

UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLUMBIA

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UNITED STATES OF AMERICA, ex rel.,  
AARON J. WESTRICK, Ph.D.,

Plaintiffs,

v.

SECOND CHANCE BODY ARMOR, INC.,  
et al.,

Defendants.

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Civil Action No. 04-0280 (PLF)

OPINION

This False Claims Act case is scheduled for trial before a jury beginning on March 5, 2018. Currently pending before the Court are ten motions in limine to exclude the opinions and testimony of seven experts proffered by the United States and three experts proffered by defendants Toyobo Co. Ltd. and Toyobo America, Inc. (collectively, “Toyobo”). At the request of the parties, the Court held a Daubert hearing with respect to one of Toyobo’s proffered experts, Dr. Kazuyuki Yabuki, on January 23, 2018. The parties agreed to rest on their papers with respect to the remaining motions. See Joint Report re: Daubert Hearings [Dkt. No. 503]. The Court has carefully reviewed the expert reports and supplemental reports of each expert; the testimony of Dr. Yabuki at the Daubert hearing and the arguments presented by counsel with respect to Dr. Yabuki; and the motions in limine filed by the parties and the oppositions and replies thereto with respect to why the proponent believes the testimony should

be admitted and why the opponent believes it should be excluded. The Court's rulings with respect to these ten proffered experts follow.<sup>1</sup>

## I. LEGAL STANDARD

Rule 702 of the Federal Rules of Evidence effectively codifies the Supreme Court's decisions in Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579 (1993) and Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999). In Daubert, the Court charged trial judges with the

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<sup>1</sup> In connection with the pending motions, the Court reviewed the following papers and exhibits attached thereto: Toyobo's Memorandum in Support of its Motion to Exclude the Opinions and Testimony of Dr. S. Leigh Phoenix ("Phoenix Mot.") [Dkt. No. 382-1], the United States' Opposition ("Phoenix Opp.") [Dkt. No. 402], and Toyobo's Reply ("Phoenix Reply") [Dkt. No. 428]; Toyobo's Memorandum in Support of its Motion to Exclude Certain Opinions and Testimony of Dr. Alan J. Lesser ("Lesser Mot.") [Dkt. No. 374-1], the United States' Opposition ("Lesser Opp.") [Dkt. No. 397], and Toyobo's Reply ("Lesser Reply") [Dkt. No. 422]; Toyobo's Memorandum in Support of its Motion to Exclude Certain Opinions and Testimony of Dr. David S. Brookstein ("Brookstein Mot.") [Dkt. No. 384-1], the United States' Opposition ("Brookstein Opp.") [Dkt. No. 401], and Toyobo's Reply ("Brookstein Reply") [Dkt. No. 421]; Toyobo's Memorandum in Support of its Motion to Exclude Certain Opinions and Testimony of Dr. Michael A. Riley ("Riley Mot.") [Dkt. No. 380-1], the United States' Opposition ("Riley Opp.") [Dkt. No. 400], and Toyobo's Reply ("Riley Reply") [Dkt. No. 424]; Toyobo's Memorandum in Support of its Motion to Exclude Certain Opinions and Testimony of Kirk Rice ("Rice Mot.") [Dkt. No. 381-1], the United States' Opposition ("Rice Opp.") [Dkt. No. 399], and Toyobo's Reply ("Rice Reply") [Dkt. No. 426]; Toyobo's Memorandum in Support of its Motion to Exclude Certain Opinions and Testimony of Joseph T. Anastasi ("Anastasi Mot.") [Dkt. No. 375-1], the United States' Opposition ("Anastasi Opp.") [Dkt. No. 396], and Toyobo's Reply ("Anastasi Reply") [Dkt. No. 420]; Toyobo's Memorandum in Support of its Motion to Exclude Certain Opinions and Testimony of Dr. A.S. Abhiraman ("Abhiraman Mot.") [Dkt. No. 377-1], the United States' Opposition ("Abhiraman Opp.") [Dkt. No. 398], and Toyobo's Reply ("Abhiraman Reply") [Dkt. No. 418]; the United States' Memorandum of Law in Support of its Motion in Limine to Exclude the Testimony of Dr. Kazuyuki Yabuki ("Yabuki Mot.") [Dkt. No. 385-1], Toyobo's Opposition ("Yabuki Opp.") [Dkt. No. 391], and the United States' Reply ("Yabuki Reply") [Dkt. No. 427]; the United States' Memorandum of Law in Support of its Motion in Limine to Exclude the Testimony of Dr. Robert M. Nowak ("Nowak Mot.") [Dkt. No. 383-1]; Toyobo's Opposition ("Nowak Opp.") [Dkt. No. 393], and the United States' Reply ("Nowak Reply") [Dkt. No. 425]; and the United States' Memorandum of Law in Support of its Motion in Limine to Exclude the Testimony of Herbert Heuchert ("Heuchert Mot.") [Dkt. No. 379-1], Toyobo's Opposition ("Heuchert Opp.") [Dkt. No. 394], and the United States' Reply ("Heuchert Reply") [Dkt. No. 419].

responsibility of acting as “gatekeepers” to shield unreliable or irrelevant expert testimony and evidence from the jury. In Kumho, the Court made clear that the gatekeeper function applies to all expert testimony, not just scientifically-based testimony.

Rule 702 provides that if the Court finds that “scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue,” and if the Court finds that the witness “is qualified as an expert by knowledge, skill, experience, training, or education,” then the Court may permit the witness to testify – so long as the witness’s “testimony is based on sufficient facts or data,” “the testimony is the product of reliable principles and methods,” and the witness has “reliably applied the principles and methods to the facts of the case.” FED. R. EVID. 702. The party seeking to introduce the expert testimony must demonstrate its admissibility under Rule 702 by a preponderance of the evidence. See Meister v. Med. Eng’r Corp., 267 F.3d 1123, 1127 n.9 (D.C. Cir. 2001) (citing Daubert v. Merrell Dow Pharm., Inc., 509 U.S. at 592 n.10); Rothe Dev., Inc. v. Dep’t of Defense, 107 F. Supp. 3d 183, 197 (D.D.C. 2015). The Court has “broad discretion in determining whether to admit or exclude expert testimony.” U.S. ex rel. Miller v. Bill Harbert Int’l Constr., Inc., 608 F.3d 871, 895 (D.C. Cir. 2010) (quoting United States v. Gatling, 96 F.3d 1511, 1523 (D.C. Cir. 1996)).

“[T]he twin requirements for the admissibility of expert testimony are evidentiary reliability and relevance.” FTC v. Whole Foods Mkt., Inc., No. 07-1021, 2007 WL 7632283, at \*1 (D.D.C. July 27, 2007). “With respect to evidentiary reliability, the Court’s focus must be on the methodology or reasoning employed by application of the factors in Rule 702 and the non-exhaustive list of factors set forth in Daubert and Kumho.” Id.; see Daubert v. Merrell Dow Pharm., Inc., 509 U.S. at 595 (holding that the “focus, of course, must be solely on principles and

methodology, not on the conclusions they generate”); Ambrosini v. LaBarraque, 101 F.3d 129, 140 (D.C. Cir. 1996) (“[T]he admissibility inquiry focuses not on conclusions but on approaches . . . .”). These factors include: “(1) whether the theory or technique can be and has been tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the method’s known or potential rate of error; and (4) whether the theory or technique finds general acceptance in the relevant scientific community.” Ambrosini v. Labarraque, 101 F.3d at 134 (citing Daubert v. Merrell Dow Pharm., Inc., 509 U.S. at 593-94). The Court is not bound by only these factors when considering reliability. As the D.C. Circuit has noted, “[t]he test of reliability is ‘flexible’ and ‘the law grants a district court the same broad latitude when it decides how to determine reliability as it enjoys [with] respect to its ultimate reliability determination.’” Gilmore v. Palestinian Interim Self-Gov’t Auth., 843 F.3d 958, 972 (D.C. Cir. 2016) (quoting Kumho Tire Co. v. Carmichael, 526 U.S. at 142).

“With respect to relevance, the Court must determine whether the proffered testimony is sufficiently tied to the facts of the case and whether it will aid the factfinder in resolving a factual dispute.” FTC v. Whole Foods Mkt., Inc., 2007 WL 7632283, at \*1 (citing Daubert v. Merrell Dow Pharm., Inc., 509 U.S. at 592-93). This is a consideration of “fit.” Ambrosini v. Labarraque, 101 F.3d at 134 (citing Daubert v. Merrell Dow Pharm., Inc., 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. (citing Daubert v. Merrell Dow Pharm., Inc., 509 U.S. at 591).

## II. EXPERTS PROFFERED BY THE UNITED STATES

Toyobo moves to exclude the opinions and testimony of seven experts proffered by the United States: (1) Dr. S. Leigh Phoenix; (2) Dr. Alan J. Lesser; (3) Dr. David S.

Brookstein; (4) Dr. Michael A. Riley; (5) Kirk Rice; (6) Joseph T. Anastasi; and (7) Dr. A.S. Abhiraman. The Court notes at the outset that the rulings set forth in this Opinion pertain to the expert reports filed in this action, United States ex rel. Westrick v. Second Chance Body Armor, Inc. (Civil Action No. 04-0280), and not the related action, United States v. Toyobo Co., Ltd. (Civil Action No. 07-1144). In addition, the portions of the pending motions relating to Dr. Allen L. Price and Dr. Bradley S. Field are now moot, as Toyobo has withdrawn its designations of those two proffered experts. See Joint Report re: Daubert Hearings [Dkt. No. 503]. Separately, in response to the Court's summary judgment rulings on September 4, 2015, see United States ex rel. Westrick v. Second Chance Body Armor, Inc., 128 F. Supp. 3d 1 (D.D.C. 2015), the parties have withdrawn their arguments related to the commercial warranty provided by Second Chance Body Armor, Inc. ("Second Chance"). See Joint Submission Regarding Previously Filed Daubert Motions [Dkt. No. 456].

*A. Dr. S. Leigh Phoenix*

Dr. S. Leigh Phoenix is a tenured professor of mechanical and aerospace engineering at Cornell University proffered by the United States to opine on the relationship between fiber properties and ballistic performance. Dr. Phoenix holds a Doctorate in Theoretical and Applied Mechanics from Cornell University. See March 2012 Report, Phoenix Mot. Ex. 1 at 1 ("Phoenix Report") [Dkt. No. 382-3]. His primary areas of research include the ballistic impact of fibrous structures, statistical and micromechanical modeling, and fracture mechanics and fatigue modeling in metals. Id. Dr. Phoenix has authored over one hundred peer-reviewed articles, including four articles on ballistic modeling. See Phoenix Opp. at 3.

Dr. Phoenix has submitted three expert reports in this case: (i) an affirmative report dated March 15, 2012; (ii) a supplemental report dated October 3, 2012, submitted in

response to one of Toyobo's proffered experts, Dr. Kazuyuki Yabuki; and (iii) a declaration dated May 15, 2013.<sup>2</sup> Toyobo has filed a motion [Dkt. No. 382] to exclude Dr. Phoenix's opinions in their entirety, a motion which the United States opposes. While the parties agree that Dr. Phoenix is qualified to opine on properties of Zylon fiber, they disagree over whether Dr. Phoenix may reliably opine on fiber properties as they relate to ballistic applications and Toyobo's disclosures to body armor manufacturers. The Court therefore will focus its analysis on the reliability and fit of Dr. Phoenix's proffered opinions.

