

Fact Sheet

Respiratory Protection for Respirable Crystalline Silica



What is a respirator?

A respirator is a device approved by the National Institute for Occupational Safety and Health (NIOSH) that miners can wear for protection against inhaling silica dust and other hazardous airborne contaminants. Respirators provide protection either: (1) by filtering or removing airborne contaminants such as respirable crystalline silica, or a combination of contaminants from the air, using filters, cartridges, or canisters (air-purifying); or (2) by supplying an independent source of clean breathing air (atmosphere-supplying).

When must mine operators make approved respirators available under MSHA's final silica rule?

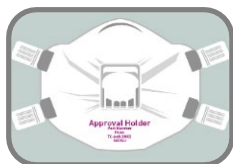
Mine operators must make approved respirators available to Coal and MNM miners before the start of the next work shift when an exposure to respirable crystalline silica exceeds the permissible exposure limit (PEL). Mine operators must ensure that miners wear respirators properly while corrective actions are taken to lower exposures to at or below the PEL. For MNM mines, respirators are required as a temporary measure when miners must work in concentrations of respirable crystalline silica above the PEL while engineering controls are being developed and implemented or it is necessary by nature of the work involved.

What types of respirators are allowed under MSHA's final silica rule when miners' exposures exceed the respirable crystalline silica PEL?

Mine operators must provide either NIOSH-approved atmosphere-supplying respiratory protection or NIOSH-approved air-purifying respiratory protection equipped with particulate protection classified as 100 series or High Efficiency "HE" under 42 CFR part 84. 100 and HE refer to the NIOSH-approved particulate filter classification and level of filtration (i.e., 99.97% filtration efficiency). Air-purifying respirators, like those shown below in Table 1, are more commonly used in the mining industry. In addition, atmosphere-supplying respirators (e.g., supplied-air respirators) can be used, depending on the task and hazard.

Table 1. NIOSH-Approved Air-Purifying Respirators Allowed Under MSHA's Final Silica Rule¹

- **Filtering Facepiece Respirators (FFRs)** are tight-fitting disposable respirators that remove particles, but not gases or vapors. Some FFRs have exhalation valves that open to let air escape when the wearer breathes out, reducing breathing resistance and increasing comfort.
- **Elastomeric Half Facepiece Respirators (EHFRs)** and **Elastomeric Full Facepiece Respirators (EFFRs)** are tight-fitting reusable respirators that remove a variety of contaminants, including silica dust, when equipped with the appropriate filter, cartridge, or canister.
- **Powered Air-Purifying Respirators (PAPRs)** are reusable respirators that protect against a variety of contaminants, including silica dust, when equipped with the appropriate filter, cartridge, or canister. PAPRs use a battery-powered fan to pull air through the attached filter, canister, or cartridge. There are loose and tight-fitting PAPRs. Loose-fitting PAPRs do not require fit testing and can be used with facial hair.



