, plaintiff Graham Yates testified that he only

worked with brakes from Honeywell's predecessor between the years of 1956 and 1957, where his primary job duty was as a gas station attendant; between 1961 and 1962 as a parts clerk; and for 6 months in a Ford dealership, where his primary job duties were as a parts clerk and parts delivery driver. Otherwise, his exposures allegedly consisted of a handful of brake changes he personally performed on his own vehicles. Mark has not sufficiently explain how these types of exposures should be compared to a study of persons whose "usual" occupations were as automobile mechanics. Mark offered conclusory testimony that plaintiff Graham Yates "would have had considerably higher exposures" than the levels identified by the Iwatsubo and Rödelsperger Studies, because of "the number of fibers that would be resulting in visible dust as well as knowing how fibers are generated in working with friction products." (Day 1 Hr'g Tr., 70:23-71:2). As noted above, the Iwatsubo [*48] Study found that mesothelioma cases occurred at exposure levels "below a cumulative exposure of 5 [fiber years per milliliter], and perhaps below 0.5 [fiber years per milliliter]" Iwatsubo Study, 133, while the Rödelsperger Study found statistically significant associations between asbestos exposure and mesothelioma at levels as low as 0-0.15 fiber years per milliliter. Rödelsperger Study, 262. Mark provided no details as to how the concentrations of fibers contained in momentary appearances of "visible dust" might be converted to the "fiber years" which was used as the unit of measurement in the Iwatsubo and Rödelsperger Studies. Indeed, he declined to estimate the cumulative fiber-year level for plaintiff Graham Yates's work. (March 16 Depo., 80:13-17); (Day 1 Hr'g Tr. 141:7-16) He did not explain how the differences in chrysotile potency might affect his calculations. Furthermore, for the reasons explained above, Mark's discussion of 30 "visible dust" is not based on sufficient facts or data or helpful to the jury. It may be true that Mark's exposure levels exceeded the levels identified by the Iwatsubo and Rödelsperger Studies, but Mark has failed to show that he used any reliable method to [*49] reach this conclusion. Rather than engage in any specific, meaningful comparison of the scientific data with plaintiff Graham Yates's exposures, Mark's opinions essentially attempt to overwhelm with statistics and studies, lacking guidance as to how a juror ought to apply them to the instant case, aside from joining Mark's ultimate conclusion that plaintiff Graham Yates's mesothelioma was caused by

defendants' products. This is not a reliable method, and it will not assist a jury.

c. Mark's Proposed Alternative Methods of Assessing Causation

Instead of following the accepted methods of causation outlined above, Mark purports to rely heavily on a set of principles known as the "Helsinki Criteria," initially developed in 1997 by an interdisciplinary group of scientists meeting in Helsinki, Finland. "Asbestos, asbestosis, and cancer: the Helsinki criteria for diagnosis and attribution," 23 Scand. J. Work Env't Health 311 (1997) (DE 332-17).¹² Among its guidance, the Helsinki Criteria provides that

[a] lung fiber count exceeding the background range for the laboratory in question *or* the presence of radiographic or pathological evidence of asbestos-related tissue injury (e.g., asbestosis or pleural [*50] plaques) *or* histopathologic evidence of abnormal asbestos content (e.g. asbestos bodies in histologic sections of lung) should be sufficient to relate a case of pleural mesothelioma to asbestos exposure on a probability basis. *In the absence of such markers, a history of significant occupational, domestic, or environmental exposure to asbestos will suffice for attribution.*

Id., 313 (emphasis added).

¹²The Helsinki Criteria was recently updated in a follow-up report, which did not alter the relevant recommendations. "Asbestos, asbestosis, and cancer, the Helsinki criteria for diagnosis and attribution 2014: recommendations," 41 Scand. J. Work Environ. Health 5, 5 (2015).

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The Helsinki Criteria goes on to state that "[a]n occupational history of brief or low-level exposure should be considered sufficient for mesothelioma to be designated as occupationally related." *Id.*

As an initial matter, it is questionable that Mark's methods are fully consistent with the principles espoused by this document. The Helsinki Criteria requires that a past exposure to asbestos be "significant" before mesothelioma can be attributed to the asbestos exposure. *Id.* Thus, it implies that a certain level has been established [*51] at which the asbestos exposure attains "significance." Mark has failed to show this for the reasons explained above. The Helsinki Criteria also states that "[a] cumulative fiber dose, as expressed in fiber-years per cubic centimeter, is an important parameter of asbestos exposure." *Id.*, 311 As noted above, however, Mark has declined to estimate any cumulative fiber dose level for plaintiff Graham Yates's work. (March 16 Depo., 80:13-17); (Day 1 Hr'g Tr. 141:7-16).

