

HAZARD ALERT

CPWR
THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

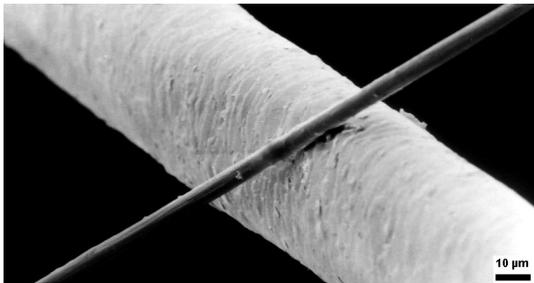
NANOMATERIALS



What are Nanomaterials?

There are many kinds of nanomaterials, but they all share a remarkably small size (roughly 100,000 times thinner than a human hair). At this size, they can add new properties to many construction products.

Nanoparticles exist in nature and in man-made combustion sources, but this alert is about manufactured nanomaterials that are added to products. These products are called nano-enabled.



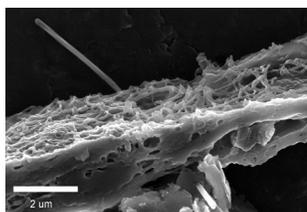
A carbon nanotube laying across a human hair

PHOTO CREDIT: ANTON WINKLER/A COMMISSIONER-BUSINESS/3.0/GETTY IMAGES/REUTERS/CONTRAST/SHUTTERSTOCK

What are the risks?

Some nanomaterials may be safe, but others have been shown to be toxic in the lab. Of particular concern are respiratory exposures to long, thin fibers, such as carbon nanotubes (CNTs).

Certain types of CNTs cause lung problems in rodents, similar to asbestos. Nanoparticles don't seem to penetrate healthy skin but may get through



Multi-walled carbon nanotube penetrating the lung

PHOTO CREDIT: NIOSH

damaged skin. Nanomaterials can be released from nano-enabled products, but the risks are not well understood. **The key is to limit exposure.**

Find out more about construction hazards.

To receive copies of this Hazard Alert and cards on other topics

Call 301-578-8500

**If you think you are in danger:
Contact your supervisor. Contact your union.
Call OSHA 1-800-321-6742**

Protect yourself

1 Learn about nanomaterials in your trade

CPWR maintains a website called **eLCOSH Nano** that features over 450 products that may be nano-enabled.

Construction products that may contain nanomaterials include:

- ▶ **Coatings**
- ▶ **Cements**
- ▶ **Insulation**
- ▶ **Lubricants**
- ▶ **Adhesives**
- ▶ **Patching compounds**



2 Control dust

NIOSH and CPWR have demonstrated that dust collection systems attached to tools will reduce the number of nanoparticles along with normal dust. Wet methods will work too.

Photo: Worker with full protective gear conducting CPWR test inside a special chamber using a dust collection system



3 Wear a respirator

Testing shows that nanoparticles do **NOT** get through high efficiency respirator filters. Reduce dust first with a dust collection system or water. If dust levels are still high, use a respirator.



PHOTO COURTESY OF NORTH-HAVENWELL

Are nanomaterials regulated?

OSHA does not have a regulation or Permissible Exposure Limit for any specific nanomaterial, but there are many existing OSHA standards, like the respirator standard, that would still apply. NIOSH has set Recommended Exposure Limits for carbon nanotubes and nano-sized titanium dioxide that employers should follow. EPA has reporting requirements for nanoparticles under TSCA.

Learn more

- ▶ OSHA Respiratory Protection Standard (29 CFR 1926.103): <http://tinyurl.com/OSHA1926-103>
- ▶ OSHA Nanotechnology: <http://tinyurl.com/OSHANano>
- ▶ NIOSH Nanotechnology: <http://tinyurl.com/NIOSHnano>
- ▶ EPA TSCA Regulations for Nanoscale Materials: <http://tinyurl.com/EPANano>