### 1. Opinions Regarding Ballistics

Dr. Phoenix opines that fiber tensile strength is a critical factor in determining the ballistic performance of body armor: if fiber tensile strength decreases by a significant amount, so too will the ballistic performance of that fiber. See Phoenix Report at 5-6. Toyobo seeks to exclude this opinion and Dr. Phoenix's other opinions regarding ballistics on the grounds that they are not reliable, will not assist the jury in deciding the issues in this case, and would invade the province of the jury. Phoenix Mot. at 10.

Toyobo argues that Dr. Phoenix relied solely on mathematical models and did not conduct any tests using "real bullets" to ensure that his models accurately predict the real-life performance of Zylon fiber incorporated into a bulletproof vest. Phoenix Mot. at 4. Toyobo further asserts that Dr. Phoenix's ballistic models apply to only a subset of the bulletproof vests at issue, ignore the effects of vest design and construction, are not used to design or test body armor, and do not accurately predict the results of ballistic testing done by Second Chance on its used Zylon vests. Id. at 10-14. In addition, Toyobo contends that Dr. Phoenix has neither

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<sup>2</sup> Dr. Phoenix has also submitted a rebuttal report dated May 23, 2012 in response to Dr. Allen Price and Dr. Field who, as noted, have been withdrawn.

designed nor manufactured bulletproof vests and thus lacks relevant professional experience to support his conclusions regarding ballistic performance. Id. at 14. Permitting Dr. Phoenix's testimony under these circumstances, Toyobo argues, would be unfairly prejudicial to Toyobo. Id.

The Court disagrees. Dr. Phoenix's opinions regarding ballistics and ballistic performance are based on a sound methodology and would aid the jury in evaluating the suitability of Zylon for use in bulletproof vests. Dr. Phoenix used his expertise in fiber properties and ballistic modeling to analyze Toyobo's testing data measuring the tensile strength of Zylon fiber over time. See, e.g., Phoenix Report at 6-10. Dr. Phoenix's ballistic impact modeling is generally accepted science that has been cited forty-nine times in peer-reviewed articles. Phoenix Opp. at 13. Dr. Phoenix need not have experience designing or manufacturing bulletproof vests to reliably assess the behavior of Zylon fiber incorporated into bulletproof vests using peer-reviewed ballistic modeling. Furthermore, Toyobo's concerns over the lack of ballistic testing using "real bullets" or the limits of Dr. Phoenix's ballistic models go to the weight to be accorded to his testimony and not its admissibility under Daubert or Rule 702. See Robinson v. District of Columbia, 75 F. Supp. 3d 190, 200 (D.D.C. 2014). The Court therefore will admit Dr. Phoenix's proffered opinions regarding ballistics and ballistic performance.

Separately, Toyobo seeks to exclude Dr. Phoenix's opinion that Second Chance's used-vest testing showed that some Zylon vests would fall below the standards set by the National Institute of Justice ("NIJ") before five years. Phoenix Mot. at 15-16; Phoenix Report at 42. Toyobo characterizes this opinion as pertaining to "the durability of Second Chance's Zylon vests." Phoenix Mot. at 15. The United States responds that Dr. Phoenix does not offer an opinion on the durability of Second Chance vests, but rather questions Second Chance's

interpretation of its used-vest testing data. Phoenix Opp. at 29-30. Based on Dr. Phoenix's report and his deposition testimony, however, it appears that Dr. Phoenix does indeed offer an opinion that "one can crudely estimate [that] some vests would likely fall below the NIJ standard well before 5 years . . . ." See Phoenix Report at 42; 01/17/13 Phoenix Dep. at 913:16-915:8 [Dkt. No. 382-15]. Because this opinion is admittedly based on a "crude" estimate, the Court will exclude it.

## 2. Opinions Regarding Toyobo's Disclosures

In 2001, Toyobo periodically tested the strength retention of thirteen spools of Zylon fiber that had been continuously exposed to conditions of 40°C and 80% relative humidity. Toyobo then disclosed the results of that testing to body armor manufacturers and others in the body armor industry. Dr. Phoenix opines that Toyobo's disclosures were improper for several reasons: (i) Toyobo "suppressed" the fact that each spool had a different level of strength retention by disclosing averaged data rather than raw data for each spool; (ii) Toyobo selected spools with higher "Na/P ratios" in order to boost the results of the fiber strength testing; (iii) Toyobo deleted outlier data points; and (iv) Toyobo delayed the disclosure of its testing data.

Toyobo seeks to exclude Dr. Phoenix's opinions about Toyobo's disclosures for two main reasons. First, Toyobo asserts that Dr. Phoenix's opinions about the impact of the disclosures on the body armor industry are based on speculation rather than on reliable principles or accepted data-reporting standards in the fiber and ballistics industries. Phoenix Mot. at 18-20. Toyobo argues that Dr. Phoenix does not know what body armor manufacturers did with the information from Toyobo, whether they were misled, what expectations they had of Toyobo, whether they asked to receive raw data for each spool of Zylon, or what information they found important. Id. Toyobo further argues that Dr. Phoenix has not worked for a fiber supplier, has



not designed a bulletproof vest, and is not familiar with the data reporting methods of fiber suppliers. Id. Second, Toyobo contends that Dr. Phoenix's opinions about Toyobo's internal knowledge and motives are speculative and would invade the province of the jury. Id. at 20-21. Toyobo asserts that Dr. Phoenix has no reliable basis to proffer opinions about what Toyobo knew or intended when it conducted its testing and disclosed data to the body armor industry. Id.

The Court will admit certain portions of Dr. Phoenix's proffered opinions and exclude others. Dr. Phoenix's methodology is reliable insofar as he used his expertise in fiber properties to compare Toyobo's internal testing data to the representations made in its disclosures. Dr. Phoenix need not have experience as a fiber supplier or in bulletproof vest design to reliably interpret Toyobo's data generated from testing Zylon fiber. Due to the technical nature of Toyobo's data and disclosures, Dr. Phoenix's opinions would aid the jury in evaluating whether Toyobo's disclosures were misleading. The Court therefore will admit Dr. Phoenix's opinions comparing Toyobo's testing data to the data presented in its disclosures and explaining how a reasonable person would have interpreted the disclosures. See In re Rail Freight Fuel Surcharge Antitrust Litig., No. 07-mc-0489, 2017 WL 5311533, at \*40 n.25 (D.D.C. Nov. 13, 2017) (admitting expert's opinion that defendants' behavior was consistent with collusion but excluding his opinion that defendants intended to collude). For instance, Dr. Phoenix may explain the results of Toyobo's testing, describe what information Toyobo did or did not disclose (e.g., reporting averaged data rather than raw data and removing certain data points), opine on whether and why certain spools of Zylon fiber performed better than others, and describe the amount of time between disclosures.

The Court will exclude, however, opinions regarding Toyobo's knowledge or intentions with respect to its disclosures to body armor manufacturers. Such testimony would be

too speculative to satisfy the reliability threshold of Rule 702 and would touch upon the ultimate issue for the jury of whether Toyobo's disclosures were misleading. See SEC v. Johnson, 525 F. Supp. 2d 70, 78-79 (D.D.C. 2007) (excluding expert's opinion that employees intended to deceive auditors and that defendants misled auditors). Specifically, Dr. Phoenix will not be permitted to opine on what Toyobo knew about Zylon degradation, why Toyobo made the decision to test certain spools over others, why Toyobo chose to disclose or withhold certain data, why Toyobo chose to present certain data in the manner that it did, or whether Toyobo was motivated by business or other concerns. See Sykes v. Napolitano, 634 F. Supp. 2d 1, 9 (D.D.C. 2009) (excluding expert's conclusion that a party was motivated by "self promotion and a fervent quest to discredit the Plaintiff"); see also In re Chantix (Varenicline) Prod. Liab. Litig., 889 F. Supp. 2d 1272, 1287 (N.D. Ala. 2012) (excluding expert testimony as to what defendant "knew" or that defendant "misled" the FDA, but admitting testimony as to what information defendant provided to the FDA).

Relatedly, the Court will exclude bald assertions based on the documentary record regarding Toyobo's intent or motivations. Dr. Phoenix includes these statements in some of his discussion of the documentary record and Toyobo's testing. See, e.g., Phoenix Report at 12 ("Documents show . . . [that] there was marketing pressure to increase the production speed [of spools of Zylon fiber]."). The jury is competent to read and interpret the evidence without Dr. Phoenix's proffered opinions. See In re Rail Freight Fuel Surcharge Antitrust Litig., 2017 WL 5311533, at \*21 (holding that "an economist's testimony is not admissible where he or she simply reads and interprets evidence of collusion as any juror might, or where an economist infers intent to collude from mere documentary evidence, unrelated to his or her economic expertise").

For similar reasons, the Court will exclude portions of Dr. Phoenix's opinions regarding whether body armor manufacturers were misled by Toyobo's disclosures, what information should have been conveyed to body armor manufacturers, and what information was important to body armor manufacturers. Dr. Phoenix's expertise in fiber properties and ballistic modeling does not support his opinions on norms governing the disclosure of testing data within the body armor industry.

### 3. Opinions in Response to Dr. Kazuyuki Yabuki

Toyobo seeks to exclude Dr. Phoenix's opinions provided in response to one of Toyobo's proffered experts, Dr. Kazuyuki Yabuki. Dr. Phoenix and Dr. Yabuki disagree over the relationship between "Na/P ratio" and the strength retention of Zylon. In Dr. Phoenix's opinion, Na/P ratio is an important indicator of how quickly Zylon fiber will degrade due to exposure to heat and humidity. See October 2012 Report, Phoenix Mot. Ex. 3 at 5-6 [Dkt. No. 382-5]. Dr. Phoenix opines that Dr. Yabuki incorrectly concludes that there is a weak correlation between Na/P ratio and Zylon degradation. Toyobo argues that Dr. Phoenix is not a polymer chemist and thus lacks relevant experience, training, or education to reliably opine on the relationship between Na/P ratio and strength retention. Phoenix Mot. at 23-24.

The Court is not persuaded that Dr. Phoenix's opinion and testimony on this topic should be excluded. Dr. Phoenix employed a reliable methodology by using his expertise in mathematical modeling to compare Toyobo's testing data tracking the Na/P ratio and strength retention of various samples of Zylon fiber tested under conditions of 40°C and 80% relative humidity. Dr. Phoenix need not be a polymer chemist to perform this type of data analysis. Dr. Phoenix's opinions proffered in response to Dr. Yabuki therefore will be admitted for the jury's consideration.

*B. Dr. Alan J. Lesser*

Dr. Alan J. Lesser is a tenured professor of polymer science at the University of Massachusetts, Amherst proffered by the United States as an expert in fiber properties and ballistic performance. Dr. Lesser holds a Doctorate in Civil Engineering from Case Western Reserve University and worked as a research scientist in the Polymeric Materials Department for Shell Development Company prior to entering academia. March 2012 Report, Lesser Mot. Ex. 1 at 1 and Appendix A (“Lesser Report”) [Dkt. No. 374]. His research interests include fracture and adhesion of fibers and environmental stress cracking and chemical degradation of polymer-based materials. *Id.* at 1. Dr. Lesser has significant research experience in polymer chemistry and fiber properties and has authored ninety-four peer-reviewed papers, including ten papers detailing the impacts of environmental effects on the behavior of polymers and polymer-based fibers. Lesser Report at 5.

Dr. Lesser has submitted an affirmative report dated March 15, 2012 in this case. Toyobo has filed a motion [Dkt. No. 374] to exclude portions of Dr. Lesser’s opinions, a motion which the United States opposes. The Court will address each of Toyobo’s objections in turn.