More importantly, the Helsinki Criteria is concerned only with whether mesothelioma can

be attributed to asbestos, as a general matter. The Helsinki Criteria does not articulate principles for distinguishing which particular "occupational, domestic or environmental exposure[s] to asbestos" caused the disease. See *Butler*, 310 Ga. App. at 27 (noting that Helsinki Criteria fails to "address whether a *component* of a cumulative exposure of asbestos is causative") (emphasis added). The facts of this case present the jury with multiple potential sources of exposure, and jurors will be required to decide whether plaintiff Graham Yates's disease was caused by defendant Honeywell's brakes, defendant Ford's brakes, or both. The Helsinki Criteria may be a generally accepted and [*52] reliable method for attributing a particular case of mesothelioma to asbestos, but plaintiffs have not shown its relevance, or "fit," as applied to the facts and issues of this case. See *Daubert*, 509 U.S.

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at 591 ("[S]cientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes."). To the extent the Helsinki Criteria does not require an expert to establish the levels at which the particular fiber type of asbestos presents a risk, the criteria cannot substitute for the well-established and legally-recognized methods of determining when a substance is hazardous, as explained above.

d. Summary

Plaintiffs have failed to show that Mark's testimony will be helpful to the jury, is based on sufficient facts or data, is the product of reliable principles and methods, or that he has reliably applied these principles and methods to the facts of the case. Mark has failed to reliably establish a level at which chrysotile asbestos is harmful, generally. To the extent Mark seeks to satisfy this through his "visible dust" theory, that theory lacks sufficient supporting facts and will not assist the jury. To the extent he seeks to satisfy the requirement by showing that [*53] plaintiff Graham Yates's exposures "are of the types that have been proven by scientific evidence in their accumulation to cause diffuse malignant mesothelioma," his testimony is circular and will not assist the jury.

Furthermore, he has failed to demonstrate that the scientific evidence he musters in support establishes any quantitative or qualitative level of reference for exposures, or that he has ever taken the fundamental step of reliably comparing plaintiff Graham Yates's exposures with any level established as generally hazardous. To the extent Mark adheres to the Helsinki Criteria as an

alternative method, these criteria lack the proper "fit" to this case and do not allow him to circumvent well-established scientific and legal principles for establishing causation. Accordingly, for all these reasons, Mark's causation testimony must be excluded. Because this subject comprises the essence of Mark's testimony, he will not be permitted to testify at trial.

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B. Honeywell's Motion (DE 380), Joined by Defendant Ford (DE 385)

Defendant Honeywell's motion is narrower in scope than defendant Ford's, but raises largely the same arguments. It seeks to exclude particular subjects of testimony from [*54] Brody, Hays, and Mark - specifically, 1) testimony that "exposure to brake dust or chrysotile asbestos from brakes causes pleural mesothelioma," and 2) testimony that " 'every exposure to asbestos' above background was a substantial contributing factor to the development of plaintiff Graham Yates's alleged mesothelioma." (Memo. In Supp., 1) (DE 381). Testimony regarding the opinion that "every exposure counts" is addressed above. For the reasons explained, the motion is granted as it relates to Brody's testimony that "each and every exposure" counts, but denied as it relates to Hays and Mark, as the court does not find these experts offer such testimony.

The above discussion also addresses Mark's testimony that brake dust causes mesothelioma, and in this part, defendant Honeywell's motion is granted. As to testimony from Brody or Hays that brake dust causes mesothelioma, these experts do not offer this opinion in their reports. Neither, however, do they offer any basis for holding such opinion. Accordingly, to the extent either expert would seek to offer such testimony at trial, defendant Honeywell's motion to exclude testimony that brake dust causes mesothelioma is also granted with respect to [*55] Brody and Hays.

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CONCLUSION

For the reasons explained above, the court GRANTS IN PART, and DENIES IN PART, defendants' Daubert motions. Defendant Ford's motion (DE 380), joined by defendant Honeywell (DE 384) is GRANTED as it relates to testimony from Brody as to "each and every exposure" theory. Otherwise, with respect to Brody, defendant Ford's motion is DENIED. As it relates to Hays, defendant Ford's motion is DENIED. As it relates to Mark, however, defendant Ford's motion

is GRANTED. Mark is excluded from testifying in this case.

Defendant Honeywell's motion (DE 382), joined by defendant Ford (DE 385) is GRANTED as it relates to Brody's opinion on "each and every exposure" theory. It is DENIED as it relates to