The NIOSH Approach to Supporting Nanomaterial Commercialization

Nanomanufacturing Summit 2011 & 10th Annual NanoBusiness Conference

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Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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National Institute for Occupational Safety and Health

NIOSH

Quick Refresher: NIOSH: In DHHS, Part of CDC Research Mission

- NIOSH headquarters : Washington, D.C. and Atlanta, GA
- Staff in Anchorage, AK; Cincinnati, OH; Denver, CO; Morgantown, WV; Pittsburgh, PA; and Spokane, WA.
- Professionally diverse staff of 1,200 scientists

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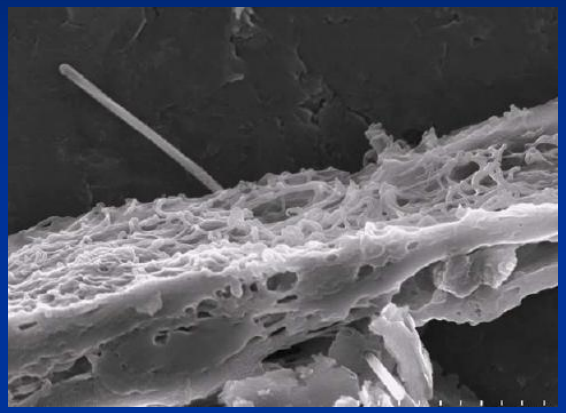
NIOSH

Agency Mission

The mission of NIOSH is to generate new knowledge in the field of occupational safety and health and to transfer that knowledge into practice for the betterment of workers.

Ultimately, this will benefit the business and society as a whole.

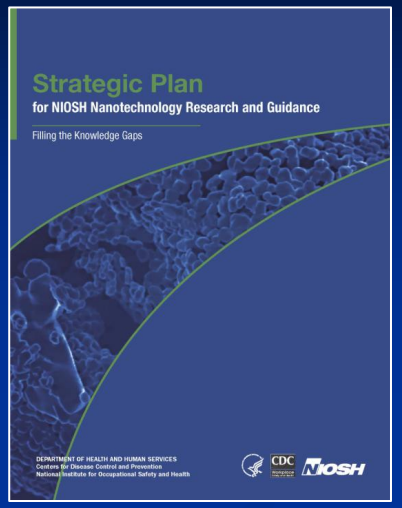
Why is NIOSH Important to You?



Active in the lab and in the field

The Nanotechnology Research Center Strategic Plan

Four overarching goals
Ten critical areas of research



- Determine the potential hazards of nanomaterials
- Research possible applications of nanotechnology
- Develop recommendations and guidance
- Enhance global nanomaterial health and safety

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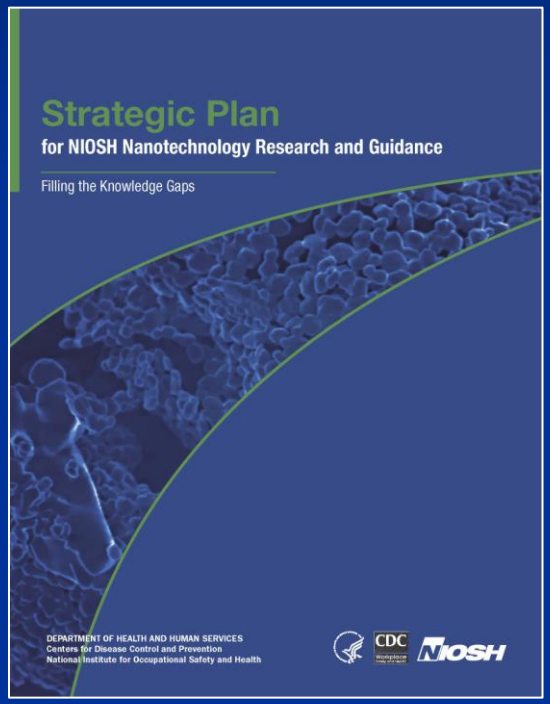
The Nanotechnology Research Center Strategic Plan

