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## Comments: State of the Art Evidence in Products Liability Suits in Maryland

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# STATE OF THE ART EVIDENCE IN PRODUCTS LIABILITY SUITS IN MARYLAND

## I. INTRODUCTION

A court's decision to admit state of the art evidence in a products liability suit often amounts to a fundamental policy choice.<sup>1</sup> Regardless of whether a claim is brought in strict liability or negligence, state of the art evidence can have a profound effect on a case.<sup>2</sup> Indeed, when courts allow state of the art evidence to be introduced in strict liability cases, they are essentially grafting negligence principles onto strict liability theory.<sup>3</sup> Absent direction from

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1. See 6 STUART M. SPEISER ET AL., *THE AMERICAN LAW OF TORTS* § 18:165, at 341 (1989) (citing *Beshada v. Johns-Manville Prods. Corp.*, 447 A.2d 539, 545-49 (N.J. 1982)); Sheila L. Birnbaum & Barbara Wrubel, 'State of the Art' and Strict Products Liability, 21 *TORT & INS. L.J.* 30, 31 (1985). According to some commentators:  
[E]normous difficulties [persist] around the country, as courts seek to maintain a distinction between negligence and strict liability while avoiding the lure of absolute liability. In each of these cases, a critical issue for determination was the proper role, if any, of 'state of the art' evidence in a strict liability cause of action.  
*Id.* at 31.
  2. See *ACandS, Inc. v. Asner*, 344 Md. 155, 165-68, 686 A.2d 250, 254-56 (1996) (discussing the critical role of state of the art evidence in strict liability and negligence); *ACandS, Inc. v. Godwin*, 340 Md. 334, 367-92, 667 A.2d 116, 132-44 (1995) (noting the importance of state of the art evidence in determining whether to affirm a trial court's award of punitive damages); *Eagle-Picher Indus. v. Balbos*, 326 Md. 179, 194-97, 604 A.2d 445, 452-53 (1992) (relying on the plaintiff's state of the art evidence to affirm the trial court's award of damages in a strict liability failure to warn case).
  3. See 3 LOUIS R. FRUMER & MELVIN I. FRIEDMAN, *PRODUCTS LIABILITY* § 18.03[4], at 18-71 (1998); Gary C. Robb, *A Practical Approach to Use of State of the Art Evidence in Strict Liability Cases*, 77 *NW. U. L. REV.* 1, 13-16 (1982); see also Aaron Twerski, *A Moderate and Restrained Federal Product Liability Bill: Targeting the Crisis Areas for Resolution*, 18 *U. MICH. J.L. REFORM* 575, 591-92 (1985) ("Although the formulation of these 'state of the art' rules differs from jurisdiction to jurisdiction, in the end for all practical purposes, the defense reinstates the negligence standard as the operative rule in all cases where it applies."); Alan Calnan, Note, *Perpetuating Negligence Principles in Strict Products Liability: The Use of State of the Art Concepts in Design Cases*, 36 *SYRACUSE L. REV.* 797, 800 (1985) (observing that state of the art evidence injects negligence principles into strict liability, thereby blurring the distinction between the two theories); *cf.*

the legislature, on the issue of state of the art evidence, courts must sift through the common law of torts, trends in American jurisprudence, and overall notions of fairness and equity to decide which theory to apply and, ultimately, should bear responsibility for defective products.<sup>4</sup>

Unfortunately, an examination of court decisions on state of the art evidence will place even the most learned jurist in a state of confusion.<sup>5</sup> Only a small fraction of the case law can be accurately characterized as well-settled.<sup>6</sup> Indeed, even referring to this body of law as evidence is arguably misleading, because it constitutes an affirmative defense in certain jurisdictions.<sup>7</sup> While state of the art pre-

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W. Page Keeton, *Products Liability—Inadequacy of Information*, 48 TEX. L. REV. 398, 407 (1969) (noting that the conduct required for strict liability is similar to the conduct under a negligence theory); John W. Wade, *On the Nature of Strict Tort Liability for Products*, 44 MISS. L.J. 825, 834-35 (1973) (noting that strict liability is seen as a form of negligence).

4. See John F. Vargo, *The Emperor's New Clothes: The American Law Institute Adorns a 'New Cloth' for Section 402A Products Liability Design Defects — A Survey of the States Reveals a Different Weave*, 26 U. MEM. L. REV. 493, 806 (1996) (discussing the significant difference between the plaintiff's burden in strict liability and negligence); David J. Molnar, Note, *Should Loss-Spreading Be the Paramount Public Policy Rationale for the Imposition of Strict Products Liability? A Study of the Intersection of Strict Products Liability & Landlord-Tenant Law*, 22 J. CORP. L. 93, 99-104 (1996) (discussing reasons for imposing strict liability); Patricia M. Monaghan, Note, *Supreme Court Permits Design Defect Claims in Both Strict Liability and Negligence*. Brooks v. Beech Aircraft Corp., 26 N.M. L. REV. 629, 635-37 (1996).
5. The comments to the RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY highlight the confusion that courts have created by defining state of the art in various ways; noting "[t]he confusion brought about by these various definitions is unfortunate." RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 cmt. d. (1997). Louis Frumer and Melvin Friedman, authors of an extensive multi-volume treatise on products liability, have explained: "State of the art' is one of the more confused and confusing concepts in products liability law." 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03 [1], at 18-46.2. For a penetrating examination of state of the art evidence with various jurisdictional approaches, see *id.* § 18.03, at 18-46.2 to 18-72.
6. See W. Page Keeton, *The Meaning of Defect in Product Liability Law—A Review of Basic Principles*, 45 MO. L. REV. 579, 594 (1980) (noting multiple definitions employed by various courts); Robb, *supra* note 3, at 2 (describing the courts' confusion and inconsistency in applying this term).
7. See *Owens-Illinois, Inc. v. Zenobia*, 325 Md. 420, 438 n.8, 601 A.2d 633, 641 n.8 (1992) (discussing Charles C. Marvel, Annotation, *Strict Products Liability: Liability for Failure to Warn as Dependent on Defendant's Knowledge of Danger*, 33 A.L.R. 4th 368 (1981)); Thomas C. Galligan, Jr., *The Louisiana Products Liability Act: Making Sense of It All*, 49 LA. L. REV. 629, 670-71 (1989) (discussing the use of state of the art as an affirmative defense); Steven P. Zabel & Jeffrey A. Eyres,

cedent in Maryland is certainly more established today than it was a mere decade ago,<sup>8</sup> the advent of the *Restatement (Third) of the Law of Torts: Products Liability* and its abandonment of strict liability for all products liability cases, except those involving manufacturing defects,<sup>9</sup> may prove troubling.<sup>10</sup> This Comment attempts to clear up some of the confusion created by state of the art evidentiary issues. Particular emphasis is placed on Maryland products liability law; however, due to the infancy of the subject, this Comment necessarily resorts to extraterritorial approaches for scenarios that Maryland courts have not yet addressed. Part II begins by defining state of the art and explaining how it is applied in different contexts.<sup>11</sup> Part III sets forth the standards of decision-making that underlie each cause of action in which state of the art evidence issues arise.<sup>12</sup> Part IV details the relevance of state of the art evidence in products liability suits grounded in negligence. Part V addresses the most controversial context in which state of the art evidence may be relied upon—strict liability cases.<sup>13</sup> Necessarily, this Comment provides greater discussion on duty to warn issues, because they form the most common basis for modern products liability cases.<sup>14</sup> Part VI discusses

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*Conflict of Law Issues in Multistate Product Liability Class Actions*, 19 HAMLINE L. REV. 429, 441-42 (1996) (noting the responses of several different jurisdictions to use of the state of the art as an affirmative defense). See generally Robb, *supra* note 3, at 1 (discussing the confusion surrounding the application of state of the art in products liability cases and proposing a solution).

8. See JOEL A. DEWEY ET AL., PRODUCTS LIABILITY LAW MANUAL 131 (1990) (observing that as recently as 1990, "the Court of Appeals of Maryland has not yet addressed the admissibility of state of the art evidence under any products liability theory"); Edward S. Digges, Jr. & John G. Billmyre, *Product Liability in Maryland: Traditional and Emerging Theories of Recovery and Defense*, 16 U. BALT. L. REV. 1, 52 (1986) (noting that as of 1986, the court of appeals had not addressed the use of state of the art evidence).
9. See RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 (1997); William E. Westerbeke, *The Sources of Controversy in the New Restatement of Products Liability: Strict Liability Versus Products Liability*, 8 KAN. J.L. & PUB. POL'Y. 1, 8 (1998) ("By adopting a negligence standard for design defects and warning defects, the new Restatement shifts away from a rigid 'strict liability' view of section section 402A and more toward the 'products liability' view.").
10. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-59.
11. See *infra* notes 18-52 and accompanying text.
12. See *infra* notes 53-78 and accompanying text.
13. See *infra* notes 188-217 and accompanying text.
14. See M. Stuart Madden, *The Duty to Warn in Products Liability: Contours and Criticism*, 89 W. VA. L. REV. 221, 222 (1987); Lars Noah, *The Imperative to Warn: Disentangling the "Right to Know" from the "Need to Know" about Consumer Product Hazards*, 11 YALE J. ON REG. 293, 344 (1994) (noting that in products liability

*ACandS, Inc. v. Asner*,<sup>15</sup> a recent case decided by the Court of Appeals of Maryland that addressed a state of the art evidentiary issue.<sup>16</sup> Part VII examines the *Asner* court's opinion in light of the preceding analysis.<sup>17</sup> This Comment concludes with a general summary of several trends that Maryland case law appears to support when dealing with state of the art evidence.

## II. WHAT IS STATE OF THE ART?

One difficulty in dealing with issues of state of the art evidence is determining what state of the art actually means.<sup>18</sup> State of the art has been defined in various ways by different jurisdictions.<sup>19</sup> Even within the same jurisdiction, there are inconsistencies as to what state of the art encompasses.<sup>20</sup> In Maryland, "[s]tate of the art includes all of the available knowledge on a subject at a given time, and this includes scientific, medical, engineering, and any other knowledge that may be available."<sup>21</sup> The evidentiary concept of

litigation, failure to warn cases are displacing the traditional design and manufacturing defect causes of action).

15. 344 Md. 155, 686 A.2d 250 (1996).

16. See *infra* notes 411-30 and accompanying text.

17. See *infra* notes 441-48 and accompanying text.

18. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-47 (discussing the fluidity of courts' definitions of state of the art evidence); Robb, *supra* note 3, at 3-4 (explaining that courts often confuse state of the art evidence with existing trade standards, compliance with statutes or regulations, or feasibility considerations); Rexford M. Reynolds & Michele Sunahara, Note, *Johnson v. Raybestos-Manhattan, Inc.: The Death of State of the Art Evidence in Strict Products Liability Cases Involving Inherently Dangerous Products*, 11 U. HAW. L. REV. 175, 184 (1989) (noting that courts neither define nor apply state of the art evidence uniformly).

19. See Edward C. Sobota, Note, *Product Liability Reform Proposal: The State of the Art Defense*, 43 ALB. L. REV. 941, 945-46 (1979) (discussing the spectrum of definitions used for state of the art evidence).

20. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03 [1], at 18-46.2.

21. *ACandS, Inc. v. Asner*, 344 Md. 155, 165, 686 A.2d 250, 254 (1996) (quoting *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986)); see also *United States Gypsum Co. v. Mayor of Baltimore*, 336 Md. 145, 165, 647 A.2d 405, 415 (1994) ("[State of the art evidence] includes not only discoveries by the general scientific community or discoveries reflected in the general scientific literature, but also the discoveries by scientists or experts employed by other manufacturers."); *Owens-Illinois, Inc. v. Zenobia*, 325 Md. 420, 434-35, 601 A.2d 633, 639-40 (1992) ("[E]vidence concerning the presence or absence of knowledge in the expert community is called 'state of the art' evidence."); cf. *Babylon v. Scruton*, 215 Md. 299, 304, 138 A.2d 375, 378 (1958) ("[A manufacturer] will be held to the skill of an expert in that business and to an expert's knowledge of the arts, materials, and processes. Thus he must

state of the art has developed through Maryland case law.<sup>22</sup> However, several states have codified what constitutes state of the art evidence.<sup>23</sup> Regardless of whether a state codifies its approach or develops it through case law, there are two distinct views of how state of the art may be used by litigants. First, state of the art forms a category of evidence.<sup>24</sup> Second, state of the art creates an affirmative defense in certain contexts.<sup>25</sup> However, this fundamental distinction is often blurred by courts when ruling on a state of the art issue.<sup>26</sup> Addressing each view in separate analysis provides useful insight into Maryland's approach to state of the art issues.

#### A. State of the Art—Defense or Merely Evidence

Several states have provided for a state of the art defense by way of statute.<sup>27</sup> The treatment of state of the art as a defense<sup>28</sup> varies depending on each statute.<sup>29</sup> Despite the differing approaches of

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keep reasonably abreast of scientific knowledge and discoveries touching his product . . . ." (quoting 2 FOWLER V. HARPER & FLEMING JAMES, JR., THE LAW OF TORTS § 28.4 (1956)).

22. See *Zenobia*, 325 Md. at 439 n.8, 601 A.2d at 641 n.8.
23. See AMERICAN LAW OF PRODUCTS LIABILITY § 39.9-39.11 (Timothy E. Travers et al. eds., 1987) (noting several statutory approaches to state of the art evidence).
24. See *infra* notes 32-33 and accompanying text.
25. See *infra* notes 27-31 and accompanying text.
26. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[1], at 18-46.2 (noting that state of the art "is both a category of evidence and an affirmative defense, although at times, in some judicial opinions, it is difficult to differentiate between the two"); Reynolds & Sunahara, *supra* note 18, at 184.
27. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4], at 18-59 to 18-61 (discussing state of the art statutory defenses to product liability actions in Arizona, Indiana, Iowa, Louisiana, Missouri, Nebraska, and New Jersey and rebuttable presumptions in Colorado and Kentucky); Michael A. Pope & Michale K. Batosz, "State of the Art": *Is There Any Life Left in the Defense?*, 316 PLL/LIT 187, 202-04 (1986) (discussing Arizona, Colorado, Kentucky, Tennessee, and Indiana statutes that provide state of the art defenses).
28. In some jurisdictions, the state of the art may provide an affirmative defense, thereby fully relieving a manufacturer of liability. See 1 FRUMER & FRIEDMAN, *supra* note 3, § 8.04[6], at 8-203 to 8-212; PRODUCTS LIABILITY PRACTICE GUIDE § 15.05[3], at 15-121 to 15-122 (John F. Vargo et al. eds., 1998).
29. Compare ARIZ. REV. STAT. § 12-683(1) (1998) (relieving a manufacturer of liability for a strict liability claim for defective design or manufacture if it proves that "the plans or designs for the product or the methods and techniques of manufacturing, inspecting, testing, and labeling the product conformed with the state of the art at the time the product was first sold by the defendant"), with COLO. REV. STAT. ANN. § 13-21-403(1)(a) (1998) (providing a rebuttable presumption in strict products liability for sellers and manufacturers if the product conformed to the state of the art at the time of sale).

each statute, courts and commentators will often refer to these statutes collectively as "the state of the art defense."<sup>30</sup> While all of the statutes consider state of the art evidence relevant, the overwhelming majority do not permit the evidence to establish an absolute defense.<sup>31</sup> It is perhaps more accurate to view the majority of statutes that deal with state of the art as codifying an element that may be considered when assessing a manufacturer's liability.<sup>32</sup> Indeed, one commentator has concluded that labeling these statutory applications of state of the art evidence as "a defense is in general a misnomer."<sup>33</sup> In states that have codified the appropriate treatment of state of the art, courts undoubtedly have more guidance on such matters than do courts in their sister states that must take a common law approach to resolving the same issues. Maryland has not codified a state of the art defense. Moreover, recent decisions indicate a reluctance to creating a common law state of the art defense.<sup>34</sup> Instead, state of the art is treated as evidence that forms part of the plaintiff's case-in-chief.<sup>35</sup> Defendants may use state of the art evidence under certain causes of action, not as an absolute de-

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30. *Owens-Illinois Inc. v. Zenobia*, 325 Md. 420, 438 n.8, 601 A.2d 633, 641 n.8 (1992) (noting the reference to state of the art "defenses" made by numerous courts).

31. See 1 FRUMER & FRIEDMAN, *supra* note 3, § 8.04[6], at 8-203 to 8-212 (discussing the various statutory approaches).

32. The RESTATEMENT (THIRD) appears to view this as the appropriate approach. Section 2, comment d discusses state of the art and notes that "[w]hen a defendant demonstrates that its product design was the safest in use at the time of sale, it may be difficult for the plaintiff to prove that an alternative design could have been practically adopted . . . . While such evidence is admissible, it is not necessarily dispositive." RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 cmt. d (1997). Recently, Aaron Twerski, one of the reporters for the American Law Institute, explained why the RESTATEMENT (THIRD) considers state of the art evidence relevant, but not conclusive. Twerski explained:

If a plaintiff can suggest to a court an alternative design, the fact that the proposed design has not been adopted for commercial use or no one has even thought about adopting it, if its sound and sensible, it ought to be admitted into evidence. And if, a jury finds that the product is defective, so be it.

Aaron D. Twerski, *In Defense of the Products Liability Restatement: Part I*, 8 KAN. J.L. & PUB. POL. 27, 29 (1998).

33. Robb, *supra* note 3, at 7.

34. See *Zenobia*, 325 Md. at 438 n.8, 601 A.2d at 641 n.8 (rejecting the use of the state of the art as an affirmative defense); see also DEWEY ET AL., *supra* note 8, at 131.

35. See *Zenobia*, 325 Md. at 438 n.8, 601 A.2d at 641 n.8.

fense, but as evidence to rebut the plaintiff's evidence.<sup>36</sup> A court's consideration of state of the art evidence turns on its relevance.<sup>37</sup> Conceptually, the relevance of industry standards or customs will often parallel the relevance of state of the art evidence.<sup>38</sup> In Maryland, however, it would be imprecise to draw conclusions as to state of the art evidence from precedent addressing the admissibility of industry standards or customs.

*B. State of the Art Distinguished from Industry Standards*

The close relationship between state of the art evidence and evidence of industry standards has resulted in some confusion among courts and commentators.<sup>39</sup> While some courts have concluded that state of the art evidence is equivalent to evidence of industry standards,<sup>40</sup> the majority view, adopted by Maryland,<sup>41</sup> is that they are two distinct concepts.<sup>42</sup> One useful method of distinguishing between the two standards is to think of industry standards as what is actually done by the industry and state of the art as what can be done by the industry.<sup>43</sup> Whereas state of the art evidence includes

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36. See 1 M. STUART MADDEN, PRODUCTS LIABILITY § 12.13, at 530 (1988).
  37. See, e.g., FED. R. EVID. 401 (defining relevant evidence under federal law); FED. R. EVID. 402 (forbidding the admission of irrelevant evidence under federal law); MD. R. EVID. 5-401 (defining relevant evidence under state law); MD. R. EVID. 5-402 (forbidding the admission of irrelevant evidence under state law).
  38. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-50 to 18-54 (discussing various jurisdictional approaches to state of the art evidence that view it equivalent or parallel to industry standards).
  39. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-52 to 18-54 (noting that some jurisdictions consider evidence of industry standards equivalent to state of the art evidence); Robb, *supra* note 3, at 4, 33 n.10 (noting several courts' confusion between state of the art evidence and evidence of industry standards).
  40. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-52 to 18-54 (discussing *Lane v. Amsted Indus.*, 779 S.W.2d 754 (Mo. Ct. App. 1989); *Sexton By Sexton v. Bell Helmets, Inc.*, 926 F.2d 331 (4th Cir. 1991) (applying Kentucky law)); 2 J. D. LEE & BARRY A. LINDAHL, MODERN TORT LAW: LIABILITY & LITIGATION § 27.77, at 736 (1989).
  41. See *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986) (distinguishing state of the art evidence and industry standard evidence under Maryland law).
  42. See *Pope & Batosz*, *supra* note 27, at 190; 2 LEE & LINDAHL, *supra* note 40, § 27.77, at 736.
  43. See *Lohrmann*, 782 F.2d at 1164; see also 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 1850 ("[State of the art evidence] is distinguishable from evidence of industry custom, here at issue. 'Custom' refers to the usual practice of the manufacturer, that is, what is done; 'state of the art' refers to the technologi-



all product-related knowledge,<sup>44</sup> evidence of industry standards concerns the actual practices of the participants in a given industry.<sup>45</sup> Thus, adhering to the state of the art places a greater burden on a manufacturer than merely meeting industry standards, because scientific knowledge grows more rapidly than an industry can assimilate such knowledge.<sup>46</sup> Although an industry's standards may provide insight as to the past or current state of the art,<sup>47</sup> evidence of an industry standard may not be necessary to demonstrate what is the state of the art.<sup>48</sup> When the admissibility of state of the art evidence is before a Maryland court, the general focus is on all of the product-related knowledge available.<sup>49</sup> This broad view could encompass what the industry is doing currently.<sup>50</sup> However, the appropriate inquiry looks not only at industry practices, but at the industry's expert knowledge as well.<sup>51</sup> Merely proving that a defendant complied with the state of the art or industry standards will not normally exculpate the defendant from liability.<sup>52</sup>

### III. THE TESTS EMPLOYED TO DETERMINE LIABILITY

One issue that must be resolved in a products liability case is the test a court will employ to determine the contours of a given cause of action. Maryland courts apply either the consumer expectations test or the risk-utility test to resolve various elements in each products liability case.<sup>53</sup> Neither test has been exclusively applied in every type of products liability case in Maryland. A court's decision

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cal environment, that is, what *can* be done." (quoting *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 347 (5th Cir. 1983))).

44. For a discussion of how Maryland courts generally define state of the art, see *supra* note 21 and accompanying text.
45. See *Lohrmann*, 782 F.2d at 1164.
46. See *id.*
47. See *Robb*, *supra* note 3, at 7 (citing 2 HARPER & JAMES, *supra* note 21, at 977-78 (1956)).
48. See *id.* at 4 n.10.
49. See *supra* note 44 and accompanying text.
50. See PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, § 15.08[6] (including an investigation of industry standards in a manufacturer's assessment of the state of the art); cf. *Reed v. Tiffin Motor Homes, Inc.*, 697 F.2d 1192 (4th Cir. 1982) (applying South Carolina law) ("We find that the state of the art and trade customs are relevant in helping the jury make a determination of whether the product is unreasonably dangerous when used in a manner expected by the ordinary consumer in the community.").
51. See *supra* note 46 and accompanying text.
52. See *infra* note 110 and accompanying text.
53. See *infra* notes 54-75.

concerning whether or not to employ the consumer expectation test or the risk-utility test establishes the framework on which a litigant can build to demonstrate the relevance of state of the art evidence.

#### A. *The Consumer Expectations Test*

Maryland courts will frequently rely upon the consumer expectations test in products liability cases.<sup>54</sup> The Court of Appeals of Maryland explained that the consumer expectations test requires a court to determine whether a "product failed to perform as safely as an ordinary consumer would expect when used in an intended or reasonably foreseeable manner."<sup>55</sup> The test is objective in nature<sup>56</sup> and is used to gauge negligence, defectiveness, unreasonable dangerousness, or adequacy of warning based on the expectations of the average consumer.<sup>57</sup> The precise language used to frame the consumer expectations test will vary slightly depending upon the given context.<sup>58</sup>

Preliminarily, state of the art evidence may seem irrelevant where a court chooses to apply the consumer expectations test.<sup>59</sup> Ordinary consumers would have no expectations as to what is known by, in many cases, only the experts in the industry.<sup>60</sup> However, state of the art evidence may nonetheless be relevant to demonstrate consumer expectations at the time a product was sold

54. See *Kelley v. R.G. Indus.*, 304 Md. 124, 135-36, 497 A.2d 1143, 1148 (1985) (citing *Phipps v. General Motors Corp.*, 278 Md. 337, 344, 363 A.2d 955, 959 (1976)); *Simpson v. Standard Container Co.*, 72 Md. App. 199, 203-04, 527 A.2d 1337, 1340 (1987); *Sheehan v. Anthony Pools*, 50 Md. App. 614, 621, 440 A.2d 1085, 1089-90 (1982); see also *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 717, 566 A.2d 135, 146 (1989) (citing the comments to section 402A of RESTATEMENT (SECOND) OF TORTS as explaining the requirements of a strict liability claim in terms of consumer expectations); *Zeigler v. Kawasaki Heavy Indus.*, 74 Md. App. 613, 620, 539 A.2d 701, 704 (1988) (noting that the consumer expectations test is easier to apply where the alleged defect is a manufacturing error).

55. See *Kelley*, 304 Md. at 137, 497 A.2d at 1149 (quoting *Barker v. Lull Eng'g Co.*, 573 P.2d 443, 446 (Cal. 1978)).

56. See *Ziegler*, 74 Md. App. at 622 n.8, 539 A.2d at 705 n.8 (quoting *Wade*, *supra* note 3, at 839-40).

57. See *Kelley*, 304 Md. at 135-36, 497 A.2d at 1148 (citing *Phipps*, 278 Md. at 344, 363 A.2d at 959).

58. See *supra* notes 54-57.

59. See *Dewey et al.*, *supra* note 8, at 130 (noting that the consumer expectations test deters the admissibility of state of the art evidence).

60. See *infra* notes 98-103.

or manufactured.<sup>61</sup> Thus, when a manufacturer shows that a particular safety feature was not contemplated by even experts in a particular field, it suggests that an ordinary consumer would not expect a particular product to embody such advanced technology.<sup>62</sup> Overall, the consumer expectations test appears to be losing its appeal to Maryland courts as well as other jurisdictions.<sup>63</sup> While the consumer expectations test focuses a court's attention on one factor and is relatively easy to apply, it has been the subject of criticism.<sup>64</sup> One commentator has concluded that the consumer expectations test provides no guidance for reviewing courts because it justifies any result reached by a fact-finder.<sup>65</sup> To call on a jury to apply its amorphous dictates provides the jury with little meaningful instruction.<sup>66</sup> The *Restatement (Third) of the Law of Torts: Products Liability* indicates that the consumer expectations test's days are numbered.<sup>67</sup> The new *Re-*

61. See 1 MADDEN, *supra* note 36, § 12.13, at 530 (discussing *Bruce v. Martin-Marietta Corp.*, 544 F.2d 442 (10th Cir. 1976)).