1. Opinions Regarding Ballistics and Vest Performance

Dr. Lesser opines that various properties of Zylon fiber render Zylon “so mechanically and chemically fragile” that it is not suitable for use in bulletproof vests. Lesser Report at 19. According to Toyobo, this opinion and Dr. Lesser’s other opinions related to ballistic performance are unreliable because he lacks relevant ballistics experience – including designing, manufacturing, or testing bulletproof vests – and did not conduct ballistic testing to confirm that his opinions accurately reflect the behavior of Zylon fiber incorporated into a bulletproof vest. Lesser Mot. at 7. Toyobo also contends that Dr. Lesser merely parrots a model

of ballistic performance developed by another United States expert, Phillip M. Cunniff, that is intended to be used in conjunction with ballistic testing. Id. at 7-9.

The Court will admit Dr. Lesser's opinions regarding ballistic performance and the suitability of Zylon for use in bulletproof vests. Dr. Lesser is qualified to offer opinions on these topics based on his experience studying and working with fibers and ballistic impact models. He reached his opinions through a reliable methodology, in which he applied his knowledge of fiber properties to assess Toyobo's degradation data using the Cunniff model of ballistic performance. See, e.g., Lesser Report at 7-9. The Cunniff model – which predicts the performance of soft body armor based on alterations in various fiber properties – has been peer-reviewed and is generally accepted in the scientific community. Id. at 8. Dr. Lesser's opinions on the properties of fibers and their impact on ballistic performance would assist the jury in assessing the suitability of Zylon fiber for use in bulletproof vests.

Contrary to Toyobo's assertion, Dr. Lesser does not merely parrot the Cunniff model, but rather applies his own expertise to compare the results of the Cunniff model against other ballistic models to measure ballistic performance. See Lesser Report at 7-9; McReynolds v. Sodexo Marriott Servs., Inc., 349 F. Supp. 2d 30, 36 (D.D.C. 2004) (“An expert witness is permitted to use assistants in formulating his expert opinion.” (quoting Dura Auto. Sys. of Ind., Inc. v. CTS Corp., 285 F.3d 609, 612 (7th Cir. 2002))); see also Lee Valley Tools, Ltd. v. Indus. Blade Co., 288 F.R.D. 254, 266 (W.D.N.Y. 2013) (“Where the expert was directly involved in the research, analysis or drafting of the report, even with substantial assistance from a colleague or associate, his involvement in and knowledge of the report are matters of weight, not admissibility.”). Dr. Lesser's lack of experience designing or manufacturing bulletproof vests does not render his opinions regarding ballistic performance and the suitability of Zylon in

bulletproof vests unreliable. Furthermore, Toyobo's objections regarding the lack of ballistic testing and the purported limitations of the Cunniff model go to weight and not admissibility. See Robinson v. District of Columbia, 75 F. Supp. 3d at 200. The Court therefore will admit Dr. Lesser's opinions on ballistic performance and Zylon's suitability for use in bulletproof vests.

## 2. Opinions Regarding Toyobo's Disclosures

Toyobo seeks to exclude Dr. Lesser's opinion that Toyobo communicated "misleading" disclosures to body armor manufacturers. Lesser Mot. at 15-19. Dr. Lesser opines that Toyobo presented data that overestimated Zylon's strength retention, made inappropriate predictions about service life, continually altered the manner in which it presented data, used metrics that misled customers with respect to durability, and misrepresented data by removing data points from graphs sent to manufacturers. Lesser Report at 20-28. Toyobo argues that these opinions are speculative because Dr. Lesser does not know what information body armor manufacturers sought or expected from Toyobo or how they interpreted the disclosures. Lesser Mot. at 15-19. In addition, Toyobo asserts that opining on the effect of the disclosures on the body armor industry is speculative and would invade the province of the jury. Lesser Reply at 10-12.

For the same reasons discussed in connection with Dr. Phoenix, the Court will admit certain portions of Dr. Lesser's proffered opinion and exclude others. Dr. Lesser's methodology is reliable insofar as he uses his expertise in polymer science and fiber properties to compare Toyobo's internal testing data to the representations made in its disclosures. Dr. Lesser need not have experience as a fiber supplier or in bulletproof vest design to reliably interpret Toyobo's data generated from testing Zylon fiber. Dr. Lesser's comparisons would assist the jury in evaluating, inter alia, whether Toyobo's disclosures regarding its fiber testing results were

misleading. The Court therefore will admit Dr. Lesser's opinions comparing Toyobo's testing data to the data presented in its disclosures and explaining how a reasonable person would have interpreted the disclosures. For instance, Dr. Lesser may describe the results of Toyobo's testing, the information that Toyobo did or did not disclose, and the manner in which the data was presented. See, e.g., Lesser Report at 28 ("Each of these [alterations in the way the data was presented] make it difficult for customers to independently evaluate appropriate service life of products based on strength retention.").

The Court will exclude, however, opinions regarding Toyobo's knowledge or intentions with respect to its disclosures to body armor manufacturers. Such testimony would be based on unsupported speculation and would invade the province of the jury. In particular, Dr. Lesser will not be permitted to opine on what Toyobo knew about Zylon degradation at a given time, why Toyobo chose to disclose or withhold certain data, why Toyobo chose to present certain data in the manner that it did, or whether Toyobo was motivated by business or other interests.

The Court will also exclude bald conclusions based on the documentary record regarding Toyobo's intent or motivations or other topics beyond the scope of Dr. Lesser's expertise. For example, Dr. Lesser opines that "[t]he pressure from the business and sales part of . . . Toyobo's organization over this period of time caused considerable tension between the various individuals and groups in the company" and that "numerous internal documents from Toyobo support the immense difficulty they incurred while trying to neutralize the residual PPA in Zylon AS fiber." Lesser Report at 17. This will not be permitted. The jury is competent to read and interpret the evidence relevant to these topics without Dr. Lesser's proffered opinions. As another example, Dr. Lesser provides opinions on Toyobo's quality control procedures, but

has not established any specialized expertise in quality control procedures beyond reading internal Toyobo documents: “[S]ince Toyobo has no methods in place to control this concentration at the time of delivery to their customers, they have no way to insure that any of their products meet their own specifications.” *Id.* at 13; see id. at 17 (“This becomes particularly critical since simply identifying a product as ‘red’ is too subjective and cannot be used as a criterion for quality control.”). The Court therefore will exclude this type of proffered testimony.

For similar reasons, the Court will exclude Dr. Lesser’s opinions regarding whether body armor manufacturers were misled by Toyobo’s disclosures, what information should have been conveyed to body armor manufacturers, and what information was important to body armor manufacturers. See, e.g., Lesser Report at 20 (“Toyobo communicated misleading results to customers.”). Dr. Lesser’s expertise in polymer science and fiber properties does not support his opinions on norms applicable to the disclosure of testing data within the fiber and ballistics industries.

### *C. Dr. David S. Brookstein*

Dr. David S. Brookstein has a Bachelor’s Degree in Textile Engineering from the Georgia Institute of Technology, and both a Master of Science Degree in Textile Technology and a Doctorate in Mechanical Engineering from the Massachusetts Institute of Technology. Brookstein Opp. at 4. From 1994 to 2010, he served as the Dean of the School of Engineering and Textiles at Philadelphia University and a professor of engineering. *Id.* Prior to that time, Dr. Brookstein spent fourteen years as the Associate Director of the Albany International Research Company, a commercial research laboratory where he conducted a wide range of research and development projects involving high-performance fibers such as Kevlar. See March 15, 2012 Report, Brookstein Mot. Ex. 1 at 1 (“Brookstein Report”) [Dkt. No. 384-3].



Dr. Brookstein has submitted one affirmative expert report dated March 15, 2012.<sup>3</sup> Toyobo seeks to exclude Dr. Brookstein's testimony that Zylon is unsuitable for use in ballistic applications. Brookstein Mot. at 8. According to Toyobo, Dr. Brookstein's methodology is not reliable because he lacks expertise in ballistics – including vest design, construction, or manufacturing – and has not conducted ballistic testing to confirm how Zylon fiber behaves once it is incorporated into a bulletproof vest. Id. at 9; Brookstein Reply at 4-7. In addition, Toyobo asserts that Dr. Brookstein could not pinpoint what makes Zylon defective or explain why other fibers that have kink bands and undergo hydrolysis are not similarly defective. Brookstein Mot. at 12-13. Toyobo also urges the Court to exclude Dr. Brookstein's opinions about Toyobo's manufacturing, quality assurance, and quality control processes, Brookstein Mot. at 14-18, and his opinion that Toyobo misled the body armor industry. Id. at 19-21.

After reviewing his expert report, the Court has questions about Dr. Brookstein's methodology and the bases for many of his opinions and conclusions. Beyond that, many of his observations are conclusory or speculative, clearly are not proper for testimony by an expert, intrude upon the function of the jury, attribute motives to Toyobo that are beyond his ken, or are pejorative in tone (e.g., that "Toyobo was derelict" and the manufacturing process "was out of control"). His chart of "what Toyobo knew and when it first knew it regarding the strength retention of Zylon fiber used in the ballistics industry," Brookstein Report at 54-56, clearly is beyond the pale. Furthermore, many of Dr. Brookstein's opinions regarding Toyobo's

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<sup>3</sup> Dr. Brookstein has also submitted a supplemental report dated May 23, 2012 in response to Dr. Price and Dr. Field who, as noted, have been withdrawn. The supplemental report also responds to opinions offered by a third Toyobo expert, Herbert Heuchert. Because the Court will exclude Mr. Heuchert's testimony, infra at 47-51, the Court need not address the portions of Dr. Brookstein's May 23, 2012 supplemental report pertaining to Mr. Heuchert's proffered opinions.

disclosures are not admissible for the same reasons explained with respect to Dr. Phoenix and Dr. Lesser.

Should the United States still wish to offer Dr. Brookstein as an expert witness for limited purposes, it should indicate in writing which opinions it still seeks to offer at trial, after which the Court will hear testimony from Dr. Brookstein at a further Daubert hearing in advance of trial.

*D. Dr. Michael A. Riley*

Dr. Michael A. Riley is a body armor researcher proffered by the United States as an expert in ballistic testing and ballistic performance of Zylon body armor. Because Dr. Riley is neither a retained expert nor an individual whose duties regularly involve giving expert testimony, he did not provide an expert report but rather provided a letter summarizing his qualifications and affirmative expert opinions. See FED. R. CIV. P. 26(a)(2)(C).

Dr. Riley holds a Doctorate in Civil Engineering from the State University of New York at Buffalo. Riley Opp. at 4. He joined the National Institute of Standards and Technology (“NIST”) in 1997 and currently serves as the Program Manager for Test and Evaluation in the Protective Systems Research Group of the Office of Law Enforcement Standards. Id. at 3-4. In that capacity, Dr. Riley oversees ballistic testing of body armor, develops proficiency tests for ballistic armor testing laboratories, and assesses commercial laboratories’ abilities to perform body armor testing. Id. at 3. He also advises the NIJ on the development of new body armor standards. Id. In addition, Dr. Riley helped revise the NIJ Standard for testing law enforcement body armor and evaluate the safety of Zylon vests in the field. Id.

