Nanotechnology: A Primer for Product Liability Lawyers

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As our society becomes more technologically advanced, product manufacturers are increasingly incorporating engineered nanomaterials (ENMs) and nanomanufacturing processes into their products. This article explores the impact of these technological developments on product liability litigation, and offers several practice tips for defending claims against this emerging class of consumer products.

What Is Nanotechnology?

Nanotechnology is any technology that incorporates ENMs.[1] Nanomaterials are defined as engineered particles that range from 1 to 100 nanometers in size.[2] A nanometer is one-billionth of a meter. To give a sense of scale, a single nanometer is about the width of three atoms.[3] On a more practical level, a sheet of newspaper is approximately 100,000 nanometers thick.[4]


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How Are ENMs Currently Used?

ENMs are commonly used in the healthcare, coatings, and electronics industries. Examples of their use in healthcare include ceramic ENMs injected in bones or incorporated into certain dental implants.[5] These ceramic particles are used because their mechanical and chemical properties can be "tuned" to attract bone cells from the surrounding tissue to make new bone.[6] As another example, some pharmaceutical products have already been reformulated with ENMs to improve their absorption and make them easier to administer.[7] In the near future, ENMs will be used to deliver toxic anti-cancer drugs targeted directly to tumors, minimizing collateral damage to other parts of the body.[8] Other ENMs will be able to make MRI and CAT scans safer and more effective.[9]

ENMs are beneficial in coatings products because they create lightweight, strong materials for a wide range of applications such as boat hulls, sporting equipment, and automotive parts.[10] Opticians, for example, apply coatings containing ENMs to eyeglasses to make them easier to keep clean and harder to scratch.[11] ENMs are used on fabrics to make clothing stain-resistant and easier to clean.[12] Other examples of ENMs coatings include certain sunscreens and cosmetics.[13]

In terms of high-performance electronics, ENMs have paved the way to making faster and more advanced computer chips.[14] As a recent example, scientists at IBM now believe they can create a new type of transistor (a tiny switch inside a computer chip) made with parallel carbon nanotubes.[15] This new technology may be the key to once again increasing the speed of computer processors, which has stalled in the last decade.[16]

Potential Health Risks

ENMs are not without risk. In fact, it is precisely many of those characteristics that make nanoparticles so useful—tiny size, high ratio of surface area to volume, and reactivity—that may pose unique and unknown risks to human health.[17] For example, concern exists that a particular type of ENMs (carbon nanotubes) might cause asbestos-like reactions if inhaled into the lungs.[18] After reaching the lungs, these particles are then small enough to potentially enter the bloodstream, posing a threat to other vital organs, including the brain.[19] Another area of concern is that certain ENMs may interfere with the signaling pathways of cells, cell division, and cardiac function.[20]

Currently, risk-assessment models for nanotechnology are still in their infancy.[21] As a result, it is impossible to draw a line between the level of exposure that might be dangerous to humans and the level of exposure that is not.[22] Until we have more reliable data, "the risks from nanoparticles remain largely unknown and, in all likelihood, unknowable until time passes."[23]

Practice Tip No. 1 – Stick to the Basics

Although nanotechnology is new and its risks are largely unknown, Oregon's established legal framework for resolving products liability claims involving ENMs is not. The plaintiffs' bar likes the strict liability theory because it allows a finding of liability without the need to prove negli-

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gence.[24] On the other hand, ORS 30.900 *et seq.* provides a number of unique substantive protections to product liability defendants. For example, ORS 30.910 provides a favorable rebuttable presumption that a product is not unreasonably dangerous. ORS 30.915 sets out a unique alteration/modification defense for product cases. And, ORS 30.920(1) requires the jury to find a product is unreasonably dangerous to establish liability.

