Engineering Controls Program

July 2018

What are our priorities?

The National Institute for Occupational Safety and Health (NIOSH) Engineering Controls Program seeks to protect workers by removing hazardous conditions or by placing a barrier between the worker and the hazard. The program works with partners in industry, labor, trade associations, professional organizations, and academia on these areas among others:

- Reducing worker exposures to silica dust and welding fumes at construction sites.
- Reducing worker exposures to silica and drilling fluids at oil & gas extraction sites.
- Reducing worker exposures to hazardous drugs in healthcare and veterinary medicine.
- Reducing worker asphalt fume exposure for roofers and pavers.
- Provide engineering control recommendations to protect workers from emerging hazards.

What do we do?

- Increase awareness and use of silica dust controls and practices for work tasks linked to silica exposure.
- Promote the use of engineering controls for silica and asphalt fume to U.S. and international industry partners, regulatory agencies and consensus standard bodies.
- Develop and test engineering controls for dust, chemicals, and noise exposures.
- Recommend engineering controls for emerging hazards in nanotechnology, robotics, and advanced manufacturing methods such as 3D printing.
- Evaluate the effectiveness of engineering controls to protect health care and veterinary workers from exposure to hazardous drugs.
- Design and evaluate engineering solutions to control pathogen exposure in aircraft cabins.

What have we accomplished?

- Published three NIOSH engineering control workplace design solution documents that highlight effective engineering control approaches for protecting workers during nanomaterial reactor operations, handling of nanomaterials, and intermediate and downstream processing of nanomaterials.
- Published a draft universal performance test protocol for closed system-drug transfer devices, which are supplementary engineering controls used to reduce exposure of healthcare workers handling hazardous drugs. NIOSH held public meetings and established a memorandum of understanding with manufacturers and stakeholders to develop the test protocol.
- Completed testing and published five reports (Concrete Surface Preparation Tools Machine 1, Machines 2 & 3, Machine 4, Machine 5, and Machine 6) evaluating engineering controls for silica exposures during concrete surface preparation. The reports provide detailed information about the effectiveness of the silica dust capture and filtration systems fitted to a variety of concrete surface preparation machines.
- Published field study results on engineering control assessments of nano-metal oxides.
- Developed an improved prototype mini-baghouse to control the release of respirable crystalline silica at oil and gas extraction sites.
- Published generation rates of respirable dust for controlling silica exposures from cutting fiber cement siding with different tools. The results will help optimize future tool development aimed at minimizing dust generation while producing a satisfactory cut.

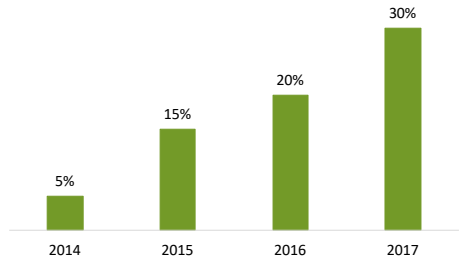
What's next?

- Develop a simple, affordable engineering control to reduce exposure potential to passengers and crew when a fellow passenger exhibits symptoms of a potentially infectious illness while in-flight.
- Publish engineering control field study results from additive manufacturing workplaces that use fused deposition modeling.
- Develop final recommendations for reducing the crystalline silica exposures of workers fabricating and installing stone countertops.
- Reduce bricklayers' exposures to respirable crystalline silica from using electric grinders to remove mortar (part of the task known as tuckpointing or repointing) by identifying other mortar removal tools to replace or supplement grinders.

At-A-Glance

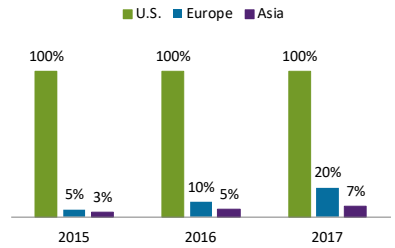
The NIOSH Engineering Control Program seeks to protect workers through engineering interventions that can be used to eliminate or allow safe work around hazards. This snapshot shows recent accomplishments and upcoming work.

Approximate percentage of asphalt milling machines in the U.S. fitted with engineering controls for silica



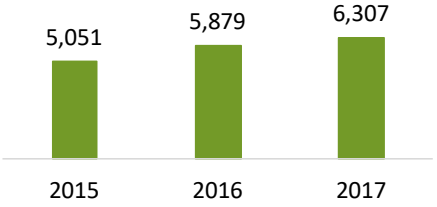
Source: National Asphalt Pavement Association

Percentage of global highway class asphalt pavers fitted with engineering controls for asphalt fumes



Source: National Asphalt Pavement Association, NIOSH program records, and the Institut National de Recherche et de Securite (INRS) program records

Cumulative downloads of NIOSH Publication-Nanomaterial Production and Downstream Handling Processes



Source: NIOSH Program Records

Publication Spotlight:

To learn more, visit https://www.cdc.gov/niosh/programs/eng/default.html

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