Toyobo has filed a motion [Dkt. No. 380] to exclude only the following opinion proffered by Dr. Riley: “Fiber suppliers such as Toyobo Co. should provide a product to weavers and body armor manufacturers that is consistent with purchasing specifications – including documentation about normal production variations, how the material ages, and factors that influence aging – and does not significantly change from those purchasing specifications over warranty periods of active use.” November 9, 2012 Affirmative Opinions Letter, Riley Mot. Ex. 4 at 2 (Opinion Six) [Dkt. No. 380-6].<sup>4</sup>

Toyobo argues that Dr. Riley is not qualified and has no reliable basis to opine on the relationship between a fiber supplier and a weaver or body armor manufacturer, or the duties allegedly owed by a fiber supplier. Riley Mot. at 8. Toyobo contends that Dr. Riley fails to explain how his research and experience in Zylon degradation and fiber properties qualify him to opine on the type of information a fiber supplier should provide in purchasing specifications. Riley Reply at 11-14. According to Toyobo, Dr. Riley has had no conversations with body armor manufacturers or weavers about what information they expect to receive from fiber suppliers in purchasing specifications; has neither worked for fiber suppliers, weavers or body armor manufacturers, nor designed a bulletproof vest; has not seen a Zylon weaver’s purchasing specifications for Zylon fiber; and is not aware of purchasing specifications that require the type of information that Dr. Riley opines Toyobo and other fiber suppliers should provide. Riley Mot. at 8-10. Toyobo points out that although Dr. Riley has spoken to three fiber suppliers, he has little information about how fiber suppliers and body armor manufacturers worked together prior to 2005, the period relevant to this case. Id. at 9.

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<sup>4</sup> Toyobo has also moved to exclude another opinion offered by Dr. Riley pertaining to Second Chance’s commercial warranty, which is no longer at issue. See Joint Submission Regarding Previously Filed Daubert Motions [Dkt. No. 456].

The Court is not persuaded that this opinion should be excluded. As the project manager responsible for overseeing ballistic testing of law enforcement body armor on behalf of the United States, Dr. Riley is qualified to opine on whether fiber suppliers should provide a product that meets its purchasing specifications. Dr. Riley has experience using Zylon fiber specifications to study the effect of aging on Zylon and determining when a product fails to meet its purchasing specifications. As for his experience working with fiber suppliers, Dr. Riley has had “extensive discussions with some fiber suppliers and [he has] spent a great deal of time looking through some of their literature to understand what’s provided.” 03/12/13 Riley Dep. at 879:4-13 [Dkt. No. 400-2]. Dr. Riley has also spoken with procurement officials whose jobs are to purchase armor for officers in their agencies. Riley Reply Ex. 5 at 4. Toyobo’s arguments that those conversations occurred after the time period at issue here and did not involve purchasing specifications go to the weight of Dr. Riley’s opinion and not its admissibility.

In addition, the Court concludes that Dr. Riley’s knowledge and experience as a researcher in the field of safety standards provides a sound basis for his opinion. At his deposition, Dr. Riley explained that he based his opinion on literature related to fiber suppliers and discussions with three fiber suppliers. Furthermore, rather than opining that Toyobo failed to meet a particular requirement or satisfy a legal duty, Dr. Riley opines that fiber suppliers should provide a product that is consistent with purchasing specifications and remains so over a given period of time. That Dr. Riley has never worked for a fiber supplier, bulletproof vest manufacturer, or weaver goes to weight and not admissibility. In addition, it appears that Toyobo largely agrees with Dr. Riley on this point and that its disagreement concerns the scope of Dr. Riley’s opinion. See Riley Reply at 11 n.28 (“Toyobo largely agrees” with the proposition that “fiber manufacturers should provide a product consistent with its purchasing

specifications. . . .”). The Court therefore will admit Dr. Riley’s opinion regarding purchasing specifications.

*E. Kirk Rice*

Kirk Rice is a body armor researcher proffered by the United States as an expert in ballistic testing and ballistic performance of Zylon body armor. Because Mr. Rice is neither a retained expert nor an individual whose duties regularly involve giving expert testimony, he did not provide an expert report but rather provided a letter summarizing his qualifications and affirmative expert opinions. See FED. R. CIV. P. 26(a)(2)(C).

Mr. Rice holds a Bachelor of Science Degree in Chemical Engineering from the University of Maryland and a Master’s Degree in Engineering Administration from George Washington University. Rice Opp. at 3. Mr. Rice is the lead government scientist working on body armor systems at NIST. His title is Supervisory Physical Scientist serving as Program Manager for Protective Systems Research in the Office of Law Enforcement Standards. Id. In that role, Mr. Rice oversees a team of engineers and chemists studying body armor and develops performance standards and test protocols for body armor. Id. Mr. Rice is also responsible for the introduction of the NIJ’s Stab-Resistant Body Armor Standard and Ballistic-Resistant Body Armor Standard. Rice Mot. Ex. 1 at 75. He was a key participant in establishing the formal body armor testing laboratory accreditation program relied upon by NIJ for its compliance testing. Id.

Toyobo has filed a motion [Dkt. No. 381] to exclude only the following opinion proffered by Mr. Rice: “Fiber suppliers such as Toyobo Co. should provide a product to weavers and body armor manufacturers that is consistent with purchasing specifications – including documentation about normal production variations, how the material ages, and factors that

influence aging – and does not significantly change from those purchasing specifications over warranty periods of active use.” November 9, 2012 Affirmative Opinions Letter, Rice Mot. Ex. 4 at 2 (Opinion Six) [Dkt. No. 381-6].<sup>5</sup>

Toyobo’s arguments largely mirror those raised in support of its motion to exclude an identical opinion proffered by Dr. Riley. Toyobo argues that Mr. Rice is not qualified and has no reliable basis to opine on the relationship between a fiber supplier and a weaver or body armor manufacturer, or the duties allegedly owed by a fiber supplier. Rice Mot. at 1. Toyobo contends that Mr. Rice has only a general, academic understanding of the types of material used by body armor manufacturers, rather than real-world experience. *Id.* at 7. Toyobo argues that Mr. Rice has never worked for a fiber supplier or body armor manufacturer; has never designed, developed, or sold a bulletproof vest; has not seen a weaver’s purchasing specification for Zylon fiber; and is not aware of any purchasing specifications that require the information that he opines Toyobo and other fiber suppliers should provide. *Id.* Toyobo further asserts that Mr. Rice did not speak to any fiber suppliers about the type of information they typically provide to weavers and body armor manufacturers in purchasing specifications.

The Court concludes that Mr. Rice is qualified to offer this opinion and has an adequate basis for his opinion. As the lead scientist for the United States on body armor systems and standards, Mr. Rice is qualified to opine on whether fiber suppliers should provide a product that meets its purchasing specifications. He also has significant experience with fiber specifications. At deposition, Mr. Rice testified that his opinion is informed by his discussions with several fiber suppliers and his involvement in fiber degradation research. Rice Opp. at 18.

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<sup>5</sup> Toyobo has also moved to exclude another opinion offered by Mr. Rice pertaining to Second Chance’s commercial warranty, which is no longer at issue. *See* Joint Submission Regarding Previously Filed Daubert Motions [Dkt. No. 456].

Toyobo’s arguments that those conversations occurred after the time period at issue here and did not involve purchasing specifications go to weight and not admissibility. Moreover, rather than opining that Toyobo failed to meet a particular requirement or satisfy a legal duty, Mr. Rice opines that fiber suppliers should provide a product that is consistent with purchasing specifications and that remains so over a given period of time. It appears that Toyobo largely agrees with Mr. Rice on this point and that its disagreement concerns the scope of Mr. Rice’s opinion. See Rice Reply at 11 n.30 (“Toyobo largely agrees” with the proposition that “fiber manufacturers should provide a product consistent with its purchasing specifications . . .”). The Court therefore will admit Mr. Rice’s opinion regarding purchasing specifications.

*F. Joseph T. Anastasi*

Joseph T. Anastasi is a certified public accountant proffered by the United States as an expert witness in forensic accounting and the performance of damages analysis for matters in litigation. He has filed two expert reports in this case, one dated March 15, 2012, and the other dated September 14, 2012. In addition, by Memorandum Opinion and Order of January 17, 2018, the Court permitted the United States to file a supplemental expert report of Mr. Anastasi dated December 22, 2017. See Mem. Op. and Order [Dkt. No. 514]. Toyobo has filed a motion [Dkt. No. 375] to exclude the opinions and testimony of Mr. Anastasi, a motion which the United States opposes.

Mr. Anastasi holds a Bachelor of Science Degree in Accounting from Pennsylvania State University. Mr. Anastasi is a managing director at the Berkeley Research Group, a financial and economic consulting firm. He has also served variously as the Global Practice Leader for the Forensic & Investigative Service Practice at Deloitte and a Managing Partner at PricewaterhouseCoopers.

Toyobo argues that Mr. Anastasi has no basis to opine on damages in this case both because his methodology is flawed and unreliable and because, as a matter of law, what the United States paid Second Chance does not answer the ultimate question of what damages the United States actually suffered because the product sold had more than zero value. In other words, Toyobo contends that the United States' expenditures or payments do not equate with damages. Anastasi Mot. at 10. Rather, Toyobo maintains, the proper measure of damages is the difference between the value of the goods or services actually provided and the value they would have had if delivered as promised. Anastasi Reply at 5-6. The United States responds that Mr. Anastasi is being offered as an expert witness to provide the jury with an understanding of the vast sales data at issue in the case, his testing of that sales data, and his quantification of the data. It maintains that the methodologies he used to analyze this massive amount of sales data were painstaking and reliable and that his analysis would be helpful to the jury. Anastasi Opp. at 17-18. As for the legal question, the United States argues that the law is clear: False Claims Act damages in a case involving the sale of defective products is a straight-forward analysis of how much the United States paid for the defective product since the defect renders the product sold and delivered valueless. Anastasi Opp. at 9.

The Court has carefully reviewed Mr. Anastasi's March 2012 and September 2012 expert reports and his proffered supplemental report of December 22, 2017. In his reports, Mr. Anastasi separately reviewed (1) the sales made directly by Second Chance to United States agencies through the General Services Administration ("GSA") and (2) reimbursements made by the United States to state, local, and tribal law enforcement agencies under the Bulletproof Vest Partnership Act ("BVP"). In the case of the GSA sales, Mr. Anastasi and his staff examined 17,000 line items and twenty-three boxes of Second Chance sales invoices and other



documentation and matched spreadsheets to supporting invoices, order forms and other kinds of documentation. Anastasi Opp. at 1-2, 17-18. He found that the vast majority of the electronic sales records were supported by Second Chance invoices and other forms of documentation. Doing further calculations to account for instances where they did not match or where there were possible overcharges, he made corrections and calculated an amount. Id. at 17-18. With respect to the BVP reimbursements, Mr. Anastasi relied primarily on calculations done by Linda Hammond-Deckard, but he then did his own analysis and calculated an amount in BVP reimbursements made by the United States to state, local, and tribal law enforcement agencies. In his September 2012 report, he engaged in random sampling techniques and corroborated the earlier analysis he had done with respect to the BVP sales. In his supplemental report of December 22, 2017, Mr. Anastasi provided a payments analysis – to supplement his earlier sales analysis – with respect to orders for sales to federal agencies under GSA contracts as to which he had already provided an analysis of sales data.<sup>6</sup>

The Court agrees with the United States that Mr. Anastasi's analysis, both with respect to the GSA payments and the BVP reimbursements, is thorough and that his methodologies are sound. His work with respect to GSA payments went well beyond the realm of simple mathematics, contrary to Toyobo's assertion, and required the extensive review of twenty-three boxes of invoices and other sales documents, as well as the application of recognized forensic accounting techniques and statistical analysis. Indeed, his forensic accounting analysis resulted in his making downward adjustments to the underlying sales data

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<sup>6</sup> In that supplemental report, Mr. Anastasi also revised the start date for his calculations to conform to this Court's July 14, 2017 ruling. See United States ex rel. Westrick v. Second Chance Body Armor, Inc., 266 F. Supp. 3d 110 (D.D.C. 2017). Toyobo does not oppose the supplementation of Mr. Anastasi's earlier reports, calculations, and opinions to revise the start date.

numbers because of errors, credits, overcharges, and the like, which he discovered. With respect to Mr. Anastasi's BVP reimbursements analysis, it is true that he relied heavily on Ms. Hammond-Deckard, but he did not simply rubber stamp or "parrot" her work. He also conducted an independent review of a significant sample of the data, which confirmed that the BVP reimbursements data that had been compiled by Ms. Hammond-Deckard were supported by entries in the BVP accounting system database. See, e.g., SEC v. e-Smart Techs., Inc., 85 F. Supp. 3d 300, 312 (D.D.C. 2015) ("Experts at IDTP, moreover, did not simply parrot opinions articulated elsewhere. They examined data, verified results, gathered their own data, and ran tests of their own. Their approach to the technical issues in this case was appropriate to support expert testimony."); Dura Auto. Sys. of Ind., Inc. v. CTS Corp., 285 F.3d at 612 ("An expert witness is permitted to use assistants in formulating his expert opinion."). In both instances, Mr. Anastasi's analyses conformed to accepted forensic accounting methods, and their presentation at trial will be extremely helpful to the jury. For all of these reasons, the Court will admit Mr. Anastasi's opinions and testimony at trial, subject to the following reservation.