Critical Areas of Research

- Toxicology
- Measurements
- Exposure Assessment
- Risk Assessment
- Controls & PPE
- Safety
- Recommendations & Guidance
- Communication & Information
- Epidemiology & Surveillance
- Applications



Linked to NNI EHS Goals

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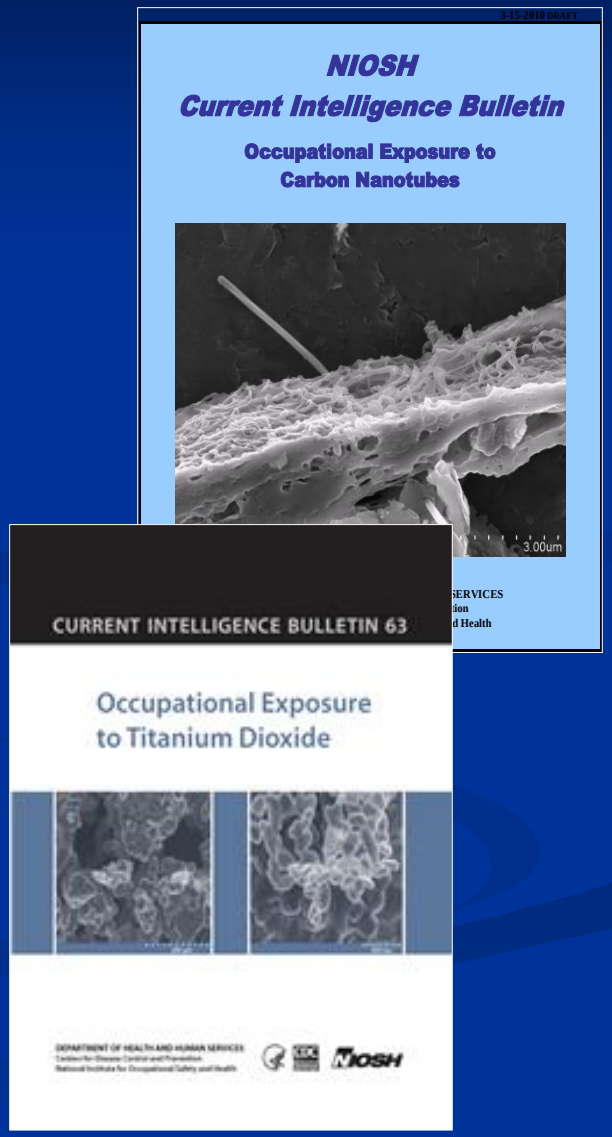
Conduct Risk Assessments for High Volume Nanomaterials

