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.

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

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.

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 some nanomaterials, including carbon nanotubes and nano-sized titanium dioxide, which employers should follow. EPA has reporting requirements for nanoparticles under the Toxic Substances Control Act (TSCA).

Learn more
- OSHA Nanotechnology: http://tinyurl.com/OSHAnano
- NIOSH Nanotechnology: http://tinyurl.com/NIOSHnano
- EPA TSCA Regulations for Nanoscale Materials: http://tinyurl.com/EPAnanoTSCA