The Court need not now opine on the legal question raised by the parties – whether payments or expenditures made by the United States are the appropriate measure of damages in a False Claims Act case involving the sale of defective products, or whether the price paid must be reduced by value received in order to calculate damages.<sup>7</sup> That determination can be postponed until the Court has had a further opportunity to review the various court decisions cited by the parties and any additional authority they wish to provide. Furthermore, the parties

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<sup>7</sup> Each side cites numerous cases in support of their legal arguments, but the touchstone in this jurisdiction must be United States v. Science Applications Int'l Corp., 626 F.3d 1257, 1277-80 (D.C. Cir. 2010). See also JOHN T. BOESE, CIVIL FALSE CLAIMS AND QUI TAM ACTIONS §§ 3.01 [B], 3.01 [C], 3.01 [D] (4th ed. 2011).

will soon submit proposed jury instructions, including instructions with respect to damages, which will, of course, be supported by case citations and references to standard instructions used in other similar cases. The only open question as it relates to Mr. Anastasi's opinions and testimony to be offered at trial is whether he will be permitted to characterize the numbers about which he testifies as a result of his calculations and analyses as "damages" or as something else.<sup>8</sup>

*G. Dr. A.S. Abhiraman*

Dr. A.S. Abhiraman is a fiber scientist proffered by the United States as a rebuttal witness to respond to one of Toyobo's proffered experts, Herbert Heuchert. Such rebuttal testimony is not necessary, however, because Mr. Heuchert will not be permitted to testify for the reasons discussed infra at 47-51.

## II. EXPERTS PROFFERED BY TOYOBO

The Court turns next to the expert witnesses proffered by Toyobo. The United States moves to exclude portions of the opinions and testimony of three expert witnesses proffered by Toyobo: (i) Dr. Kazuyuki Yabuki; (ii) Dr. Robert M. Nowak; and (iii) Herbert Heuchert.

*A. Dr. Kazuyuki Yabuki*

Dr. Kazuyuki Yabuki is an industrial fiber researcher and chemist. See May 2012 Report, Yabuki Mot. Ex. 1 at 1 ("Yabuki Report") [Dkt. No. 385-3]. He holds a Doctorate in Engineering from the Tokyo Institute of Technology and joined Toyobo as a researcher in 1972.

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<sup>8</sup> Furthermore, Toyobo has filed a motion in limine [Dkt. No. 499] on the measure of damages which raises this issue and the parties will shortly be filing proposed jury instructions.

See Yabuki Opp. at 3-4. While employed at Toyobo, Dr. Yabuki served variously as a research chemist, chief research engineer, and director of research and development at Toyobo. Id. at 3-4, 6. Between 1994 and 2000, Dr. Yabuki oversaw the development and commercialization of Zylon fiber, which involved overseeing technical aspects of Zylon development including spinning, polymerization, and construction of the commercial production plant for Zylon. Id. at 1, 3-4; Transcript of Daubert Hearing With Respect to Dr. Kazuyuki Yabuki (“Yabuki Hearing Transcript”) at 36:7-38:6 (Jan. 23, 2018). In December 2000, Dr. Yabuki left his position overseeing the day-to-day aspects of Zylon to take on broader management roles at Toyobo. Yabuki Report at 4. Between 2009 and his retirement in 2013, he served as a corporate auditor responsible for ensuring that Toyobo’s board of directors properly discharged its duties. Dr. Yabuki has also been a visiting professor at several universities in Japan. Id. at 4, 6. He has published twenty-seven articles on Zylon, as well as several other research papers on fiber properties. Id.

Dr. Yabuki has been designated as a rebuttal witness to respond to three experts proffered by the United States – Dr. Phoenix, Dr. Lesser, and Dr. Brookstein. Dr. Yabuki has submitted one rebuttal report dated May 23, 2012. The United States filed a motion [Dkt. No. 385] to exclude Dr. Yabuki’s opinions in their entirety, a motion which Toyobo opposes. The Court will refer to each opinion by the number of the corresponding section in Dr. Yabuki’s report where the opinion is discussed.

The Court held a Daubert hearing on January 23, 2018, at which Dr. Yabuki testified. During the hearing, Toyobo withdrew Opinion Eight, regarding Toyobo’s efforts to develop stronger Zylon fiber through the “ZKP Project,” and Opinion Ten, regarding the “forthcoming and reasonable” nature of Toyobo’s disclosures. See Yabuki Hearing Transcript at

8:24-9:25, 71:14-18. Toyobo also withdrew Opinion Eleven, with the exception of the final two paragraphs discussing “Na/P ratio” and the use of Zylon vests in 2003. Id.<sup>9</sup>

The United States asserts three global objections to Dr. Yabuki’s proffered opinions. First, it argues that Dr. Yabuki’s reports were prepared in significant part by other Toyobo employees with expertise beyond the scope of Dr. Yabuki’s own expertise and whose work Dr. Yabuki “blindly” accepted without independent verification. Yabuki Mot. at 8-14, 18-21.<sup>10</sup> Second, the United States contends that Dr. Yabuki either did not read certain references cited in his report or read them many years ago. Id. at 15-24. *Third*, the United States asserts that Dr. Yabuki’s opinions do not fit the facts of the case because Dr. Yabuki offers opinions about Toyobo’s manufacturing process and quality control system but does not know how either system operated.<sup>11</sup>

Toyobo responds that Dr. Yabuki’s reliance on other Toyobo employees was proper because he “directed and supervised all of [the] work [of these employees], personally drafted his expert report, and reviewed and verified their work to confirm its accuracy.” Yabuki Opp. at 7. Toyobo asserts that Dr. Yabuki employed a sound methodology by using his professional experience working with Zylon fiber and his expertise in various fiber properties to

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<sup>9</sup> The Court will reserve judgment on Opinions 14-17 proffered only in the related Toyobo action (Civil Action No. 07-1144).

<sup>10</sup> The United States argues that it did not have the opportunity to cross-examine these employees. Yabuki Mot. at 11-15. The Court finds this argument unavailing, however, as the United States could have moved to compel the depositions of these employees but declined to do so.

<sup>11</sup> The United States also seeks to preclude Dr. Yabuki from offering certain opinions that he agreed not to offer at his deposition. See Yabuki Mot. at 41-43. Because the parties represented that they would resolve this issue through a joint stipulation, the Court need not address the issue here. See Yabuki Hearing Transcript at 74:19-75:15.

analyze facts provided by these employees. See id. at 8-10. Toyobo argues that these employees had specialties that were “very similar” to his own and that Dr. Yabuki opined on topics that fall within his areas of expertise. Id. at 11. In light of Dr. Yabuki’s sound methodology, Toyobo contends, his failure to read certain references or to read them recently goes to the weight of his opinions rather than to their admissibility. Id. at 33-35.

Upon careful review of Dr. Yabuki’s report, deposition testimony, and testimony before the Court at the January 23 Daubert hearing, the Court will admit certain portions of his proffered opinions and exclude others. While the Court acknowledges the concerns expressed by the United States with respect to Dr. Yabuki’s reliance on other Toyobo employees and his failure to read certain references in his report, the Court finds that these concerns do not permeate all of Dr. Yabuki’s reports, testimony and opinions. Yabuki Mot. at 2. Accordingly, the Court will address each of Dr. Yabuki’s opinions in turn.

#### 1. Opinion One (Kink Bands)

Dr. Yabuki concludes that the opinions of Dr. Phoenix and Dr. Brookstein regarding the presence of “kink bands” in Zylon fiber – damage to fiber structure due to compression or bending – are incorrect for several reasons. Yabuki Report at 3-5. For instance, Dr. Yabuki opines that kink bands are not unique to Zylon and do not necessarily cause a significant loss in tensile strength, and that it is “well known in the ballistic industry that fiber damage due to weaving can decrease [ballistic] performance.” Id. Dr. Yabuki further opines that “Toyobo has no control over how Zylon is woven, handled and/or treated” once it leaves Toyobo’s plant and that weavers and end-product manufacturers are “in the best position to determine what impact post-manufacturing processing has on a fiber.” Id. Dr. Yabuki also

opines that “Second Chance had the information it needed to account for the impacts of the weaving process on Zylon fiber when designing its Zylon vests.” Id.

The Court will admit Opinion One for the jury’s consideration. Dr. Yabuki’s conclusions regarding kink band formation and whether kink bands render Zylon defective are based on a sound methodology grounded in Dr. Yabuki’s extensive experience with industrial fibers and supported by references to multiple research papers.<sup>12</sup> With respect to Dr. Yabuki’s conclusions regarding fiber damage caused by the weaving process – (i) that it is “well known that fibers are susceptible to [the formation of kink bands] during the weaving process”; (ii) that it is “well known in the ballistic industry that fiber damage due to weaving can decrease [ballistic performance]”; and (iii) that “[t]hese facts were known to body armor makers and others in the ballistics industry” – it appears that Dr. Yabuki drew upon his extensive experience developing fibers for commercialization and use by manufacturers in various end-products. As a fiber chemist who was intimately involved in Toyobo’s efforts to develop Zylon fiber and bring it to market, Dr. Yabuki may reliably opine on whether it was “well known” that fiber damage due to weaving, including the formation of kinks bands, could decrease ballistic performance. To be sure, Dr. Yabuki testified at his deposition that he is “not too knowledgeable about [ballistics]” and relied on Mr. Kuroki in preparing his opinions about manufacturing for ballistic applications. See 8/22/12 Yabuki Dep. at 17:11-23 [Dkt. No. 385-6]; Yabuki Hearing Transcript at 53:21-55:18, 59:10-20. Dr. Yabuki appears to be opining, however, on whether body armor

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<sup>12</sup> Dr. Yabuki withdrew one of the references cited in this section of his report – a PowerPoint prepared by one of the government’s experts, Dr. Amanda Forster – because he had not read it. See 8/22/12 Yabuki Dep. at 58:7-59:18, 73:1-5 [Dkt. No. 385-6]. The Court is not persuaded that Opinion One is “so unreliable . . . that it fails Daubert’s reliability prong” based on this single withdrawn reference. See In re Rail Freight Fuel Surcharge Antitrust Litig., 2017 WL 5311533, at \*37.

manufacturers, as consumers of fiber for use in bulletproof vests, would have known that fiber is susceptible to damage due to the weaving process and may affect ballistic performance as a result. The Court therefore will admit Opinion One for whatever weight the jury may deem appropriate.

