

Nano-Enabled Cement Materials with Titanium Dioxide

Engineered and manufactured nanomaterials are very small — much thinner than a human hair. Products that contain nanomaterials, called nano-enabled products, are increasingly used in construction. When workers cut, grind, sand, or disturb such products, dust containing the nanomaterial gets into the air that workers breathe. Nano-size titanium dioxide is added to coatings and cement-based products, such as roofing tiles, pavements, and mortar, to make the cement self-cleaning and to break down air pollutants. Nano-sized titanium dioxide harms lung tissue and causes lung cancer in lab animals, so the National Institute for Occupational Safety and Health (NIOSH) considers it a potential occupational carcinogen. Cement-based products can also contain other hazardous materials such as silica.

Joe's Story

Joe is installing a new type of roofing tile that is supposed to be self-cleaning and destroy pollutants in the air. Some of the tiles will need to be cut with a power saw to finish the job. Joe knows that cutting the tile will create a lot of dust in the air. He is concerned that the dust from the tile may contain materials that could make him sick.

- ✂ **Have you or someone you know ever worked around hazardous dust? If so, what was done to protect workers from breathing the hazardous dust?**
- ✂ **What could be done to prevent the dust from getting into the air?**

- ✂ **How could you find more information about the nano-enabled product that was used to make the cement?**

Remember This

Your employer is required to provide water or a vacuum system to prevent the dust containing silica and other hazards from getting into the air.

- Either wet the material to be cut or attach a hose to the saw, running to an industrial vacuum with a HEPA filter. This system will capture the dust before it gets into the air. Using a stationary saw on the ground is the safest approach.
- Use a HEPA vacuum to clean up when work is complete.
- Use a respirator along with the water or vacuum system if some of the dust escapes. Your employer should provide you with the right type of respirator as part of a full respiratory protection program required by OSHA.
- Ask your employer if the product you are working with is nano-enabled. Look for this information on the product label, on the safety data sheet, or in CPWR's electronic Library of Construction Occupational Safety and Health: <http://nano.elcosh.org>.
- Wear goggles or a face shield to protect your eyes from the dust, as well as hearing protection to prevent hearing loss.

How can we stay safe today?

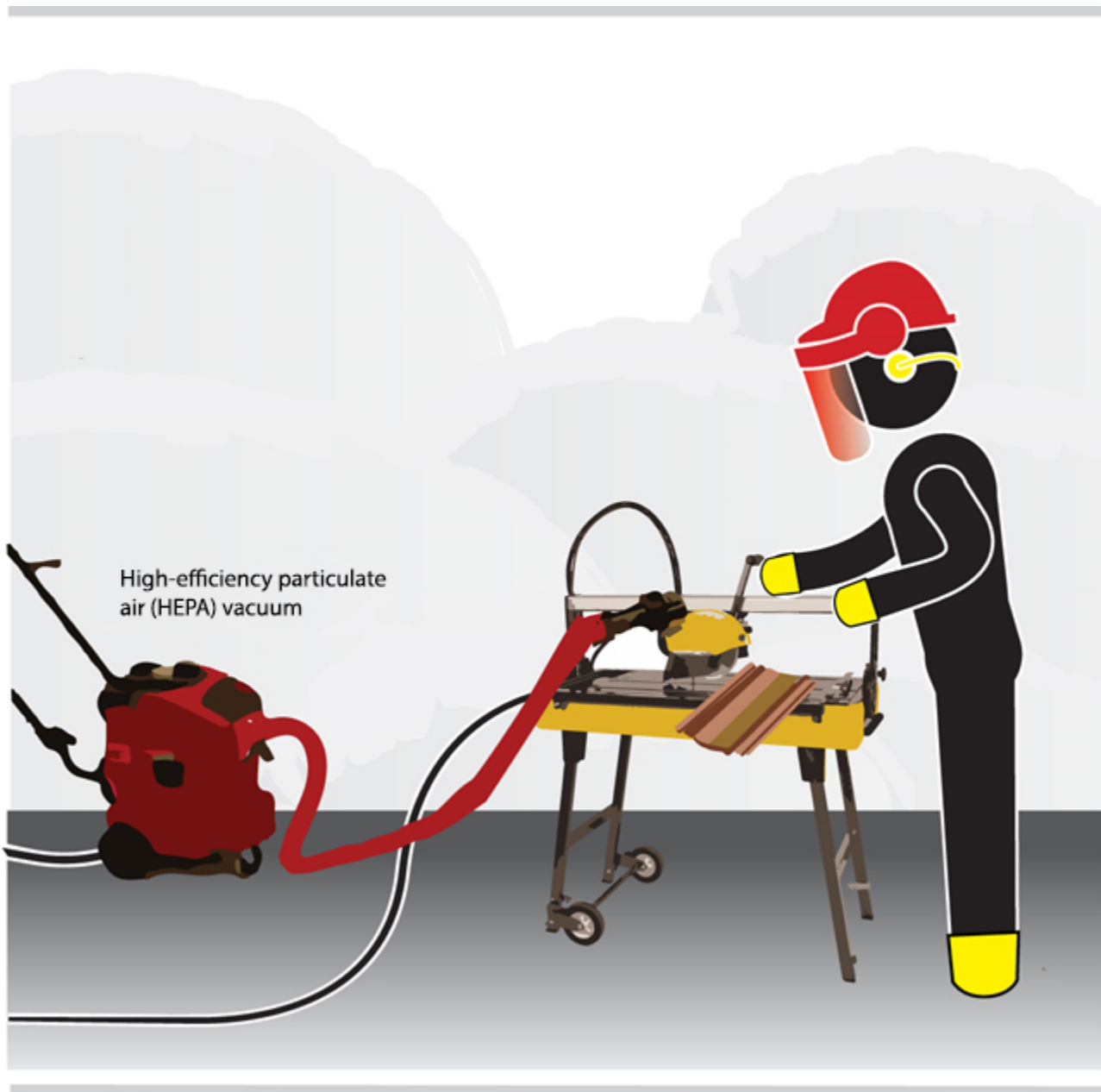
What will we do at the worksite to control the dust from nano-enabled products?

1. _____

2. _____

OSHA Standard: 1926.56

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- ✘ Use a power saw with water or attached to a vacuum with a HEPA filter to capture the dust before it gets into the air.
- ✘ Use a respirator if the water or vacuum alone does not capture enough of the dust.
- ✘ Wear goggles or a face shield to protect your eyes from the dust, and hearing protection to prevent hearing loss.