Nanotechnology

Nanotechnology is the science of working with materials at the atomic or molecular scale. Although there are a number of different definitions in use, it is commonly accepted that nanotechnology refers to particles of 100 nm and smaller. Nanotechnology holds great promise for the future, and is expected to provide many benefits to society. Research is being conducted on using nano-enabled drugs to target cancer cells, using nanotechnology to help develop batteries that will be used in electrically-powered vehicles, and in pollution remediation technologies. The unique properties of nanomaterials are currently used in a variety of consumer products, including stain and odor-resistant clothing, plastic composites that are both lighter and stronger plastics, electronic components, and many more.

The Department of Labor Standards (DLS) encourages the safe and responsible development of this technology in the Commonwealth. Any potentially adverse consequences to human health that result from working with engineered nanomaterials should be assessed and prevented. A balanced approach that prevents harm to workers, users, and researchers, while encouraging the continued exploration of the potential benefits of this emerging technology, will benefit the industry as well as workers.

DOS is a member of the Massachusetts Interagency Nanotechnology Committee, a working group consisting of representatives from other state agencies including the Department of Environmental Protection (DEP), the Department of Public Health (DPH), and the Office for Technical Assistance (OTA), as well as the Toxics Use Reduction Institute (TURI). This committee, formed in 2007, has sponsored two nanotechnology workshops for industry and interested professionals, the most recent of which, Promoting the Safe Development of Nanotechnology in Massachusetts, was held in January 2009.

The purpose of the January 2009 workshop was to continue the dialogue with stakeholders from industry, government, research, academia, and others, on approaches to protecting workers, public health and the environment from exposure to engineered nanoparticles. Representatives from the National Institute for Occupational Safety and Health (NIOSH) and the Center for High-Rate Nanomanufacturing at the University of Massachusetts at Lowell spoke to the 170 participants about existing Interim Best Practices and Good Current Practices to protect workers, the environment and public health. Breakout sessions provided an opportunity for participants to apply the practices. The afternoon session focused on techniques to measure airborne nanoparticle releases within the workplace, and was the first time this training was provided for the East Coast and Mid-Atlantic regions. PDF: www.mass.gov/dep/toxics/stypes/nanoproced.pdf

The Interagency Committee's earlier workshop, The Big Picture: Safe Development of Nanotechnology, initiated a dialogue with the agencies' stakeholders on this emerging issue, and addressed specific issues such as worker protection, environmental releases and product safety. The approximately 120 participants discussed the next steps that they wanted the Interagency Committee to take in order to continue the dialogue and to address key issues. PDF: www.mass.gov/dep/toxics/stypes/safenano.pdf

The work of the Interagency Committee was recognized by the United States Environmental Protection Agency (U.S. EPA) in an October 2008 issue of Inside EPA: "The Massachusetts Interagency Nanotechnology Committee - believed to be the first state group focused on the safe use of nanotechnology - is compiling a set of best management practices for laboratories and companies working with nanomaterials to protect workers, the environment and public health from the possible risks of the emerging technology…" Full article can be viewed here

DOS is dedicated to providing occupational safety and health information and guidance to the Commonwealth's businesses and workers operating within this flourishing industry. Staff members from our

occupational safety and health programs continue to participate in workshops and trainings that deal specifically with nanotechnology, so that we can serve as a conduit to connect Massachusetts employers and employees with appropriate safety and health resources.

Below please find web links to a variety of sources designed to help employers in developing and maintaining best practices when working with engineered nanomaterials. Additionally, please feel free to contact DLS's On-Site Consultation Program, a free consultation service jointly funded by the DLS and the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), designed to help employers recognize and control potential safety and health hazards at their worksites, improve their safety and health programs, and assist in training employees.

In addition to the services provided by DLS, a field team from the National Institute of Occupational Safety and Health (NIOSH) works on a confidential and collaborative basis to assist nanotechnology companies in assessing potential exposures and evaluating control strategies.
>> More information on this effort, along with information on how to contact NIOSH.

NANOTECH WEB RESOURCES

Massachusetts Office of Technical Assistance& Technology (OTAT)

- Prepared by the Massachusetts Office of Technical Assistance & Technology (OTAT), this document is intended to assist in the development of nanotechnology by identifying good manufacturing practices for preventing exposures and releases. The document also contains a useful list of technical references and assistance contact information: OTA Technology Guidance Document: Nanotechnology - Considerations for Safe Development

National Institute for Occupational Safety and Health (NIOSH)

- Approaches to Safe Nanotechnology: Managing the Health and Safety Concerns Associated with Engineered Nanomaterials
- Good Current Practices for Managing Nanomaterials
  Presented at the 2nd Annual Massachusetts Nanotechnology Workshop by Charles L. Geraci, Ph.D., CIH, Centers for Disease Control and Prevention National Institute for Occupational Safety and Health - January 29, 2009

- Interim Guidance for Worker Medical Screening, Hazard Surveillance Pertaining to Engineered Nanoparticles
- Safe Nanotechnology in the Workplace: An Introduction for Employers, Managers, and Safety and Health Professionals

InterNano; Gateway to the National Nanotechnology Network

- Environmental Health and Safety Websites

The University of Massachusetts at Lowell

- Nanotechnology Controls and Practices Overview
- Best Practices for Working Safely with Nanoparticles in Laboratories

International Council on Nanotechnology (ICON) / Rice University

- The GoodNanoGuide, an online, community-driven wiki for information about the safe handling of nanomaterials.
- The Virtual Journal of Nanotechnology Environment, Health and Safety

Quebec Occupational Health and Safety Research Institute (IRSST)

- Best Practices Guide to Synthetic Nanoparticle Risk Management

The United Kingdom Health and Safety Executive

- Nanoparticles: An Occupational Hygiene Review

Woodrow Wilson International Center for Scholars

- http://www.wilsoncenter.org