Practice Tip No. 2 – Focus on Unreasonably Dangerous

Especially in design defect cases, keep in mind that the plaintiff must prove that the product was "in a defective condition unreasonably dangerous to the user or consumer or to the property of the user or consumer[.]"[25] The test for "unreasonably dangerous" is whether the product was "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."[26]

In most design defect cases, the plaintiff is required to produce evidence that there was an "available alternative, safer design, practicable under the circumstances."[27] The evidence needed to meet that standard in any given case will vary, but as an example, the Oregon Supreme Court in an aircraft case deemed it to require evidence covering the "cost, economy of operation, maintenance requirements, [and] overall performance" of the alternate design.[28] Given the enormous technological advances and potential benefits made possible through ENMs, making this risk/utility balancing a focal point of the defense is likely a good strategy. While the technology may not be entirely free from danger, it is not unreasonably dangerous because its potential benefits outweigh its risks.

Practice Tip No. 3 – Keep in Mind the Raw Material Supplier Doctrine

In Oregon, the manufacturer of a component part is not subject to strict liability if the component part was misapplied by the whole-product manufacturer rather than defectively designed.[29] In *Hoyt v. Vitek,* 134 Or App 271, 274 (1995), the court addressed the question of whether du Pont could be strictly liable for a Vitek jaw implant containing du Pont's Teflon that was unreasonably dangerous because the Teflon fragmented and broke apart inside the human body. The court rejected that notion, reasoning that "Teflon is a multi-use raw material that is not inherently defective. It became unreasonably dangerous only when incorporated as a component in Vitek's TMJ implant."[30] With the frequent use of ENMs in coating products, more cases like *Hoyt* are surely to arise in the future.

Conclusion

While the technological advancements made possible by ENMs are exciting, it will be some time before we have a good understanding of all of their associated risks. In the meantime, practitioners defending ENMs product cases should stick to the basics, focus on the "unreasonably dangerous" standard, and keep in mind the raw material supplier doctrine.

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Endnotes

1 David Dana, *When Less Liability May Mean More Precaution: The Case of Nanotechnology,* 28 UCLA J. Envtl. L. & Pol'y 153, 155 (2010).

2 *Id.;* Ethan V. Torrey, *Sweat the Small Stuff—Nanotechnology Insurance Issues,* Law360 (Aug. 25, 2010, 11:52 AM), http://www.law360.com/articles/187450/sweat-the-small-stuff-nanotech-insurance-issues.

3 *Torrey,* supra note 2.

4 *What is Nanotechnology?,* NANO.gov (last visited Mar. 1, 2016), http://www.nano.gov/nanotech-101/what/definition.

5 *Frequently Asked Questions,* NANO.gov (last visited Mar. 1, 2016), http://www.nano.gov/nanotech-101/nanotechnology-facts.

6 *Id.*

7 *Id.*

8 *Id.*

9 *Id.*

10 *Id.*

11 *Id.*

12 *Id.*

13 *Id.*

14 *Id.*

15 John Markoff, *IBM Scientists Find New Way to Shrink Transistors,* The New York Times (Oct. 1, 2015), http://www.nytimes.com/2015/10/02/science/ibm-scientists-find-new-way-to-shrink-transistors.html.

16 *Id.*

17 David G. Owen, Bending Nature, Bending Law, 62 Fla L Rev 569, 577 (2010).

18 *Id.* at 577, n 37 (noting that "[n]anoparticles might be thin enough to reach sensitive areas of the lungs, long enough to bypass the lungs' built-in defense systems, and persistent enough to remain without dissolving for many years").

19 *Id.* at 577–78.

20 *Id.* at 578.

21 *Id.*

22 *Id.*

23 *Id.*

24 ORS 30.920(2)(a).

25 ORS 30.920(1).

26 *McCathern v. Toyota Motor Corp.,* 332 Or 59, 77 (2001) (quoting Restatement (Second) of Torts § 402A, comment I (1965)).

27 *Wilson v. Piper Aircraft Corp.*, 282 Or 61, 67 (1978) (internal quotations omitted).

28 *Id* at 70.

29 *Hoyt v. Vitek, Inc.,* 134 Or App 271 (1995).

30 *Id.* at 285.