Nanotechnology Research Center

July 2017

What are our priorities?

The Nanotechnology Research Center (NTRC) of the National Institute for Occupational Safety and Health (NIOSH) conducts research to understand the potential effects on human health of exposure to engineered nanomaterials and develops methods to control or eliminate exposures. Nanoparticles are extremely small particles (between 1 and 100 nanometers) designed to have certain new or unique characteristics, like strength, elasticity, or reactivity. These new properties make advanced materials and products possible. NTRC works with partners in industry, labor, government, trade associations, professional organizations, and academia. NTRC focuses on these areas:

- Increasing understanding of potential health risks to workers making and using nanomaterials.
- Preventing occupational exposures to nanomaterials.

What do we do?

- Identify engineered nanomaterials emerging into commerce through market forecasting and research, technology surveillance, and partner and stakeholder input.
- Prioritize engineered nanomaterials for toxicological testing and field evaluation of workplace exposure. Engineered nanomaterials are being created faster than we can evaluate them, so we have to focus on the ones that have the greatest potential for exposure and harm to workers and that will be used in high volumes.
- Conduct laboratory research to expand our understanding of the underlying biological mechanisms and the effects of exposure over time and across the life cycle.
- Conduct field investigations and epidemiological studies for a realistic understanding of exposure and risks to nanomaterial workers.
- Issue recommendations on how to use engineering controls and personal protective equipment to mitigate exposure to engineered nanomaterials.
- Provide critical input into the U.S. cross-agency National Nanotechnology Initiative and other international organizations' strategies to address health and safety of nanomaterials.
- Provide nanomaterial businesses the opportunity to be successful by developing tools they can use to keep their workers safe, develop public trust, and in turn accelerate their commercialization.
- Help companies function in the face of uncertainty about potential adverse effects of engineered nanomaterials.

What have we accomplished?

- Published "Building a Safety Program to Protect the Nanotechnology Workforce: A Guide for Small to Medium-Sized Enterprises."
- Published 132 journal articles in the peer-reviewed scientific literature including toxicology studies, potential explosion hazards of specific nanoparticles, critical research needs for worker health and safety, and refinement of laboratory methods.
- Contributed to a nanoparticle sampling prototype launched by NASA for use on the International Space Station.
- Collaborated with the Consumer Product Safety Commission, the U.S. Environmental Protection Agency, and the Occupational Safety and Health Administration on a "Responsible development and Commercialization" session at the Technical Association of the Pulp and Paper Industry 2016 International Conference on Nanotechnology for Renewable Materials.

What's next?

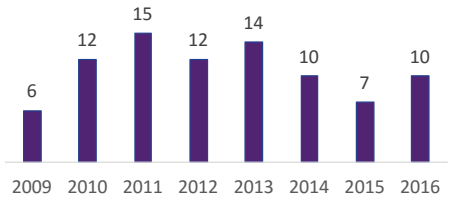
- Publish "Current Intelligence Bulletin: Health Effects from Occupational Exposure to Silver Nanomaterials."
- Publish the second in a series of nanomaterial handling recommendations, "Workplace Design Solutions: Protecting Workers during Reactor Operations."
- Work with private sector partners to develop practices for the use of nano and advanced materials.
- Complete peer and stakeholder review of the draft "Current Intelligence Bulletin: Approaches to Developing Occupational Exposure Limits or Bands for Engineered Nanomaterials."

At-A-Glance

'Helping Industry Move Safely and Responsibly into the Future'

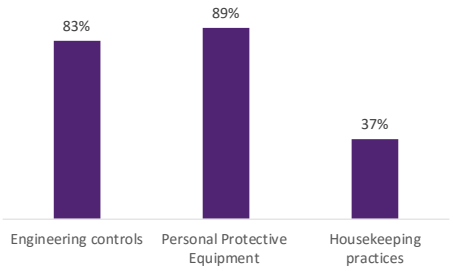
The Nanotechnology Research Center (NTRC) leads the federal government's effort in conducting occupational safety and health research, which is a key component of the U.S. National Nanotechnology Initiative. The NTRC develops recommendations that support responsible development of nanotechnology. This snapshot shows recent accomplishments and upcoming work.

Number of field assessments in nanomaterial manufacturer and user facilities



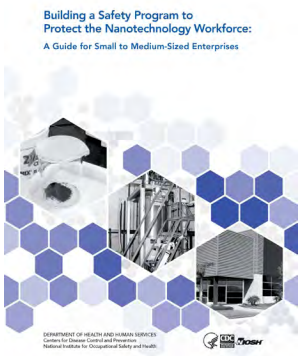
Source: NIOSH Program Records

Use of exposure controls in 46 nanomaterials facilities visited by NIOSH



Source: Adapted from Schubauer-Berigan et al. [2015]. J Occup Environ Hyg Jan; 12(1):69-75

Publication Spotlight:



Building a Safety Program to Protect the Nanotechnology Workforce: A Guide for Small to Medium Enterprises. DHHS (NIOSH) Publication No. 2016-102

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To learn more, visit https://www.cdc.gov/niosh/programs/nano/default.html