62. See Wade, *supra* note 3, at 829 ("[I]n many situations, particularly involving design matters, the consumer would not know what to expect, because he would have no idea how safe the product could be made.").

63. See *infra* notes 216-17 and accompanying text.

64. One commentator has highlighted three recurring criticisms of the consumer expectations test:

First, the test caused confusion about *whose* expectations should control in cases in which the expectations of an injured child, patient, employee or bystander who used the product differed significantly from the expectations of the parent, doctor, employer or owner who purchased or prescribed the product. Second, the test seemed inadequate in complex product cases in which the consumer simply did not have any well-defined expectations about product safety in various accident scenarios. Third, the consumer expectation test did not permit liability in obvious danger cases.

Westerbeke, *supra* note 9, at 9.

65. See W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 99, at 699 (5th ed. 1984).

66. See *id.*

67. In commenting on the RESTATEMENT (THIRD), James Henderson, Jr., one of its reporters noted:

If you look at the scholarship prior to 1992—I'm thinking of giants like Prosser, Wade, Page Keeton and some contemporaries who are in this room; Gary Schwartz, Stu Madden. These are major players in this products liability field almost without exception they, in their earlier work, said consumer expectations will not work as a mainstream test. It's got to be some form of risk-utility.

James A. Henderson, Jr., Symposium, *A Discussion and Defense of the Restatement (Third) of Torts: Products Liability*, 8 KAN. J.L. & PUB. POL'Y. 19, 20 (1998).

*statement* merges the consumer expectations test with the risk-utility test.<sup>68</sup> Instead of forming the entire inquiry, the consumer expectation becomes merely one of several factors a court considers in analyzing a manufacturer's conduct or product under the *Restatement (Third) of Torts*.<sup>69</sup>

### B. The Risk-Utility Test

Alternatively, Maryland courts will assess a manufacturer's liability pursuant to the risk-utility test.<sup>70</sup> The risk-utility test, under which state of the art evidence is more readily admissible,<sup>71</sup> requires that the trier of fact weigh the "utility of risk inherent in the [product] against the magnitude of the risk."<sup>72</sup> The plaintiff has the burden of proving that the utility or benefit that the defendant's product provides society is outweighed by the probability and severity of risk to the consumer.<sup>73</sup> The risk-utility analysis takes into consideration a number of factors including: the availability of alternative products that meet the needs of the consumer, but are safer; the manufacturer's ability to eliminate the danger of the product without impairing its utility; and the common knowledge that users have about the dangerousness of the product.<sup>74</sup> A litigant seeking to admit state

68. See RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY § 2 cmts. a, g, m (explaining that in design defect and inadequate warning cases, a risk-utility balancing test should be applied that weighs consumer expectations as one of its factors).

69. See Henderson, *supra* note 67, at 26 ("[t]he consumer expectation test . . . is not a stand alone test for defect. But it is a factor, and an important factor, in risk-utility balancing.").

70. See Kelley v. R.G. Indus., 304 Md. 124, 136, 497 A.2d 1143, 1148-49 (1985) (citing Barker v. Lull Eng'g Co., 573 P.2d 443 (Cal. 1978)).

71. See DEWEY ET AL., *supra* note 8, at 130.

72. Phipps v. General Motors Corp., 278 Md. 337, 345, 363 A.2d 955, 959 (1976); accord KEETON ET AL., *supra* note 65, § 99, at 699.

73. See Kelley, 304 Md. at 137, 497 A.2d at 1149 (citing Barker, 573 P.2d at 446); Troja v. Black & Decker Mfg., 62 Md. App. 101, 108-09, 488 A.2d 516, 519 (1985); see also *infra* notes 123-27 and accompanying text.

74. See John W. Wade, *Strict Tort Liability of Manufacturers*, 19 Sw. L.J. 5, 17 (1965). Eight years after initially establishing these factors, Dean John W. Wade revised them to include:

- (1) The usefulness and desirability of the product—its utility to the user and to the public as a whole
- (2) The safety aspects of the product—the likelihood it will cause injury, and the probable seriousness of the injury
- (3) The availability of a substitute product which would meet the same need and not be as unsafe
- (4) The manufacturer's ability to eliminate the unsafe character of the product without impairing its usefulness or making it too expensive to maintain its util-

of the art evidence will often establish that it is relevant to one of the several factors that form the risk-utility test.<sup>75</sup>

### C. Plaintiff's Theory of Recovery

When a court must decide whether to admit state of the art evidence, its approach varies markedly depending on whether the action lies in negligence, strict liability, or both.<sup>76</sup> Within the negligence and strict liability arena, a court's approach to the admissibility of state of the art evidence will differ depending on whether the claim is one for manufacturing defect,<sup>77</sup> design defect,<sup>78</sup> or failure to warn.<sup>79</sup> Careful analysis of each cause of action demonstrates the role of state of the art evidence in products liability law.

## IV. NEGLIGENCE

The primary distinction between a products liability suit grounded in negligence and one in strict liability is that negligence suits focus on the conduct of the manufacturer, whereas suits brought in strict liability focus on the product itself.<sup>80</sup> Before any

ity (5) The user's ability to avoid danger by the exercise of care in the use of the product (6) The user's anticipated awareness of the dangers inherent in the product and their avoidability, because of general public knowledge of the obvious condition of the product, or of the existence of suitable warnings or instructions (7) The feasibility, on the part of the manufacturer, of spreading the loss by setting the price of the product or carrying liability insurance.

Wade, *supra* note 3, at 837-38; *accord* *Valk Mfg. v. Rangaswamy*, 74 Md. App. 304, 314, 537 A.2d 622, 627 (1988), *rev'd on other grounds*, 317 Md. 185, 562 A.2d 1246 (1989); *Sheehan v. Anthony Pools*, 50 Md. App. 614, 620 n.6, 440 A.2d 1085, 1089 n.6 (1982).

75. See *infra* notes 102-03 and accompanying text.

76. See *Robb*, *supra* note 3, at 3 (asserting that the application of state of the art evidence depends on the theory of liability advanced); *Reynolds & Sunahara*, *supra* note 18, at 184 (explaining that the definitions of state of the art depends on the court's context).

77. See *infra* notes 90-96 and accompanying text.

78. See *infra* notes 116-18 and accompanying text.

79. See *infra* notes 151-53 and accompanying text.

80. See *Phipps v. General Motors Corp.*, 278 Md. 337, 344, 363 A.2d 955, 958 (1976); *KEETON ET AL.*, *supra* note 65, § 99, at 365 ("In strict liability, the plaintiff is not required to impugn the conduct of the maker or other seller, but he is required to impugn the product."); 2 *LEE & LINDAHL*, *supra* note 40, § 27.77, at 734-35; 1 *MADDEN*, *supra* note 36, § 12.13, at 531 (quoting *Cryts v. Ford Motor Co.*, 571 S.W.2d 683, 689 (Mo. App. 1978)). *But cf.* *Denny v. Ford Motor Co.*, 662 N.E.2d 730, 735 (N.Y. 1995) (quoting S. Birnbaum, *Unmasking the Test for Design Defect: From Negligence [to Warranty] to Strict Liability to Negligence*, 33 *VAND. L. REV.* 593, 610, 648 (1980) (noting in a design defect case

Maryland court squarely addressed whether state of the art evidence was admissible in any type of product liability case, one commentator noted: "There is little doubt that state of the art evidence is admissible in negligence cases because negligence focuses on a manufacturer's conduct and compares that conduct to what a reasonable manufacturer in similar circumstances would have done."<sup>81</sup> These comments are in accord with the near unanimous view state courts have adopted.<sup>82</sup> One important reason for admitting state of the art evidence in a negligence case is that it would be unreasonable to hold a manufacturer liable for its failure to employ technology or warn of dangers that were not invented or known at the time of manufacture.<sup>83</sup> However, a manufacturer does not have to implement state of the art technology to avoid liability.<sup>84</sup> If one begins from the premise that state of the art evidence is likely to be admitted in all negligence cases,<sup>85</sup> one naturally might question why any further discussion is necessary. First, even though state of the art evidence may, on a general level, be admissible in negligence suits, the evidence must be relevant.<sup>86</sup> Accordingly, a litigant must convey

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brought in strict liability that "the reality is that the risk/utility balancing test is a 'negligence inspired' approach, since it invites the parties to adduce proof about the manufacturer's choices and ultimately requires the factfinder to make a 'judgment about [the manufacture's] judgement'").

81. Digges & Bilmyre, *supra* note 8, at 52 n.302.

82. See 1 FRUMER & FRIEDMAN, *supra* note 3, § 8.04[6], at 8-204 (explaining that a defendant's use of state of the art evidence in a negligence matter nearly constitutes a complete defense and concluding that the plaintiff "cannot recover, absent proving that the defendant is mistaken").

83. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4], at 18-56. This treatise goes on to note that "it is just as unreasonable and illogical in a strict liability cause of action, but for policy reasons, a number of courts ha[ve] chosen to ignore logic and reason." *Id.* at 18, n.45.

84. See *id.* at 18-58.

85. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[3], at 18-56 ("Evidence of the state of the art is almost universally admitted with respect to negligence causes of action."); DEWEY ET AL., *supra* note 8, at 130 ("In negligence suits, such evidence is typically admitted to demonstrate the reasonableness of the defendant's conduct."); Robert F. Blomquist, *Emerging Themes and Dilemmas in American Toxic Tort Law, 1988-91: A Legal-Historical and Philosophical Exegesis*, 18 S. ILL. U.L.J. 1, 30 n.74 (1993) (noting that state of the art evidence is relevant to foreseeability); Robb, *supra* note 3, at 6 (noting that for negligence claims, courts "uniformly admit state of the art evidence"); Vargo, *supra* note 4, at 628.

86. See MD. R. EVID. 5-401 (defining relevance); MD. R. EVID. 5-402 (addressing admissibility of relevant evidence); accord FED. R. EVID. 401 (defining relevance); FED. R. EVID. 402 (addressing admissibility of relevant evidence). On the admis-

to the court the elements of the cause of action to which state of the art evidence is relevant. Second, there are certain strategic reasons why a plaintiff may want to include a negligence claim with one in strict liability.<sup>87</sup> A party's use of state of the art evidence in a negligence case is one item to be considered.<sup>88</sup> Finally, most courts are in agreement with the *Restatement (Third) of Products Liability* inasmuch as they do not apply strict liability to most design defect and inadequate warning claims.<sup>89</sup>

#### A. Manufacturing Defect

Of the millions of products that come off assembly lines across the nation, there exists an irreducible minimum number of products that will contain manufacturing defects.<sup>90</sup> These manufacturing defects often cause injuries even when the product is used as in-

sibility of relevant evidence, the Court of Appeals of Maryland has observed:

There are two components to relevant evidence: materiality and probative value. Materiality looks to the relation between the propositions for which the evidence is offered and the issues of the case. If the evidence is offered to help prove a proposition which is not a matter in issue, the evidence is immaterial. What is in issue, that is, within the range of litigated controversy, is determined mainly by the pleadings, read in the light of the rules of pleading and controlled by the substantive law.

Ellsworth v. Sherne Lingerie, Inc., 303 Md. 581, 600, 495 A.2d 348, 358 (1985) (quoting E. CLEARY, MCCORMICK ON EVIDENCE § 185, at 541 (3d ed. 1984)).

87. See *infra* notes 188-89 and accompanying text.

88. See *infra* notes 104-06 and accompanying text.

89. See Westerbeke, *supra* note 9, at 6-8. As one commentator observed:

Strict liability occurs when a manufacturer is held liable for failing to warn about an unknowable danger . . . . Strict liability occurs when a manufacturer is held liable for failing to adopt a design that was not technologically feasible at the time of manufacture and sale . . . . The majority of courts have not applied true strict liability to either warning or design defect cases . . . . By adopting a negligence standard for design defect and warning defects, the new *Restatement* shifts away from a rigid "strict liability" view of section 402A and more toward the "products liability" view.

*Id.*

90. See RESTATEMENT (THIRD) OF TORTS § 2 cmt. a (1997) (noting that manufacturers know "that a predictable number of flawed products will enter the marketplace" and consciously deliberate "about the amount of injury that will result from their activity"); Westerbeke, *supra* note 9, at 6 ("Theoretically, an occasional flaw in a unit of production will occur despite the most carefully developed system of production and will avoid discovery despite the most carefully planned and implemented system of testing and inspection.").

tended.<sup>91</sup> A finished product that qualitatively varies from the normal production run by being defective due to poor material selection,<sup>92</sup> defective assembly,<sup>93</sup> or improper testing and inspection<sup>94</sup> can result in liability to the manufacturer.<sup>95</sup> To determine whether a manufacturer will be held liable for a manufacturing defect in a negligence suit, courts will focus on the manufacturer's conduct during these various stages of manufacturing.<sup>96</sup>

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91. See *Coca Cola Bottling Works v. Catron*, 186 Md. 156, 160-61, 46 A.2d 303, 305 (1946) (noting that a plaintiff who drank a bottle of soda and suffered from vomiting and nausea after discovering a mouse in the bottle and permitting the jury to infer that the soda caused the illness).
  92. See *Babylon v. Scruton*, 215 Md. 299, 306, 138 A.2d 375, 379 (1958) (“[T]he jury could properly infer that four short [reinforcing rods], two on each side, did not make the [concrete] slab reasonably safe for its intended use.”).
  93. See *id.* at 307, 138 A.2d at 379 (“Babylon proved that the concrete in the broken slab was sound and of structural quality . . . [The break] had to be due to the inadequate reinforcement.”); see also *Harley-Davidson Motor Co. v. Wisniewski*, 50 Md. App. 339, 346, 437 A.2d 700, 704 (1981). In *Wisniewski*, a motorcycle rider sued a motorcycle manufacturer for personal injuries sustained when the throttle assembly slipped off the handlebars. See *id.* at 343, 437 A.2d at 702. In discussing the plaintiff's negligent manufacturing defect claim, the court noted that “[i]t was obvious from the testimony that [Harley-Davidson] had used less than an ideal assembly process.” *Id.* at 346, 437 A.2d at 704.
  94. See *Coca Cola Bottling Works*, 186 Md. at 160, 46 A.2d at 305 (noting that the presence of a mouse in a bottle of soda when opened is sufficient evidence to infer that the manufacturer was negligent in either processing or inspecting the product); 2 JAMES A. DOOLEY, *MODERN TORT LITIGATION* § 32.13 & n.2 (1977) (“Industry frequently employs spot or check testing . . . [which] may be inadequate.” (citing *Trowbridge v. Abrasive Co. of Phila.*, 190 F.2d 825 (3d Cir. 1951))).
  95. See *Harley-Davidson Motor Co.*, 50 Md. App. at 346, 437 A.2d at 704 (affirming the jury verdict for compensatory damages as “[t]here was more than sufficient evidence to establish negligence on the part of Harley-Davidson”); see also KEETON ET AL., *supra* note 65, § 96, at 699 (“A manufacturer who fails to exercise reasonable care to avoid and discover unintended dangers occurring in the construction process is subject to liability.”).
  96. See *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 193 (4th Cir. 1991) (“In the manufacture and distribution of blood and blood products, [the defendant] is held to the standard of care, skill, and diligence that a reasonable pharmaceutical manufacturer would use under the same or similar circumstances.”); *Babylon*, 215 Md. at 303, 138 A.2d at 377 (“Reasonable care in manufacture includes the adoption and use of a plan . . . which, if properly followed, will produce an article safe for the use for which it is produced, the selection and use of proper materials and parts, and the making of such tests during manufacture and after the article is completed” to ensure safety); *Salisbury Coca Cola Bottling Co. v. Lowe*, 176 Md. 230, 238, 241, 4 A.2d 440, 444, 446 (1939) (noting that evidence of the efficiency and design of the defendant's manufacturing



A cause of action for negligent manufacturing accrues when a manufacturer fails to exercise reasonable care and creates a defective product that causes harm to the user.<sup>97</sup> Maryland courts have articulated a heightened duty of care for manufacturers, noting that they "will be held to the skill of an expert in th[eir] business and to an expert's knowledge of the arts, materials, and processes."<sup>98</sup> The steps that a manufacturer must take to avoid liability varies with the degree of potential harm the product may cause to its user.<sup>99</sup> When

equipment and system of inspection was relevant to the issue of due care); *see also* RESTATEMENT (SECOND) OF TORTS § 395 cmt. f (1965). Comment f states:

The particulars in which reasonable care is usually necessary for protection for those whose safety depends upon the character of chattels are, (1) the adoption of a formula or plan which, if properly followed, will produce an article safe for the use for which it is sold, (2) the selection of material and parts to be incorporated in the finished article, (3) the fabrication of the article by every member of the operative staff no matter how high or low his position therein, (4) making such inspections and tests during the course of manufacture and after the article is completed as the manufacturer should recognize as reasonably necessary to secure the production of a safe article, and (5) the packing of the article so as to be safe for those who must be expected to unpack it.

*Id.*

97. *See* *Woolley v. Uebelhor*, 239 Md. 318, 325, 211 A.2d 302, 305-06 (1965) (noting that a mere assertion that a product fails to perform as expected was not sufficient evidence to allow the issue of negligent manufacture to be submitted to the jury); *Babylon*, 215 Md. at 303, 138 A.2d at 377. The *Babylon* court observed that Maryland courts adhere to the RESTATEMENT OF TORTS § 395 cmt. c (1934) and impose liability on manufacturers who fail "to exercise reasonable care in manufacturing any article which, if carelessly manufactured, is likely to cause more than trivial harm to those who use it." *Babylon*, 215 Md. at 303, 138 A.2d at 377.
98. *Babylon*, 215 Md. at 304, 138 A.2d at 377 (quoting 2 HARPER & JAMES, *supra* note 21, § 28.4). In addition, the manufacturer "must keep reasonably abreast of scientific knowledge and discoveries touching his [products] and of techniques and devices used by practical men in his trade." *Id.*; *see also* 2 DOOLEY, *supra* note 94, § 32.10 (providing that a manufacturer should be held to the standards of an expert and charged with superior knowledge).
99. *See* RESTATEMENT (SECOND) OF TORTS § 395 cmt. e (1965) ("[T]he character of harm likely to result from the failure to exercise care in manufacture affects the question as to what is reasonable care."). Furthermore, comment e states in part that:

It is reasonable to require those who make or assemble automobiles to subject the raw material, or parts, procured from even reputable manufacturers, to inspections and tests which it would be obviously unreasonable to require of a product which, although defective, is unlikely to cause more than some comparatively slight, though still

a product, such as an automobile, poses great risk to the consumer if defective, courts will require "the manufacturer to exercise almost meticulous precautions . . . in order to secure substantial perfection."<sup>100</sup>

The burden is on the plaintiff in a negligent manufacturing case to demonstrate that the manufacturer deviated in some manner from the required degree of care to ensure product safety.<sup>101</sup> While consumer expectations may guide a court's inquiry, in certain contexts, Maryland courts appear willing to apply the risk-utility test in assessing whether a manufacturer violated its duty of care.<sup>102</sup> In

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substantial, harm to those who use it. Manufacturers owe this reasonable care duty not only to the direct purchasers of the product, but also to "all persons whose right or privilege to use the article is derived from" the purchaser.

*Id.*

100. *Id.* at § 395 cmt. g.

101. See *Woolley*, 239 Md. at 325, A.2d at 305-06 (upholding a directed verdict in favor of a manufacturer because plaintiff failed to produce evidence, beyond mere possibility or speculation, that the manufacturer failed to exercise reasonable care in manufacturing an automobile); *Salisbury Coca Cola Bottling Co.*, 176 Md. at 244, 4 A.2d at 447 (approving a trial court's instruction to the jury that the plaintiff has the burden to prove that the defendant failed to exercise reasonable care in manufacturing its product); *Vito v. Sargis & Jones*, 108 Md. App. 408, 417 A.2d 129, 134 (1996) ("In a negligence action, plaintiff, of course, has the burden of proving defendant's negligence." (citing *Harris v. Otis Elevator Co.*, 92 Md. App. 49, 51, 606 A.2d 305, 306-07 (1992))).

102. In *Babylon*, the court of appeals affirmed the trial court's decision to submit the case to the jury. See *Babylon*, 215 Md. at 305, 138 A.2d at 378. The *Babylon* court explained that the case could have been submitted to the jury under a theory of design defect and in the alternative, manufacturing defect. See *id.* at 303-05, 138 A.2d at 377-78. The court employed the risk-utility language to determine whether the product was defective, but it is unclear whether the court was limiting its analysis to the design defect claim and not the manufacturing defect claim. See *id.* at 304, 138 A.2d at 378. For other cases applying the risk-utility test to determine a manufacturer's negligence, see *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 194 (4th Cir. 1991) (applying a risk - utility analysis to a negligent manufacturing claim brought against a pharmaceutical manufacturer, under Maryland law, for failing to properly test its product for contamination); see also RESTATEMENT (SECOND) OF TORTS § 395 (1965). Comment (d) provides that success in an action for negligent manufacture requires "that the risk [created by the negligently manufactured product] be an unreasonable [risk], as stated in § 291." RESTATEMENT (SECOND) OF TORTS § 395 cmt. d (1965). Section 291 states that a risk is unreasonable if it "outweigh[s] what the law regards [to be] the utility of the act" which created the risk. RESTATEMENT (SECOND) OF TORTS § 291 (1965); see also *Moran v. Fabergé*, 273 Md. 538, 543, 332 A.2d 11, 15 (1975) (stating that an unreasonable risk exists if the seri-

order to demonstrate the relevance of state of the art evidence, not only should a party tie its evidence in with factors relevant to due care in general, but also to specific factors in the risk-utility test.<sup>103</sup>

A plaintiff could use state of the art evidence to demonstrate the feasibility of adopting alternative manufacturing techniques that would decrease the likelihood of products being manufactured in an unsafe manner.<sup>104</sup> When a defendant fails to adopt state of the art manufacturing techniques, the defendant should argue that the increased risks imposed on the consumer by its manufacturing process were outweighed by the decreased utility of implementing the proposed manufacturing process.<sup>105</sup> If the allegation relates to negligent product testing, a manufacturer can provide convincing rebuttal evidence by demonstrating that it complied with industry standards or lacked the capability to know of the suggested technique for testing its product.<sup>106</sup>

Alternatively, the defendant manufacturer can use state of the art evidence to show that it acted with reasonable care in manufac-

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ousness of harm outweighs the cost of taking appropriate precautions).

103. See *infra* notes 104-10 and accompanying text.

104. See Wade, *supra* note 3, at 838. The fourth Wade factor requires the court to look to "[t]he manufacturer's ability to eliminate the unsafe character of the product without impairing its usefulness or making it too expensive to maintain its utility." *Id.*; cf. ACandS, Inc. v. Abate, 121 Md. App. 590, 699-702, 710 A.2d 944, 998-99 (1996) (approving a jury instruction by the trial court that explained that "[t]he manufacturer has a duty to test and inspect its products commensurate with the dangers that the manufacturer knows or should know are involved.") Neither Maryland appellate courts nor federal courts interpreting Maryland law have dealt with the admissibility of state of the art evidence in a negligent manufacturing defect case. See DEWEY ET AL., *supra* note 8, at 131. It has been recognized that "[t]he relevance of the level of technology at the time the product was made . . . would seem to be of little value in establishing that the manufacturer failed to meet its own production standards." *Id.* However, it may be relevant to demonstrate other elements of a manufacturing defect claim in negligence. See *infra* notes 105-06 and accompanying text.

105. Cf. *Doe*, 927 F.2d at 194. The *Doe* court noted that the only alternative the manufacturer had to avoid the risks of manufacturing defects in its products was to withdraw the product. See *id.* The court held that "[s]uch a measure would be too drastic in light of the disparity between the slight risk of transmitting AIDS during the use of [the product] and the life essential features of the product." *Id.*

106. See *id.* at 193-94 ("Hindsight opinions by [plaintiff's] experts suggesting that more should have been done to prevent the transmission of what was then and now remains an enigmatic disease are insufficient to discredit the conclusion that the applicable standard of care did not require [the defendant] to utilize screening and testing procedures at the time of [plaintiff's] injury.").

turing its product.<sup>107</sup> A defendant could accomplish this by offering proof that the manufacturing techniques employed were state of the art.<sup>108</sup> Generally, compliance with state of the art, as with compliance with industry standards, does not provide an absolute defense.<sup>109</sup> In Maryland, compliance with state of the art is likely to be weighed as one factor in assessing the manufacturer's exercise of reasonable care.<sup>110</sup> While litigants continue to combine negligent manufacturing claims with strict liability claims, fewer negligent manufacturing claims are brought due to difficulties of meeting the burden of proof.<sup>111</sup> The difficulty in proving a manufacturing defect claim often rests with establishing the origin of the defect.<sup>112</sup> The

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107. *Cf. Salisbury Coca Cola Bottling Co. v. Lowe*, 176 Md. 230, 241, 4 A.2d 440, 446 (1939) (noting that the defendant put forth evidence of its "modern" manufacturing process to establish that it exercised reasonable care).
108. *See, e.g., Dreiling v. General Elec. Co.*, 511 F.2d 768, 775 (5th Cir. 1975) ("On the negligence issue, [the defendant] introduced substantial testimony regarding the care with which it manufactured its heart pacemakers. [The defendant's] evidence was to the effect that its production methods represented the most advanced procedure possible under the current state of the art.").
109. *See* 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4] & n.53 (quoting *The T.J. Hooper*, 60 F.2d 737 (2d Cir. 1932); *Gelsumino v. E.W. Bliss Co.*, 296 N.E.2d 110, 113 (Ill. App. 1973)).
110. *Cf. Salisbury Coca Cola Bottling Co.*, 176 Md. at 238, 241, 244, 4 A.2d at 444, 446-47 (1939) (noting that the defendant's testimony regarding its modern manufacturing and inspection system that was designed to remove any semblance of the contamination complained of in the plaintiff's complaint was a factor to be considered by the jury in assessing whether the defendant was negligent in manufacturing its product).
111. *See Woolley v. Uelbelhor*, 239 Md. 318, 325, 211 A.2d 302, 305 (1965) (upholding a directed verdict in favor of automobile manufacturer) (citing RESTATEMENT (SECOND) OF TORTS § 395 (1965)). The *Woolley* court noted that "[t]here was no testimony rising above possibility or speculation that at the time Chrysler sent the car from its plant . . . it was dangerous . . . . *Id. See generally* Robert E. Powell & M. King Hill, Jr., *Proof of a Defect or Defectiveness*, 5 U. BALT. L. REV. 77, 90 (1976) ("[W]hen the product is more complex . . . proving a defect will be more difficult.").
112. *See Hacker v. Shofer*, 251 Md. 672, 677, 248 A.2d 351, 354 (1968) ("There was no evidence before the Court as to the origin of the defect in the bicycle. We cannot presume as to its origin."). A plaintiff cannot simply rely on the doctrine of *res ipsa loquitur*, unless the item remains under the control of the defendant at the time of the injury. *See id.* at 676, 248 A.2d at 353; *Harrison v. Bill Cairns Pontiac of Marlow Heights, Inc.*, 77 Md. App. 41, 48, 549 A.2d 385, 389 (1988). In a case that involved an alleged manufacturing defect in a bicycle, the court of appeals explained: "[T]his is not a situation where *res ipsa loquitur* may apply where you can merely say 'we had this article; we were using it and we were injured,' and offer no explanation of how the injury occurred

plaintiff's burden of presenting evidence that demonstrates the specific act or omission by a manufacturer that resulted in the plaintiff's injury is nearly impossible.<sup>113</sup>

Nevertheless, the desire to put evidence of a lack of due care before the jury through state of the art evidence may influence a plaintiff's choice to claim negligence in conjunction with a claim in strict liability.<sup>114</sup> Unlike inadequate warning and design defect claims, manufacturing defect claims appear to maintain distinctions when brought under a strict liability theory, as opposed to negligence.<sup>115</sup> While negligent design cases parallel negligent manufacturing cases, separate consideration for each cause of action is warranted.

