

Spray Painting and Cutting Concrete Block Coated with Nano-Enabled Silver Paint

Nanoparticles are very small, about 100,000 times smaller than the width of a human hair. Manufacturers of construction products are using silver nanoparticles to improve the properties of an increasing number of materials, including lumber, flooring products, paints, and coatings. Nano silver is being added to paints and coatings to prevent mold and bacteria from growing on exterior and interior surfaces like wood, masonry, drywall, plaster, and metal. Workers can breathe in nano silver when they spray these types of paints and coatings or disturb them after drying.

The National Institute for Occupational Safety and Health (NIOSH) believes nano silver might be harmful to workers because it can harm the lungs and liver in laboratory animals. NIOSH has recommended an exposure limit for silver nanoparticles that is much lower than the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit for normal airborne silver dust. OSHA has no specific standard for any engineered nanomaterial, but other standards, like respiratory protection or hazard communication, may apply.

Bob's Story

Bob is using an airless sprayer and a new paint that contains nano-silver to paint a concrete block wall. At some point after the paint dries, another worker will use a hand-held masonry saw to make multiple cuts on the wall. The paint is a new nano-enabled product containing silver that is supposed to prevent the growth of mold and bacteria. Bob knows spraying creates mist and cutting the block creates a lot of dust in the air. Bob is concerned that breathing the mist or dust may be harmful to the lungs and make him and his co-worker sick.

- ✘ How could you find more information about the nano silver paint?
- ✘ What could be done to prevent the mist and dust from getting into the air?

Remember This

- Check CPWR's online inventory of more than 700 nano-enhanced construction materials at <http://nano.elcosh.org> for materials you use.
- Ask your employer if the product you are working with contains silver nanoparticles. Look for this information on the product label or the Safety Data Sheet (SDS). Be aware that this information may not be reported by the manufacturers on labels or SDSs.
- NIOSH has a [recommended exposure limit](#) for nano silver.
- Try to work upwind when spraying paint to reduce exposure to the mist. Rotate with other painters to reduce exposure.
- CPWR researchers found nano-silver exposures did not exceed the NIOSH recommended exposure limit when using an airless sprayer but caution that workplace conditions could result in higher exposures.
- Use a hose on your hand-held masonry saw connected to a vacuum with a HEPA filter. This system will capture the dust before it gets into the air.
- If practical, use a hand-held masonry saw with an integrated water delivery system that sprays water at the point where the saw blade comes into contact with the nano silver paint to keep the dust levels down.
- [Follow Table I of the OSHA Silica Standard](#). A respirator may be required depending on the conditions and the amount of time being used. Your employer is responsible for providing you with the right type of respirator as part of a full respiratory protection program required by OSHA. N95 or P100 filters effectively capture nanomaterials.
- Always wear proper personal protective equipment (PPE) including goggles or a face shield to protect your eyes from the dust and hearing protection to protect your hearing when using a masonry saw.

How can we stay safe today?

What will we do at this worksite to prevent exposure to the mist and dust from the nano silver paint?

1. _____

2. _____

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- ✘ Use a hand-held masonry saw attached to a vacuum with a HEPA filter or a masonry saw that uses wet methods to capture dust before it gets into the air.
- ✘ Use a respirator when cutting masonry if the vacuum or wet method 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.