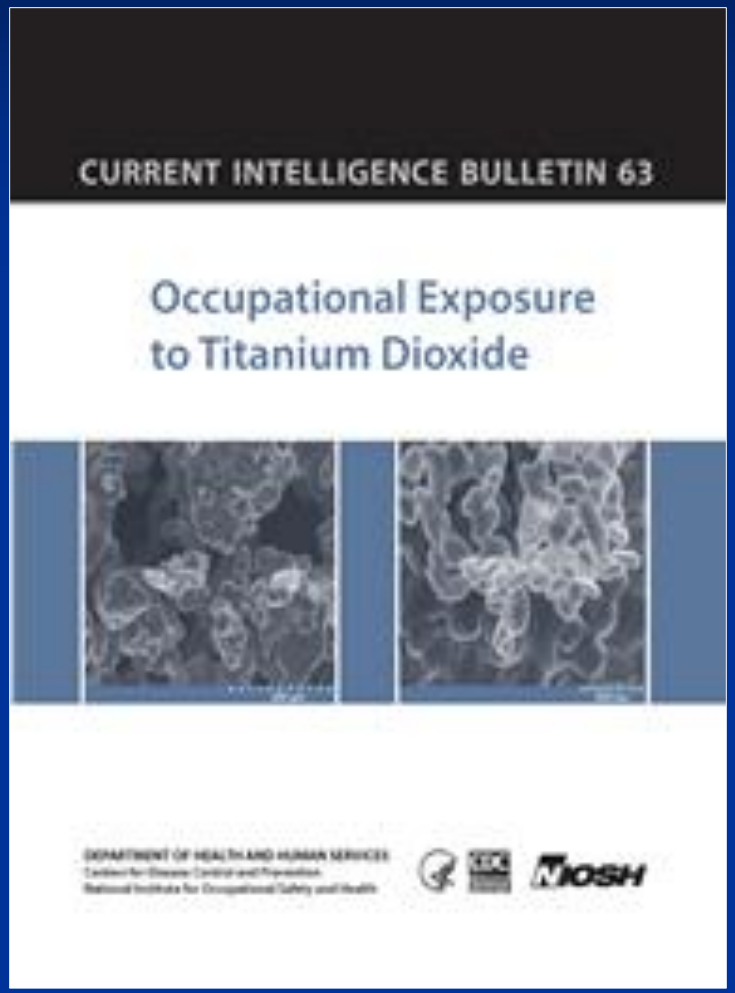
- Gather and analyze hazard data for authoritative recommendations
- Developed nanoparticle lung models
- Risk assessments on two key nanomaterials:
  TiO_2 and Carbon Nanotubes/fibers
- Coordinated development of Current Intelligence Bulletins
- Developed Recommended Exposure Limits: first issuance by a government agency



Final NIOSH CIB: TiO_2

- Hazard assessment
- NIOSH proposed REL:
  - 2.4 mg/m3 for fine TiO_2
  - 0.3 mg/m^3 for Ultrafine (Nano) TiO_2
- Exposure assessment recommendations
- Control technologies
- Research needs

www.cdc.gov/niosh/docs/2011-160/pdfs/2011-160.pdf



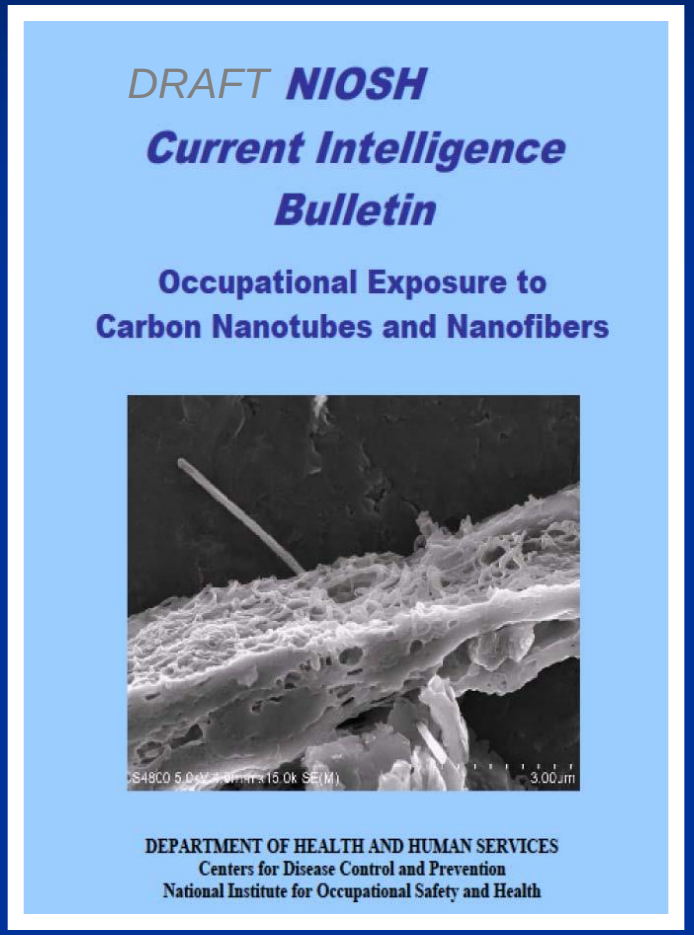
NIOSH

Draft NIOSH CIB: Carbon Nanotubes and Nanofibers

- Summarize the hazards
- Dose-response risk assessment

  NIOSH proposed REL:
  - 7 ug/m^3 for CNT and CNF
- Exposure assessment guidance
- Evaluation of controls
- Research needs