### *B. Design Defect*

Prior to manufacturing a product, manufacturers make crucial decisions about the design of their products.<sup>116</sup> These decisions affect the safety of the end product.<sup>117</sup> The crucial distinction between

with reference to the construction of the article." *Hacker*, 251 Md. at 676, 248 A.2d at 353; see also KEETON ET AL., *supra* note 65, § 99, at 695 (detailing several reasons why *res ipsa loquitur* is rarely successful in manufacturing defect cases).

113. See KEETON ET AL., *supra* note 65, § 99, at 695; Wade, *supra* note 3, at 825-26.

114. See Digges & Billmyre, *supra* note 8, at 23. As one commentator recognized:

There are certain tactical advantages to including a negligence claim in a product liability action. A strict product liability claim focuses on the allegedly defective product, but a negligence claim focuses on the product *and* any culpable conduct of the defendant. Directing attention to the defendant's alleged carelessness not only generates sympathy among jurors, but also increases the likelihood of a punitive damages award.

*Id.* It would seem to naturally follow that when a manufacturer has implemented state of the art technology in its product, a claimant would want to avoid bringing a suit in negligence if a court, considering only a claim in strict liability, would not admit such evidence.

115. See *infra* notes 218-39 and accompanying text; see also Westerbeke, *supra* note 9, at 6-7 (noting that the majority of courts have not applied true strict liability to warning or design defect cases, but have found it appropriate for manufacturing defect cases).

116. See, e.g., *Frericks v. General Motors Corp.*, 274 Md. 288, 291-92, 336 A.2d 118, 121 (1975) (alleging that the defendant was negligent in design by "using steel alloys of inadequate tensile strength in construction of roof supports [and] by using steel alloys of insufficient strength and thickness in seat tilting mechanism").

117. See *id.*; see also *Ziegler v. Kawasaki Heavy Indus.*, 74 Md. App. 613, 623, 539 A.2d 701, 706 (1988) ("The most important aspect of the design defect is that it is

a design defect and a manufacturing defect is that products that are defectively designed come off the assembly line as intended, whereas a manufacturing defect occurs when a product deviates from the intended design.<sup>118</sup>

Often a plaintiff asserts, with the benefit of hindsight, that the design chosen was unreasonable,<sup>119</sup> thereby rendering the product

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the result of a conscious and voluntary choice of the form of quality of the product. The result of such a defect is that the plaintiff is injured while using the product in its ordinary and intended manner.” (quoting Comment, *Foreseeability in Product Design and Duty to Warn Cases—Distinctions and Misconceptions*, 1 WIS. L. REV. 228, 231 (1968))).

118. See Frank J. Vandall, *The Restatement (Third) of Torts, Products Liability, Section 2(B): Design Defect*, 68 TEMP. L. REV. 167, 177 (1995); Angela C. Rushton, Comment, *Design Defect under the Restatement (Third) of Torts: A Reassessment of Strict Liability and the Goals of a Functional Approach*, 45 EMORY L.J. 389, 396 (1996) (“According to the traditional definition, a manufacturing defect occurs when a product does not conform to the manufacturer’s design as a result of a mistake in the manufacturing process. A design defect, on the other hand, occurs when the product is produced as the manufacturer intended, but, because of some aspect of the design, the product is unreasonably dangerous.”); see also KEETON ET AL., *supra* note 65, § 96, at 685 (“A manufacturer or other seller in the marketing chain is subject to liability for negligence in selling a product with a flaw in the product. A flaw in a product is a condition of the product that is different than what was intended to be.”).
119. See *Pontifax v. Sears, Roebuck, & Co.*, 226 F.2d 909, 909-10 (4th Cir. 1955) (holding that a lawn mower’s design was not defective simply because newer models incorporated an additional safety feature); *Rock v. Oster Corp.*, 810 F. Supp. 665, 667 (D. Md. 1991) (holding that the plaintiffs’ lack of care in preventing the spilling of a fondue pot of hot oil defeated their alternative design arguments); *Polansky v. Ryobi Am. Corp.*, 760 F. Supp. 85, 87-88 (D. Md. 1991) (holding that the probative value of an alternative design outweighed the risk of unfair prejudice in determining the relevance of evidence); *Singleton v. International Harvester Co.*, 727 F.2d 217, 223 (D. Md. 1989) (holding that there was no duty on a crane manufacturer to eliminate all blind spots); *Mondshour v. General Motors Corp.*, 298 F. Supp. 111, 114 (D. Md. 1969) (holding that a bus was not defectively designed because the manufacturer implemented a reasonably safe design for the time of manufacture); *Volkswagen of America, Inc. v. Young*, 272 Md. 201, 216, 321 A.2d 737, 745 (1974) (holding that a plaintiff may recover for enhanced injuries sustained due to a automobile manufacturer’s negligent design, notwithstanding the negligence of the plaintiff or the driver in resulting in the accident); *Myers v. Montgomery Ward & Co.*, 253 Md. 282, 295, 252 A.2d 855, 863 (1969) (holding that a lawn mower manufacturer was not required to utilize state of the art designs to escape liability); *Babylon v. Scruton*, 215 Md. 299, 138 A.2d 375 (1958) (holding that the jury could properly infer that the design of a concrete roofing slab by the manufacturer was not reasonably safe for its intended use); *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 712, 566 A.2d 135, 144 (1989) (holding

defective and the manufacturer liable under a negligent design theory.<sup>120</sup> However, Maryland courts will not find a manufacturer liable for negligent design solely because the plaintiff's injury occurred.<sup>121</sup> To recover under this theory, a plaintiff must demonstrate that the manufacturer could have reasonably foreseen that the design would cause injuries, was not obvious to the user, and that the design actually caused the injuries alleged.<sup>122</sup>

In determining whether a manufacturer negligently designed its product,<sup>123</sup> courts focus on whether the manufacturer exercised reasonable care at the time of manufacture.<sup>124</sup> Not only must the

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that a manufacturer had no duty to include a motorcycle safety device); *Simpson v. Standard Container Co.*, 72 Md. App. 199, 207, 527 A.2d 1337, 1341 (1987) (affirming the trial court's dismissal of a case concerning an allegedly defectively designed gasoline can because of the obviousness of the danger); *Banks v. Iron Hustler Corp.*, 59 Md. App. 408, 425, 475 A.2d 1243, 1251 (1984) (holding that the plaintiff created an issue of fact by disputing the patency of an alleged design defect); *Jensen v. American Motors Corp.*, 50 Md. App. 226, 235, 437 A.2d 242, 247 (1981) (holding that the plaintiffs failed to meet the burden of proof by not demonstrating what probably happened); *American Laundry Mach. Indus. v. Horan*, 45 Md. App. 97, 106-07, 412 A.2d 407, 414-15 (1980) (holding that the defendants' failure to implement a safety device it patented supported the jury's verdict for the plaintiffs).

120. See, e.g., *Evans v. General Motors Corp.*, 359 F.2d 822, 825 (7th Cir. 1966) (claiming that a manufacturer created "an unreasonable risk of serious injury" by its choice in design); *Phipps v. General Motors Corp.*, 278 Md. 337, 353, 363 A.2d 955, 963 (1976) (adopting section 402A of THE RESTATEMENT (SECOND)); *Ziegler*, 74 Md. App. at 623-24, 539 A.2d at 706.
121. See *Jensen*, 50 Md. App. at 230-32, 437 A.2d at 245.
122. See *Volkswagen of Am., Inc.*, 272 Md. at 216, 321 A.2d at 745; see also *Rock*, 810 F. Supp. at 667 (holding that the danger posed by a fondue pot's cord was obvious); *Nicholson*, 80 Md. App. at 715, 566 A.2d at 145 (concluding that the dangers of a motorcycle without safety devices are obvious); see also note 119 and accompanying text for a discussion of the latent/patent rule in strict liability design defect cases. The requirement that the danger be latent has drawn great criticism. See *Banks*, 59 Md. App. at 422-23, 475 A.2d at 1250 (characterizing the latent/patent rule as an "anachronism" that should be discarded).
123. Unlike negligent manufacture, where the courts look to a negligent deviation from the manufacturer's design, plaintiffs pursuing claims under negligent design defect seek to demonstrate the negligence resulted in the design itself. See *Volkswagen of Am., Inc.*, 272 Md. at 207, 321 A.2d at 740.
124. See *Mondshour*, 298 F. Supp. at 114 (observing that the manufacturer's negligence must be measured at the time of manufacture, not that of the trial); cf. *Singleton v. Manitowoc*, 727 F. Supp. 217, 223-24 (1989) (finding no defect in a crane based on the manufacturer's duty when the product was originally sold); *Volkswagen of Am., Inc.*, 272 Md. at 216, 321 A.2d at 745 ("In sum, 'traditional rules of negligence' lead to the conclusion that [a] . . . manufacturer is

manufacturer design the product to satisfy foreseeable uses, but it has an affirmative duty to test a product for design defects.<sup>125</sup> To determine where reasonable care was exercised, Maryland courts apply the risk-utility test under which the likelihood and the gravity of the harm are weighed against the burden of implementing the precautions necessary to avoid that harm.<sup>126</sup> Specifically, the risk-utility test is used to measure when a defect exists to the extent that reasonable care would require that the manufacturer produce a safer product.<sup>127</sup>

Often in a negligent design case, a plaintiff must demonstrate the manufacturer's negligence through expert testimony.<sup>128</sup> This expert testimony may amount to state of the art evidence.<sup>129</sup> The Court of Appeals of Maryland indicated the relevance of state of the art evidence in *Babylon v. Scruton*.<sup>130</sup> In *Babylon*, the court of appeals addressed a negligence claim regarding a manufacturer's allegedly defective design of a concrete roofing slab.<sup>131</sup> In so doing, the court noted:

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liable for a defect in design which the manufacturer could have reasonably foreseen would cause or enhance injuries, . . . which is not patent or obvious to the user, and which in fact leads to or enhances . . . injuries.”).

125. See *Frericks v. General Motors Corp.*, 274 Md. 288, 302, 336 A.2d 118, 126-27 (1975) (holding that the manufacturer's alleged failure to test its product helped establish the plaintiff's statement of a claim for which relief could be granted); *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 712, 566 A.2d 135, 144 (1989) (addressing whether a plaintiff may recover for a design defect for a manufacturer's failure to test other available safety options).
126. See *Rock*, 810 F. Supp. at 666; *Phipps*, 278 Md. at 345-46, 363 A.2d at 959; *Volkswagen of Md., Inc.*, 272 Md. at 213, 321 A.2d at 743; *Nicholson*, 80 Md. App. at 712-13, 566 A.2d at 144. For example, when discussing the style and intended purpose for the vehicle, one court noted that a “convertible could not be made ‘as safe in roll-over accidents as a standard four-door sedan with center posts and full-door frames.’” *Dreisonstok v. Volkswagenwek, A. G.*, 489 F.2d 1066, 1072 (4th Cir. 1974) (quoting *Dyson v. General Motors Corp.*, 298 F. Supp. 1064, 1073 (D.C. Pa. 1979)).
127. See *Babylon v. Scruton*, 215 Md. 299, 304, 138 A.2d 375, 378 (1958).
128. See *Digges & Billmyre*, *supra* note 8, at 27; *cf.* *Howard v. McCrory*, 601 F.2d 133, 138 (4th Cir. 1979) (admitting expert testimony regarding an alternative test for flammability of a child's pajamas).
129. See, e.g., *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 193-94 (4th Cir. 1991) (noting that the expert testimony proffered by the plaintiff failed to establish a state of the art sufficient to place a duty to screen and test for AIDS on the defendant).
130. 215 Md. 299, 138 A.2d 375 (1958).
131. See *id.* at 305-06, 138 A.2d at 379.



[A] person who undertakes such manufacturing will be held to the skill of an expert in that business and to an expert's knowledge of the arts, materials, and processes. Thus [a manufacturer] must keep reasonably abreast of scientific knowledge and discoveries touching his produce and of techniques and devices used by practical men in his trade.<sup>132</sup>

While this language highlights the relevance of state of the art evidence, the words "techniques and devices used by the practical men in the trade" led future courts to focus more attention on the compliance with industry standards to assess a manufacturer's exercise of due care.<sup>133</sup>

State of the art evidence is useful in establishing the reasonableness of a manufacturer's conduct in designing a product.<sup>134</sup> A plaintiff might use it to demonstrate a reasonably safe alternative to the defendant's design.<sup>135</sup> Indeed, some courts may require a plaintiff to provide evidence that a reasonable alternative design ex-

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132. *Id.* at 304, 138 A.2d at 378 (quoting 2 HARPER & JAMES, *supra* note 21, § 28.4).

133. *Moran v. Fabergé, Inc.*, 273 Md. 538, 552 n.10, 332 A.2d 11, 20 n.10 (1975) (declaring that the trier of fact may consider both product's prior history and the manufacturer's adherence to industry-wide standards and practices); *see, e.g., Honolulu Ltd. v. Cain*, 244 Md. 590, 598, 224 A.2d 433, 437 (1966) (holding that "[c]onformance to an industry standard is of course weighty evidence that the action in question is reasonable and non-negligent. When circumstances make the customary method 'inherently dangerous or obviously improper' the duty of reasonable care requires a change from ordinary practice.").

134. *See Mondshour v. General Motors Corp.*, 298 F. Supp. 111, 114 (D. Md. 1969) (noting that reasonableness is determined at the time of manufacture, not time of trial); *Lundgren v. Ferno-Washington Co.*, 80 Md. App. 522, 526, 565 A.2d 335, 337 (1989) (allowing testimony of an expert that manufacturer's product was unreasonably dangerous because the locking mechanism required the operator to engage the lock manually instead of locking automatically and that the only thing holding the mechanism in place was friction); *see also Digges & Billmyre, supra* note 8, at 23; *Robb, supra* note 3, at 8 ("In negligent design cases, courts admit state of the art evidence as a measure of the manufacturer's duty to use reasonable care in design.").

135. *See* 1 MADDEN, *supra* note 36, § 12.13, at 528 (noting that in design defect actions, evidence of an alternative design is relevant to prove whether a manufacturer fulfilled its duty of care). In one notable Maryland case, the plaintiff presented evidence that the manufacturer did not incorporate its own patented device to alleviate the danger of its product. *See American Laundry Mach. Indus. v. Horan*, 45 Md. App. 97, 106-08, 412 A.2d 407, 414-15 (1980).

isted.<sup>136</sup> However, such evidence is not controlling<sup>137</sup> insofar as courts do not expect a manufacturer to incorporate "the ultimate in safety features."<sup>138</sup> Thus, state of the art evidence simply bolsters the argument that a safer alternative design existed,<sup>139</sup> and that the manufacturer failed to exercise reasonable care in failing to adopt the alternative design.<sup>140</sup>

A defendant can also offer state of the art evidence to demonstrate that there were no superior designs available.<sup>141</sup> Generally, this is accomplished by showing that it implemented a state of the art design when it manufactured the product.<sup>142</sup> If the evidence produced by the defendant shows that the design in question is state of the art, the evidence buttresses its argument that it exercised reasonable care<sup>143</sup> and may result in a directed verdict for the defend-

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136. See, e.g., *Garst v. General Motors Corp.*, 484 P.2d 47, 61 (Kan. 1971) (noting that the "need to show that there was a defect of some kind in design and not merely that a better design might have been conceived"). See generally RESTATEMENT OF THE LAW (THIRD) OF TORTS: PRODUCTS LIABILITY § 2 cmt. b (1997) (explaining that "in most cases involving defective design the plaintiff must prove the availability of an alternative reasonable design").

137. 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-66.

138. 1 MADDEN, *supra* note 36, at 529; see also *Mondshour*, 298 F. Supp. at 114 (noting that although there may be an alternative design, courts hold manufacturers liable by a "standard of reasonable safe design, not safest possible design"); *Frericks v. General Motors Corp.*, 274 Md. 288, 295, 336 A.2d 118, 122-23 (1975) (quoting *Volkswagen of Am. v. Young*, 272 Md. 201, 217, 321 A.2d 737, 745 (1974)); *Robb*, *supra* note 3, at 8-9 ("In negligent design cases, . . . a manufacturer's noncompliance with the then-existing state of the art would not automatically result in a finding of negligence."). Likewise, Stuart Madden argues that courts should not hold manufacturers liable solely because they use lighter, less durable products than other manufacturers in the same industry; much like evidence of alternative designs, evidence of other manufacturers' materials does not directly prove that the product was unsuitable for its intended purpose. See 1 MADDEN, *supra* note 36, at 529; see also *Hull v. Eaton Corp.*, 825 F.2d 448, 453-55 (D.C. Cir. 1987) ("[E]vidence of a design alternative, by itself, is not sufficient to impose liability on the manufacturer." (quoting *Westinghouse Elec. Corp. v. Nutt*, 407 A.2d 606, 611 (D.C. App. 1979))); 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-66.

139. See 1 MADDEN, *supra* note 36, at 528 (noting the relevance of the alternative designs and safety precautions of other manufacturers to prove design defect and the feasibility of safety devices).

140. See *Powell & Hill*, *supra* note 111, at 85-87.

141. See 1 MADDEN, *supra* note 36, § 12.13, at 529-30.

142. See *Digges & Billmyre*, *supra* note 8, at 52 n.302 (noting that manufacturers would likely use state of the art evidence to disprove allegations of defect based in negligence).

143. See *Powell & Hill*, *supra* note 111, at 85-87. In making this determination,

ant.<sup>144</sup> When a manufacturer does not implement a state of the art design, its defense should focus on the elements considered by Maryland courts in their risk-utility analysis.<sup>145</sup> For example, a defendant could assert that the costs of implementing the design would destroy the economic utility of the product<sup>146</sup> and that the alternative design does not create substantial benefits in safety.<sup>147</sup>

Unlike negligent manufacturing defect cases, there are several more compelling reasons for framing design defect claims in negli-

courts may also consider, but are not controlled by, the manufacturer's adherence to federal statutes or regulations. *See also* Howard v. McCrory Corp., 601 F.2d 133, 138 (4th Cir. 1979).

144. As one commentator explained:

[T]hough state of the art is not a recognized affirmative defense in negligent products actions, its admissibility may have the same practical result. If the defendant manufacturer introduces evidence establishing that the technology of its product had advanced only so far at the time of the product's manufacture, and if it shows that its product incorporated these latest innovations, then, unless the plaintiff can adduce some evidence of an alternative, technologically-possible design or of the defendant's failure to use the latest technology, some courts will direct a verdict for the defendant.

Robb, *supra* note 3, at 7 (citing Dreiling v. General Elec. Co., 511 F.2d 768 (5th Cir. 1975); Wiska v. St. Stanislaus Soc. Club, Inc., 390 N.E.2d 1133 (Mass. App. 1979)).

145. *See* Troja v. Black & Decker Mfg., 62 Md. App. 101, 108, 488 A.2d 516, 519 (1985) (quoting Wade, *supra* note 74, at 17). Professor Wade revised these considerations to include:

the usefulness and desirability of the product—its utility to the user and to the public as a whole[; t]he safety aspects of the product—the likelihood it will cause injury, and the probable seriousness of the injury[; t]he availability of a substitute product which would meet the same need and not be as safe[; t]he manufacturer's ability to eliminate the unsafe character of the product without impairing its usefulness or making it too expensive to maintain its utility . . .[; t]he feasibility on the part of the manufacturer, of spreading the loss by setting the price of the product or carrying liability insurance.

Wade, *supra* note 3, at 837-38.

146. *See* Troja, 62 Md. App. at 108, 488 A.2d at 519 (incorporating the expense of correcting the unsafe nature of the product into the utility prong of the risk-utility test).

147. *See* 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-63 to 18-66 (citing Murphy v. Chestnut Mountain Lodge, Inc., 464 N.E.2d 818 (Ill. App. Ct. 1984); Rucker v. Norfolk & W. Ry., 396 N.E.2d 534 (Ill. 1979); Connelly v. General Motors Corp., 540 N.E.2d 370 (Ill. App. Ct. 1989)); 1 MADDEN, *supra* note 36, § 12.13, at 528-30 (noting that some courts view a defendant's use of state of the art evidence as a nonprejudicial rebuttal to the plaintiff's evidence of alternative design).

gence instead of strict liability. If a plaintiff cannot demonstrate that a product could be made safer, then strict liability may be precluded because the product is not unreasonably dangerous.<sup>148</sup> Additionally, in certain design defect scenarios, Maryland courts have disregarded the distinction between strict liability and negligence.<sup>149</sup> Thus, a plaintiff that is hesitant about alleging a count in negligence, because evidence of due care could have an adverse effect on the jury, may not be able to preclude the defendant from introducing evidence that its product was state of the art.<sup>150</sup> Similarly, inadequate warning claims brought in negligence and strict liability appear to overlap.

### C. Failure to Warn

Under a negligence theory, a manufacturer may be liable for injury or damage that was the result of its failure to adequately warn of the dangers of the product it manufactures.<sup>151</sup> In order for

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148. See *Griggs v. BIC Corp.*, 981 F.2d 1429, 1434 (3d Cir. 1992) (holding that because the plaintiff did not contend that the product was unsafe for its intended use, it was not defective as a matter of law); *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 190 (4th Cir. 1991) (noting that under Maryland law, "a product is not unreasonably dangerous if it is determined to be unavoidably unsafe") (internal quotation marks omitted)).
149. See *Polansky v. Ryobi Am. Corp.*, 760 F. Supp. 85, 87 (D. Md. 1991). In this design defect case, the court observed: "The element of a negligence action and a strict liability action are the same 'with the exception that in negligence plaintiff must show a breach of a duty of care by defendant while in strict liability plaintiff must show that the product was unreasonably dangerous.'" *Id.* (quoting *Werner v. Upjohn*, 628 F.2d 848, 858 (4th Cir. 1980)).
150. See *infra* notes 2-15 and accompanying text.
151. See *Singleton v. International Harvester Co.*, 685 F.2d 112, 117 (4th Cir. 1989) (affirming a trial court's refusal to submit a negligent duty to warn case to the jury when the plaintiff failed to establish liability under strict liability for a failure to warn of possible injuries associated with tractor); *Higgins v. Diversey Corp.*, 998 F. Supp. 598, 605 (D. Md. 1997) (refusing to hold a drug manufacturer liable for not warning consumers of unforeseeable injuries); *Doe*, 927 F.2d at 194-95 (refusing to hold a manufacturer liable because it could not reasonably foresee the possibility of its product contributing to the transmission of AIDS); *Eagle-Picher Indus. v. Balbos*, 326 Md. 179, 197, 604 A.2d 445, 453 (1992) (holding a manufacturer liable for negligent failure to warn, despite its inability to foresee the specific type of injury suffered); *Moran v. Fabergé, Inc.*, 273 Md. 538, 555, 332 A.2d 11, 21 (1975) (concluding that the issue of reasonable foreseeability, even when a product is not used as intended, is a matter for the jury); *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 712, 566 A.2d 135, 144 (1989) (holding that a motorcycle manufacturer had no duty to warn the plaintiff of lower leg injuries); see also RESTATEMENT (SECOND) OF TORTS § 388 (1965); Madden, *supra* note 14, at 235. A related is-

a duty to warn to arise, the danger presented by the use of the product in absence of an adequate warning must be unreasonable.<sup>152</sup> Thus, a manufacturer must warn product users when there is "a reasonable probability of injury" in the absence of a warning.<sup>153</sup>

In a products liability case based on negligent failure to warn, the assessment of whether an unreasonable risk exists entails a balancing of the probability and the seriousness of the harm with the costs of taking appropriate precautions.<sup>154</sup> This type of risk-utility approach, however, has received criticism because it provides little framework for analyzing failure to warn claims.<sup>155</sup> A court's emphasis on the nominal burden that a warning places on a manufacturer significantly undermines the usefulness of this analytical tool.<sup>156</sup> Courts viewing the cost of providing a warning as the central factor to the utility prong will almost undoubtedly find that it is outweighed by the risk of harm to the user in the absence of a warning.<sup>157</sup> This may indicate one reason why courts place more empha-

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sue is whether the defendant has exercised reasonable care in formulating and updating its warning. *See* *Werner v. Upjohn*, 628 F.2d 848, 858 (4th Cir. 1980). This issue is of prime importance in cases addressing unavoidably dangerous drugs, for which strict liability is unavailable. *See id.* (discussing comment k of section 402A).

