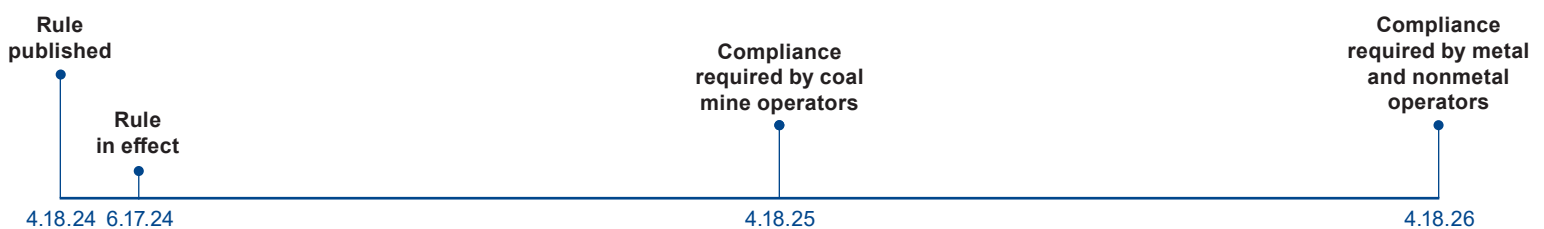


## BACKGROUND:

The U.S Department of Labor’s Mine Safety and Health Administration (MSHA) issued its final rule, *Lowering Miners’ Exposure to Respirable Crystalline Silica and Improving Respiratory Protection* (Ref 1) on April 18, 2024, changing Federal standards to enhance the protection of US miners from health hazards related to exposure to respirable crystalline silica (aka, silica dust).

- » Respirable crystalline silica means quartz, cristobalite and/or tridymite forms of silica contained in airborne particles that meet particle size-and-device-specific characteristics set forth by the International Organization for Standardization (ISO).

Increasing silica-related disease has been a factor in this change. Inhaled silica is a carcinogen, and prolonged exposures to respirable crystalline silica and/or mixed coal mine dust can cause disease. This includes black lung disease (aka, coal workers’ pneumoconiosis), progressive massive fibrosis (PMF), silicosis, emphysema/COPD, kidney disease, lung cancer, and other disabling and often fatal diseases. These diseases can be found among the ~200,000 US metal and nonmetal (MNM) miners and the ~55,000 US underground and surface coal miners. One major issue driving this change is that in U.S. coal miners, black lung disease has reached the highest level recorded in 25 years. It afflicts 10% of miners who have 25+ years on the job and in Appalachia, it’s closer to 20%. (Ref 2)



## IMPLEMENTATION TIMELINE:

The new part 60 final rule requirements will take effect on **June 17, 2024** except for the material in amendment 60, which is approved beginning April 14, 2025, and the material in amendments 9 and 18, which is approved beginning April 8, 2026.

- » For *coal mine* operators, compliance with part 60 is required by *12 months* after the April 18, 2024 publication date.
- » For MNM operators, compliance is required by *24 months* after the publication date.

## OVERVIEW OF KEY ELEMENTS:



### **The Permissible Exposure Standard and Action Levels are lowered**

MSHA is lowering the silica dust exposure limits for quartz or respirable crystalline silica to  $50 \mu\text{g}/\text{m}^3$  and setting an action level of  $25 \mu\text{g}/\text{m}^3$  for ALL miners, both coal miners and MNM miners. These levels are calculated over a full shift as an 8-hour time-weighted average (TWA).

This change is consistent with the 2016 changes Federal OSHA made when it lowered the Silica Standard PEL for respirable crystalline silica to  $50 \mu\text{g}/\text{m}^3$ , and the action level to  $25 \mu\text{g}/\text{m}^3$ , as an 8-hour TWA, for the general, construction and maritime industries OSHA regulates.



### **New medical surveillance requirements at MNM operations**

Medical Surveillance will be expanded to cover MNMI miners. This will be new for the ~200,000 U.S. MNM miners. Medical surveillance requirements already exist for coal miners ([Ref 3](#)).

Provision of examinations: MNM operators are required to provide all miners with initial and periodic medical examinations as follows:

- For “*all miners employed at the mine*” (i.e., miners not new to the mining industry), voluntary initial examination during an initial 12-month period, and a periodic exam every 5 years is required to be offered.
- For “*each miner who begins work in the mining industry for the first time*”, it is mandatory that an initial examination (within 60 days of employment), and a medical examination no later than 3 years after the initial examination be completed. If these examinations show lung issues, a 3<sup>rd</sup> examination is required in another 2 years after the 2<sup>nd</sup> exam.

Examination Content: The required examinations consist of a history (silica exposure, lung issues, TB issues and smoking), a physical examination, a PA chest x-ray (with ILO B-read), and pulmonary function testing. Results of the exam are to be reported only to the miner within 30 days. A written opinion sent to the mine operator from the examiner (i.e., a Physician or other Licensed Health Care Professional [aka, PLHCP]) will contain only: (1) the date of exam, (2) a statement the exam has met MSHA requirements, and (3) any recommended limitations on the miner’s use of a respirator. These opinions shall be kept by the operator for the duration of the miner’s employment plus 6 months.

» The new standard makes no provision for *medical removal* from employment for a MNM miner who has evidence of silica-related lung disease; however, per 60.14(b), MSHA has clarified that “any miner” so affected “must receive a temporary job transfer [...] at the same mine where respiratory protection is not required”.

