

TAKING THE NANOPULSE

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Nanotechnology. Good and Green.

Environmental questions have answers you'll like.

BY SCOTT E. RICKERT

If you learned about nanotechnology's environmental impact from the crazed nanobots in Michael Crichton's book "Prey", you gained as much reality-based knowledge on nanotechnology as you got on DNA research from another of the author's books, "Jurassic Park." In other words, save the hype. We don't have time for it. The sky isn't falling.

Nanotechnologists care about the environment, too. We live on this earth, too, drinking the water and breathing the air. And, in fact, most of us have more contact with nanomaterials on a daily basis than anyone in the general public. For example, for two decades, my company has been developing nano-products. We've worked with countless researchers, employees, customers and, through them, literally millions of end-users, always with safety as a top priority.

Let's review some history. Nanomaterials have been in existence since the beginning of time. "Nano" is simply a measure of size, roughly 1/10,000th of the thickness of a human hair. From the nano-thick film of a soap bubble to the cells in an onion skin, there are naturally occurring nanomaterials in our environment. The erosion of stone can put nanoparticles into the air. The lipids in body fat are nanomaterials. There is no evidence that materials at this scale are processed by the body differently than larger-scale versions of them.

In addition, research now reveals that large-scale manmade materials that are currently deemed safe have long created nanoparticles that enter the environment. For example, tires release nanoparticles of their components. Worn concrete releases nanoparticles of its components. The carbon electrodes used on batteries for decades have more recently been found to include carbon nanotubes. It's only under the eye of today's higher-powered measuring tools that the fact has become known.

But what about the future? The National Science Foundation

projects nanotechnology to be a \$1 trillion industry by 2015. If nanotechnology is to fulfill that potential, we need to clearly understand the issues and get comfortable with the answers. That's why a number of governmental bodies are at work studying the issues with the full support of industry.

I saw the process in action this autumn when I joined a session of the Environmental Protection Agency's Nanotechnology Work Group. This newly formed committee, which consists of stakeholders from science, industry and environmental groups, is charged with leading the discussion on a Voluntary Pilot Program to guide the regulatory treatment of nanoscale chemical substances. I joined other representatives to comment on how best to foster an open sharing of information that will expedite research and reasonable standards, build public trust and enable responsible development.

The US Government is committed to understanding the environmental nature of nanomaterials. Their investment will be substantial. The National Nanotechnology Coordination Office states that the federal government will invest \$39 million dollars in fiscal year 2006 on potential risks to health and the environment. In industry, we have suggested even a higher figure might be in order, perhaps as much as \$100 million, even if it means reallocating previous government funding to this important task.

Couldn't we simply slow down the whole expensive process and take a wait-and-see attitude? There is at least one multinational company executive who has publicly stated this to be his approach. There are two reasons why the answer must be no. First, the global economy will continue to push the limits of nanotechnology's possibilities; America can't afford to fall behind. Moreover, and most importantly, nanotechnology holds the potential to unlock advances that replace current environmentally harmful practices with new greener ones. Organizations such as The Foresight Nanotech Institute spotlight prospects, from solving global needs for clean energy to providing abundant clean water.

Two, ten or twenty years from now, I believe nanotechnology will be seen as environmentally friendly and the critical element in environmental solutions, and we'll wonder what the panic was about. I'm doing everything I can every day to help make our planet greener through nanotechnology. How about you?

Scott E. Rickert is chief executive of Nanofilm, Ltd, located in Valley View, Ohio. His e-mail address is nanotech@industryweek.com.