152. *See, e.g., Doe*, 927 F.2d at 194 (citing *Chambers v. G.D. Searle & Co.*, 441 F. Supp. 377, 381 (D. Md. 1975)); *McAlpin v. Leeds & Northrup Co.*, 912 F. Supp. 207, 209 (W.D. Va. 1996) (stating that under a theory of negligence, the focus is on whether the manufacturer's failure to warn was unreasonable); *Eagle-Picher Indus.*, 326 Md. at 194-95, 604 A.2d at 452 (quoting RESTATEMENT (SECOND) OF TORTS § 95). *See generally* Madden, *supra* note 14, at 235 ("[T]he duty to warn under negligence principles is triggered where the potential for harm from the use of the product without warnings or instructions is 'significant.'").
153. *Katz v. Arundel-Brooks Concrete Corp.*, 220 Md. 200, 204, 151 A.2d 731, 733 (1959).
154. *See Moran*, 273 Md. at 543, 332 A.2d at 15.
155. *See* James A. Henderson & Aaron D. Twerski, *Doctrinal Collapse in Products Liability and the Empty Shell of Failure to Warn*, 65 N.Y.U. L. REV. 265, 270 (1990) ("Concepts such as . . . risk-utility balancing . . . are so devoid of content in the failure-to-warn context that they cannot hope to test the bona fides of the plaintiff's claim.").
156. *See id.* at 293-94; Madden, *supra* note 14, at 241-42. However, Henderson and Twerski note that the utility factor of providing an additional warning might weigh in favor of a manufacturer because consumers inundated with excessive warnings may fail to heed those more crucial to safe use of the product. *See* Henderson & Twerski, *supra* note 155, at 296-97 (charging courts and commentators with the erroneous assumption that warnings are costless).
157. *See* Madden, *supra* note 14, at 241-42; Richard N. Pearson, *Strict Liability and*

sis on resolving the foreseeability and knowledge elements of an inadequate warning claim.

A manufacturer's failure to warn may create a foreseeable<sup>158</sup> and avoidable risk of harm.<sup>159</sup> To recover under a failure to warn claim, a plaintiff must demonstrate that it was reasonably foreseeable that harm would result from the use or exposure to the product in the absence of warnings.<sup>160</sup> Foreseeability plays a crucial role in the duty to warn context and has been interpreted quite expansively by the Court of Appeals of Maryland.<sup>161</sup>

In *Moran v. Fabergé*,<sup>162</sup> the seminal Maryland failure to warn case, the court of appeals declared that "[t]he manner in which the risk culminates in harm may be unusual, improbable and highly unexpected . . . . And yet, if the harm suffered falls within the general danger area, there may be liability."<sup>163</sup> Therefore, although

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*Failure to Warn*, 3 PROD. LIAB. L.J. 108, 111 (1992). According to one commentator:

It perhaps would be an unusual case in which a manufacturer could avoid negligence liability for failing to warn of a hazardous characteristic by arguing that a warning would not have been cost effective. Courts tend to look at warnings as relatively cheap, although there are costs to warnings that courts frequently overlook.

Pearson, *supra*, at 111.

158. See RESTATEMENT (SECOND) OF TORTS §§ 388, 395 (1965).

159. See WILLIAM L. PROSSER, HANDBOOK ON THE LAW OF TORTS § 31 (4th ed. 1971).

160. See RESTATEMENT (SECOND) OF TORTS § 395 (1965).

161. See *Moran v. Fabergé, Inc.*, 273 Md. 538, 544, 332 A.2d 11, 15 (1975); *Twombly v. Fuller Brush Co.*, 221 Md. 476, 158 A.2d 110 (1960); *Katz v. Arundel Corp.*, 220 Md. 200, 151 A.2d 731 (1959). The *Moran* court noted that one reason foreseeability plays such an important role in the negligent failure to warn analysis is because the cost of correcting the deficiency, placing a warning on the label, heavily favors the plaintiff. See *Moran*, 273 Md. at 543-44, 332 A.2d at 15.

162. 273 Md. 538, 332 A.2d 11 (1975). In *Moran*, the plaintiff brought suit after being burned by a burst of fire when her friend attempted to scent a lit candle with a Fabergé cologne. See *id.* at 541, 332 A.2d at 13. In reversing the court of special appeals and the circuit court's decisions, the court of appeals held:

[I]n the products liability domain a duty to warn is imposed on a manufacturer if the item it produces has an inherent and hidden danger about which the producer knows, or should know, could be a substantial factor in bringing injury to an individual or his property when the manufacturer's product comes near to or in contact with the elements which are present normally in the environment where the product can reasonably be expected to be brought or used.

*Id.*

163. *Id.* at 551, 332 A.2d at 19 (quoting FOWLER HARPER, A TREATISE ON THE LAW OF TORTS § 7 (1933)).

a manufacturer may assume that its product will be put to its anticipated use,<sup>164</sup> the manufacturer may still be found liable for the dangers of a product that flow from a noncustomary, but nonetheless foreseeable use.<sup>165</sup> Maryland appellate courts have reasoned that "[t]he pertinent inquiry . . . is not whether the harm that occurred—the actual use—was itself foreseeable, but rather whether it fell 'within a general field of danger which should have been anticipated.'"<sup>166</sup> This concept of foreseeability calls on a court to consider

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164. The court of appeals noted that it was not necessary for the plaintiff to demonstrate that the manufacturer foresaw or should have foreseen the precise manner in which the accident would occur—that their cologne would be used to scent a lit candle. *See id.* at 553, 332 A.2d at 20 (stating that it is only necessary that the manufacturer be able to foresee possible danger if its product comes into contact with elements normally found in the environment where the product will be used). Rather, the plaintiff's evidence was sufficient to show the following: the cologne possessed a latent danger of flammability; persons at Fabergé knew or should have known of the latent danger; it was normal to find a flame and cologne in a home; it was reasonably foreseeable to Fabergé that the two might come in contact; and, a manufacturer, knowing of the cologne's dangerous propensity, should have warned consumers. *See id.* at 554, 332 A.2d at 21; *see also* RESTATEMENT (SECOND) OF TORTS § 395 cmt. j (1965). Comment j reads in pertinent part:

*Unforeseeable use or manner of use.* The liability stated in this Section is limited to persons who are endangered and the risks which are created in the course of uses of the chattel which the manufacturer should reasonably anticipate. In the absence of special reason to expect otherwise, the maker is entitled to assume that his product will be put to a normal use, for which the product is intended or appropriate; and he is not subject to liability when it is safe for all such uses, and harm results only because it is mishandled in a way which he has no reason to expect, or is used in some unusual and unforeseeable manner.

*Id.* § 395 cmt. j. To further support its analysis, the *Moran* court also relied on comment k, which declares in pertinent part: "The manufacturer may, however, reasonably anticipate other uses than the one for which the chattel is primarily used." *Id.* cmt. k.

165. *See* RESTATEMENT (SECOND) OF TORTS § 395 cmt. k (1965). *See generally* Madden, *supra* note 14, at 237-39.
166. *American Laundry Mach. Indus. v. Horan*, 45 Md. App. 97, 104, 412 A.2d 407, 413 (1980) (quoting *Segerman v. Jones*, 256 Md. 109, 132, 259 A.2d 794, 805 (1969)). In *American Laundry Machine Industries*, the Court of Special Appeals of Maryland, relying on the *Moran* court's expansive view of foreseeability, held that injuries sustained from an exploding commercial drying machine, being used to dry a hot air balloon, were sufficiently foreseeable to require the issue of negligence to be resolved by the jury. *See id.* at 108, 412 A.2d at 414-15.

a manufacturer's knowledge, whether actual or constructive. The *Restatement (Second) of Torts* and subsequent case law adopting its provisions and comments provide direct support for focusing on this knowledge component.

The negligence standard that measures a seller's or manufacturer's duty to warn derives primarily from section 388 of the *Restatement (Second) of Torts*.<sup>167</sup> Under this section, the standard of liability for failure to warn is whether a manufacturer or supplier has "reason to know"<sup>168</sup> of the dangerous propensities of the product.<sup>169</sup> While this section sets forth the general principles of a manufacturer's duty to warn, Maryland courts hold manufacturers to a more exacting standard.<sup>170</sup>

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167. See *Moran*, 273 Md. at 544, 332 A.2d at 15 (implementing the RESTATEMENT (SECOND) OF TORTS § 388 (1965)). Section 388 provides that:

One who supplies directly or through a third person a chattel for another to use is subject to liability to those whom the supplier should expect to use the chattel with the consent of the other or to be endangered by its probable use, for physical harm caused by the use of the chattel in the manner for which and by a person for whose use it is supplied, if the supplier (a) knows or has reason to know that the chattel is or is likely to be dangerous for the use for which it is supplied, and (b) has reason to believe that those for whose use the chattel is supplied will realize its dangerous condition, and (c) fails to exercise reasonable care to inform them of its dangerous condition or of the facts which make it likely to be dangerous.

RESTATEMENT (SECOND) OF TORTS § 388 (1965). While section 388 only mentions sellers, RESTATEMENT (SECOND) OF TORTS section 394 explains that a manufacturer's duties are the same as a seller. See RESTATEMENT (SECOND) OF TORTS § 394 cmt. a. In particular, comment a provides that: "[t]he manufacturer of a chattel is under those general liabilities which are common to all suppliers of chattels for the use of others." *Id.*

168. According to the RESTATEMENT (SECOND) OF TORTS, courts considering the "reason to know" standard focus on whether "the actor has information from which a person of reasonable intelligence or of the superior intelligence of the actor would infer that the fact in question exists, or that such person would govern his conduct upon the assumption that such fact exists." RESTATEMENT (SECOND) OF TORTS § 12(1).

169. See *Eagle-Picher Indus., Inc. v. Balbos*, 326 Md. 179, 202-03, 604 A.2d 445, 446 (1992) (holding that a nonmanufacturing seller that acts merely as a conduit of goods will be held to the "reason to know standard" of sections 12, 388, and 401 of the RESTATEMENT (SECOND) OF TORTS).

170. See, e.g., *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 194 (4th Cir. 1991); *Bottazzi v. Petroleum Helicopters, Inc.*, 664 F.2d 49 (5th Cir. 1981); *Higgins v. Diversey Corp.*, 998 F. Supp. 598, 605 (D. Md. 1997); *United States Gypsum Co. v. Mayor of Baltimore*, 336 Md. 145, 164-65, 647 A.2d 405, 414-15 (1994); *Eagle-Picher Indus.*, 326 Md. at 195, 604 A.2d at 452 (citing *Babylon v. Scruton*, 215



For a manufacturer, the heightened duty of care takes into account what the manufacturer knows or should have known about any hazardous propensities of the product.<sup>171</sup> Unlike the "reason to know standard," the "should have known" standard creates an affirmative duty on the part of the manufacturer to discover the dangers a product imposes on foreseeable consumers that use the product in any foreseeable manner.<sup>172</sup> Thus, in a negligent failure to warn case, a manufacturer "is held responsible for knowing what was generally known in the scientific or expert community about the product's hazards."<sup>173</sup> As such, a manufacturer must remain fully apprized of all developments relevant to its product.<sup>174</sup> This affirma-

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Md. 299, 304, 138 A.2d 375, 378 (1958)); *Moran*, 273 Md. at 552, 332 A.2d at 20.

171. See, e.g., *Eagle-Picher Indus.*, 326 Md. at 195-200, 604 A.2d at 452-56 (holding suppliers and installers that are more than mere conduits will be held to the "should have known" standard of manufacturers); *Moran*, 273 Md. at 552, 332 A.2d at 20; *United States Gypsum Co.*, 336 Md. at 164, 647 A.2d at 414 (approving a jury instruction holding manufacturers and sellers to a "should have known" standard in a duty to warn case); see also, e.g., RESTATEMENT (SECOND) OF TORTS § 12(2) (1965). Section 12(2) reads:

The words "should know" are used throughout the Restatement to denote the fact that a person of reasonable prudence and intelligence or of the superior intelligence of the actor would ascertain the fact in question in the performance of his duty to another, or would govern his conduct upon the assumption that such fact exists.

*Id.*

172. See *Madden*, *supra* note 14, at 226-27.
173. *United States Gypsum Co.*, 336 Md. at 165, 647 A.2d at 415-16 (citing *Eagle-Picher Indus.*, 326 Md. at 194-95, 604 A.2d at 452; *Babylon*, 215 Md. at 304, 138 A.2d at 378). Courts have held that under this standard, a manufacturer is held to the level of an expert in the field. See *Eagle-Picher Indus.*, 326 Md. at 195, 604 A.2d at 452; *Babylon*, 215 Md. at 304, 138 A.2d at 378 ("[A] person who undertakes such manufacturing will be held to the skill of an expert in that business and to an expert's knowledge of the arts, materials, and processes. Thus he must keep reasonably abreast of scientific knowledge and discoveries touching his product . . ." (quoting 2 HARPER & JAMES, *supra* note 21, § 28.4)). However, evidence that an injury has never before been seen nor published in national literature is admissible to determine the state of the art. See *Higgins*, 998 F. Supp. at 605.
174. See *Babylon*, 215 Md. at 304, 138 A.2d at 378; HARPER & JAMES, *supra* note 21, § 28.4, at 350; see also *Braun v. Roux Distrib. Co.*, 312 S.W.2d 758, 763 (Mo. 1958) (stating that the appellant is required to keep reasonably abreast of scientific knowledge and discoveries concerning his field); *Beshada v. Johns-Manville Prods. Corp.*, 447 A.2d 539, 545-46 (N.J. 1982). However, the duty to warn for drug manufacturers may be lower than that for other products. It requires medical consensus, not merely a potential espoused in medical litera-

tive duty to seek out and warn of certain expert knowledge becomes the central element to establishing the relevance of state of the art evidence when a negligence claim is brought for an inadequate warning.<sup>175</sup>

The element of what the defendant should have known contains a temporal restriction.<sup>176</sup> Maryland adopted the majority view<sup>177</sup> that manufacturers are held to what they "should have known at the time the products were manufactured or sold."<sup>178</sup> Therefore, a manufacturer can argue that, at the time of manufacture, the state of the art did not contemplate the general harm caused.<sup>179</sup> The expansive view of foreseeability, combined with the heightened standard of knowledge imputed to manufacturers, however, would seem to work more in the plaintiff's favor.

The "should have known" requirement in the failure to warn scenario includes more than merely the "evidence from the general scientific community."<sup>180</sup> It imputes not only "scientifically discovera-

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ture: "If pharmaceutical companies were required to warn of every suspected risk that could possibly attend the use of a drug, the consuming public would be so barraged with warnings that it would undermine the effectiveness of these warnings." *Doe*, 927 F.2d at 194.

175. See *infra* note 180-84 and accompanying text.

176. The temporal element varies from state to state. See 6 SPEISER ET AL, *supra* note 1, § 18:166.

177. See Pearson, *supra* note 157, at 109-11. The majority view measures the manufacturer's knowledge by considering the state of the art at the time of sale. See *id*; PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, § 15.05[8] at 15-126. The minority view that has received its fair share of criticism focuses on the state of the art at the time that case is at trial. See Pearson, *supra* note 157, at 109-11.

178. See *United States Gypsum Co.*, 336 Md. at 165, 647 A.2d at 415; see also *Doe*, 927 F.2d at 194 (dating the knowledge requirement at the time the drug was administered).

179. See *Eagle-Picher Indus.*, 326 Md. at 195, 604 A.2d at 453 (permitting the manufacturer to argue that at the time of manufacture the state of the art precluded it from foreseeing the connection between asbestos and the disease mesothelioma). However, courts will hold a manufacturer nonetheless liable if it can foresee an injury of the general type suffered by the plaintiff. See *id.* at 196-97, 604 A.2d at 453 (holding that even though the manufacturer may not have foreseen that the plaintiff would contract mesothelioma, an asbestos-related disease, its ability to foresee the possibility of asbestosis or any lung disease in general supported a jury verdict for negligent failure to warn).

180. *United States Gypsum Co.*, 336 Md. at 164, 647 A.2d at 414. It appears that in Maryland, "[t]he knowledge of one manufacturer can be a proper basis for concluding that another manufacturer should have warned of a specific defect." *Id.*

ble" information to a manufacturer or seller, but also "what other manufacturers and sellers knew about their products."<sup>181</sup> Thus, a plaintiff can use state of the art evidence to prove "any other knowledge that may be available" to any manufacturer in the defendant's field.<sup>182</sup> For example, in *United States Gypsum Co. v. Mayor of Baltimore*,<sup>183</sup> the court of appeals permitted one corporation's internal correspondence regarding that corporation's knowledge of a product to be used as state of the art evidence to prove the should have known element in a negligent failure to warn case brought against a separate corporate entity.<sup>184</sup>

The knowledge standards enunciated by the Maryland appellate courts in negligent duty to warn cases have particular significance in strict products liability because the same knowledge components are applied.<sup>185</sup> This application of negligence standards in strict liability cases further strengthens the degree of congruity between the two theories in the inadequate warning context.<sup>186</sup> Indeed, Maryland, like many other jurisdictions, has developed a strict liability jurisprudence that retains many of the concepts developed in negligence cases, particularly in the context of inadequate warnings and design defects.<sup>187</sup>

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181. *Id.*

182. *Id.* at 168, 647 A.2d at 416.

183. 336 Md. 145, 647 A.2d 405 (1994).

184. *See id.* at 167-68, 647 A.2d at 416.

185. *See* ACandS, Inc. v. Abate, 121 Md. App. 590, 614, 710 A.2d 944, 956 (1988). According to the Court of Special Appeals of Maryland:

'In an asbestos product liability failure to warn action sounding in strict liability or negligence and brought against a manufacturer or a distributor-installer, a plaintiff must show that the defendant knew or should have known that distribution of the product involved an unreasonable risk of causing physical harm to the consumer.'

*Id.* (quoting ACandS, Inc. v. Godwin, 340 Md. 334, 397-98, 667 A.2d 116, 254-55 (1995)). Compare *supra* notes 149-84 and accompanying text, with *infra* notes 188-215 and accompanying text.

186. *See infra* notes 298-308 and accompanying text. *See generally* Henderson & Twerski, *supra* note 155, at 271-79 (discussing the significant overlap between negligent failure to warn and strict liability failure to warn).

187. According to two commentators: [I]n both defective-design and failure-to-warn cases, cost-benefit balancing is inevitably required to determine product defectiveness. Because cost-benefit balancing is also at the heart of negligence, it is no easy matter in design and warning cases to discover a difference between strict liability and negligence . . . . After years of frustration, many courts have finally abandoned the search and declared that, for all intents and purposes, strict liability, as applied to generically dangerous product cases, was

## V. STRICT LIABILITY

Strict liability allows a court to imply negligence; thus, it has been likened to negligence *per se*.<sup>188</sup> As such, there is often an overlap between the elements of a strict liability cause of action and the relevant features of a case brought in negligence.<sup>189</sup> Recognizing those overlaps provides assistance in predicting the admissibility of state of the art evidence in suits grounded in strict liability.

Section 402A of the *Restatement (Second) of Torts*, adopted by an overwhelming majority of states,<sup>190</sup> sets forth the general rule of strict liability.<sup>191</sup> According to section 402A, a seller will be held liable for any injury resulting from the intended use of its defective product,<sup>192</sup> notwithstanding the seller's exercise of all possible care.<sup>193</sup> In *Phipps v. General Motor Corp.*,<sup>194</sup> the Court of Appeals of Maryland adopted section 402A of the *Restatement (Second) of Torts*.<sup>195</sup>

simply negligence by another name. Henderson & Twerski, *supra* note 155, at 271-72.

188. As the *Phipps* court explained:

Although the plaintiff need not prove any specific act of negligence on the part of the seller, as in other product liability cases, proof of a defect existing in the product at the time it leaves the seller's control must still be presented. As one commentator has observed, the doctrine of strict liability is really but another form of negligence *per se*, in that it is a judicial determination that placing a defective product on the market which is unreasonably dangerous to a user or consumer is itself a negligent act sufficient to impose liability on the seller.

*Phipps v. General Motors Corp.*, 278 Md. 337, 351, 363 A.2d 955, 962 (1976) (quoting Wade, *supra* note 74, at 14).

189. See *infra* notes 190-217 and accompanying text.

190. See Joseph E. Martineau, Note, *The Duty to Warn Under Strict Products Liability as Limited by the Knowledge Requirement: A Regretful Retention of Negligence Concepts*, 26 ST. LOUIS U. L.J. 125, 125 n.12 (1981) (noting that 43 states and the District of Columbia have adopted strict liability).

191. See *Phipps*, 278 Md. at 352, 363 A.2d at 963.

192. The plaintiff's burden of proving defect distinguishes strict liability from absolute liability. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4], at 18-65 (quoting *O'Brien v. Muskin Corp.*, 463 A.2d 298 (N.J. 1983)).

193. See RESTATEMENT (SECOND) OF TORTS § 402A (1965). Underlying section 402A is the policy that the public has a right to expect protection against accidental injuries that are caused by defective and dangerous products and that this burden most logically falls on those who manufacture, supply, and sell the products. See *id.*

194. 278 Md. 337, 363 A.2d 955 (1976).

195. See *id.* at 353, 363 A.2d at 963 (concluding that a cause of action brought under strict liability by a party injured by a defective and unreasonably dan-

The *Phipps* court explained that to establish a claim under section 402A, a plaintiff is required to demonstrate four elements: (1) the product was in a defective condition at the time that it left the possession or control of the seller, (2) that it was unreasonably dangerous to the user or consumer, (3) that the defect was a cause of the injuries, and (4) that the product was expected to and did reach the consumer without substantial change in its condition.<sup>196</sup> Thus, Maryland courts apply the majority rule<sup>197</sup> that in order to recover under section 402A, the plaintiff must prove that the product at issue was both defective<sup>198</sup> and unreasonably dangerous.<sup>199</sup>

Although the *Phipps* court did not officially adopt any of the comments<sup>200</sup> to section 402A, it noted that several of the comments could be used as a defense to claims grounded in strict liability.<sup>201</sup> Thus, the *Phipps* court made clear that “[d]espite the use of the term ‘strict liability’ the seller is not an insurer, as absolute liability is not imposed on the seller for any injury resulting from the use of his product.”<sup>202</sup> While defenses to strict liability include a plaintiff’s failure to read or follow the given instructions<sup>203</sup> and misuse of the

gerous product is valid in Maryland).

196. *See id.* at 344, 363 A.2d at 958.

197. *See* *Bruce v. Martin-Marietta Corp.*, 544 F.2d 442, 447 (10th Cir. 1976) (citing *Kleve v. General Motors Corp.*, 210 N.W.2d 568 (Iowa 1973)); *C & K Lord, Inc. v. Carter*, 74 Md. App. 68, 87, 536 A.2d 699, 708 (1988); *Brown v. Western Farmers Ass’n*, 521 P.2d 537 (Or. 1974); *Jagmin v. Simonds Abrasive Co.*, 211 N.W.2d 810 (Wis. 1973).

198. A defect is not simply a condition that creates a risk of harm; it is some type of imperfection, whether in design, manufacture, or warning. *See Singleton v. Manitowoc Co.*, 727 F. Supp. 217, 221 (D. Md. 1989).

199. *Phipps*, 278 Md. at 344, 363 A.2d at 959 (“For a seller to be liable under § 402A, the product must be both in a ‘defective condition’ and ‘unreasonably dangerous’ at the time that it is placed on the market by the seller.”); RESTATEMENT (SECOND) OF TORTS § 402A cmt. i (1965) (explaining that section 402A only applies if the “defective condition of the product makes it unreasonably dangerous to the user or consumer”). *But see* *Wade*, *supra* note 74, at 14-15 (explaining that “defective” is synonymous with “unreasonably dangerous”); *Borel v. Fibreboard Paper Prod. Corp.*, 493 F.2d 1076, 1087 n.20 (5th Cir. 1973).

200. The *Phipps* court’s discussion of the strict liability standard made use of the comments’ definitions of “defective condition” and “unreasonably dangerous.” *Phipps*, 278 Md. at 344, 363 A.2d at 958 (citing RESTATEMENT (SECOND) OF TORTS § 402A cmts. g, i).

201. *See id.* at 346, 363 A.2d at 959-60 (citing RESTATEMENT (SECOND) OF TORTS § 402A cmts. g, h, j, n (1965)).

202. *Id.* at 351-52, 363 A.2d at 963.

203. *See Simpson v. Standard Container Co.*, 72 Md. App. 199, 204-05, 527 A.2d

product,<sup>204</sup> the increased emphasis on the manufacturer's knowledge<sup>205</sup> has brought issues of the admissibility of state of the art evidence to the forefront.

State of the art evidence is particularly relevant to the temporal element of knowledge—"What is known and when was this knowledge available."<sup>206</sup> Unlike negligence suits, however, the relevance of state of the art evidence in strict liability creates controversy and the law is increasingly unsettled.<sup>207</sup> The principal difference between a negligence claim and strict liability claim is the shift in focus from the *conduct* of the manufacturer to the *product* itself.<sup>208</sup> Accordingly, some courts and commentators conclude that a manufacturer's knowledge of a risk or hazard is irrelevant.<sup>209</sup> Jurisdictions employ

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1337, 1340 (1987).

204. *See id.* at 204-06, 527 A.2d at 1340-41.

205. In the words of Stuart Madden:

Rather than confine evaluation of the meaning of unreasonably dangerous to the monochromatic consideration of the consumer expectations test, growing authority suggests that even under the principles of strict liability, a product should be considered unreasonably dangerous if the danger arises from mismanufacture, misdesign, or misinformation by reference to the seller's actual or constructive knowledge.

Madden, *supra* note 14, at 225 (footnote omitted).

206. *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986).

207. *See* 3 Frumer & Friedman, *supra* note 3, §18.03[4], at 18-58.

208. *Phipps*, 278 Md. at 344, 363 A.2d at 958 ("In strict liability, the plaintiff is not required to impugn the conduct of the maker or other seller but he is required to impugn the product." (citing *KEETON ET AL.*, *supra* note 65, § 99, at 695; *Wade*, *supra* note 74, at 17)).