## 2. Opinion Two (Microvoids)

Dr. Yabuki responds to the opinions of Dr. Lesser and Dr. Brookstein regarding microvoids – fiber swelling due to moisture – by explaining that microvoids are not unique to Zylon and do not render Zylon defective. Yabuki Report at 5-10. Dr. Yabuki describes how microvoids form, draws comparisons to microvoids in Kevlar, and critiques the analysis applied by Dr. Lesser and Dr. Brookstein. Yabuki Report at 6-8. He also opines that “end-product manufacturers must protect Zylon from external moisture . . . .” Id. at 10.

The Court will admit Opinion Two for the jury’s consideration. Dr. Yabuki applied a reliable methodology grounded in his knowledge of industrial fibers and personal involvement in the development of Zylon fiber. Dr. Yabuki cites multiple research papers to support his opinion, including four that he co-authored, as well as other research conducted by Toyobo. Yabuki Report at 5-10. With respect to Dr. Yabuki’s reliance on other Toyobo employees, Dr. Yabuki testified at his deposition that Dr. Abe prepared the calculations for Figure 2 and that he “had Dr. Kitigawa check Dr. Lesser’s calculations.” See 8/22/12 Yabuki Dep. at 17:6-10, 39:18-40:6 [Dkt. No. 385-6]. Accordingly, as to Opinion Two, it appears that Dr. Yabuki relied on other Toyobo employees to verify and plot certain data. Furthermore, to the extent that Dr. Yabuki relied on other Toyobo employees for their expertise in microstructures, morphology, and x-ray scattering, Dr. Yabuki testified that he also has expertise



in those areas. See 08/22/12 Yabuki Dep. at 38:20-39:24 [Dkt. No. 385-6] (“So between or among Dr. Murase, Dr. Kitigawa and myself, our specialties are very similar.”).

The United States argues that Dr. Yabuki read three references cited in support of Opinion Two many years ago. See 8/22/12 Yabuki Dep. at 83:3-85:13 [Dkt. No. 385-6] (explaining that he read the book chapter by Young cited at footnote 16 in his report in 1990); 8/22/12 Yabuki Dep. at 90:19-91:18 [Dkt. No. 385-6] (explaining that he read the Northholt paper cited at footnote 18 in his report in 1990 or 1991 and “perhaps” did not read the entirety of the paper in preparing his reports but “confirmed and checked” the paper); 8/23/12 Yabuki Dep. at 102:1-105:4 [Dkt. No. 385-6] (explaining that he read the Martin paper cited at footnote 20 in his report in 1998 and re-read certain pages in preparing his report). Because Dr. Yabuki appears to have read each of these references at some point, and in light of the other references cited in support of Opinion Two, the Court concludes that this issue does not render Dr. Yabuki’s opinion “so unreliable . . . that it fails Daubert’s reliability prong.” See In re Rail Freight Fuel Surcharge Antitrust Litig., 2017 WL 5311533, at \*37. The Court finds that the United States’ further efforts to discredit Dr. Yabuki’s methodology by asserting that the book chapter by Dr. Young cited in Dr. Yabuki’s report stands for the opposite proposition than that for which it is cited goes to weight rather than admissibility. See Ambrosini v. Labarraque, 101 F.3d at 140; McReynolds v. Sodexo Marriott Servs., Inc., 349 F. Supp. 2d at 39; SEC v. Johnson, 525 F. Supp. 2d at 76.

### 3. Opinion Three (Moisture Regain)

Dr. Yabuki responds to Dr. Lesser’s and Dr. Brookstein’s conclusions that the moisture regain in Zylon fiber renders the fiber defective by explaining that moisture regain is “a well understood phenomenon in polymer chemistry” and is not unique to Zylon. Yabuki Report

at 11. Dr. Yabuki opines that the “end product manufacturer should design its product so as to protect the polymer . . . from external moisture.” Id. at 11. Dr. Yabuki also offers multiple opinions in response to Dr. Brookstein’s conclusions about Toyobo’s manufacturing process and quality control procedures. Id.

The Court will admit certain portions of Opinion Three and exclude others. Dr. Yabuki may offer opinions on: (i) the fiber properties of Zylon as they relate to moisture regain; (ii) the duration of exposure to sunlight sufficient to cause degradation; (iii) whether Toyobo has control over Zylon fiber once it leaves Toyobo’s plant; and (iv) whether end-product manufacturers or weavers could take steps to protect the fiber from moisture. These opinions were reached through a reliable methodology grounded in Dr. Yabuki’s extensive experience with fiber properties and his knowledge of the certain aspects of the manufacturing process (e.g., exposure to light or water) that may affect fiber properties.

The Court will exclude, however, certain opinions regarding Toyobo’s quality control procedures or those of weavers and Second Chance. Although Dr. Yabuki may properly opine that “were any light or ambient condition-induced degradation to occur, it would be reflected in the fiber properties that are measured after Zylon is ‘exposed’ to light and ambient conditions at the plant,” he may not opine that “the spool would be downgraded under Toyobo’s [quality control] procedures” as a result. Yabuki Report at 11. Furthermore, he may not opine that “weavers checked the fiber properties of Zylon fiber when it arrived at their plant, and with the exception of long red yarn and shipping-related physical damage (unrelated to light or hygrothermal degradation), there is no evidence that any shipments of Zylon were rejected because the fiber properties were outside of specification” or that “weaver [quality control] processes demonstrated that the Zylon that arrived at the weaver’s factories met Toyobo’s Zylon

specification.” Id. at 11. Dr. Yabuki has not established any specialized expertise in Toyobo’s quality control procedures or those of weavers of ballistic fibers. Indeed, it appears that his knowledge of Toyobo’s quality control procedures is based solely on information provided by other Toyobo employees, namely Mr. Kuroki and Mr. Teramoto. See, e.g., 8/22/12 Yabuki Dep. at 41:6-13 [Dkt. No. 385-6].

#### 4. Opinions Regarding Residual Phosphorous

Opinions Four, Five, and Six address the presence of residual phosphorus in Zylon fiber, which can lower tensile strength and resistance to thermal degradation. In particular, Opinion Four challenges Dr. Brookstein’s and Dr. Lesser’s conclusion that Toyobo allows excessive phosphorus to remain in Zylon fiber. Yabuki Report at 12-13. Relatedly, in Opinion Five, Dr. Yabuki concludes that Dr. Lesser and Dr. Brookstein wrongly suggest that “residual PPA” (residual phosphoric acid) is not adequately neutralized and contributes to hydrolytic degradation (moisture damage) in Zylon. Yabuki Report at 13. Similarly, Opinion Six provides that Dr. Lesser’s opinions about the existence of residual phosphorus in Zylon as a mono-aryl phosphate ester are incorrect. Id. at 14-16. Dr. Yabuki describes Toyobo’s research on this topic and concludes that PBO mono-phosphate does not catalyze hydrolysis. Id. at 15-16.

The Court will admit Opinions Four, Five, and Six, subject to the exceptions below. These opinions are based in large part on a reliable methodology grounded in his extensive experience analyzing fiber properties and his personal involvement in the research efforts of Toyobo and Dow Chemical. The Court will exclude, however, the following portions of Opinion Four and Opinion Five regarding Toyobo’s quality control procedures for confirming that the fiber was properly neutralized:

Opinion Four: [T]he evidence establishes that the Zylon Toyobo sold was well within the residual P target of 5,000 ppm or less. For example, the manufacturing process that was designed to reduce residual P to levels at or below 5,000 ppm and production conditions (e.g., residence time and wash temperature) was tightly controlled to ensure that this was accomplished. . . . Toyobo frequently checked the residual P content and, in all instances except one, found that Zylon contained less than 5,000 ppm residual P. With respect to the one exception, residual P was only slightly more than 5,000 ppm and Toyobo did not ship the fiber for use in bullet-resistant applications.

Opinion Five: As a quality assurance measure, Toyobo checked the color of the Zylon fiber in the fourth washing cabinet to confirm neutralization. This verified that the Zylon produced was neutralized. And during production, Toyobo frequently checked the residual sodium and phosphorous content in Zylon, and used the data to calculate Na/P molar ratios. This testing consistently confirmed that the Zylon produced for commercial sale was properly neutralized, and that the Na/P ratio remained within the specified range.

Yabuki Report at 12-14. Dr. Yabuki has not established that he has specialized expertise in this area and appears to have relied solely on Mr. Teramoto and certain Toyobo documents. See 8/22/12 Yabuki Dep. at 41:6-13 [Dkt. No. 385-6].

With respect to Opinion Six, the United States argues that Dr. Yabuki cited the wrong paper written by Dr. Ying-Hung So. See 8/23/12 Yabuki Dep. at 143:3-144:25 [Dkt. No. 385-6]. The United States asserts that Dr. Yabuki also misstated or overstated Dr. So's research findings because, inter alia, Dr. So's research required more than just adding "a drop of water" to remove the mono-aryl phosphate ester from the PBO molecule. 8/23/12 Yabuki Dep. at 155:17-21 [Dkt. No. 385-6]. The Court is not persuaded that Opinion Six is "so unreliable . . . that it fails Daubert's reliability prong" based on the citation to the incorrect article by the same author in one instance. See In re Rail Freight Fuel Surcharge Antitrust Litig., 2017 WL 5311533, at \*37. The Court further concludes that the objection that Dr. Yabuki overstated the article's findings goes to weight and not admissibility. See SEC v. Johnson, 525 F. Supp. 2d at 76.

## 5. Opinion Seven (Strength Loss)

Dr. Yabuki opines that Dr. Phoenix, Dr. Lesser, and Dr. Brookstein incorrectly suggest that Zylon is defective because it is susceptible to strength loss over time. Yabuki Report at 16-21. Dr. Yabuki opines that all materials, including fibers like Zylon, are susceptible to degradation. Id. at 16-17. Dr. Yabuki explains that Kevlar, like Zylon, degrades under certain conditions and is not considered to be “sub-standard.” Id. at 17-19. Dr. Yabuki also opines that the rate of hydrolysis can be reduced if “the end-product manufacturers protect Zylon from exposure to external moisture.” Id. at 19. Dr. Yabuki relies on a NIST study regarding the degradation of Zylon due to moisture to show that “if the Zylon fiber is protected from exposure to external moisture once it has been incorporated into a vest, there should be little or no degradation of the strength of the Zylon fiber.” Id. at 19-20.

The United States raises two primary objections to Opinion Seven. First, the United States argues that the NIST study that Dr. Yabuki relied on was issued two years after Zylon stopped being sold. See Yabuki Hearing Transcript 36:7-38:6 [Dkt. No. 385-6]; Yabuki Report at 19 n.62. Second, the United States argues that at his deposition, Dr. Yabuki identified two “commercially available and well-known methods” for protecting Zylon against external moisture using seaweed and aluminum film. 11/8/12 Yabuki Dep. at 293:4-294:25. The United States argues that these opinions do not fit the facts of this case because Dr. Yabuki does not know if these methods can be used to protect Zylon from external moisture in ballistic applications or whether Toyobo informed body armor manufacturers about the need to protect Zylon from moisture degradation.