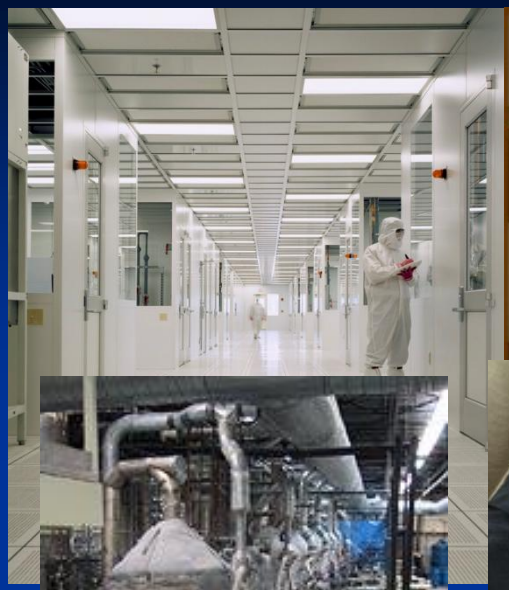
http://www.cdc.gov/niosh/docket/review/docket161A/



Conduct Workplace Research

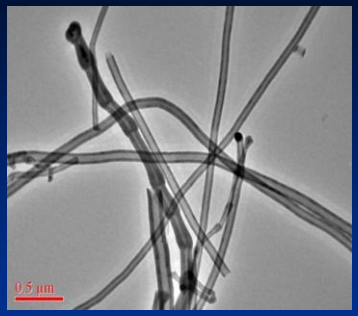
- Initial broad based studies
- Focused efforts:
  - CNT/CNF
  - Controls
- Evaluate processes and personal exposures
- Use and extend existing methods
- **Partnerships with the private sector is a key to success**
- Guidance and recommendations
- Summary results published

Nanomaterial Risk Management: Real World Challenges



It's not all clean rooms and electron microscopes

Site Visits

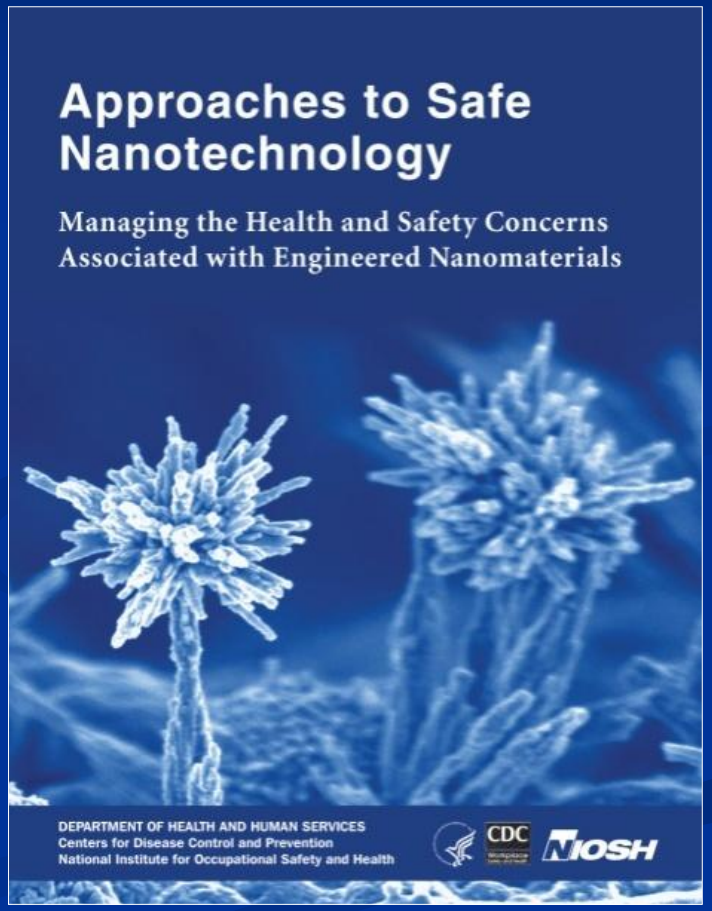


- Types of sites:
  - Laboratories
  - Scale up and test market
  - Industrial producers and users
- Types of nanomaterials: TiO_2, CNT, CNF, Ag, Fe, Ni, Quantum Dots, Graphene
- Life cycle: Composites, laminates