209. *See id.* at 344, 363 A.2d at 958; *see also* *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337, 1441 (9th Cir. 1986) (quoting *Lenhardt v. Ford Motor Co.*, 683 P.2d 1097, 1100 (Wash. 1984) (declaring that a manufacturer's liability is determined by the product, not its behavior); *Johnson v. Raybestos-Manhattan, Inc.*, 740 P.2d 548, 549 (Haw. 1987) (noting the three elements listed under section 402A); *KEETON ET AL.*, *supra* note 65, § 99, at 700. This reasoning is consistent with the different burdens of proof a plaintiff bears under negligence and strict liability. *See Phipps*, 278 Md. at 351, 363 A.2d at 962. To recover in negligence, a plaintiff must prove that the defendant breached the duty of due care, whereas in strict liability, a plaintiff must prove that the product was defective and unreasonably dangerous. *See Werner v. Upjohn Co.*, 682 F.2d 848, 858 (4th Cir. 1980). According to the *Phipps* court, strict liability is little more than another form of negligence per se. *See Phipps*, 278 Md. at 351, 363 A.2d at 962-63 (quoting *Wade*, *supra* note 74, at 14). However, the trend among American jurisdictions is to admit state of the art evidence in strict liability cases to demonstrate the knowledge of the defendant. *See* 1 FRUMER & FRIEDMAN, *supra* note 3, § 8.04[4], at 8-205.

ing this reasoning have held that state of the art evidence is inadmissible in strict liability cases.<sup>210</sup> These jurisdictions impute knowledge of a product's defective condition to the manufacturer.<sup>211</sup> The rationale is that the scientific inability to discover the product's unreasonably dangerous nature does not excuse the fact that, ultimately, the product may prove to be both defective and unreasonably dangerous.<sup>212</sup>

However, even under a strict liability theory, a manufacturer will not be liable simply because an accident happened.<sup>213</sup> Subjecting a manufacturer to liability, because it did not warn of unknown dangers or incorporate designs that even experts did not contemplate, arguably transforms strict liability into absolute liability. A court applying this logic may admit state of the art evidence to demonstrate the manufacturer's knowledge of the alleged product defect.<sup>214</sup> Specifically, state of the art evidence can be admitted to demonstrate that the defect did not render the product unreasonably dangerous because the product complied with the state of the

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210. See, e.g., *Kisor*, 783 F.2d at 1141 (applying Washington law that compliance with industry standards is not relevant in strict liability actions); *Elmore v. Owens-Illinois, Inc.* 673 S.W.2d 434, 438 (Mo. 1984) (holding that state of the art evidence has no bearing on the outcome of a strict liability claim in Missouri); *Beshada v. Johns-Manville Prod. Corp.*, 447 A.2d 539, 546-49 (N.J. 1982) (holding that a product may be unsafe regardless of industry knowledge). See generally 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4], at 18-71 to 18-72 (providing multiple cases and discussing the general argument made by these courts).

211. See *supra* notes 208-10 and accompanying text.

212. See KEETON ET AL., *supra* note 65, § 99, at 700-01. Furthermore, "[i]t is generally agreed, however, that inability to prevent flaws from occurring will not excuse, but there is considerable diversity of opinion about inability to discover or appreciate hazards related to the way products are designed or composed." *Id.* at 701 (footnotes omitted).

213. *Harrison v. Bill Cairns Pontiac, Inc.*, 77 Md. App. 41, 51, 549 A.2d 385, 390 (1988) (noting that a manufacturer cannot be held liable simply because an accident occurred); *Jensen v. American Motors Corp.*, 50 Md. App. 226, 229-30, 437 A.2d 242, 244 (1989) (noting that the mere fact that an accident happens does not prove that a product was defective, but realizing that a litigant can create a jury issue as to whether a defect in the product existed through circumstantial evidence when "the addition of very little more in the way of facts, . . . may be enough to support the inference." (quoting W. Prosser, *The Fall of the Citadel*, 50 MINN. L. REV. 791, 840-44 (1966))).

214. See Birnbaum & Wrubel, *supra* note 1, at 31; Daniel Webster Bishop, Comment, *Use of 'State of the Art' Evidence in Strict Liability Claims: The New Texas Standard*, 33 BAYLOR L. REV. 165, 171 (1981); Sobota, *supra* note 19, at 945-46.

art.<sup>215</sup>

Deciding whether state of the art evidence is relevant may hinge on the type of test a court employs to assess liability. Under section 402A, products are judged defective and unreasonably dangerous based on the expectations of consumers.<sup>216</sup> However, modern courts have de-emphasized and, in some jurisdictions, abandoned the consumer expectations test, opting instead to apply the risk-utility test.<sup>217</sup> Maryland appears willing to apply both depending on which type of strict liability claim is asserted.

#### A. Manufacturing Defect

In a strict liability claim that alleges a manufacturing defect—a result of an error in the manufacturing process—the appropriate inquiry seeks to determine whether the product conformed to the manufacturer's intended design or whether it deviated from the other units of the product line.<sup>218</sup> To recover for a manufacturing

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215. See KEETON ET AL., *supra* note 65, § 99, at 700.

216. See RESTATEMENT (SECOND) OF TORTS § 402A cmt. i (1965) ("The article sold must be dangerous to an extent beyond that which would be *contemplated by the ordinary consumer* who purchases it, with the ordinary knowledge common to the community as to its characteristics." (emphasis added)).

217. See Birnbaum & Wrubel, *supra* note 1, at 31 ("In some jurisdictions, courts have noted that while strict liability may be appropriate in manufacturing defect cases, negligence is the proper basis of liability in design and warning cases where the test for defect is the risk-utility balancing of factors analysis.").

218. See *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 192 (4th Cir. 1991) (refusing to hold a manufacturer liable for a manufacturing defect of which it could not have knowledge nor against which it could not have screened at the time of manufacture); *Stalkner v. General Motors Corp.*, 934 F. Supp. 179, 180 (D. Md. 1996) (holding that the plaintiff's expert presented insufficient evidence to prove a specific deviation from the manufacturer's design); *A.J. Decoster Co. v. Westinghouse Elec. Corp.*, 333 Md. 245, 247-48, 634 A.2d 1330, 1331 (1994) (alleging that a transfer switch to a ventilation system was defectively manufactured causing the loss of more than 140,000 chickens); *Eaton Corp. v. Wright*, 281 Md. 80, 85, 90, 375 A.2d 1122, 1125, 1127 (1977) (alleging that a distributor was strictly liable for a deformed valve core that rendered a propane fuel container unreasonably dangerous); *Zeigler v. Kawasaki Heavy Indus.*, 74 Md. App. 613, 620, 539 A.2d 701, 704 (1988) (citing *Phipps v. General Motors Corp.*, 278 Md. 337, 363 A.2d 955 (1976)); see also *Phipps*, 278 Md. at 345, 363 A.2d at 959 (noting that jurisdictions readily adopt RESTATEMENT (SECOND) OF TORTS section 402A for manufacturing defect strict liability cases); KEETON ET AL., *supra* note 65, § 99, at 695 ("This is a far cry from negligence liability since the target defendant is liable without proof that there was any negligence on the part of the target defendant in creating or failing to discover the flaw.").



defect, the plaintiff must demonstrate that the manufacturer distributed the product in a defective condition,<sup>219</sup> the product reached the consumer without substantial change,<sup>220</sup> the defect rendered the product unreasonably dangerous,<sup>221</sup> and the deviation<sup>222</sup> caused the

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219. See *Phipps*, 278 Md. at 353, 363 A.2d at 963; see also *A.J. Decoster Co.*, 333 Md. at 260, 634 A.2d at 1337; *Harrison v. Bill Cairns Pontiac, Inc.*, 77 Md. App. 41, 48, 549 A.2d 385, 389 (1988) (holding that plaintiff's speculative expert testimony combined with the fact that the evidence was destroyed five years after manufacture did not produce sufficient evidence to infer a manufacturing defect existed at the time it left the manufacturer); *Eaton Corp.*, 281 Md. at 89-90, 375 A.2d at 1127 (noting that it was proper to infer that the product was in a defective condition when it left the defendant's possession because the product was used within one hour of its purchase); *Jensen v. American Motors Corp.*, 50 Md. App. 226, 231, 437 A.2d 242, 245 (1989) (explaining that defects in manufacturing or design must exist when the product leaves the manufacturer's control).
220. See *Phipps*, 278 Md. at 353, 363 A.2d at 963; see also *A.J. Decoster Co.*, 333 Md. at 260, 634 A.2d at 1337; *C & K Lord, Inc. v. Carter*, 74 Md. App. 68, 88, 536 A.2d 699, 708 (1988) (holding in a design defect case grounded in strict liability that the disconnection of an automatic flood system of a conveyor created a jury issue as to whether the product reached the consumer without substantial change). However, "not every change made to a product after it leaves the manufacturer suffices to preclude liability under § 402A . . . . [I]t seems that, in most cases, the substantiality of the change is a question of fact, and if there is any conflict in the evidence, it is for the jury to decide." *Banks v. Iron Hustler Corp.*, 59 Md. App. 408, 432, 475 A.2d 1243, 1255 (1984) (citations omitted).
221. See *Phipps*, 278 Md. at 353, 363 A.2d at 963; see also *A.J. Decoster Co.*, 333 Md. at 260, 634 A.2d at 1337. The *Phipps* court recognized instances in which a manufacturing or design defect would never be reasonable. See *Phipps*, 278 Md. at 345, 363 A.2d at 959 (citing *Henningsen v. Bloomfield Motors, Inc.*, 161 A.2d 69 (N.J. 1960) (new car's defective steering mechanism resulted in the automobile swerving off the road)); see also *Elmore v. American Motors Corp.*, 451 P.2d 84 (Cal. 1969) (new automobile's drive shaft separates from the vehicle under normal driving conditions); *Sharp v. Chrysler Corp.*, 432 S.W.2d 131 (Tex. App. 1968) (new car's brakes fail); *DEWEY ET AL.*, *supra* note 8, at 4.
222. Regarding a strict liability suit to recover a manufacturing defect, it is sufficient to simply demonstrate that the product deviated from the manufacturer's design. See *Koch v. Sports Health Home Care*, No. 94-1346, 1995 WL 290409, at \*5 (4th Cir. May 15, 1995) (citing *Singleton v. International Harvester Co.*, 685 F.2d 112, 117 (4th Cir. 1989)); see also *KEETON ET AL.*, *supra* note 65, § 99, at 700 ("The scientific inability to avoid occasional flaws in products due to miscarriages in the construction process has never altered the fact that an impure or flawed product is defective if the product tends to be more dangerous than it was intended to be."). However, a failure to present such evidence is fatal to a manufacturing defect case. See *Koch*, 1995 WL 290409, at \*5. Although, unlike in negligence, a plaintiff does not have to demonstrate a spe-

plaintiff's injury.<sup>223</sup>

In strict liability manufacturing defect cases, the Court of Appeals of Maryland has stated a preference for the consumer expectation test because of its simplicity in application.<sup>224</sup> Under the consumer expectations test, when a product injures a consumer due to a manufacturing defect, it will usually fail the expectations of the reasonable consumer and will thus be deemed unreasonably dangerous.<sup>225</sup> This standard calls for a comparison of a product against the manufacturer's intended design.<sup>226</sup> Generally, the manufacturer's negligent conduct or knowledge is irrelevant to the case.<sup>227</sup> This limited inquiry has little need for evidence of past potential alternatives; therefore, state of the art evidence is arguably irrelevant to the court's inquiry.<sup>228</sup>

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*cific action* that deviated from the duty of due care, a plaintiff must demonstrate specifically how the *product* deviated from the intended design. *See Singleton*, 685 F.2d at 115 (noting that to recover under a strict liability manufacturing defect case, the plaintiff must demonstrate that the product does not conform to the manufacturer's specifications). *Compare Stalkner*, 934 F. Supp. at 180 (refusing to grant relief to the plaintiff for an alleged manufacturing defect because of the expert's failure to identify a specific deviation from the manufacturer's design), *with Eaton Corp.*, 281 Md. at 85, 90, 375 A.2d at 1125, 1127 (affirming a verdict for the plaintiff when he presented, through expert testimony, that a critical part of the manufacturer's product deviated from its design and specifications).

223. *See Phipps*, 278 Md. at 353, 363 A.2d at 963; *see also A.J. Decoster Co.*, 333 Md. at 260, 634 A.2d at 1337; *Dudley v. Baltimore Gas & Elec.*, 98 Md. App. 182, 204, 632 A.2d 492, 502 (1993) (noting that the plaintiff failed to prove that the natural gas manufactured by the defendant was defective and erroneously asserted that because the gas caused the injury, the defective pipes that caused the injury shall result in recovery from the defendant).

224. *See Phipps*, 278 Md. at 344, 363 A.2d at 959 (citing FRUMER & FRIEDMAN, *supra* note 3, § 16(A)(4) at 3-318 to 3-320 (1976)); DEWEY ET AL., *supra* note 8, at 4). Such a determination is for the court, not the jury. *See DEWEY ET AL.*, *supra* note 8, at 6.

225. *See DEWEY ET AL.*, *supra* note 8, at 4.

226. *See supra* notes 54-62 and accompanying text.

227. *See supra* notes 54-58 and accompanying text.

228. *See Reed v. Tiffin Motor Homes, Inc.*, 697 F.2d 1192, 1196, 1198 n.8 (4th Cir. 1982) (applying South Carolina law); *Robb*, *supra* note 3, at 14 ("Even the most conservative defense counsel would agree that state of the art evidence has no relevance to strict products actions involving manufacturing defects."); *cf. Johnson v. Raybestos-Manhattan, Inc.*, 740 P.2d 548, 549 (Haw. 1987) (holding that state of the art evidence was inadmissible for the purpose of establishing a manufacturer's knowledge because such an inquiry was irrelevant in a strict liability cause of action concerning an inherently unsafe product).

The only way that state of the art evidence could be relevant in a strict liability manufacturing defect case appears to be when a manufacturer asserts that the product is unavoidably unsafe.<sup>229</sup> For example, in *Doe v. Miles Laboratories, Inc., Cutter Laboratories Division*,<sup>230</sup> the plaintiff alleged that Konyne, a drug made from blood, was defectively manufactured because it was contaminated with AIDS.<sup>231</sup> The plaintiff alleged that the manufacturer failed to adequately test the product.<sup>232</sup> The manufacturer relied on what may be fairly characterized as state of the art evidence, which demonstrated that, at the time the product was manufactured and administered, the medical community had not reached a consensus as to whether AIDS could be transmitted through blood.<sup>233</sup> Notably, the scientific community did not know of the plaintiff's proposed screening procedures at the time of manufacture.<sup>234</sup>

Relying on this evidence, the court conducted a risk-utility analysis to determine if the product was unreasonably dangerous.<sup>235</sup> The court relied upon comment k of section 402A of the *Restatement (Second) of Torts*<sup>236</sup> and deemed the product unavoidably unsafe.<sup>237</sup> Ac-

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229. *But see* DEWEY ET AL., *supra* note 8, at 130 (concluding that "[s]tate of the art evidence may only be relevant in strict liability design defect and failure to warn cases, as manufacturing defects involve variance from the manufacturer's self-imposed standards, whether current or not.").

230. 927 F.2d 187 (4th Cir. 1991). Before deciding the case, the United States District Court for the District of Maryland certified questions to the Court of Appeals of Maryland. *See Miles Lab. Inc. v. Doe*, 315 Md. 704, 707, 556 A.2d 1107, 1109 (1989).

231. *See Miles Lab., Inc.*, 315 Md. at 708-09, 556 A.2d at 1109; *see also Doe*, 927 F.2d at 189.

232. *See Miles Lab., Inc.*, 315 Md. at 732, 556 A.2d at 1121; *see also Doe*, 927 F.2d at 191-92.

233. *See Miles Lab., Inc.*, 315 Md. at 732, 556 A.2d at 1121; *see also Doe*, 927 F.2d at 191-92. *But see* DEWEY ET AL., *supra* note 8, at 131 (concluding that the other questions certified to the Court of Appeals of Maryland in *Doe v. Miles Lab. Inc.*, precluded the court of appeals from considering state of the art evidence in strict liability cases).

234. *See Miles Lab., Inc.*, 315 Md. at 732, 556 A.2d at 1121; *see also Doe*, 927 F.2d at 191-92.

235. *See Doe*, 927 F.2d at 191. *But see supra* note 224 and accompanying text. Comment k of the RESTATEMENT (SECOND) OF TORTS section 402A provides the considerations underlying the risk-utility test. *See id.*

236. Comment k to RESTATEMENT (SECOND) OF TORTS section 402A excludes the following from liability under a strict liability theory: "those products, drugs in particular, which in the state of human knowledge, are incapable of being safe for their intended and ordinary use (i.e. rabies vaccine), but where existing medical experience justifies the marketing and use of the product de-

cordingly, the manufacturer was exempted from liability.<sup>238</sup>

Other than instances in which the unavoidably unsafe exception to strict liability is applied, it appears as though manufacturing defect cases represent the only area of products liability that courts employ strict liability in a conceptually pure form.<sup>239</sup> However, outside the realm of manufacturing defect cases, the struggle over strictly applying section 402A is evident. The next section explores this tension and demonstrates how state of the art evidence plays a role in defining the contours of a design defect cause of action in strict liability.

### B. Design Defect

Despite the seemingly unqualified rejection of strict liability for design defects by the court of appeals in *Volkswagen of America, Inc. v. Young*,<sup>240</sup> the court nonetheless accepted this cause of action in *Phipps v. General Motors Corp.*<sup>241</sup> In design defect cases based on a strict liability theory, the elements that a plaintiff must prove to recover essentially mirror those for manufacturing defect grounded in

spite the risk." RESTATEMENT (SECOND) OF TORTS § 402A cmt. k (1965). In its consideration, the court of appeals invoked this provision. See *Miles Lab., Inc.*, 315 Md. at 732, 556 A.2d at 1121.

237. In deciding that the product was unavoidably unsafe, the Court of Appeals of Maryland and the United States Court of Appeals for the Fourth Circuit emphasized the utility of the product and the lack of available alternatives. See *Doe*, 927 F.2d at 191-193; *Miles Lab., Inc.*, 315 Md. at 732-34, 556 A.2d at 1121;. The court of appeals specifically alluded to the use of state of the art evidence in this rare circumstance by observing that "the manufacturer must demonstrate 'that at the time of preparation or marketing of the product, the *state of the art* had not progressed to where the risk was no longer unavoidable, and that the product's benefits could not be achieved by a substitute product or in another manner.'" *Doe*, 315 Md. at 726, 556 A.2d at 1118 (quoting *Belle Bonfils Mem'l Blood Bank v. Hansen*, 665 P.2d 118, 120 (Colo. 1983)).

238. See *Miles Lab., Inc.*, 315 Md. at 732-34, 556 A.2d at 1121; see also *Doe*, 927 F.2d at 191-93.

239. See *supra* note 227 and accompanying text.

240. 272 Md. 201, 321 A.2d 737 (1974). According to the *Volkswagen of America, Inc.* court:

[W]e are convinced that [§ 402A] has no proper application to liability for design defects . . . . Since the existence of a defective design depends upon the reasonableness of the manufacturer's action, and depends upon the degree of care which he has exercised, it is wholly illogical to speak of a defective design even though the manufacturer has 'exercised all possible care' in preparation of his product.

*Id.* at 220-21, 321 A.2d at 747.

241. 278 Md. 337, 353, 363 A.2d 955, 963 (1976).

strict liability.<sup>242</sup> The principal distinction drawn between design defect and manufacturing defect cases is that in a design defect case the plaintiff is required to prove that the defendant's entire product

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242. For an examination of these elements, see *supra* notes 218-39 and accompanying text. See also *Hull v. Eaton Corp.*, 825 F.2d 448, 453-55 (D.C. Cir. 1987) (alleging that the manufacturer's forklift design was defective because the bolts were removable and one could not determine whether the counterweight was properly attached from mere observation of the forklift); *Singleton v. International Harvester Co.*, 685 F.2d 112, 114 (4th Cir. 1981) (alleging that a manufacturer should be held strictly liable for failing to incorporate a roll over protective structure in the design of its tractor); *Rock v. Oster Corp.*, 810 F. Supp. 665, 666 (D. Md. 1991) (attempting to recover under strict liability for defective design of a fondue pot); *Polansky v. Ryobi of Am. Corp.*, 760 F. Supp. 85, 86 (D. Md. 1991) (alleging that a manufacturer was liable for a design defect under a strict liability theory for injuries incurred in the use of a miter saw); *Singleton v. Manitowoc Co.*, 727 F. Supp. 217, 218 (1989) (alleging design of a crane was defective, subjecting a manufacturer to strict liability because it allowed for blind spots); *Kelley v. R.G. Indus.*, 304 Md. 124, 138, 497 A.2d 1143, 1149 (1985) (considering whether a handgun used in a killing constituted a defectively designed product); *Klein v. Sears, Roebuck & Co.*, 92 Md. App. 477, 483-84, 608 A.2d 1276, 1280 (1992) (alleging that a radial saw was defective in design because it lacked a lower blade guard and seeking recovery under strict liability); *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 716, 566 A.2d 135, 146 (1989) (alleging that a motorcycle was defectively designed, subjecting the manufacturer to strict liability because it was not equipped with a protective device to prevent lower leg injuries in an accident); *Lundgren v. Ferno-Washington, Co.*, 80 Md. App. 522, 526, 565 A.2d 335, 337 (1989) (alleging that a cart used to transport photocopiers was defectively designed); *C & K Lord, Inc. v. Carter*, 74 Md. App. 68, 88, 536 A.2d 699, 708 (1988) (holding that a plaintiff presented sufficient evidence to create a jury question as to whether a conveyor was defectively designed because it did not incorporate safety guards, thereby subjecting the defendant to strict liability); *Zeigler v. Kawasaki Heavy Indus.*, 74 Md. App. 613, 625, 539 A.2d 701, 707 (1987) (alleging that a motorcycle manufacturer should be held strictly liable for a design defect that failed to protect an operator's lower extremities in an accident); *Simpson v. Standard Container Co.*, 72 Md. App. 199, 202, 527 A.2d 1337, 1339 (1987) (considering whether a manufacturer should be held strictly liable for the design of a gasoline can because it lacked a childproof cap and considering the same elements as those listed for manufacturing defects); *Troja v. Black & Decker Mfg.*, 62 Md. App. 101, 105, 488 A.2d 516, 518 (1985) (alleging that a manufacturer should be held liable for failing to incorporate a safety system for a radial arm saw); *Banks v. Iron Hustler Corp.*, 59 Md. App. 408, 411, 475 A.2d 1243, 1243 (1984) (alleging that the defendant should be held strictly liable for designing a conveyor without a shield); *Sheehan v. Anthony Pools*, 50 Md. App. 614, 620 n.6, 440 A.2d 1085, 1089 n.6 (1982) (noting that appellants alleged, on appeal, that the cost and utility elements of applying non-stick covering on a diving board were not outweighed by the risk of designing the board without it).

line, not just one product, is defective due to an improper design.<sup>243</sup> If a plaintiff is forced to resort to circumstantial evidence to prove a design defect, Maryland courts generally require “distinct circumstances described by the witnesses as well as expert testimony.”<sup>244</sup>

Design defect cases create the greatest confusion as to what test to apply—consumer expectations or risk–utility—as well as whether a true distinction between negligence and strict liability exists.<sup>245</sup> Ma-

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243. See *Klein*, 92 Md. App. at 485, 608 A.2d at 1280 (noting that in a design defect case, a plaintiff may recover if the product’s design “was actually intended by the manufacturer,” but is nonetheless defective). Ultimately, however, the plaintiff must also prove that the product in fact malfunctioned. See *Kelley*, 304 Md. at 138, 497 A.2d at 1149 (1985) (holding that “a handgun that functions as intended and as expected is not ‘defective’ within the reasoning of [§ 402A]”).
244. *Jensen v. American Motors Corp.*, 50 Md. App. 226, 233, 437 A.2d 242, 246 (1981). For a discussion of the importance of expert testimony, see *supra* notes 47-51 and accompanying text. Maryland courts also consider whether the alleged defect is latent. The latent/patent rule generally will require a court to hold that patent or obvious defects in design do not create an unreasonable risk, whereas latent defects may. See *Rock*, 810 F. Supp. at 667 (holding that the risks in a fondue pot were so apparent so as to preclude a finding of a unreasonable dangerousness under a risk-utility test); *Banks*, 59 Md. App. at 427, 475 A.2d at 1252 (contending that the latent/patent distinction has been incorporated into the Wade factors and is not an absolute bar to recovery). Notwithstanding the criticism of this consideration, the risk-utility test nonetheless incorporates such a consideration. See *Phipps*, 278 Md. at 345 n.4, 363 A.2d at 959 n.4 (listing the fourth consideration as “the obviousness of the danger”). Although the latent/patent rule may preclude a plaintiff’s recovery under a negligence theory in Maryland, it is considered as one of the Wade factors in a strict liability action. See *Banks*, 59 Md. App. at 427, 475 A.2d at 1252. Additionally, the defendant’s compliance with statutory standards may be considered in a design defect case brought in strict liability. See *Ellsworth v. Sherne Lingerie*, 303 Md. 581, 602, 495 A.2d 348, 358 (1985) (noting that compliance with a statutory standard, although relevant to defectiveness, does not preclude recovery).
245. See, e.g., *Nicholson*, 80 Md. App. at 720, 566 A.2d at 147 (regarding strict liability: “[W]hether one uses the ‘consumer expectation’ or ‘risk-utility’ test, the plaintiff has the burden of alleging and proving that the defendants acted unreasonably in placing the product with the patent defect into the stream of commerce.”) (emphasis added). Apparently, this difficulty is not unique to Maryland courts. As one California court noted, courts differ on whether the consumer expectations test or risk-utility test should be applied to strict liability design defect claims. See *Morton v. Owens-Corning Fiberglass Corp.*, 40 Cal. Rptr. 2d 22, 24 (Cal. Ct. App. 1995). The court went on to recognize that even within the same jurisdiction, a court may apply the consumer expectation test to one type of design defect claim and the risks utility test to another type of design defect claim. See *id.*

ryland decisions in which a plaintiff has brought a design defect claim in strict liability frequently begin their inquiry by citing the tendency of Maryland courts to utilize the consumer expectations test.<sup>246</sup> As a threshold matter, however, Maryland courts must determine whether the defect created an "inherently unreasonable risk" to the user.<sup>247</sup> If the court answers in the affirmative, it applies the consumer expectations test.<sup>248</sup> Maryland's position on this matter is in accord with the views expressed in the *Restatement (Third) of the Law of Torts: Products Liability*.<sup>249</sup>

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246. See *Kelley*, 304 Md. at 137, 497 A.2d at 1149 (citing *Phipps*, 278 Md. at 337, 363 A.2d at 955; *Simpson*, 72 Md. App. at 203-04, 527 A.2d at 1340).