The Court will admit Opinion Seven for the jury’s consideration. Dr. Yabuki applied a sound methodology by applying his knowledge of fiber properties as well as research

from papers that he co-authored to assess Zylon fiber's susceptibility to moisture degradation and strength loss. His partial reliance on the NIST study that was issued two years after Zylon was no longer being sold is permissible, as Dr. Yabuki testified at the Daubert hearing that the findings and the study mainly confirmed an established scientific fact that he had always known. See Yabuki Hearing Transcript 36:7-38:6. Opinion Seven would assist the jury in assessing the suitability of Zylon fiber for use in ballistic applications.

As for his references to the protective qualities of seaweed and aluminum film, Dr. Yabuki does not purport to opine on whether the methods are feasible to protect body armor made from Zylon fiber from moisture or whether these methods were communicated to body armor manufacturers. Rather, he offered these suggestions in response to a question asked by counsel for the United States. 11/08/12 Yabuki Dep. at 293:9-294:6 [Dkt. No. 385-6]. Counsel may cross examine Dr. Yabuki on this point.

#### 6. Opinion Nine (Red Thread)

According to Dr. Yabuki, Dr. Lesser and Dr. Brookstein incorrectly conclude that the presence of red thread indicates that Zylon is defective. Yabuki Report at 21. Dr. Yabuki opines that there is no evidence that Second Chance used Zylon fabric containing red thread, Toyobo had quality control processes in place to inspect for red thread, and weavers and body armor manufacturers had quality control systems in place to segregate non-conforming fiber. Id. at 21-22. Dr. Yabuki opines that "my review of the record shows that these stops worked because weavers and Second Chance caught red thread during their [quality assurance and quality control] processes, and Toyobo never received a report of red fiber being used in the manufacture of a bullet-resistant vest." Id. at 22.

The Court will exclude Opinion Nine in its entirety. Dr. Yabuki's opinion appears to be based on his "review of the record" and information conveyed by Toyobo employees rather than on any specialized expertise in Toyobo's quality control processes. 11/8/12 Yabuki Dep. at 304:7-307:4 [Dkt. No. 385-6] (explaining that Dr. Yabuki's understanding of Toyobo's quality assurance and quality control procedures discussed in his reports to detect red thread was based on what he was told by Mr. Teramoto or Mr. Tanaka); Yabuki Hearing Transcript at 56:4-58:8. Dr. Yabuki does not analyze red thread in terms of its impact on Zylon fiber or its formation during the manufacturing process, but rather focuses on whether Toyobo's quality control procedures were designed to identify and segregate Zylon fiber containing red thread. Opinion Nine therefore will be excluded.<sup>13</sup>

#### 7. Opinion Eleven (Na/P Ratio)

In the portion of Opinion Eleven that Toyobo has not withdrawn, Dr. Yabuki opines that Dr. Phoenix miscalculated the correlation between Na/P ratio and strength retention. Yabuki Report at 30-32. After re-plotting the same data used by Dr. Phoenix, Dr. Yabuki found a weaker correlation than the figures reported by Dr. Phoenix. Id. Separately, Dr. Yabuki opines that Dr. Brookstein "ignores the fact that Second Chance continued to use Zylon in Triflex vests even after Toyobo's October 2003 disclosures and Second Chance's warranty exchange program." Id. at 32.

Because Dr. Yabuki's correlation analysis is based on the same data that Dr. Phoenix used and Dr. Yabuki merely disagrees with Dr. Phoenix's conclusions, the Court will

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<sup>13</sup> Because the Court will exclude Opinion Nine, the Court need not address the arguments raised by the United States with respect to the expert report of Herbert Heuchert or the Hexcel Corporation documents cited on page 22 of Dr. Yabuki's report.

admit Dr. Yabuki's correlation analysis in Opinion Eleven. See Ambrosini v. LaBarraque, 101 F.3d at 140 (“[T]he admissibility inquiry focuses not on conclusions but on approaches . . .”). The Court will exclude, however, the final paragraph of Opinion Eleven regarding Second Chance's continued use of Triflex vests after 2003. This portion of Dr. Yabuki's proffered opinion reads more like a lawyer's argument than an expert opinion based on specialized knowledge of or experience with Toyobo's disclosures to body armor manufacturers.

#### 8. Opinion Twelve (Use of Averaged Data)

In Opinion Twelve, Dr. Yabuki opines that, contrary to the conclusions reached by Dr. Phoenix, Dr. Lesser, and Dr. Brookstein, Toyobo properly accounted for data scatter in tensile strength measurements by averaging the results of Toyobo's strength testing. Yabuki Report at 32. The Court will admit Opinion Twelve, except for the following sentence: “Toyobo's handling of the data is consistent with JIS L1013 and ASTM 0885.” Id. Dr. Yabuki testified at his deposition that he read JIS L1013 or ASTM 0885 many years ago and did not re-read them in preparation for his report and relied on Toyobo's quality control and quality assurance department to confirm that Toyobo's procedures had conformed to these standards. 11/9/12 Yabuki Dep. at 398:14-399:23 [Dkt. 385-6].

#### 9. Opinion Thirteen (Ballistic Application)

In Opinion Thirteen, Dr. Yabuki disagrees with Dr. Brookstein's opinion that Toyobo was responsible for determining the suitability of Zylon for use in a given end-product. Yabuki Report at 32-33. First, Dr. Yabuki opines that the “final determination of suitability for use lies with the end-product manufacturers – here, Second Chance.” Yabuki Report at 33. With respect to fiber used in ballistic applications, Dr. Yabuki opines, inter alia, that “there are



many different end-product designs” and that “fiber manufacturers cannot test their fiber for each of the infinite array of product designs with respect to vests using Zylon, and the use of Zylon with other ballistic materials.” Id. The Court will admit these portions of Opinion Thirteen for the jury’s consideration.

Second, Dr. Yabuki opines that “in my experience the end users like Second Chance consider their end product design to be proprietary and do not share the designs with a raw material supplier like Toyobo.” Yabuki Report at 33. He also opines that “fiber suppliers do not control end-product designs, including how the fiber is processed and whether it is protected from sources of environmental damage, such as light degradation or external moisture, or how much Zylon is incorporated into the end design.” Id. He concludes: “For all of these reasons, it is customary in the high performance fiber industry for high performance fiber suppliers not to provide any warranties or guarantees regarding the use of the fiber in end applications.” Id.

The Court will exclude these portions of Opinion Thirteen. Dr. Yabuki fails to cite a single publication, article, or other resource setting forth industry standards or other conventions to support his opinions regarding the specific practices of Second Chance or other body armor manufacturers. Although Dr. Yabuki has extensive professional experience as a raw fiber supplier at Toyobo, he has not established how that experience informs or supports his opinions regarding the “customary” practices of body armor manufacturers. Absent such a showing, Dr. Yabuki’s opinions are grounded in speculation rather than a reliable methodology.

#### *B. Dr. Robert M. Nowak*

Dr. Robert M. Nowak is a polymer chemist proffered by Toyobo as a rebuttal witness to respond to two experts proffered by the United States, Dr. David S. Brookstein and

Dr. Alan J. Lesser. Dr. Nowak holds a Doctorate in Chemistry from the University of Illinois. Nowak Opp. at 2-3. He spent thirty-seven years at Dow Chemical Company, where he served as Chief Scientist and Head of Central Research until retiring in 1993. Id. While employed at Dow Chemical, Dr. Nowak oversaw the development of a number of synthetic polymers, including Zylon. Id. Since that time, Dr. Nowak has spent fifteen years as the President and CEO of the Michigan Molecular Institute, a polymer research institute. Id. Dr. Nowak has published eighteen papers on organic reaction mechanisms and reinforced plastics. Id.

Dr. Nowak has submitted a rebuttal report dated May 23, 2012. The United States has filed a motion [Dkt. No. 383] to exclude certain opinions proffered by Dr. Nowak, a motion which Toyobo opposes. Specifically, the United States seeks to exclude Opinions One, Two, Three, Four, Five and Twelve in their entirety. Nowak Mot. at 3. The United States also seeks to exclude opinions on four additional topics: (i) analogies or comparisons of degradation in Zylon fiber or its polymer to degradation of human skin in sunlight and to metal fatigue in aircraft parts and resulting aircraft crashes; (ii) whether Zylon's aging characteristics and vulnerabilities had been quantified and its susceptibility to degradation could be addressed when designing a product; (iii) whether the results of testing used Zylon vests were more important than testing Zylon fiber in a laboratory; and (iv) whether Toyobo had any control over Zylon after it was shipped.<sup>14</sup>

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<sup>14</sup> The United States also seeks to exclude "any topic on which Dr. Nowak testified at his deposition that he had no opinion." Nowak Mot. at 4, 27. The United States attached a Proposed Order to its motion identifying seventeen topics as to which Dr. Nowak purportedly testified that he had no opinion. See Proposed Order [Dkt. No. 383-5]. Because the United States' request does not clearly identify which numbered opinions it seeks to exclude, the parties are directed to submit a joint stipulation identifying which opinions, if any, listed in Dr. Nowak's report remain in dispute in light of this Opinion.

### 1. Opinions One & Two (Strength Loss)

In response to Dr. Brookstein's opinions that Toyobo should not have continued to sell Zylon because it could not resolve the Zylon degradation problem and that, because of its degradation problem, Zylon was not suitable for use in ballistic applications, Dr. Nowak opines that all materials degrade over time and degradation vulnerabilities – such as fiber tensile strength loss – must be considered by the end-product manufacturer when designing end products. May 2012 Nowak Report, Mot. Ex. 1 at 3 (“Nowak Report”) [Dkt. No. 383-3]. The United States argues that Opinions One and Two are based on “junk science” rather than a reliable methodology and are generalized opinions which do not fit the facts of this case.

First, the United States seeks to exclude Dr. Nowak's comparisons of Zylon degradation to degradation of human skin in sunlight and metal fatigue in aircraft parts. Nowak Mot. at 9-14. In support of Opinions One and Two, Dr. Nowak explains that steps can be taken to protect polymers from degradation sources like heat, light, and moisture, such as using sunscreen to protect skin (a natural polymer) from sun damage. Nowak Report at 7-8. In support of Opinion Two, Dr. Nowak explains that aluminum is used in aircraft parts even though it is susceptible to fatigue and corrosion in order to illustrate that Zylon's susceptibility to degradation does not render it defective. Id. at 8-9.

According to the United States, because Dr. Nowak did not explain the relationship between human skin or metal and Zylon, the comparisons are not the product of a reliable methodology. Nowak Mot. at 9. The United States asserts that Dr. Nowak lacks the training or expertise to draw such a comparison because he is not a doctor or a metallurgist. Id. at 11-12. In addition, the United States contends that Dr. Nowak's analogies risk confusing the jury by conveying that degradation is either easily solved or an accident. Id. at 12-13. Toyobo

responds that Dr. Nowak's comparisons are mere "illustrations" and that Dr. Nowak does not analogize Zylon degradation to sun degradation in skin or metal fatigue in aircrafts. Nowak Opp. at 9. Rather, Dr. Nowak based his opinions concerning degradation on polymer chemistry. Toyobo argues that he used the examples only to show that all materials degrade (albeit differently) but may still be used so long as appropriate steps are taken by the end-product manufacturer. Id. at 9-10.

The Court concludes that Dr. Nowak's proffered comparisons are admissible for the purpose for which they are offered – to show that all materials degrade over time and that susceptibility to degradation can be addressed when designing a product. Dr. Nowak used a reliable methodology by applying his knowledge of and experience in principles of polymer chemistry and fiber properties. The jury can decide what weight to give to the examples he invokes in support of his opinions regarding degradation. Furthermore, Dr. Nowak expressly acknowledged that these two materials are not analogous, thus minimizing the risk of confusion to the jury.

