

## What are our priorities?

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

- Increasing understanding of hazards and related health risks to workers who make and use nanomaterials.
- Preventing occupational exposures to nanomaterials.

## What do we do?

- Identify emerging engineered nanomaterials moving into commerce through market forecasting and research, technology surveillance, and partner and stakeholder input.
- Identify engineered nanomaterials to undergo toxicological testing and field evaluation of workplace exposure. Engineered nanomaterials are being created faster than we can evaluate them, so we have to prioritize the ones that have the greatest potential to harm workers and that will be used in high volumes.
- Conduct laboratory research to expand our understanding of the effects of exposure over time and the underlying biological mechanisms.
- Conduct field investigations and epidemiological studies to understand exposure and risks to nanomaterial workers.
- Issue guidance documents 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, a White House priority, and other international organizations' strategies to address health and safety of nanomaterials.

## What have we accomplished?

- Published safe practice guidance as an outcome of the 2012 "Safe Nano Design" workshop organized by the NIOSH Nanotechnology Research Center, NIOSH Prevention through Design program, and the SUNY Polytechnic Institute's Colleges of Nanoscale Science and Engineering (SUNY Poly CNSE). The focus is on safer design of both molecules and manufacturing processes.
- Launched a Nano Health & Safety Consortium with SUNY Poly CNSE. It will support safe development of nanotechnology by using a public-private partnership for health and safety research to support commercialization of nanomaterial products.
- Published 108 peer-reviewed journal articles in 2015 about the toxic effects of nanomaterials and how to limit exposure.
- Received the Edward J. Baier Award from the American Industrial Hygiene Association for making a significant contribution to industrial hygiene. It was presented to the NIOSH Nanotechnology Field Research Team at the 2015 American Industrial Hygiene Conference & Exposition.
- Contributed to the American Industrial Hygiene Association fact sheet, "Personal Protective Equipment for Engineered Nanoparticles."

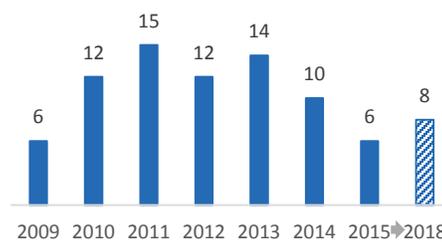
## What's next?

- Hold a public meeting, and complete peer and stakeholder review of the draft "Current Intelligence Bulletin: Health Effects from Occupational Exposure to Silver Nanomaterials."
- Publish "Building a Safety Program to Protect the Nanotechnology Workforce: A Guide for Small to Medium-Sized Enterprises."
- Analyze biomarkers from research studies of nanomaterial workers.
- Publish the first in a series of nanomaterial handling guidance, "Workplace Design Solutions: Protecting Workers during the Handling/Weighing of Nanomaterials."
- Use data on high volume nanomaterials to characterize the size and location of the nanomaterial workforce.
- Complete the draft "Current Intelligence Bulletin: Approaches to Developing Occupational Exposure Limits or Bands for Engineered Nanomaterials."

## At-A-Glance

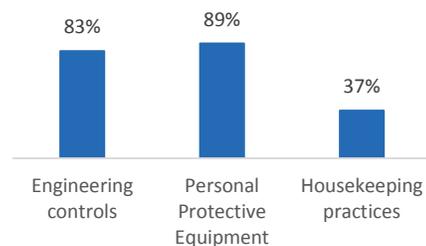
The Nanotechnology Research Center (NTRC) leads the federal government nanotechnology initiative by conducting research and providing guidance on the occupational safety and health implications and applications of nanotechnology. This snapshot shows recent accomplishments and upcoming work.

Number of field assessments in nanomaterial manufacturer and user facilities



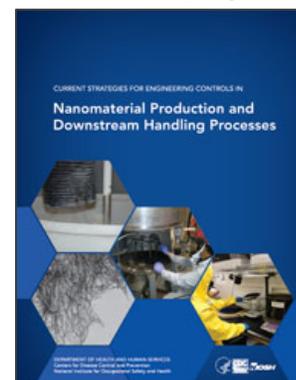
Source: NIOSH program records

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:



Current Strategies for Engineering Controls in Nanomaterial Production and Downstream Handling Processes  
DHHS (NIOSH) Publication No. 2014-102