247. *Lundgren*, 80 Md. App. at 530, 565 A.2d at 339 ("[W]e do not feel it is not the province of the jury to decide that a particular product, which may serve an important function in the community is inherently dangerous. Because of the policy considerations at stake and the need for consistent application, this determination is one that a jury in each individual case is ill equipped to make."); *Ellsworth*, 303 Md. at 601, 495 A.2d at 358 (noting the requirement that a plaintiff prove that a product is unreasonably dangerous); *Zeigler*, 74 Md. App. at 620, 539 A.2d at 704 ("[C]onsumer expectations do not provide guidelines fully suitable to situations involving design defects, where 'the consumer would not know what to expect, because he would have no idea how safe the product could be made.'" (quoting *Wade*, *supra* note 3, at 829)).

248. If the defective design is "obvious," Maryland courts do not require a balancing of factors. See *Troja v. Black & Decker Mfg.*, 62 Md. App. 101, 108, 488 A.2d 516, 519 (1985) (noting that in cases where there is an inherently dangerous product, no balancing is required); *Ziegler*, 74 Md. App. at 620, 539 A.2d at 705 (quoting *Digges & Billmyre*, *supra* note 8, at 52); *C & K Lord, Inc.*, 74 Md. App. at 89-90, 536 A.2d at 709 (holding that the failure to provide a safety guard on a conveyor is not an inherently unreasonable risk); accord *Morton*, 40 Cal. Rptr. 2d at 24. With an inherently unreasonable risk in design, the case is analogous to a manufacturing defect case, in that the product failed to perform as the manufacturer initially intended. See *id.* (quoting *Digges & Billmyre*, *supra* note 8, at 52). Courts have struggled to apply the consumer expectations test in claims for strict liability for design defects. See *Phipps*, 278 Md. at 345 n.4, 363 A.2d at 959 n.4 (noting the difficulty of applying the consumer expectations test when the design conforms to the manufacturer's specifications).

249. See RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 cmt. b (1997). The comments to the Restatement explain this method courts employ to bifurcate design defect claims in strict liability as follows:

Section 3 frees the plaintiff from the strictures of [proving the availability of a reasonable alternative design] in circumstances in which common experience teaches that an inference of defect may be warranted under the specific facts, including the *failure of the product to perform its manifestly intended function*. When the defect established [by way of circumstantial evidence that supports an inference of product

When the consumer expectations test guides the court's assessment of the defendant's product, state of the art evidence could be relevant in establishing the temporal element for the fact-finder. For example, in *Bruce v. Martin-Marietta Corp.*,<sup>250</sup> the court explained:

State-of-the-art evidence helps to determine the expectation of the ordinary consumer. A consumer would not expect a Model T to have the safety features which are incorporated in an automobile made today. The same expectation applies to airplanes. Plaintiffs have not shown that the ordinary consumer would expect a plane made in 1952 to have the safety features of one made in 1970.<sup>251</sup>

Other courts disagree, finding that state of the art evidence is not relevant to demonstrate what a reasonable consumer would expect.<sup>252</sup> The rationale is that ordinary consumers do not build expectations based on product design information that is not generally available.<sup>253</sup> Thus, state of the art evidence is irrelevant because jurors have the requisite knowledge of an ordinary consumer and can perform their fact-finding role without evidence of state of the art designs that may have existed.<sup>254</sup> Thus, state of the art evidence would not be admissible in design defect cases brought in Maryland in which the consumer expectations test is applied.

The prerequisite to applying the consumer expectations test is a finding that the product created an inherently unreasonable

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defect] may involve product design, some courts recognize consumer expectations as an adequate test for defect, in apparent conflict with the reasonable alternative design requirement [which suggests a risk-utility balancing test]. But when the claims involve a product's failure to perform its manifestly intended function and [circumstantial evidence supports an inference of product defect], the apparent conflict disappears.

*Id.*

250. 544 F.2d 442 (10th Cir. 1976).

251. *Id.* at 447.

252. See *Morton*, 40 Cal. Rptr. 2d at 25-26 (holding that in an asbestos exposure case, state of the art evidence regarding the awareness of the scientific community as to the dangers of asbestos was irrelevant when a court applies the consumer expectation test). However, this same court held that "[u]nder certain circumstances, expert testimony may be admissible to prove what ordinary consumers of the product actually expect when those expectations are beyond the lay experience common to all jurors." *Id.* at 26.

253. See *supra* note 60 and accompanying text.

254. See *supra* note 65 and accompanying text.



risk.<sup>255</sup> Maryland cases have likened this category of cases to manufacturing defect cases in which the defect is established by showing that the product failed to perform as intended.<sup>256</sup> For instance, when the drive shaft of a new car separates from the body of the car under normal driving conditions and causes a collision, no further inquiry is required.<sup>257</sup> State of the art evidence could not absolve a defendant because “[c]onditions like these, even if resulting from the design of the products, are defective and unreasonably dangerous without the necessity of weighing and balancing various factors involved.”<sup>258</sup>

Conversely, when a court determines that the product did not create an inherently unreasonable risk,<sup>259</sup> it will apply the risk-utility test, utilizing the Wade factors,<sup>260</sup> to determine whether the defect is unreasonably dangerous.<sup>261</sup> With increasing frequency, the risk-utility

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255. See *supra* note 57 and accompanying text.

256. See *supra* note 55 and accompanying text.

257. See *Phipps v. General Motors Corp.*, 278 Md. 337, 345, 363 A.2d 955, 958 (1976).

258. *Id.* at 346, 363 A.2d at 959; accord RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 cmt. b, § 3 (1997) (suggesting that it is appropriate to apply the consumer expectations test and permit an inference of design defect when circumstantial evidence demonstrates that the incident that harmed the plaintiff was the type that normally occurs as the result of a defect).

259. Determining whether a risk is inherently unreasonable is a question for the court, not the jury. See DEWEY ET AL., *supra* note 8, at 6.

260. See *Banks v. Iron Hustler Corp.*, 59 Md. App. 408, 425, 475 A.2d 1243, 1252 (1984) (discussing *Phipps*, 278 Md. at 345, 363 A.2d at 955); see also *Binakovsky v. Ford Motor Co.*, 133 F.3d 281, 285 (4th Cir. 1998) (noting that Maryland suggests that courts employ the seven-factor Wade analysis); *Polansky v. Ryobi of Am. Corp.*, 760 F. Supp. 85, 87 (1991).

261. See *Binakovsky*, 133 F.3d at 285; *Hull v. Eaton Corp.*, 825 F.2d 448, 454 (D.C. Cir. 1987); *Singleton v. International Harvester Co.*, 685 F.2d 112, 114-15 (4th Cir. 1981) (citing *Phipps*, 278 Md. at 346, 363 A.2d at 959 (holding that the failure to incorporate an alternate rollover protective design in a tractor did not qualify as an inherently unreasonable risk and therefore, applying the risk-utility test); *Polansky*, 760 F. Supp. at 87; *Singleton*, 727 F. Supp. at 221 (alleging risk-utility for an alleged design defect due to a lack of mirrors to prevent blind spots for crane); *Valk Mfg. v. Rangaswamy*, 74 Md. App. 304, 314, 537 A.2d 622, 627 (1988), *rev'd on other grounds*, 317 Md. 185, 562 A.2d 1246 (1989) (quoting KEETON ET AL., *supra* note 65, § 99, at 699); *Ziegler v. Kawasaki Indus.*, 74 Md. App. 613, 621, 624, 539 A.2d 701, 705, 706 (1987) (applying the risk-utility test to determine whether a motorcycle manufactured without lower extremity safety guards was unreasonably dangerous) (citing *Digges & Billmyre*, *supra* note 8, at 52); *Troja v. Black & Decker Mfg.*, 62 Md. App. 101, 108-09, 488 A.2d 516, 519 (1985) (holding that in a case in which the plaintiff alleged that the manufacturer failed to incorporate a safety system for a radial arm

test has been both discussed<sup>262</sup> and applied in Maryland as an alternative test to determine whether a product was rendered unreasonably dangerous due to a defect in design.<sup>263</sup> However, the Court of Appeals of Maryland has never specifically overruled the use of the consumer expectations test in a strict liability design defect case.<sup>264</sup> Nevertheless, Maryland's lower court decisions and federal court decisions interpreting Maryland law<sup>265</sup> indicate that scenarios in which the risk-utility test is applicable dwarf those in which the consumer expectations test is involved.<sup>266</sup>

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saw did not pose an inherently unreasonable risk). The alternative, consumer expectations test is inadequate in such a determination. *See* KEETON ET AL., *supra* note 65, § 99, at 698-99. Courts in other jurisdictions make similar distinctions. A product that falls outside of the inherently unreasonable risk category of design defect may be characterized as a product that involves "complicated design considerations, . . . obscure components, [or] esoteric circumstances surrounding the accident," the risk-utility test is more likely to be applied. *Morton v. Owens-Corning Fiberglass Corp.*, 40 Cal. Rptr. 2d 22, 24 (Cal. Ct. App. 1995).

262. *See Phipps*, 278 Md. at 346, 363 A.2d at 959; *Kelley v. R.G. Indus.*, 304 Md. 124, 136-38, 497 A.2d 1143, 1148-49 (1985); *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 718-19, 566 A.2d 135, 147 (1989); *Simpson v. Standard Container Co.*, 72 Md. App. 199, 204, 527 A.2d 1337, 1340 (1987); *Sheehan v. Anthony Pools*, 50 Md. App. 614, 620 n.6, 440 A.2d 1085, 1089 n.6 (1982).
263. *See Klein v. Sears, Roebuck & Co.*, 92 Md. App. 477, 485-86, 608 A.2d 1276, 1280 (1992); *Lundgren v. Ferno-Washington, Co.*, 80 Md. App. 522, 527-28, 565 A.2d 335, 338 (1989); *Zeigler*, 74 Md. App. at 620, 539 A.2d at 704; *Valk Mfg.*, 74 Md. App. at 313, 537 A.2d at 626 (noting that both the consumer expectations and risk-utility tests are used in design defect cases); *Troja*, 62 Md. App. at 107-09, 488 A.2d at 519; DEWEY ET AL., *supra* note 8, at 4.
264. *See Kelley*, 304 Md. at 137, 497 A.2d at 1149 (discussing both the consumer expectations and risk-utility test and finding that neither applied because a defect necessary for either analysis was not present); *Phipps*, 278 Md. at 348, 363 A.2d at 955 (discussing both the tests and applying the consumer expectations test).
265. *See Binakonsky*, 133 F.3d at 285 (applying the risk-utility test under Maryland law); *Doe v. Miles Lab., Inc.*, 927 F.2d 187, 191 (4th Cir. 1991) (applying the risk-utility test under Maryland law); *Hull*, 825 F.2d at 453-55 (finding that based on the *Phipps* decision, Maryland law requires adherence to the risk-utility test in a strict liability design defect case); *Johnson v. International Harvester Co.*, 702 F.2d 492, 494-95 (4th Cir. 1983) (applying the risk-utility test under Maryland law); *Singleton*, 685 F.2d at 115 (citing *Phipps*, 278 Md. at 337, 363 A.2d at 955 for approval of the risk-utility test under Maryland law); *Rock v. Oyster Corp.*, 810 F. Supp. 665, 666-67 (D. Md. 1991) (applying the risk-utility test under Maryland law); *Polansky*, 760 F. Supp. at 87 (applying the risk-utility test under Maryland law).
266. *See* DEWEY ET AL., *supra* note 8, at 4.

With the risk-utility test comes the series of Wade factors that must be weighed and considered to determine whether a product is unreasonably dangerous.<sup>267</sup> In those jurisdictions permitting use of state of the art in strict liability design defect cases,<sup>268</sup> a plaintiff can use state of the art evidence to demonstrate any unreasonable dangers posed by the manufacturer's design.<sup>269</sup> If Maryland chooses to adopt section 2 of the *Restatement (Third) of the Law of Torts: Products Liability*, a plaintiff alleging a defective design in a product that did not create inherently unreasonable risks will be required to prove the availability of a reasonable alternative design.<sup>270</sup> As Maryland law presently stands, if a plaintiff asserts that a reasonable alternative design to the defendant's product existed,<sup>271</sup> the plaintiff must offer proof of at least one of the Wade factors to create a jury question.<sup>272</sup>

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267. See *supra* note 74 for a discussion of section 402A and the Wade factors.

268. But see *supra* notes 206-12 and accompanying text. These jurisdictions reason that "because the manufacturer's standard of care is irrelevant [under RESTATEMENT (SECOND) OF TORTS § 402A(2)(a)], state of the art evidence should be excluded because such evidence relates solely to the reasonableness of the manufacturer's design choice." Robb, *supra* note 3, at 12. These courts conclude that state of the art evidence in design defect cases based on strict liability inject negligence principles into strict liability. See *id.* at 14-15. Yet, while strict liability imputes knowledge of the defect on the manufacturer, it does not impute knowledge of a cure; therefore, in this regard, state of the art evidence is relevant under a strict liability theory. See Ellen Wertheimer, *Unknowable Dangers and the Death of Strict Products Liability: The Empire Strikes Back*, 60 U. CIN. L. REV. 1183, 1210-11 (1992).

269. See Robb, *supra* note 3, at 10-11 (noting the relevance of the state of the art to the reasonableness of the manufacturer's design); Birnbaum & Wrubel, *supra* note 1, at 30.

270. See RESTATEMENT (THIRD) OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 & cmt. b (1997).

271. See *Binakonsky v. Ford Motor Co.*, 133 F.3d 281, 285-89 (4th Cir. 1998) (applying the risk-utility test to an allegation that the defendants' plastic fuel lines and connectors were defective because they were not designed to withstand extreme heat and pressure); *Nicholson v. Yamaha Motor Co.*, 80 Md. App. 695, 717, 566 A.2d 135, 146 (1989) (noting that Maryland courts generally use both the issues of unreasonable dangerousness and defect); *Lundgren v. Ferno-Washington Co.*, 80 Md. App. 522, 527, 565 A.2d 335, 338 (1989) (applying the risk-utility test to determine whether the defendant's design of a cart that transported photocopiers was unreasonably dangerous due to a design defect in light of the plaintiff's proposed alternative design).

272. See *Nicholson*, 80 Md. App. at 718-19, 566 A.2d at 147 ("There is nothing in the amended complaint to indicate that it would be cost-effective or commercially feasible to incorporate [the plaintiffs' proposed] modifications into the design, that any other manufacturer has done so, or that any other modifications would make the vehicle a safer product."); *Troja v. Black & Decker Mfg.*,

When a reasonable alternative design is proposed, the plaintiff will generally introduce evidence of the state of the art at the time of the product's design.<sup>273</sup> This evidence is directly related to the fourth factor of the Wade analysis<sup>274</sup>—“[t]he manufacturer's ability to eliminate the unsafe character of the product without impairing its usefulness or making it too expensive to maintain its utility.”<sup>275</sup> State of the art evidence is relevant to demonstrate the economic desirability of the alternative design, whether similarly situated manufacturers employed the alternative design, and the practicability of an alternative design.<sup>276</sup> To demonstrate that a reasonable alterna-

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62 Md. App. 101, 109, 488 A.2d 516, 520 (1985) (noting that to recover, a plaintiff must demonstrate some evidence of unreasonableness as determined by the Wade factors).

273. See KEETON ET AL., *supra* note 65, § 99, at 701 (citing *Caterpillar Tractor v. Beck*, 593 P.2d 871 (Alaska 1979); *Anderson v. Herron Eng'g Co.*, 604 P.2d 674 (Colo. 1979); *Olson v. A.W. Chesterton*, 256 N.W.2d 530 (N.D. 1977)); *Sobota*, *supra* note 19, at 950 (noting that most courts agree that the state of the art should be measured from the time of design). See generally 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-63 to 18-66 (discussing *O'Brien v. Muskin Corp.*, 463 A.2d 298 (N.J. 1983); *Boatland of Houston, Inc. v. Bailey*, 609 S.W.2d 743 (Tex. 1980)).
274. See *Phipps v. General Motors Corp.*, 278 Md. 337, 345 n.4, 363 A.2d 955, 959 n.4 (1976) (listing the fourth Wade factor as “the ability to eliminate danger without seriously impairing the usefulness of the product”); *Zeigler v. Kawasaki Indus.*, 74 Md. App. 613, 625, 539 A.2d 701, 707 (1987) (noting the plaintiff's failure to present evidence regarding alternative designs and products); *Valk Mfg. v. Rangaswamy*, 74 Md. App. 304, 316-17, 537 A.2d 622, 628 (1988), *rev'd*, 317 Md. 185, 562 A.2d 1246 (1989) (noting with approval the trial court's admission of expert testimony regarding an alternative design of a snow plow hitch, but indicating that the proposal feature was common in the trade); 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-63 to 18-64 (discussing *Boatland of Houston, Inc.*, 609 S.W.2d at 746). If the evidence, whether expert or state of the art, fails to demonstrate that an alternative design would decrease the risk of harm, the defendant will be entitled to judgment as a matter of law. See *Zeigler*, 74 Md. App. at 627, 539 A.2d at 708 (upholding the trial court's grant of a judgment notwithstanding the verdict because the plaintiff's expert testimony failed to satisfy the risk prong of the risk-utility test). See generally 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[2], at 18-63 to 18-64 (discussing *Boatland of Houston, Inc.*, 609 S.W.2d 743 (explaining the significance of state of the art evidence in determining reasonable alternative designs)).
275. See Wade, *supra* note 74, at 17.
276. See PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, § 15.08[6], at 15-128; 1 MADDEN, *supra* note 36, § 12.13 at 528. Economic desirability factors would include the economic market for the alternatively designed products and any effects on the product's price. See PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, § 15.08[6], at 15-128.

tive design existed, plaintiffs often elicit testimony that supports their proposed product design change.<sup>277</sup> As with any expert evidence, testimony about a reasonable alternative design will not be admissible if it is merely an unsubstantiated opinion.<sup>278</sup> Often, direct evidence of the state of the art in the particular product line will be used to supplement the testimony of an expert, and in certain scenarios, the court will require such evidence.<sup>279</sup> Maryland courts are likely to find these use of state of the art evidence both relevant and persuasive.<sup>280</sup>

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277. See 2 PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, § 15.05[5], at 15-123 to 15-124. However, a manufacturer should not rely too heavily on expert witnesses, especially in design defect cases, because “[f]rom a jury’s standpoint, it is far more persuasive to learn about the practical effects of an alternative design from a witness who has ‘hands-on’ experience with the product and is intimately familiar with its uses, applications, and limitations in the ‘real world.’” *See id.* at 15-124.
278. See *Troja v. Black & Decker Mfg.*, 62 Md. App. 101, 110, 488 A.2d 516, 520 (1985) (affirming a trial judge’s exclusion of unsubstantiated expert testimony regarding an alternative safety lock design, characterizing it as a “bald statement”); *Singleton v. International Harvester Co.*, 685 F.2d 112, 115 (4th Cir. 1981) (noting the plaintiff’s paucity of evidence regarding an alternative design). See generally MD. R. EVID. 5-702 (permitting a trial judge to consider the factual support for an expert’s conclusion in determining admissibility).
279. See *Troja*, 62 Md. App. at 110, 488 A.2d at 520. In its discussion of the expert testimony put forth by the plaintiff, the *Troja* court seemed to look for more concrete evidence, such as the state of the art of the radial saw industry when it declared: “The total absence of any information caused [the expert’s] testimony regarding the alleged feasibility of an alternative design to be a mere proposal, unsupported by evidence.” *See id.* at 110, 488 A.2d at 520.
280. See *Singleton*, 685 F.2d at 115-16 (affirming the trial court’s directed verdict in a defective design strict liability case due in part to the lack of evidence presented by the plaintiff regarding the practical, technical, and economic feasibility of incorporating an alternative design); see also 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4], at 18-63 to 18-64 (noting the importance of “scientific knowledge, economic feasibility, and the practicalities of implementing” an alternative design in a strict liability context) (quoting *Boatland of Houston, Inc.*, 609 S.W.2d at 748). Although the court of special appeals questioned the relevance of state of the art evidence in *Banks v. Iron Hustler Corp.*, subsequent decisions applying Maryland law narrow the court’s rejection to evidence of industry standards. See *Banks v. Iron Hustler Corp.*, 59 Md. App. 408, 427-28, 475 A.2d 1243, 1252 (1984) (responding to the trial court’s conclusion that the plaintiff’s expert did not know or indicate the state of the art by commenting, “Thus, although the issue of a manufacturer’s compliance with industry standards may be relevant to a claim based on negligence, it is ‘generally considered to be irrelevant in a strict liability case’” (quoting *Rexrode v. American Laundry Press Co.*, 674 F.2d 826 (10th Cir. 1982)). Nota-

While state of the art evidence does not control a court's determination of a manufacturer's liability,<sup>281</sup> alternative designs proposed by a plaintiff may be no more than unpersuasive suggestions absent state of the art evidence.<sup>282</sup> However, a plaintiff must utilize state of the art evidence carefully because presenting this evidence "opens the door" to rebuttal evidence presented by the defendant.<sup>283</sup> The defendant may offer state of the art evidence to demonstrate that a safer product was not feasible.<sup>284</sup> Often, the defendant's rebuttal evidence will relate to the second Wade factor, which concerns the dangers of the product.<sup>285</sup> In this sense, the defendant's state of the art evidence may indicate that the plaintiff's proposed design would result in a product that posed different and potentially greater risks than the risks that existed in the manufacturer's original design.<sup>286</sup>

Commentators argue that there is no distinction between negligence and strict liability when a court applies the risk-utility test as the test is employed by courts to determine whether a manufacturer "acted reasonably in putting it[s product] on the market."<sup>287</sup> Under this formulation, many jurisdictions will admit a manufacturer's state of the art evidence even when the plaintiff does not seek to admit state of the art evidence.<sup>288</sup> The most compelling argument that supports admitting a defendant's state of the art evidence is that if a manufacturer is not permitted to demonstrate that its product was crafted with state of the art safety features the manufacturer would be absolutely liable.<sup>289</sup> A majority of jurisdictions, including Maryland,<sup>290</sup> have refused to hold manufacturers absolutely liable.<sup>291</sup>

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bly, the *Singleton* court seemed to approve of a court's admission of industry standards in assessing the feasibility of the plaintiff's alternative design. See *Singleton*, 685 F.2d at 116.

281. See Madden, *supra* note 14, at 276.

282. See PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, 15.08[6], at 15-129.

283. See 3 FRUMER & FRIEDMAN, *supra* note 3, § 18.03[4], at 18-63 to 18-64.

284. *Id.*

285. See *supra* notes 72-74 and accompanying text.

286. See PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, 15.08[6], at 15-128.

287. *Klein v. Sears, Roebuck & Co.*, 92 Md. App. 477, 486, 608 A.2d 1276, 1280 (1992) (quoting *Ziegler v. Kawasaki Heavy Indus.*, 74 Md. App. 613, 621, 539 A.2d 701, 705 (quoting *Singleton v. International Harvester Co.*, 685 F.2d 112, 115 (4th Cir. 1981))).

288. See *supra* notes 309-23 and accompanying text.

289. See Robb, *supra* note 3, at 30.

290. See *Phipps v. General Motors Corp.*, 278 Md. 337, 351-52, 363 A.2d 955, 963 (1976) (refusing to hold a manufacturer as an insurer of its product).

Much of the same reasoning applies to strict liability claims based on inadequate warnings. However, unlike strict liability design defect claims, Maryland courts have had ample opportunity to rule on state of the art evidence in inadequate warning cases.

*C. Failure to Warn*

It is well settled in American jurisprudence that a seller<sup>292</sup> of a product has an obligation to warn a purchaser, user, or consumer of the nature of the product and any dangers involved in its use, consumption or application.<sup>293</sup> Section 402A of the *Restatement (Second) of Torts* subjects a seller of "any product in a defective condition unreasonably dangerous to the user or consumer" to strict liability.<sup>294</sup> In a failure to warn case based upon strict liability, the lack of an adequate warning<sup>295</sup> may render the product defective<sup>296</sup> and

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291. See Robb, *supra* note 3, at 8-9 nn.27-28.

292. For a discussion of how certain sections of the RESTATEMENT (SECOND) OF TORTS only apply to manufacturers and non-manufacturing suppliers, see *infra* note 375.

293. See 5 SPEISER ET AL., *supra* note 1, at 967.

294. RESTATEMENT (SECOND) OF TORTS § 402A (1965). Section 402A reads:

(1) One who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his property is subject to liability for physical harm thereby caused to the ultimate user or consumer, or to his property, if (a) the seller is engaged in the business of selling such a product, and (b) it is expected to and does reach the user or consumer without substantial change in the condition in which it is sold. 2) The rule stated in Subsection (1) applies although (a) the seller has exercised all possible care in the preparation and sale of his product, and (b) the user or consumer has not bought the product from or entered into any contractual relation with the seller.

*Id.*

295. If a manufacturer has a duty to warn, strict liability may be imposed in two situations: (1) where there is a complete failure to warn, or (2) where an inadequate warning is given. See, e.g., *Basko v. Sterling Drug, Inc.*, 416 F.2d 417, 426 (2d Cir. 1969) (noting that there is no strict liability unless the consumer establishes a breach of the manufacturer's duty to warn). A warning may be deemed inadequate if it does not "catch the eye," *Madden*, *supra* note 14, at 311, if it does not warn that a certain injury could occur, see *Ferebee v. Chevron Chem. Co.*, 552 F. Supp. 1293, 1304 (D. D.C. 1982) (applying Maryland law), or if the warning does not indicate what adverse effects could transpire should the warning's instructions go unheeded. See *id.* at 1305. In addition, supplying instructions will not satisfy the manufacturer's duty to warn if the consumer is not alerted to latent dangers in the product. See *Meisner v. Patton Elec. Co.*, 781 F. Supp. 1432, 1439 (D. Neb. 1990) (finding that the manufacturer of a space heater that instructed consumers not to use an extension

unreasonably dangerous.<sup>297</sup> A manufacturer has a duty to warn when it knows, or should know, of a danger inherent in the use of its product.<sup>298</sup> However, a duty to warn under strict liability does not arise where the product's dangerous propensity is either obvious<sup>299</sup> or unforeseeable.<sup>300</sup> Ostensibly, the element of foreseeability is as important to the analysis under strict liability as it is in negligence.<sup>301</sup>

The major limitation placed on a manufacturer's duty to warn exists in comment j to section 402A.<sup>302</sup> Comment j states that the seller is only required to give warning "if he has knowledge, or by the application of reasonable, developed human skill and foresight should have knowledge" of the product's dangerous propensity.<sup>303</sup>

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cord with its product had failed to adequately warn consumers of the potential danger of its product).

