

Engineering Controls Program PPOP

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 a wide range of worker exposures including but not limited to:

- Silica dust at mining, construction, and oil and 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 healthcare 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 comparison of [pathogens dispersion in an aircraft cabin](#) using gas injection source versus a coughing manikin. This work will help researchers determine how pathogens travel through the air in an aircraft cabin.
- Published a study on the inactivation of the multi-drug-resistant pathogen *Candida auris* using [ultraviolet germicidal irradiation \(UVGI\)](#). The dose-response data is critical for recommending UVGI dosing strategies to be tested in healthcare settings.
- [Developed an effective engineering control solution](#) where twenty 3D printers fabricated their own engineering controls to reduce worker exposure to ultrafine particles. The engineering control can reduce ultrafine particle concentrations from an individual printer by 98%.
- Created and published a 3D print model on the National Institutes of Health (NIH) 3D Print Exchange ([model #: 3DPX-015467](#)) that can be downloaded, fabricated, and attached to a 3D printer to control ultrafine particle emissions.
- Developed a prototype dry decontamination method for particulate contamination: [the DryCon system](#).
- Evaluated exposures and new engineering control technology to protect workers during wet production and use processes of nanomaterials [at 11 worksites](#).
- Published a study of [surface dosimetry](#) of ultraviolet germicidal irradiation (UVGI) using a colorimetric technique. Use of colorimetric labels could provide inexpensive, easy, and accurate verification of effective UV-C dosing used for disinfection in clinical spaces.

What's next?

- Publish results of a study of interventions to protect ambulance-based healthcare workers during pandemic response.
- Publish results of an evaluation of transparent barriers in the protection of employees from coronavirus disease 2019 (COVID-19).



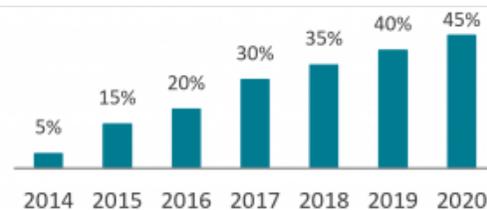
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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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



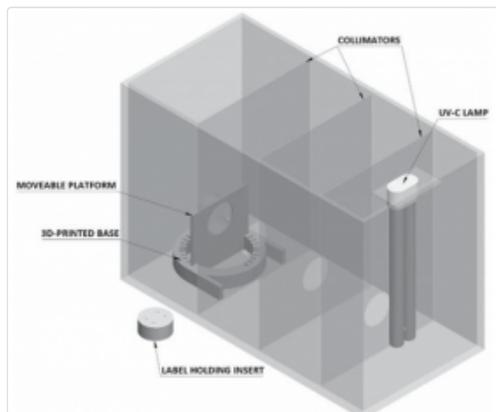
Source: National Asphalt Pavement Association

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

Publication Spotlight:



Exposure chamber with three internal collimators, test platform, and label holding insert for a study of surface dosimetry of UVGI.

To learn more, visit <https://www.cdc.gov/niosh/programs/eng/> June 2021