FFR
Use 100 Series Model



EHFR
Use 100 Series Filters



EFFR
Use 100 Series Filters



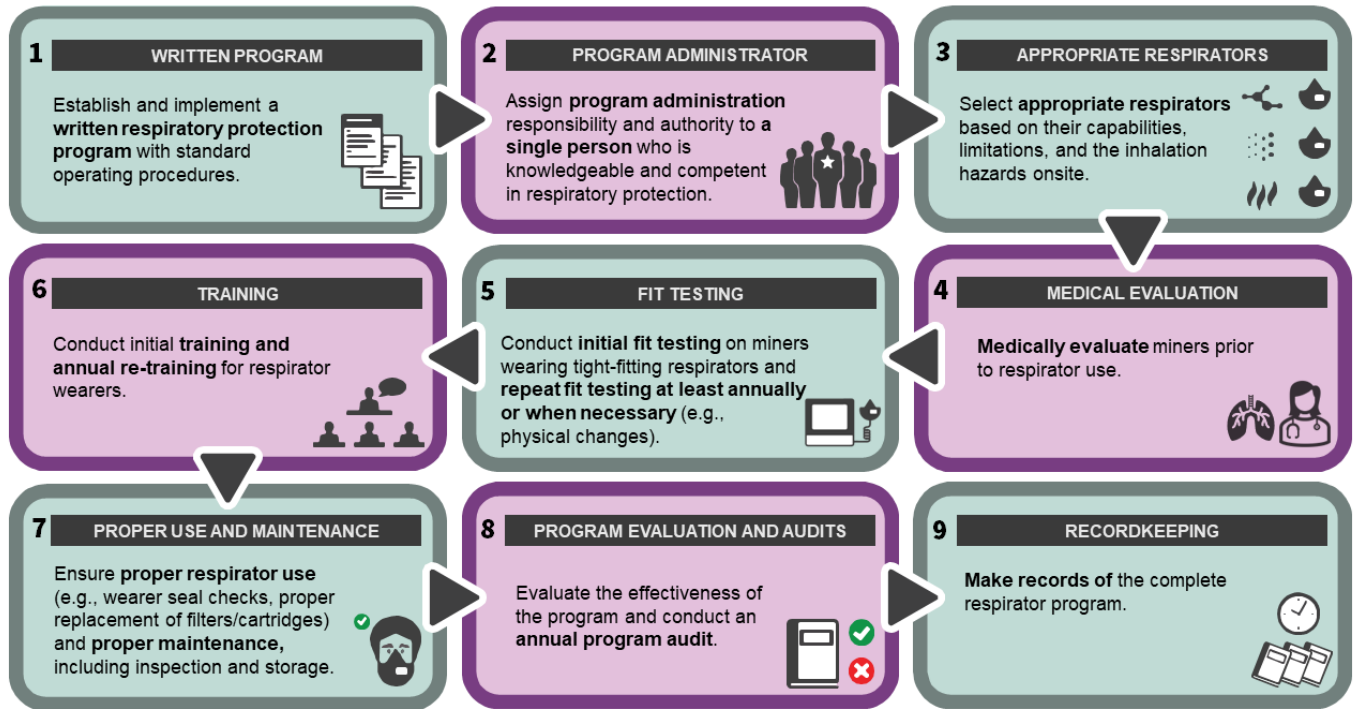
PAPR
Use HE Filter

¹ Information adapted from NIOSH Types of Respiratory Protection, 2019, and NIOSH Respirator Selection Guide for the Construction Industry, Publication No. 2022-123. Images not drawn to scale.

What actions must operators take to ensure that affected miners are properly protected when wearing respirators?

Operators must establish and maintain a respiratory protection program in accordance with **ASTM F3387-19 Standard Practice for Respiratory Protection** and ensure that miners wear respirators properly.

Figure 1. Key requirements of ASTM F3387-19 Standard Practice for Respiratory Protection²



² ASTM graphic: Information adapted from the NIOSH Respirator Selection Guide for the Construction Industry, Publication No. 2022-123.

What if a physician or other licensed health care professional (PLHCP) determines that a miner is unable to wear a respirator during the medical evaluation?

A miner unable to wear a respirator must: 1) receive a temporary job transfer to an area or to an occupation at the same mine where respirators are not required; and 2) continue to receive compensation at no less than the regular rate of pay in the occupation held by that miner immediately prior to the transfer. Affected miners may only return to their initial work area or occupation when respirators are no longer required. In addition, a record of the PLHCP's written determination must be maintained for the duration of the miner's employment plus 6 months.

Where can I find more information about respiratory protection?

- ❖ The ASTM F3387-19 standard provides information and guidance on proper respirator selection and use. A copy of the standard can be purchased through ASTM International or a free read-only version can be viewed at www.astm.org/products-services/reading-room.html. The standard can also be viewed at MSHA Headquarters, Arlington, VA, and Mine Safety Health Enforcement District and Field Offices.
- ❖ NIOSH Respirator Resource Page: <https://www.cdc.gov/niosh/topics/respirators/default.html>
- ❖ NIOSH Selection and Use of Particulate Respirators: <https://www.cdc.gov/niosh/docs/96-101/default.html>
- ❖ OSHA Respiratory Protection Resource Page: <https://www.osha.gov/respiratory-protection>

For further assistance, check the MSHA website or contact your MSHA District Office.