296. See *supra* note 191 and accompanying text.

297. See RESTATEMENT (SECOND) OF TORTS § 402A cmt. h, j (1965). Where a plaintiff alleges failure to warn based on strict liability theory, the issue or appropriate inquiry determines "whether the lack of a proper warning made the product unreasonably dangerous." DEWEY ET AL., *supra* note 8, at 6 (citing Werner v. Upjohn Co., 682 F.2d 848, 858 (4th Cir. 1980)).

298. See RESTATEMENT (SECOND) OF TORTS § 402A cmt. j (1965). Accordingly, under strict liability, a manufacturer may be imputed with constructive knowledge of the danger inherent in the use of its product. See Madden, *supra* note 14, at 243.

299. See, e.g., Bookout v. Victor Comptometer Corp., 576 P.2d 197, 198 (Colo. Ct. App. 1978) ("[T]he potential for danger inherent in a BB gun is readily apparent and a warning for the obvious is not a requirement of the doctrine of products liability.").

300. See RESTATEMENT (SECOND) OF TORTS § 402A cmts. h, j (1965).

301. See *id.*; see also Madden, *supra* note 14, at 242-43.

302. See Owens-Illinois, Inc. v. Zenobia, 325 Md. 420, 437, 601 A.2d 633, 641 (1992) (holding that comment j of section 402A is applicable to a strict liability cause of action when the alleged defect is a failure to warn).

303. RESTATEMENT (SECOND) OF TORTS § 402A cmt. j (1965). Comment j, in pertinent part, reads:

*Directions or warning.* In order to prevent the product from being unreasonably dangerous, the seller may be required to give directions or warning, on the container, as to its use. The seller may reasonably assume that those with common allergies, as for example to eggs or strawberries, will be aware of them, and he is not required to warn against them. Where, however, the product contains an ingredient to which a substantial number of the population are allergic, and the ingredient is one whose danger is not generally known, or if known is one which the consumer would reasonably not expect to find in the product, the seller is required to give warning against it, if he has knowledge, or by the application of reasonable, developed human



Thus, comment j emphasizes that section 402A does not relegate the seller to the position of an insurer.<sup>304</sup> Rather, by incorporating a knowledge component, comment j essentially injects negligence principles into strict liability.<sup>305</sup>

Many courts and commentators have expressed the opinion that, as with design defect claims, inadequate warning claims brought in strict liability and negligence are indistinguishable.<sup>306</sup>

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skill and foresight should have knowledge, of the presence of the ingredient and the danger. Likewise in the case of poisonous drugs, or those unduly dangerous for other reasons, warning as to use may be required.

*Id.*; see also *Zenobia*, 325 Md. at 437, 601 A.2d at 641 (holding that "for purposes of the 'should have knowledge' component of comment j, a manufacturer of a product is held to the knowledge of an expert in the field"). This is especially important for a manufacturer's failure to warn because "it would seem to be extending strict liability too far to require a manufacturer to bear the costs of accidents to a few who were victimized by an unknowable risk of a good product that was a boon to humanity—such as when penicillin was first marketed." KEETON ET AL., *supra* note 65, § 99, at 698. While section 402A provides a form of recovery under strict liability for inadequate warnings, at least one commentator likens this cause of action to negligence because the plaintiff must demonstrate that the defendant knew or should have known about the dangers posed by the product and failed to fulfill its duty to warn. See *id.* at 697.

304. See *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986) (stating that despite the use of the term "strict liability," the seller is not an insurer); *Zenobia*, 325 Md. at 437, 601 A.2d at 641 (citing *Lohrmann* for the proposition that "the seller is not an insurer"); *Phipps v. General Motors Corp.*, 278 Md. 337, 351-52, 363 A.2d 955, 963 (1976) (finding that despite the term "strict liability," the seller is not an insurer, as absolute liability is not imposed on the seller for all injuries resulting from his product); see also *Oakes v. Geigy Agric. Chem.*, 77 Cal. Rptr. 709, 713 (Cal. Ct. App. 1969) (stating that to "exact an obligation to warn the user of unknown and unknowable allergies . . . would be for the courts to recast the manufacturer in the role of the insurer"); *Woodill v. Parke-Davis & Co.*, 402 N.E.2d 194, 199 (Ill. 1980) (stating that to hold a manufacturer liable for failure to warn of a danger that is impossible to be aware of would make him the virtual insurer of the product); *Ortho Pharm. Co. v. Chapman*, 388 N.E.2d 541, 548 (Ind. Ct. App. 1979) (rejecting the obligation of a manufacturer to warn of all allergies to a product).
305. See *Zenobia*, 325 Md. at 435, 601 A.2d at 640.
306. See *Gauthier v. AMF, Inc.*, 788 F.2d 634, 637 (9th Cir. 1986) (finding no practical difference between strict liability and negligence in defective design cases); *Flaminio v. Honda Motor Co.*, 733 F.2d 463, 467 (7th Cir. 1984) (stating that there is no difference between strict liability and negligence in defective design cases); *Gordon v. Niagara Mach. & Tool Works*, 574 F.2d 1182, 1190 (5th Cir. 1978) (stating that negligent failure to warn triggers strict liability and ultimately a breach of duty); see also *Henderson & Twerski*, *supra* note 155, at

Thus, these two doctrines of liability are often confused and used simultaneously in failure to warn cases.<sup>307</sup> Deans Keeton and Wade, for example, previously argued that under section 402A's theory of strict liability, a manufacturer should be held liable regardless of the defendant's knowledge of the product's danger.<sup>308</sup> Several courts have adopted this reasoning and held that state of the art evidence, which operates to prove or disprove the knowledge component, is inadmissible. In *Kisor v. Johns-Manville Corp.*,<sup>309</sup> the United States Court of Appeals for the Ninth Circuit addressed a strict liability claim arising from a manufacturer's alleged failure to warn. Applying Washington law, the court determined that the sole issue was whether the manufacturer's warning was sufficiently conspicuous so as to inform consumers of the product's dangerous nature and what measures a customer could have employed to avoid those dangers.<sup>310</sup> According to the court, "[t]he focus is on the warning itself and the reasonable expectations of the consumer, not upon the manufacturer's conduct."<sup>311</sup> Therefore, the court refused to allow the manufacturer to admit expert testimony concerning the medical and industry knowledge concerning the hazards of exposure to asbestos.<sup>312</sup>

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278 (rejecting semantic differences between negligent failure to warn and strict liability failure to warn).

307. See Henderson & Twerski, *supra* note 155, at 270.

308. See Keeton, *supra* note 3, at 407-08; Wade, *supra* note 3, at 834-35; accord *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337, 1341 (9th Cir. 1986) (applying Washington law that compliance with industry standards is not relevant in strict liability actions); *Elmore v. Owens-Illinois, Inc.*, 673 S.W.2d 434, 438 (Mo. 1984) (holding that state of the art evidence has no bearing on the outcome of a strict liability claim in Missouri); *Beshada v. Johns-Manville Prod. Corp.*, 447 A.2d 539 (N.J. 1982) (holding that a product may be unsafe under New Jersey law regardless of industry knowledge). Jurisdictions forbidding the use of state of the art evidence reason that to recover "the plaintiff only has to show that the seller is engaged in the business of selling the product, that the product contains a defect, and that the defect caused the injury. Therefore, whether the seller knew or reasonably should have known of the dangers inherent in its product is irrelevant." *Johnson v. Raybestos-Manhattan*, 740 P.2d 548, 549 (Haw. 1987). See generally 1 FRUMER & FRIEDMAN, *supra* note 3, § 8.04[6], at 8-205 to 8-206 (discussing this perspective and the trend toward admitting state of the art evidence in strict liability actions).

309. 783 F.2d 1337 (9th Cir. 1986) (applying Washington law that compliance with industry standards is irrelevant in strict liability action).

310. See *id.* at 1341 (quoting *Little v. PPG Indus.*, 594 P.2d 911, 914 (Wash. 1979)).

311. *Id.*

312. See *id.*

In *Johnson v. Raybestos-Manhattan, Inc.*,<sup>313</sup> the Supreme Court of Hawaii addressed the admissibility of state of the art evidence, in a strict liability claim, to establish whether a manufacturer knew or should have known about the danger inherent in its product.<sup>314</sup> The court found that because negligence was irrelevant to a strict liability claim, the manufacturer's knowledge was equally irrelevant.<sup>315</sup> As a result, the court held state of the art evidence was not admissible for the purpose of establishing a manufacturer's knowledge of the inherent dangerousness of his product.<sup>316</sup> Although the *Johnson* court did not directly address the admissibility of state of the art evidence in strict liability cases arising from a manufacturer's failure to warn,<sup>317</sup> subsequent courts applying Hawaii law extended its holding to failure to warn cases.<sup>318</sup>

However, both Deans Keeton and Wade have since repudiated their view that knowledge of a product's danger is irrelevant when determining the defectiveness of a product based on failure to warn.<sup>319</sup> This shifting of opinions on the relevance of a manufacturer's knowledge illustrates the confusion and changing application of negligence and strict liability. The principles contained in section 402A and comment j appear contradictory, leading several courts to conclude that comment j is an exception to the general proposition set forth in section 402A.<sup>320</sup>

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313. 740 P.2d 548 (Haw. 1987) (addressing issues certified to the court by the United States Court of Appeals for the Ninth Circuit).

314. *See id.* at 549. The first issue certified was whether a manufacturer was conclusively presumed to have knowledge of the inherent danger of its product. *See id.*

315. *See id.* The court framed the relevant inquiry for determining "dangerously defective" in terms of reasonable consumer expectations. *Id.*

316. *See id.* The court was quick to note that whether state of the art evidence could be probative of another element of strict liability was not addressed here. *See id.* at 549 n.3.

317. *See id.* at 549 n.2.

318. *See In re Hawaii Fed. Asbestos Cases*, 960 F.2d 806, 815-16 (9th Cir. 1992); *In re Hawaii Fed. Asbestos Cases*, 699 F. Supp. 233, 235-37 (D. Haw. 1988).

319. *See John W. Wade, On the Effect in Product Liability of Knowledge Unavailable Prior to Marketing, Postscript*, 58 N.Y.U. L. REV. 734, 761-64 (1983) (finding that strict liability involves the consideration of the defendant's knowledge); W. Page Keeton, *The Meaning of Defect in Products Liability Law—A Review of Basic Principles*, 45 MO. L. REV. 579, 586-87 (1980) (stating that in failure to warn cases, a plaintiff must show that the defendant knew or should have known of the risk of which he failed to warn).

320. *See Owens-Illinois v. Zenobia*, 325 Md. 420, 433, 601 A.2d 633, 639 (1992) (cited *Woodill v. Parke Davis & Co.*, 402 N.E.2d 194, 200 (Ill. 1980); *Little v.*

The vast majority of courts<sup>321</sup> and legislatures<sup>322</sup> have concluded that a manufacturer of a product that is defective, because it lacks an adequate warning, cannot be found liable when the failure to warn results from a lack of knowledge of the product's dangerous nature. In order to prove the knowledge element of comment j, courts have stated that the requisite knowledge can be shown by state of the art evidence.<sup>323</sup> Maryland eventually adopted the majority view and presently admits state of the art evidence in strict liability actions premised upon a failure to warn.<sup>324</sup>

In *Ferebee v. Chevron Chemical Co.*,<sup>325</sup> the United States District

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PPG Indus., 579 P.2d 940, 946-47 (Wash. 1978), *modified on other grounds*, 594 P.2d 911 (Wash. 1979)).

321. *Id.* at 433, 601 A.2d at 639; *see also* *Outlaw v. Firestone Tire & Rubber Co.*, 770 F.2d 1012, 1014 (11th Cir. 1985) (applying Alabama law and holding that when plaintiff was injured by a tire that exploded, plaintiff was required to prove that the seller was aware of the risk and thus, should have warned plaintiff); *Robinson v. Audi Nsu Auto Union Aktiengesellschaft*, 739 F.2d 1481, 1488 (10th Cir. 1984) (applying Oklahoma law and stating that prior knowledge of a defect is "germane as to whether the product as sold was unreasonably dangerous to the user," and that evidence of such prior knowledge is admissible in a products liability action) (citing *McGrath v. Wallace Murray Corp.*, 496 F.2d 299, 304 (10th Cir. 1974)); *Kehm v. Procter & Gamble Mfg.*, 724 F.2d 613, 620 (8th Cir. 1983) (applying Iowa law and holding that a manufacturer of tampons was liable for damages due to death of a person who suffered toxic shock syndrome, even if manufacturer knew only a few persons would be harmed by product); *Zepik v. Ceeco Pool & Supply, Inc.*, 637 F. Supp. 444, 449-50 (N.D. Ind. 1986) (applying Indiana law and holding that manufacturer of component parts of a completed product was not liable to plaintiff who injured himself while diving into a pool because the component parts were not dangerous for the use for which they were supplied, and thus there was no duty to warn).
322. *See* *Henderson & Twerski*, *supra* note 155, at 268 n.13 (listing states that have adopted "state of the art" statutes).
323. *See* *Zenobia*, 325 Md. at 436-37, 601 A.2d at 640-41.
324. *See* *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986). The United States Court of Appeals for the Fourth Circuit stated that in *Phipps v. General Motors Corp.*, 278 Md. 337, 363 A.2d 955 (1976), the Court of Appeals of Maryland adopted RESTATEMENT (SECOND) OF TORTS section 402A (1965), that comment j is part of section 402A, *see id.* at 1164-65, and that "comment j is state-of-the-art language because it requires the seller to give a warning if he has, 'or by the application of reasonable, developed human skill and foresight should have knowledge' of the danger." *Id.* at 1165 (quoting RESTATEMENT (SECOND) OF TORTS § 402A cmt. j (1965)); *see also* *Zenobia*, 325 Md. at 437, 601 A.2d at 641 (holding that comment j is applicable in strict liability duty to warn cases).
325. 552 F. Supp. 1293 (D. D.C. 1982).

Court for the District of Columbia, applying Maryland law, addressed a strict liability claim arising from a distributor's failure to warn.<sup>326</sup> The plaintiff brought suit after contracting long-term pulmonary fibrosis, alleging that his condition resulted from use of the defendant's product, paraquat.<sup>327</sup> The court found that the distributor was aware that lung disease could be caused by skin exposure to paraquat.<sup>328</sup> Even though the distributor was not specifically aware that exposure to paraquat could cause long-term pulmonary fibrosis, the court charged the distributor with a duty to warn of "serious lung damage."<sup>329</sup> The court reasoned that, "[t]his is not a situation in which the defendant is being charged with notice of an unforeseeable and drastically different type of illness,"<sup>330</sup> in that pulmonary fibrosis is an ailment qualifying as serious lung disease.<sup>331</sup>

Subsequent to *Phipps's* embrace of section 402A,<sup>332</sup> two cases sought to address what degree of knowledge would be required in a strict liability failure to warn action. In *Troja v. Black & Decker Manufacturing Co.*,<sup>333</sup> the Court of Special Appeals of Maryland indicated a willingness to look at state of the art evidence, but the plaintiff failed to put forth the necessary evidence.<sup>334</sup>

In *Lohrmann v. Pittsburgh Corning Corp.*,<sup>335</sup> the United States Court of Appeals for the Fourth Circuit interpreted *Phipps* to allow state of the art evidence to be considered where the alleged defect was a failure to warn.<sup>336</sup> The Fourth Circuit, applying Maryland law, addressed a strict liability claim allegedly arising from the manufac-

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326. *See id.* at 1297-1300 (explaining that the proximate cause requirement does not rest entirely on whether plaintiff read a warning since the product was provided to him by his employer and his principal source of information was oral instructions).

327. *See id.* at 1299.

328. *See id.* at 1294-97.

329. *Id.* at 1300.

330. *Id.*

331. *See id.*

332. For a discussion of *Phipps*, see *supra* notes 194-205 and accompanying text.

333. 62 Md. App. 101, 105, 488 A.2d 516, 518 (1985) (alleging that the manufacturer's failure to include a safeguard and/or failure to warn consumers rendered the product defective and unreasonably dangerous).

334. *See id.* at 112, 488 A.2d at 521.

335. 782 F.2d 1156, 1164 (4th Cir. 1986) (finding that the charge to the jury was reasonable in that they were advised by the district court to measure defendant's conduct in light of the scientific and medical knowledge existing at the time the product was manufactured).

336. *See id.* at 1164.

turers' failure to warn.<sup>337</sup> The court correctly concluded that the Court of Appeals of Maryland had adopted section 402A of the *Restatement (Second) of Torts* in *Phipps*.<sup>338</sup> Noting that comment j is part of section 402A<sup>339</sup> and that comment j "requires the seller to give a warning if he has knowledge, or by the application of reasonable, developed human skill and foresight he should have knowledge of the danger,"<sup>340</sup> the court operated under the assumption that Maryland courts would apply comment j. The Court of Appeals of Maryland proved this assumption to be correct some six years later.

In *Owens-Illinois v. Zenobia*,<sup>341</sup> the court of appeals addressed a strict liability claim arising from the alleged failures to warn of several asbestos manufacturers and suppliers. Examining section 402A,<sup>342</sup> a prior Maryland case dealing with an inadequate warning claim grounded in negligence,<sup>343</sup> case law from other jurisdictions,<sup>344</sup> and the *Lohrmann* court's reasoning,<sup>345</sup> the *Zenobia* court concluded that state of the art evidence was admissible to demonstrate the defendants' knowledge at the time of manufacture, sale, or installation.<sup>346</sup> The court also indicated that a plaintiff would use knowledge or state of the art to prove the defective condition, rejecting the use of state of the art evidence as an affirmative defense.<sup>347</sup>

In *Zenobia*, the Court of Appeals of Maryland held that comment j is applicable in a failure to warn strict products liability

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337. *See id.* at 1162 (holding there was insufficient evidence to show causation between the manufacturer's asbestos-containing products and the plaintiff's claim of asbestosis).

338. *See id.* at 1164 (discussing *Phipps v. General Motors Corp.*, 278 Md. 337, 352-53, 363 A.2d 955, 963 (1976) (holding that defendant manufacturing and placing an automobile on the market in a defective condition which renders the automobile not reasonably safe, is liable for injuries caused by reason of that defective condition)).

339. *See id.* at 1164-65.

340. *Id.* at 1165 (quoting RESTATEMENT (SECOND) OF TORTS § 402A (1965)).

341. 325 Md. 420, 601 A.2d 633 (1992).

342. *See id.* at 432-37, 601 A.2d at 638-41.

343. *See Eagle-Picher Indus. v. Balbos*, 84 Md. App. 10, 55, 578 A.2d 228, 250 (1990) (holding that state of the art knowledge was admissible in a negligence failure to warn case), *aff'd in part and rev'd in part*, 326 Md. 179, 604 A.2d 445 (1992).

344. *See Zenobia*, 325 Md. at 433-34, 601 A.2d at 639-40.

345. *See id.* at 434-37, 601 A.2d at 639-41 (permitting the admission of scientific, medical knowledge).

346. *See id.* at 436-38, 601 A.2d at 641; *see also Singleton v. International Harvester Co.*, 685 F.2d 112, 115 (4th Cir. 1981) (noting that technological feasibility is determined from the time of manufacture).

347. *See Zenobia*, 325 Md. at 438 n.8, 601 A.2d at 641 n.8.

cause of action.<sup>348</sup> Therefore, a manufacturer is not liable unless it knows or should have known of the dangers that its product poses.<sup>349</sup> As in negligence cases, the manufacturer is held to the knowledge of an expert in the manufacturer's respective field.<sup>350</sup>

Notably, the *Zenobia* court declared that litigants may use state of the art evidence to establish what was known or should have been known by manufacturers, suppliers and installers.<sup>351</sup> The court explained that state of the art evidence encompasses all available information pertinent to a given product.<sup>352</sup> Necessarily, state of the art includes what other manufacturers know.<sup>353</sup> The court noted that there exists contrary case law on whether the state of the art component is a necessary element of the plaintiff's case or is an affirmative defense.<sup>354</sup> The court concluded, albeit in dictum, that state of the art is an element of the plaintiff's case in a strict liability failure to warn case.<sup>355</sup> While *Zenobia* may have created more certainty as to the admissibility of state of the art evidence, confusion over the substance of this body of evidence persists.

*United States Gypsum Co. v. Mayor of Baltimore*<sup>356</sup> provides an excellent example of the continued confusion regarding what state of the art evidence encompasses under an inadequate warning claim.

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348. *See id.* at 437, 601 A.2d at 641.

349. *See id.*

350. *See id.* Additionally, a manufacturer has a duty to issue post-sale warnings. *See id.* at 447, 601 A.2d at 646. This duty does not cease when the manufacturer no longer makes the defective product. *See id.* at 448, 601 A.2d at 647 (discussing factors for consideration when determining whether a manufacturer has satisfactorily discharged its post-sale duty to warn) (citing Victor E. Schwartz, *The Post-Sale Duty to Warn: Two Unfortunate Forks in the Road to a Reasonable Doctrine*, 58 N.Y.U. L. REV. 892, 896 (1983)). Furthermore, intermediate sellers such as suppliers and installers are held to the same standard as a manufacturer. *See id.* at 442-43, 601 A.2d at 644 (citing *Eaton Corp. v. Wright*, 281 Md. 82, 88-90, 375 A.2d 1122, 1126-27 (1977); RESTATEMENT (SECOND) OF TORTS § 402A cmt. j (1965)).

351. *See id.* at 433-37, 601 A.2d at 639-41.

352. *See id.* at 434, 601 A.2d at 639 (quoting *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986)).

353. *See id.* at 444, 601 A.2d at 644; *see also* *Dartez v. Fibreboard Corp.*, 765 F.2d 456, 461 (5th Cir. 1985) ("[M]anufacturers each bear the duty to fully test their products to uncover all scientifically discoverable dangers before the products are sold . . . . The actual knowledge of an individual manufacturer is not the issue.").

354. *See Zenobia*, 325 Md. at 438 n.8, 601 A.2d at 641 n.8.

355. *See id.*

356. 336 Md. 145, 647 A.2d 405 (1994).

In *Gypsum*, the trial court indicated that the knowledge component that supports admitting state of the art evidence in a strict liability suit is narrower than in a negligence suit.<sup>357</sup> For the strict liability count, the jury was instructed that a manufacturer "is held responsible for knowing what was generally known in the scientific or expert community about the product's hazards."<sup>358</sup> The instruction was further refined to provide that state of the art is "not what one doctor or even a group of doctors suspected at that time, but what the generally accepted view of the medical and scientific community was at the time that their products were sold."<sup>359</sup> The court of appeals held that this instruction was acceptable for both strict liability and negligence claims based on inadequate warning.<sup>360</sup>

For the negligence count, the trial court's instruction permitted the jury to attribute the knowledge of one manufacturer to another.<sup>361</sup> The court of appeals approved of this instruction, emphasizing that actual knowledge is not required; the standard is broad enough to encompass "any other knowledge available"<sup>362</sup> when the products were manufactured or sold.<sup>363</sup> This broad definition permitted the jury to consider another corporation's internal documents and impute such knowledge on the defendant at trial.<sup>364</sup> Although not explicit, it appears as though this expansive view of the knowledge component would be acceptable in the strict liability context as well.<sup>365</sup>

The above analysis demonstrates that in certain situations the issue of admitting state of the art evidence will be resolved under

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357. *See id.* at 165, 647 A.2d at 414. The defendant charged that the trial court's instructions were erroneous because "[i]n the negligence context, the Court described 'state of the art' to include . . . attribution of knowledge from one manufacturer to the other, but that state of the art in the strict liability context was given a much narrower definition." *Id.* (quoting *Asbestospray's* brief at 41-2) (internal quotation marks omitted)). The court replied: "Despite the fact that the two instructions were worded differently, we perceive no inconsistency and no confusion." *Id.*

358. *Id.* at 165, 647 A.2d at 415-16 (citing *Zenobia*, 325 Md. at 420, 601 A.2d at 633).

359. *Id.* at 164, 647 A.2d at 414 (approving a jury instruction to this effect).

360. *See id.* at 165, 647 A.2d at 414-15.

361. *See id.* at 165, 647 A.2d at 414.

362. *Id.* at 168, 647 A.2d at 416.

363. *See id.* at 166, 647 A.2d at 415.

364. *See id.* at 167-68, 647 A.2d at 416.

365. *See id.* at 168, 647 A.2d at 414 (holding that the non-defendant corporation's internal documents were admissible against the defendant "as state of the art evidence of the danger posed by the defendant's product").



the same standards in strict liability cases as negligence cases, whereas in other contexts it will not. In recent years, failure to warn claims have become the most common type of product liability action asserted. The most prevalent area in which these claims are asserted is in asbestos litigation.<sup>366</sup> Due to the long latency period of diseases that result from exposure to asbestos containing products, pinpointing the knowledge of a manufacturer often becomes a crucial element of the plaintiff's case. As such, the admissibility of state of the art evidence is often vigorously contested.

Far more controversy arises when a litigant seeks to admit state of the art evidence in a strict liability case than in a negligence case.<sup>367</sup> A natural impulse is to join any strict liability claim with a parallel claim in negligence because courts are more likely to admit state of the art evidence for negligence claims.<sup>368</sup> Generally, courts will permit state of the art evidence as to a negligence claim, even though the strict liability claim would not support its admissibility.<sup>369</sup> When this scenario occurs, a trial court generally must give careful instructions to the jury and special verdicts that draw the jury's attention away from the evidence as to the strict liability claim.<sup>370</sup> With this in mind, a litigant can strategically set forth claims in negligence if state of the art evidence works in its favor, but would otherwise be inadmissible in a strict liability suit. Even though a manufacturer's standard of care may be irrelevant to a strict liability claim, if a plaintiff demonstrates evidence that the manufacturer could have exercised greater care, a jury may be more sympathetic. Conversely, if the manufacturer employed state of the art technology, a plaintiff may want to avoid a claim of negligence to keep this evidence from the jury.

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366. Asbestos cases for failure to warn are the most prevalent type of case where state of the art evidence is admissible. See LEE & LINDAHL, *supra* note 40, at 737.

367. See *supra* note 207 and accompanying text.

368. See 3 Frumer & Friedman, *supra* note 3, § 18.03[3], at 18-57 ("While there continue to be actions today brought only in negligence for various reasons, in many states, it is more common for a plaintiff to sue in both negligence and strict liability . . .").