"Exposures do occur in the workplace"

Basic Risk Management Guidance from NIOSH

- One of first and most widely recognized guidance products
- First issued in October 2005, updated twice
- Compilation of NIOSH results
- Cited globally
- Basis for national programs

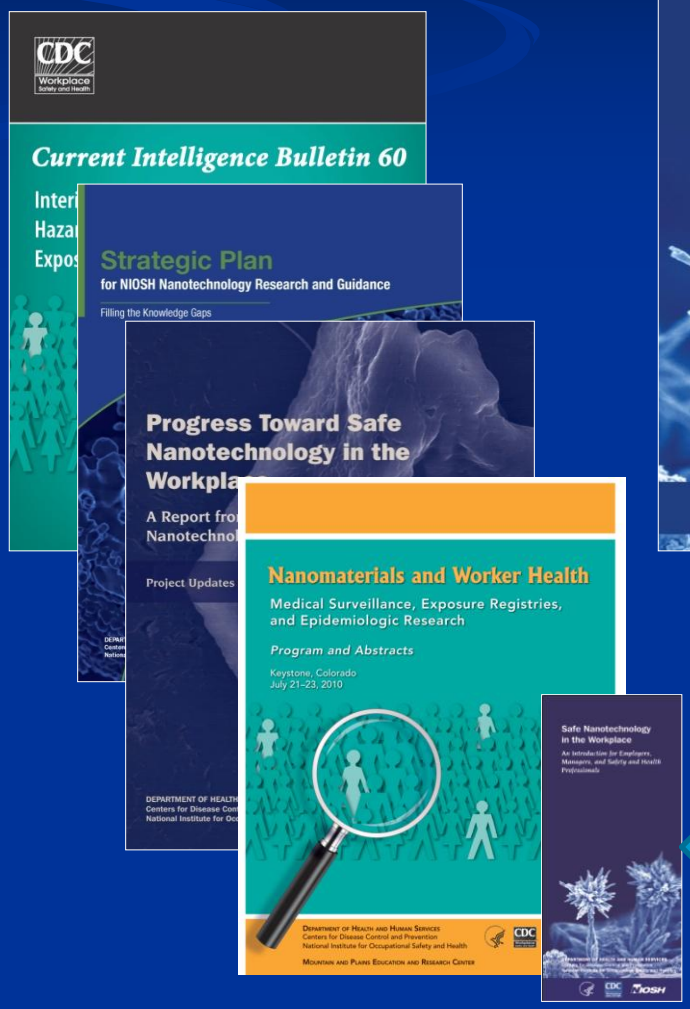


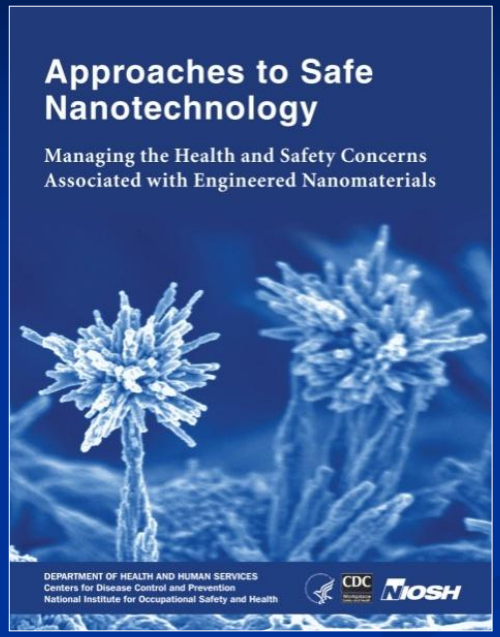
Collaboration

- Share knowledge
- Use expertise
- Build experience
- Partner

The NIOSH Nanotechnology field team is available for field assessments. Contact us.

