

Engineering Controls Program

What are our priorities?

The National Institute for Occupational Safety and Health (NIOSH) Engineering Controls Program seeks to protect workers by removing or reducing 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 to provide engineering control designs and recommendations to reduce worker exposures including but not limited to:

- Silica dust at mining, construction, and oil & gas extraction sites.
- Hazardous drugs in healthcare and veterinary medicine.
- Asphalt fume exposure for roofers and pavers.
- Hazardous airborne flavoring chemicals for food processing workers.
- Infectious diseases in healthcare and emergency services.

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 fumes 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 specific NIOSH-engineered 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 reduce infectious diseases in healthcare and emergency services.

What have we accomplished?

- Published a [study for emergency services \(EMS\) workers](#) that examined the effectiveness of ambulance ventilation at reducing EMS worker exposure to airborne particles. The results indicated that ambulance ventilation systems can be improved to protect workers.
- Assisted a stone countertop manufacturing company by conducting a [field evaluation](#) of a mobile dust control booth designed to reduce worker exposure to silica dust during stone countertop grinding. Provided recommendations to further control exposure to silica dust.
- Published [field study results](#) of engineering controls to reduce silica exposure during micro trenching performed by a communication company. Provided recommendations to reduce employees' potential exposure to respirable dust and address other health and safety issues such as excessive noise.
- Published research findings from an engineering control study of [three-dimensional printer emissions](#) and employee exposures to ultrafine particles during the printing of thermoplastic filaments containing carbon nanotubes or carbon nanofibers.
- Used tracer gas and other ventilation and engineering methods to assist with an evaluation of [exposure to radon and radon progeny](#) in an underground tourist cavern and its connected buildings. Recommended the use of engineering and administrative controls to decrease employee exposures.
- Developed [effective engineering control solutions](#) to reduce worker exposures to styrene and other volatile organic compounds associated with cured-in-place piping work.
- Evaluated new engineering control technology for controlling silica dust exposure while removing mortar from brick with a [die grinder with on-tool local exhaust ventilation](#) and with a [powered saw and modified on-tool hood](#).

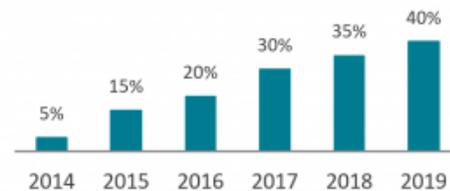
What's next?

- Publish an article showing the effectiveness of an engineering control design where twenty 3D printers fabricated their own engineering controls to reduce ultrafine particle emissions.
- Publish a workplace solutions document: [Reducing Veterinarians' Exposure to Hazards during Drug Administration](#).

At-A-Glance

The NIOSH Engineering Controls Program seeks to protect workers through engineering interventions that eliminate hazards or allow safe work around them. This snapshot shows recent accomplishments and upcoming projects.

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



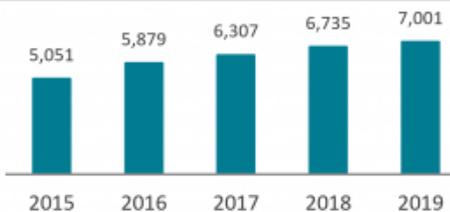
Source: National Asphalt Pavement Association

Approximate 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 Sécurité (INRS) program records

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



Source: NIOSH program records

Workplace Solutions

To learn more, visit <https://www.cdc.gov/niosh/programs/eng/> August 2020



Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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