Second, the United States contends that Dr. Nowak's opinion that body armor manufacturers could use Zylon degradation information to design their vests does not fit the facts of the case. The United States argues that Dr. Nowak did not opine on whether Toyobo provided sufficient information to body armor manufacturers to design a vest to account for degradation. Id. at 16. The United States further contends that his suggestion that the vest manufacturers "would go back to Toyobo and ask for more information" does not fit the facts because Second Chance did not ask Toyobo to conduct any testing on its vests. Id. at 18.

The Court will admit Dr. Nowak's opinion that degradation vulnerabilities must be considered by the end-product manufacturer when designing end products. The Court finds

that the United States' concerns regarding whether the information disclosed by Toyobo was sufficient or whether Second Chance asked Toyobo for further testing go to weight rather than admissibility.

## 2. Opinion Four (Kink Bands)

In Opinion Four, Dr. Nowak concludes that “[k]ink bands are a common occurrence in lyotropic LCPs like Kevlar, Zylon, M5 and others and are presumed to lower the mechanical properties of the polymer slightly. This is not a major problem and does not cause a further decay in properties over time.” Nowak Report at 13. The United States seeks to exclude this opinion because it does not fit the facts of the case. It argues that Dr. Nowak incorrectly assumed that Toyobo did not have control over Zylon fiber after it left the Toyobo manufacturing plant. Nowak Opp. at 24.<sup>15</sup> The United States argues that this assumption is belied by the facts because Toyobo played a role in selecting weavers, worked with Second Chance during the development of certain bulletproof vests, provided information and advice about weaving to Second Chance and the weavers, and knew that the vests were 100% Zylon. *Id.* at 25-26. The United States further argues that Dr. Nowak’s opinion that kink bands are not a major issue is improper because he is not a ballistics expert and cannot reliably opine on whether the ballistics industry was aware of the extent of the damage that weaving caused in Zylon. *Id.* at 26-27.

The Court will admit Opinion Four. Dr. Nowak relied on his decades of experience in polymer chemistry and working with synthetic polymers like Zylon and Kevlar to analyze the factual record and reach his conclusions regarding the impact of kink bands on

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<sup>15</sup> This appears to be one of the bases for excluding Opinion Three, which the United States does not directly address in its briefing.

Zylon's suitability for use in bulletproof vests. The United States' objections regarding whether Toyobo exercised any control over Zylon fiber after it left the plant do not establish that Dr. Nowak's methodology is unsound, but rather express disagreement with his conclusions.

### 3. Opinion Five (Hydrolysis)

In Opinion Five, Dr. Nowak states that "studying the hydrolysis of a polymer under laboratory conditions is very important data, but there is no substitute for evaluating the product containing that polymer under real life conditions by the manufacturer of the end product." Nowak Report at 15.<sup>16</sup> The United States seeks to exclude the opinion that, as the United States puts it, "ballistic testing of the vests is more important than testing the fiber," as unreliable in light of Dr. Nowak's prior testimony about the results of Second Chance's used vest testing. The United States argues that this opinion does not fit the facts of this case because Second Chance did provide Toyobo with the data from the testing of its used Zylon vests. Nowak Mot. at 22-23.

The United States has mischaracterized Dr. Nowak's opinion – Dr. Nowak merely opines that end-product testing is important, not that it is "more important." Furthermore, if there are inconsistencies between Dr. Nowak's report and his prior testimony, this may be fruitful ground for cross examination. The Court therefore will admit Opinion Five.

### 4. Opinion Twelve (Red Thread)

In Opinion Twelve, Dr. Nowak opines that Dr. Lesser and Dr. Brookstein overstate the "problem" with red thread and that Dr. Brookstein's conclusion that Zylon should

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<sup>16</sup> This also appears to be one of the bases for excluding Opinion Three, which the United States does not directly address in its briefing.

never have been sold is incorrect. Nowak Report at 21. He opines that quality control personnel “constantly monitor the process to catch any irregularities in production.” *Id.* The United States seeks to exclude this opinion on the ground that Dr. Nowak’s opinions about Toyobo’s quality control for red thread are speculative because he did not about how the quality control processes functioned. The Court agrees. Dr. Nowak has not established that his testimony regarding Toyobo’s quality control procedures is based on anything other than his review of internal Toyobo documents rather than specialized expertise. The Court therefore will exclude Opinion Twelve.

### *C. Herbert Heuchert*

Herbert Heuchert is a consultant proffered by Toyobo as an expert in the manufacture of “safety-related products.” Mr. Heuchert has over thirty years of manufacturing experience in the tire industry. Heuchert Opp. at 3-5. Between 1960 and 1993, Mr. Heuchert worked for Uniroyal Goodrich, a tire manufacturer, where he served variously as an industrial engineer, vice president of engineering and process development, and senior vice president of operations. While employed at Uniroyal, Mr. Heuchert oversaw the manufacture of rubber and other raw materials used in tires, fire protection gear, and other products. *Id.* at 4, 9-10. Mr. Heuchert was also responsible for evaluating the suitability of high-performance fibers like Kevlar for use in tires and implementing quality control systems at multiple tire manufacturing plants and rubber suppliers. *Id.* at 4-5, 10-11. Since leaving Uniroyal in 1993, Mr. Heuchert has managed his own consulting company that provides manufacturing and quality control expertise primarily in the tire industry. *Id.*

Mr. Heuchert has submitted an affirmative report dated March 15, 2012 and a rebuttal report dated May 23, 2012 in response to one of the United States’ experts, Dr. David S.

Brookstein. The United States has filed a motion [Dkt. No. 379] to exclude Mr. Heuchert's proffered opinions in their entirety, a motion which Toyobo opposes.<sup>17</sup>

Mr. Heuchert's proffered opinions focus on the respective roles and responsibilities of Toyobo and body armor manufacturers as participants in a supply chain wherein Toyobo provided the raw material (Zylon) to the end-use manufacturers (Second Chance and other body armor manufacturers) for use in bulletproof vests. Mr. Heuchert concludes that Toyobo met its duties and obligations as a supplier of raw material and that body armor manufacturers and Toyobo employed appropriate quality control procedures. March 2012 Report, Heuchert Motion Ex. 1 at 4-5 [Dkt. No. 379-1]. In his rebuttal report, Mr. Heuchert responds to Dr. Brookstein's criticisms of Zylon fiber and Toyobo's manufacturing process by opining that "the design and assembly stages of end product development are when the sensitivities and vulnerabilities of raw materials should be examined and the measures taken to protect against those sensitivities," and that Toyobo implemented appropriate quality control procedures to identify and isolate defective Zylon fiber. May 2012 Rebuttal Report, Heuchert Mot. Ex. 3 at 4, 8 [Dkt. No. 379-1].

The United States seeks to exclude Mr. Heuchert's opinions as unreliable and irrelevant because his experience is limited to the tire industry. Heuchert Mot. at 7. According to the United States, Mr. Heuchert has not shown how his experience – limited to the tire industry – applies to the manufacture of high-performance fibers used in the ballistics industry. Id. at 10, 15. The United States also contends that Mr. Heuchert has failed to explain how the duties and expectations of Uniroyal, a tire manufacturer that conducts its own testing of raw

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<sup>17</sup> The parties have withdrawn their arguments related to Second Chance's commercial warranty. See Joint Submission Regarding Previously Filed Daubert Motions [Dkt. No. 456].



materials incorporated into its tires, are comparable to those of Toyobo or Second Chance in terms of designing, testing, and manufacturing Zylon for use in bulletproof vests. Id. at 9, 13-15.

Toyobo takes a broader view of Mr. Heuchert's expertise. Toyobo acknowledges that Mr. Heuchert is not an expert in the ballistics industry but maintains that he has relevant expertise by virtue of his experience as an end-product manufacturer and a raw material supplier in the "safety-related industry." Heuchert Opp. 1, 12. Toyobo explains that Mr. Heuchert also has extensive experience with the development, implementation, and ongoing supervision of quality control management systems at multiple raw materials and safety-related end-product manufacturing plants. Id. at 1. According to Toyobo, Mr. Heuchert's opinions on manufacturing standards and quality control processes would aid the jury in understanding the relationship between a raw material supplier and an end-product manufacturer in a "safety-related industry." Id. at 2, 17.

The Court finds that Mr. Heuchert's opinions are neither reliable nor relevant. Mr. Heuchert bases his opinions exclusively on his extensive manufacturing and consulting experience in the tire industry. Mr. Heuchert fails, however, to explain how his experience in the tire industry supports his opinions about the manufacture of high-performance fibers in the ballistics industry or how these industries are comparable. See Arias v. DynCorp., 928 F. Supp. 2d at 10, 15-16 (D.D.C. 2013) (holding that an expert witness relying solely or primarily on his or her experience to form the basis of his or her opinions must explain "how that experience leads to the conclusions reached, why that experience is a sufficient basis for the opinion and how that experience is reliably applied to the facts" (quoting FED. R. EVID. 702 advisory committee notes)). While safety may be a significant concern in both industries, it is hardly adequate to say that "[t]ires, like bullet resistant vests, are safety-critical products." Opp. at 3-4.

Mr. Heuchert has not explained whether or how practices of the tire industry apply to the ballistics industry. See McClain v. Metabolife Int'l, Inc., 401 F.3d 1233, 1244-45 (11th Cir. 2005) (reversing district court's admission of expert testimony where witness could not demonstrate that the drug at issue and the drug that the expert had knowledge of acted in the same manner). Moreover, Mr. Heuchert does not cite any accepted industry standards or relevant articles in either of his reports, relying instead solely on documents and testimony from this case.

Toyobo attempts to furnish the missing link between Mr. Heuchert's tire industry experience and his opinions regarding the ballistics industry through a chart matching the topics on which he opined to his experience. See Heuchert Opp. Ex. 5 [Dkt. No. 394-6]. The chart, however, only further demonstrates the gap between Mr. Heuchert's experience and his proffered opinions. For instance, in support of his opinion that end-product manufacturers are responsible for durability testing, Toyobo cites Mr. Heuchert's "experience as both a raw material supplier and end product manufacturer." Heuchert Opp. Ex. 5 at 2 [Dkt. No. 394-6]. This assertion merely reinforces the fact that Mr. Heuchert has not explained whether or how standards in the tire industry may be applied to the ballistics industry.

Similarly, Mr. Heuchert has not shown how his opinions about conduct in the tire industry are relevant to manufacturing fiber for ballistic use. His proffered opinions would not aid the jury in assessing the responsibility of suppliers and manufacturers in the industry at issue. Indeed, his opinions would risk confusing the jury regarding the standards applicable to the body armor industry. Mr. Heuchert offers opinions about standards generally applicable to the "safety-related industry" without any experience working in or studying the particular industry at issue – fibers manufactured for ballistic use. See, e.g., SEC v. Tourre, 950 F. Supp. 2d 666, 674-

75 (S.D.N.Y. 2013) (excluding expert with expertise in “general area of structured finance,” but no experience in particular industry of collateralized debt obligations).

In sum, Mr. Heuchert has not worked in the ballistics industry and is not an expert in the field of fiber science or ballistics. His expertise in “safety-related products” is so broad a category as to be meaningless. The Court therefore will exclude Mr. Heuchert’s opinions in their entirety.

#### IV. CONCLUSION

For the reasons set forth in this Opinion, the Court will admit certain opinions and testimony offered by the parties’ expert witnesses and exclude others. Counsel shall prepare their experts to avoid the excluded subject matter. A separate Order consistent with the decisions expressed herein will be issued this same day.

SO ORDERED.

/s/

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PAUL L. FRIEDMAN  
United States District Judge

DATE: February 2, 2018