Key Communication Products





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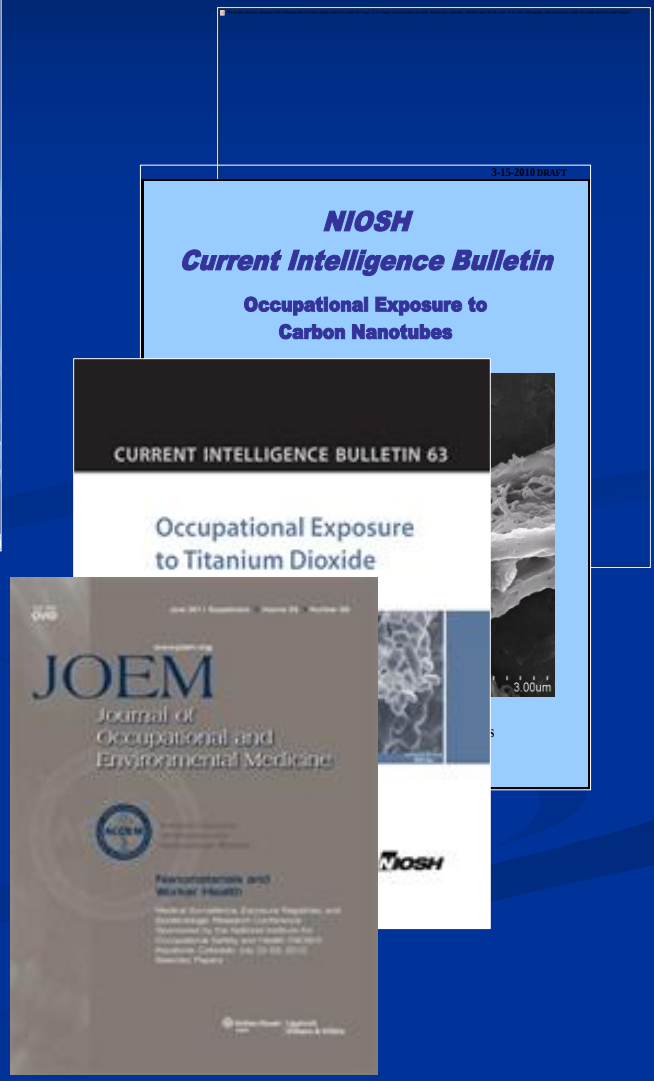

www.cdc.gov/niosh/topics/nanotech/

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NIOSH > Workplace Safety and Health Topics > Industries & Occupations

NANOTECHNOLOGY

Overview

Nanotechnology is the manipulation of matter on a near-atomic scale to produce new structures, materials and devices. This technology promises scientific advancement for many sectors such as medicine, consumer products, energy, materials and manufacturing. Nanotechnology is somewhat loosely defined, although in general terms it covers engineered structures, devices, and systems that have a length scale between 1 and 100 nanometers. At this size, materials begin to exhibit unique properties that affect physical, chemical, and biological behavior. Researching, developing, and utilizing these properties is at the heart of new technology.

As with any new technology, the earliest and most extensive exposure to hazards is most likely to occur in the workplace. Workers within nanotechnology-related industries have the

Spotlights

University of Cincinnati ERC

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Take Home Message

- Nanotechnology is here to stay
- It will be integrated onto multiple ‘sectors’
- There are OS&H issues, and they are real
- The OS&H issues can be addressed
- Effective risk management now is good for:
  - Workers and the modern workplace
  - Public trust and societal benefit
  - Business and a competitive advantage

Special thanks to the NIOSH Nanotechnology Research Center

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Thank you!

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