369. See *id.* at 18-57 to 18-58 ("In those cases where negligence has been joined with other causes of action, state-of-the-art evidence has been held to be admissible as to the negligence claim, even though it would have been kept out of evidence had the plaintiff made out a case in strict liability alone.").

370. See *id.* ("[T]rial courts, through careful instructions and special verdicts, can control the risk of jury confusion." (quoting *Landrigan v. Celotex Corp.*, 605 A.2d 1079, 1091 (N.J. 1992)).

VI. RELEVANT BACKGROUND TO *ACANDS, INC. v. ASNER*

Maryland courts have specifically admitted state of the art evidence to determine a manufacturer's knowledge at the time of sale in several asbestos cases<sup>371</sup> prior to *ACandS, Inc. v. Asner*.<sup>372</sup> There are three areas addressed by the *Asner* court that this Comment has not yet discussed. First, the defendants in *Asner* were non-manufacturing installers and suppliers of products that contained asbestos.<sup>373</sup> Second, the injured parties in *Asner* were not direct users of the defendants' product, but merely bystanders. Finally, the specific state of the art evidence that was at issue was peculiar to asbestos. Each area requires brief development.

A. *The Duty of Non-manufacturing Suppliers and Installers*

Pursuant to section 388 of the *Restatement (Second) of Torts*, a non-manufacturing supplier or installer who supplies a product that causes harm is liable only when it knows or has "reason to know"<sup>374</sup>

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371. See *Lohrmann v. Pittsburgh Corning Corp.*, 789 F.2d 1156, 1164-65 (4th Cir. 1986) (affirming a jury charge that included instructions on the state of the art in an asbestos-based failure to warn case grounded in strict liability); *Owens-Corning Fiberglass Corp. v. Garrett*, 343 Md. 500, 548, 682 A.2d 1143, 1166-67 (1996) (noting the absence of state of the art evidence in failing to find bad faith on the part of asbestos manufacturer in a strict liability failure to warn case); *ACandS, Inc. v. Godwin*, 340 Md. 334, 378-82, 667 A.2d 116, 137-39 (1995) (determining that the state of the art evidence at trial regarding an asbestos manufacturer's and installer's knowledge prevented the plaintiffs' recovery of punitive damages); *United States Gypsum Co. v. Mayor of Baltimore*, 336 Md. 145, 163-69, 647 A.2d 405, 414-16 (1994) (affirming a jury verdict for the plaintiffs based in part on state of the art evidence regarding an asbestos manufacturer and installer in a strict liability failure to warn case); *Eagle-Picher Indus., Inc. v. Balbos*, 326 Md. 179, 194-97, 604 A.2d 445, 452-53 (1992) (permitting an asbestos manufacturer to present the state of the art evidence regarding asbestos-related diseases); *ACandS, Inc. v. Abate*, 121 Md. App. 590, 614-15, 710 A.2d 944, 956 (1998) (noting the importance of state of the art evidence in a strict liability failure to warn case).

372. 344 Md. 155, 163-70, 686 A.2d 250, 254-57 (1996) (finding reversible error in the trial court's refusal to admit state of the art evidence in an asbestos-related strict liability failure to warn case).

373. See *id.*

374. See RESTATEMENT (SECOND) OF TORTS § 12(1) (1965). Section 12(1) provides: The words "reason to know" are used throughout the Restatement of this Subject to denote the fact that the actor has information from which a person of reasonable intelligence or of superior intelligence of the actor would infer that the fact in question exists, or that such person would govern his conduct upon the assumption that such fact exists.

of the dangers in using a product as intended,<sup>375</sup> has reason to believe that those supplied with the product are not aware of the product's dangerous condition,<sup>376</sup> and fails to inform the consumer of the product's dangerous propensity.<sup>377</sup> However, when the non-manufacturing supplier is "something more than a conduit,"<sup>378</sup> the supplier will be held to the heightened "should have known" standard that is normally reserved for manufacturers.<sup>379</sup>

In *Eagle-Picher Industries, Inc. v. Balbos*,<sup>380</sup> the Court of Appeals of Maryland delineated the appropriate knowledge standard to be applied to non-manufacturing suppliers and installers of asbestos products in negligence cases.<sup>381</sup> Porter-Hayden, an installer of asbestos insulation, argued that plaintiffs needed to prove that Porter-Hayden knew or had "reason to know" of the dangers of asbestos to bystanders.<sup>382</sup> The *Balbos* court reiterated the holding in *Telak v. Maszczenski*,<sup>383</sup> in which the court of appeals announced that a mere "conduit" supplier is held to the lesser standard of "reason to know."<sup>384</sup>

The *Balbos* court, however, held that Porter-Hayden, as an installer and dealer in asbestos insulation, was more than a mere conduit supplier, and therefore subject to the "should have known" standard.<sup>385</sup> The court held that Porter-Hayden should have known, and thus warned, of the dangers of asbestos because, as an installer and supplier of asbestos products, Porter-Hayden was peculiarly aware of the dangers associated with asbestos.<sup>386</sup>

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*Id.*

375. *See id.* § 388.

376. *See id.*

377. *See id.*

378. *Eagle-Picher Indus., Inc. v. Balbos*, 326 Md. 179, 202, 604 A.2d 445, 456 (1992).

379. *See id.* at 200, 604 A.2d at 455.

380. 326 Md. 179, 604 A.2d 445 (1992).

381. *See id.* at 194-204, 604 A.2d at 452-57.

382. *Id.* at 198, 604 A.2d at 454 (citations omitted).

383. 248 Md. 476, 487, 237 A.2d 434, 440 (1968) (holding that the seller of a swimming pool, who was only a distributor, was not liable for a diver's injuries).

384. *Balbos*, 326 Md. at 202-03, 604 A.2d at 456.

384. *See id.* at 203-04, 604 A.2d at 457.

386. *See id.* This finding is in accord with previous case law, which held that "a vendor, like a manufacturer, is subject to liability if, although ignorant of the dangerous character or condition, he could have by the exercise of reasonable care discovered it by utilizing the peculiar opportunity and competence which he has or should have as a dealer in such chattels." *Id.* at 200, 604 A.2d at 455 (quoting *Woolley v. Uebelhor*, 239 Md. 318, 325, 211 A.2d 302, 306 (1965) (cit-

In light of this precedent, it was not surprising that the defendants in *Asner*, who were suppliers and installers of asbestos containing products, did not dispute being held to the same standard of knowledge as manufacturers.<sup>387</sup> What was disputed, however, was the particular level of knowledge that the defendants had regarding the exposure to their product by bystanders. At the center of this dispute was the issue of foreseeability.

### B. Injuries to Bystanders

In many of the cases previously discussed, the injured party was a direct user of the product. In *Asner*, the injured parties did not directly use the asbestos-containing products—they did not cut, install, or work in any direct way with the products.<sup>388</sup> Rather, the injuries complained of were a result of the injured parties' exposure to the dust created by the asbestos-containing products while others were using, installing, or mixing them.<sup>389</sup> Products liability law labels these types of injured parties bystanders.

The *Restatement (Second)* section 402A speaks in terms of users and consumers.<sup>390</sup> The *Restatement (Second)* explicitly refrained from expressing an opinion as to the issue of liability to a bystander that is harmed by a defective product.<sup>391</sup> Determining whether the harm caused to a bystander<sup>392</sup> due to exposure to the defendant's product

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ing RESTATEMENT (SECOND) OF TORTS § 402A (1965)).

387. See *ACandS, Inc. v. Asner*, 344 Md. 155, 168 n.1, 686 A.2d 250, 256 n.1 (1996).

388. See *ACandS, Inc. v. Asner*, 104 Md. App. 608, 617-19, 657 A.2d 379, 384-85 (1995), *rev'd*, 344 Md. 155, 686 A.2d 250 (1996).

389. See *id.*

390. See RESTATEMENT (SECOND) OF TORTS § 402A (1965) ("One who sells any product in a defective condition unreasonably dangerous to the *user or consumer* or to his property is subject to liability for physical harm thereby caused to the *ultimate user or consumer*, or to his property . . .") (emphasis added).

391. See *id.* cmt. o. Comment o explains:

Casual bystanders, and others who may come into contact with the product, as in the case of employees of the retailer, or a passer-by injured by an exploding bottle, or a pedestrian hit by an automobile, have been denied recovery. There may be no essential reason why such plaintiffs should not be brought within the scope of the protection afforded, other than that they do not have the same reasons for expecting such protection as the consumer who buys a marketed product . . . . The Institute expresses neither approval nor disapproval of expansion of the rule to permit recovery by such persons.

*Id.*

392. Although no formal definition of bystander has been established by Maryland courts, *Eagle-Picher Indus., Inc.* implicitly defined the plaintiffs as persons who had not "worked directly with asbestos products" and thus were "bystanders."

is recoverable requires a fact-specific inquiry.<sup>393</sup> Courts will scrutinize the interrelationship between the use of the defendant's product and the activities of the bystander to determine whether the harm caused was foreseeable.<sup>394</sup>

As in the early line of duty to warn negligence cases, the Court of Appeals of Maryland in *Eagle-Picher Indus. v. Balbos*<sup>395</sup> addressed this issue of foreseeability of harm to bystanders.<sup>396</sup> Balbos was a sheet metal worker who worked in an area that was heavily exposed to asbestos dust and fibers for prolonged periods of time.<sup>397</sup> The manufacturer, Eagle-Picher, asserted that the available knowledge at the time of the bystanders' exposure to asbestos products did not adequately alert it of the correlation between asbestos and mesothelioma<sup>398</sup> in bystanders.<sup>399</sup> Thus, the manufacturer claimed it had no duty to warn the bystanders of the risks of exposure because the harm they suffered was not foreseeable.<sup>400</sup> However, the court found sufficient evidence to show that Eagle-Picher knew or should have known that asbestos exposure may result in some form of lung disease.<sup>401</sup> The court also found that there was sufficient evidence to allow a jury to find that Porter-Hayden had a duty to warn bystanders of the dangers of asbestos.<sup>402</sup>

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*See Eagle-Picher Indus., Inc. v. Balbos*, 326 Md. 179, 210, 604 A.2d 445, 460 (1992); *see also* BLACK'S LAW DICTIONARY 201 (6th ed. 1990) (defining bystander as "one who stands near").

393. *See Eagle-Picher Indus.*, 326 Md. at 210, 604 A.2d at 460.

394. *See id.* The court further stated that to find a substantial factor causation, the physical characteristics of the workplace and the relationship between that activities of the direct users of the product and a bystander plaintiff must be understood. *See id.*; *see also* *Rotondo v. Keene Corp.*, 956 F.2d 436, 438-39 (3d Cir. 1992) (describing and considering the effects of the working environment of the injured bystander as being six to eight feet from the pipecoverers as they placed asbestos covering on pipes).

395. 326 Md. 179, 604 A.2d 445 (1992).

396. *See id.* at 196-97, 604 A.2d at 453.

397. *See id.* at 205, 213, 604 A.2d at 457, 461.

398. Caused almost exclusively by asbestos exposure, mesothelioma is an extremely rare form of cancer that affects the chest or abdomen. *See* 4A ROSCOE N. GRAY & LOUISE J. GORDY, ATTORNEYS' TEXTBOOK OF MEDICINE 205C.72 (3d ed. 1989).

399. *See Eagle-Picher Indus.*, 326 Md. at 196, 604 A.2d at 453.

400. *See id.*

401. *See id.* at 197, 604 A.2d at 453.

402. *See id.* at 204, 604 A.2d at 457 (discussing the prior work experience of Porter's founders, as well as the near exclusiveness of the company's dealing in asbestos products).

As with other strict liability actions, state of the art evidence assists the plaintiff in determining what unreasonable dangers were foreseeable at the time of sale.<sup>403</sup> Specifically, comment j to section 402A states that "the seller is required to give warning against [an unreasonable danger], if he has knowledge or by the application of reasonable, developed human skill and foresight should have knowledge, of the presence of the ingredient and danger."<sup>404</sup> Therefore, state of the art evidence is relevant to demonstrate the risks that the asbestos containing products, which the defendant supplied and installed, posed to the bystanders.<sup>405</sup>

In *ACandS, Inc. v. Asner*,<sup>406</sup> the primary issue was whether state of the art evidence about threshold limit values ("TLVs") could be used by the defense to rebut plaintiff's evidence of actual knowledge.<sup>407</sup> The court of appeals held that the opinion of the trial court and the court of special appeals required reversal because the defendant's TLV evidence was improperly excluded.<sup>408</sup> Thus, the court reversed on the issues relating to liability.<sup>409</sup>

### C. Threshold Limit Values

A TLV is a guideline for the maximum amount of airborne contaminants that emanate from a product, averaged over the course of an eight-hour day, to which an individual may safely be exposed.<sup>410</sup> The theory is that if airborne dust can be maintained under a certain level, asbestos-related diseases will be avoided.<sup>411</sup> The United States Public Health Service conducted research at textile plants, and in 1938 proposed that the TLV for asbestos dust exposure should be placed at five million particles per cubic foot (5 MPPCF).<sup>412</sup> The 5 MPPCF guideline was based on the impinger air

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403. See PRODUCTS LIABILITY PRACTICE GUIDE, *supra* note 28, 15.08[6], at 15-129.

404. RESTATEMENT (SECOND) OF TORTS § 402A cmt. j (1965).

405. See *ACandS, Inc. v. Asner*, 344 Md. 155, 168, 686 A.2d 250, 256 (1996); *cf.* Robb, *supra* note 3, at 13-14.

406. 344 Md. 155, 686 A.2d 250 (1996).

407. See *id.* at 163, 686 A.2d at 253.

408. See *id.* at 170, 178-79, 686 A.2d at 257, 261.

409. See *id.* at 170, 686 A.2d at 257.

410. See BARRY I. CASTLEMAN, ASBESTOS: MEDICAL AND LEGAL ASPECTS 192 (1984).

411. See *ACandS, Inc. v. Godwin*, 340 Md. 334, 365, 667 A.2d 116, 130 (1995) (discussing the opinion held by groups, including the American Conference of Governmental Industrial Hygienists, that asbestos-caused diseases, mainly asbestosis, could generally be avoided if dust in the work environment could be kept below a certain limit).

412. See CASTLEMAN, *supra* note 410, at 202.

supply method, which measured the total dust count rather than a measure of just asbestos fibers.<sup>413</sup>

In 1946, the American Conference of Governmental Industrial Hygienists (ACGIH), a non-government organization of local, state, and federal health officials, adopted the 5 MPPCF as the TLV for airborne asbestos fibers.<sup>414</sup> For twenty-six years the 5 MPPCF TLV remained the standard concerning acceptable exposure to friable asbestos. In 1968 and again in 1970, the ACGIH indicated an intent to change the TLV and the means by which a new TLV would be measured.<sup>415</sup> In 1972, the first federal regulation of TLV's for asbestos-containing products was adopted; this regulation was more stringent than the 5 MPPCF measure.<sup>416</sup>

#### *D. Facts of the Instant Case*

Zalma Asner was employed as an outside machinist at Bethlehem Steel's Key Highway Shipyard from 1941 to 1982.<sup>417</sup> Charles F. Wilson worked at the Allegany Ballistics Laboratory from 1946 to 1975.<sup>418</sup> Milton W. Payne worked as an electrician at the Fairfield Shipyard during World War II.<sup>419</sup> All three died from mesothelioma.<sup>420</sup> Personal representatives of the deceased workers brought negligence and strict liability failure to warn actions against various manufacturers and supplier/installation contractors.<sup>421</sup> With the exception of ACandS, Inc. and Porter-Hayden, all other defendants either settled, sought protection under the Bankruptcy Code, or were dismissed prior to trial.<sup>422</sup>

The jury returned verdicts against ACandS, Inc. and Porter-Hayden for both compensatory and punitive damages.<sup>423</sup> The trial court entered judgment and an appeal followed.<sup>424</sup> The Court of

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413. *See id.* at 204.

414. *See id.* at 211.

415. *See Godwin*, 340 Md. at 365, 667 A.2d at 131.

416. *See id.* In 1969, the Walsh-Healey Public Contracts Act adopted a 12 fiber per cubic centimeter standard (12f/cc) for airborne asbestos exposure. *See id.* In 1972, the Occupational Safety and Health Act mandated an eight hour time-weighted standard of 5f/cc. *See id.*

417. *See ACandS, Inc. v. Asner*, 344 Md. 155, 161, 686 A.2d 250, 253 (1996).

418. *See id.* at 162, 686 A.2d at 253.

419. *See id.*

420. *See id.* at 161, 686 A.2d at 253.

421. *See id.* at 161-62, 686 A.2d at 253.

422. *See id.*

423. *See id.* at 162, 686 A.2d at 253.

424. *See ACandS, Inc. v. Asner*, 104 Md. App. 608, 654-55, 657 A.2d 379, 402 (1995),

Special Appeals of Maryland affirmed the judgments, whereupon the court of appeals granted certiorari.<sup>425</sup>

### *E. The Trial*

At trial, during cross-examination, the defendants were able to elicit testimony that there was a tentative TLV of 5 MPPCF, as per the Dreesen report.<sup>426</sup> The defendants, however, wanted to introduce through their own state of the art evidence that the Dreesen report was for total particles of dust rather than just for asbestos.<sup>427</sup> The defendant's state of the art evidence was an attempt to rebut the plaintiff's evidence in order to demonstrate that all of the medical data available to the defendant at the time the defendant distributed its product was insufficient to impute knowledge on the defendant's behalf that would create a duty to warn of the product's harmful characteristics as to bystanders.<sup>428</sup> However, the trial court concluded that the jury had heard the appropriate state of the art evidence, and the limitation of the Dreesen report, which the defendants hoped to introduce, was not relevant.<sup>429</sup> On appeal, ACandS, Inc. and Porter-Hayden argued that the exclusion of evidence concerning TLVs by the trial court was improper and prejudiced their case.<sup>430</sup>

### *F. The Court of Special Appeals Affirms*

The court of special appeals first addressed whether the plaintiffs put forth ample evidence to impose a judgment for punitive damages.<sup>431</sup> By doing so, the court foreclosed itself from objectively viewing defendants' proffered testimony as state of the art evidence. In looking at the punitive damage awards, the court found that plaintiffs' evidence clearly indicated that ACandS, Inc. was aware that asbestosis was an increasing problem among its employees during the 1950s and 1960s, yet ACandS, Inc. failed to place

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*rev'd*, 344 Md. 155, 686 A.2d 250 (1996).

425. *See Asner*, 344 Md. at 161, 686 A.2d at 253.

426. *See Asner*, 104 Md. App. at 640, 657 A.2d at 395.

427. *See Asner*, 344 Md. at 169, 686 A.2d at 257 (addressing the Dreesen report's limited applicability, as it was for total dust in textile mills).

428. *See id.* at 164, 686 A.2d at 254 (criticizing the court of special appeals's reasoning which affirmed the lower court's decision that excluded the defendant's TLC evidence).

429. *See Asner*, 104 Md. App. 608, 657 A.2d at 395.

430. *See Asner*, 344 Md. at 163-70, 686 A.2d at 254-57.

431. *See Asner*, 104 Md. App. at 619-37, 657 A.2d at 385-94.



warning labels on its asbestos products.<sup>432</sup> Similarly, the court of special appeals held that Porter-Hayden's actions constituted actual malice supported by clear and convincing evidence.<sup>433</sup> It was these findings of evidence to support the imposition of punitive damages that led the court to conclude that actual knowledge of the risks of asbestos had been proven.<sup>434</sup>

Looking to the standard enunciated in *Zenobia*, the court of special appeals rationalized that, in a strict liability failure to warn case the plaintiff need only show what the defendant knew *or* should have known, and that state of the art is only pertinent when the plaintiff attempts to prove the should have known component.<sup>435</sup> Therefore, "once a defendant's actual knowledge is shown, state of the art evidence is not necessary to show what the defendant 'should have known' or 'could have known.'"<sup>436</sup>

### G. The Court of Appeals Reverses

The court of appeals held that exclusion of defendants' TLV evidence was an error and prejudicial.<sup>437</sup> As the court of appeals explained, "[t]he error complained of lies in excluding from the jury's consideration evidence that is relevant because it tends to counter or rebut plaintiffs' evidence as to negligence, strict liability, and punitive damages."<sup>438</sup> The court stated that TLV evidence was relevant for expert determination of when bystander exposure to appellants' asbestos products was dangerous.<sup>439</sup>

The later the experts knew of the dangers, "the more that finding. . . would . . . reduce . . . the duration of a claimant's exposure after unreasonable dangerousness to bystanders was known."<sup>440</sup>

## VII. ANALYSIS OF THE ASNER COURT'S DECISION

The decision in *Asner* is one that is fair and favorable to manufacturers, suppliers, and installers of asbestos products. It leveled

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432. *See id.* at 631, 657 A.2d at 391.

433. *See id.* at 632-37, 657 A.2d at 391-94.

434. *See id.* at 639, 657 A.2d at 395.

435. *See id.* at 638, 657 A.2d at 394.

436. *Id.* at 639, 657 A.2d at 394.

437. *See Asner*, 344 Md. at 170, 686 A.2d at 257.

438. *Id.* at 164, 686 A.2d at 254.

439. *See id.* at 167, 686 A.2d at 256.

440. *Id.* at 167-68, 686 A.2d at 256. The court then provided some general observations concerning substantial factor causation and the role that evidence of non-party exposure plays in determining causation in asbestos bystander cases. *See id.* at 170-77, 686 A.2d at 257-61.

the playing field. Thus, even when the plaintiff has attempted to demonstrate that the defendant had actual knowledge of the general hazards of a product, state of the art evidence is admissible to rebut that showing.<sup>441</sup> Moreover, the *Asner* court's opinion solidifies what other courts have concluded—when a plaintiff has the opportunity to admit state of the art evidence, so shall the defense. Allowing only the plaintiffs to admit state of the art evidence does indeed provide the jury with an incomplete picture of what was known and when it was known by the expert community.<sup>442</sup> Furthermore, the court indicated that evidence of TLVs is relevant irrespective of whether the defendants knew what experts in the field knew.<sup>443</sup>

TLV evidence is not a fabricated piece of evidence designed to exculpate “corporate killers.” Rather, evidence of TLVs is relevant and necessary because it shows that, even if people in the industry were aware of asbestos' potential hazards, manufacturers and suppliers still believed and had reason to believe that asbestos exposures under certain levels were safe. Precluding defendants from putting on their state of the art evidence would permit plaintiffs to offer testimony that all exposures, regardless of the dosage, lead to asbestos-related diseases. Such a view mischaracterizes what was known about occupational asbestos exposure and fails to take into account all state of the art evidence.<sup>444</sup>

The belief that there were safe dosages of asbestos was predicated on the surveys and research undertaken by health professionals during the 1930s and 1940s.<sup>445</sup> Manufacturers relied upon the Public Health Service's and ACGIH's adoption of the asbestos TLV of 5 MPPCF.<sup>446</sup> Furthermore, those scientific studies focused on textile workers who worked with pure asbestos in high concentrations, not occupational users such as the *Asner* plaintiffs.<sup>447</sup> The threat of injury to textile workers, as well as asbestos miners, was much more palpable based on their high exposure levels. Logic dictated that the occupational user's risk of contracting asbestos-related diseases was reduced because of their lower, more permissible, asbestos dosages. The concept that there are permissible levels of exposure is a

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441. See *Asner*, 104 Md. App. at 164, 686 A.2d at 254.

442. See *id.* at 168, 686 A.2d at 256.

443. See *id.* at 167, 686 A.2d at 256.

444. See *supra* notes 438-40 and accompanying text.

445. See *supra* notes 410-16 and accompanying text.

446. See *Asner*, 344 Md. at 169, 686 A.2d at 257.

447. See *supra* notes 417-19 and accompanying text.

touchstone of science which recognizes the relationship between potential toxins and doses. This is not an attempt to trivialize the dangers of asbestos exposure, but rather emphasizes the notion that deductive reasoning is premised upon measuring the correlation between various factors. Such was the case between exposures below a TLV of 5 MPPCF and asbestos-related diseases.

*ACandS, Inc. v. Asner*<sup>448</sup> suggests that trial courts should be more flexible in ruling on the admissibility of state of the art evidence. A court's central concern should be whether the proffered evidence tends to illustrate what was known about the dangers of asbestos during the time period in which the plaintiff was exposed. Likewise, *Asner* indicates that state of the art evidence is always admissible to rebut a plaintiff's showing of knowledge, even where the showing amounts to actual knowledge, because state of the art evidence—particularly testimony as to TLVs—is part of a defendant's knowledge. The importance of this decision is that it rounds out the presentation of evidence and thus serves to level the evidentiary playing field.

#### VIII. CONCLUSION

A few generalizations can be drawn from the preceding discussion. First, it is far more likely that a court will accept state of the art evidence in a negligence cause of action than in one sounding in strict liability. Second, courts dealing with strict liability failure to warn cases are apt to permit state of the art evidence because of the negligence principles grafted onto section 402A through comment j. Third, when a plaintiff presents state of the art evidence, it is more conceivable that a defendant will be permitted to present its own state of the art evidence. Fourth, when a plaintiff asserts that a feasible alternative design existed, a court is more likely to permit a defendant to present state of the art evidence to rebut this charge. Finally, courts in jurisdictions such as Maryland, that have no codified version of a state of the art defense, will be far less inclined to allow a defendant's proof that it employed the state of the art in its product to create an absolute defense.

The drafters of the *Restatement (Third)* have taken the view that strict liability will exist in manufacturing defect cases and only those design defect cases in which the product itself fails to perform a manifestly intended function. Thus, negligence principles control most product liability causes of action. If Maryland adopts this view

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448. 344 Md. 155, 686 A.2d 250 (1996).

it may lead to more liberal admittance of state of the art evidence. While many of the positions in the new *Restatement* have been criticized and characterized as a tort reform project, a close examination reveals that in many instances, it has accurately restated Maryland law. Where differences exist, change may be wise for "the common law is not static; its life and heart is its dynamism—its ability to keep pace with the world while constantly searching for just and fair solutions to pressing societal problems."<sup>449</sup>

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449. *Kelley v. R.G. Indus.*, 304 Md. 124, 140, 497 A.2d 1143, 1150 (1985) (quoting *Harrison v. Montgomery County Bd. of Educ.*, 295 Md. 442, 460, 456 A.2d 894 (1983)).