» Medical Surveillance for Underground Coal Miners regulation is detailed in Title 30; Chapter I Subchapter O Part 72 ([Ref 3](#))



### **Expansion of exposure monitoring for respirable crystalline silica**

Mine operators are required to conduct sampling to assess miners' exposures to respirable crystalline silica both initially and periodically. Mine operators are also required to evaluate the impact of mining production, processes, equipment, engineering controls, and geological condition changes on respirable crystalline silica exposures. MSHA's new rule requires exposure sampling and corrective actions when miners' exposures exceed the proposed PEL.

The new regulation also updates the standard for respirable crystalline silica sampling requirements and the techniques used to conduct sampling for respirable crystalline silica that requires use of respirable particle size-selective samplers that conform to ISO 7708:1995 (an international consensus standard that defines airborne sampling conventions).



### **PEL exceedances require immediate reporting to MSHA**

Whenever an overexposure is identified, mine operators must immediately report this to MSHA and take corrective action to lower the concentration of respirable crystalline silica. The concentration needs to be lowered to at or below the PEL, and resample to determine the efficacy of the corrective action.



### **Specifies methods of controlling respirable crystalline silica required**

All mines are required to install, use, and maintain feasible engineering controls as the primary means of controlling respirable crystalline silica. Administrative controls may be used, when necessary, as a supplementary control. Respirators will only be allowed as a temporary measure at MNM mines and coal mines for times when miners must work in concentrations above the PEL while engineering control measures are being developed (or when it is necessary by nature of the work involved).



### **Replaces ANSI respirator protection standard with ASTM standard:**

The final rule replaces the prior ANSI respiratory protection standard with the *Standard Practice for Respiratory Protection*, (ASTM F3387-19) (Ref 4). ASTM International (formerly American Society for Testing and Materials) is an international standards organization that publishes consensus technical standards. The mine operator must now have a written respiratory protection program conforming to ASTM requirements.



# IMPLICATIONS & CONSIDERATIONS FOR MINES:

- 1 Medical Surveillance considerations**

Assure that local clinics or mobile medical service providers have health care providers who are aware of the expanded requirements of the MSHA Standard. They should be able to perform the required medical surveillance evaluations with appropriate systems to provide employee follow up and feedback as required.
- 2 The lower exposure limit will likely make exposure control changes needed.**

Exposure control methods in the final rule emphasize and require more advanced and efficient engineering controls and limit reliance on personal protective equipment (PPE). The new regulation suggests these might include the installation of proper ventilation systems, use of water sprays or wetting agents to suppress airborne contaminants, installation of machine-mounted dust collectors to capture respirable crystalline silica and other contaminants or the installation of control booths or environmental cabs to enclose equipment operators.
- 3 Administrative controls can supplement engineering controls.**

In the final rule, administrative controls may be used, but are secondary to engineering controls as they require significant oversight. MSHA cites an example of a clothes cleaning system that removes silica dust from a miner's clothing throughout the workday and reduces silica dust exposures.
- 4 Enhanced air sampling/monitoring.**

It is possible there may be a scarcity of "certified persons" (per Sec. 90.2T definition) to do required dust sampling and/or of approved sampling devices (e.g., CDPM, CMDPSU, etc.). Prepare now to identify, train and hire certified persons and needed dust monitoring devices.
- 5 Old coal dust air monitoring results may not conform to the new standard.**

MSHA's Phase III 2014 RCMD (respirable coal mine dust) Standard went into effect August 1, 2016. Dust air monitoring samples taken prior to implementation of the RCMD standard may not be representative of current respirable crystalline silica exposure levels in coal mines, based on the requirements of the new standard.
- 6 Immediate reporting silica exposure levels above the PEL.**

Consider having a system in place to respond to inquiries from MSHA, as well as to be prepared to re-evaluate, re-monitor, take corrective actions.
- 7 Updated Respiratory Protection Standard implementations possibly needed.**

The rule incorporates an updated respiratory protection standard, for respirable crystalline silica and all other regulated airborne contaminants - ASTM F3387-19, "Standard Practice for Respiratory Protection" [Ref 4](#). Compare the administrative and equipment differences between ASTM F3387-19 and what you are currently doing for respiratory protection at your facility.
- 8 Recordkeeping requirements will accompany the other changes.**

Recordkeeping will require more detailed and specific documentation than current MSHA recordkeeping focusing on both exposure levels and health monitoring. A table in the regulation summarizes some requirements:  
§ 60.16 Recordkeeping requirements. TABLE 1 TO PARAGRAPH (a)—RECORDKEEPING REQUIREMENTS

Record	Section References	Retention Period
Evaluation records	§ 60.12(c)	At least 5 years from each evaluation
Sampling records	§ 60.12(g)	At least 5 years from sample date
Corrective actions records	§ 60.13(c)	At least 5 years from date of each corrective action
Written determination records received from a PLHCP	§ 60.14(b)	Duration of miner's employment plus 6 months
Written medical opinion records received from a PLHCP or specialist.	§ 60.15(f)	Duration of miner's employment plus 6 months

## GUIDE REFERENCES

### **REF 1.US Department of Labor announces proposed rule to reduce silica dust exposure, better protect miners' health**

MSHA User Friendly Version: <https://www.federalregister.gov/documents/2024/04/18/2024-06920/lowering-miners-exposure-to-respirable-crystalline-silica-and-improving-respiratory-protection>

Federal Register PDF Print Version: <https://www.govinfo.gov/content/pkg/FR-2024-04-18/pdf/2024-06920.pdf>

### **Ref 2. Mining Topic: Respiratory Diseases - The National Institute for Occupational Safety and Health (NIOSH)**

<https://www.cdc.gov/niosh/mining/topics/respiratorydiseases.html#:~:text=However%2C%20since%20that%20time%2C%20CWP,with%20PMF%2C%20an%20unprecedented%20number.>

### **Ref 3 Medical Surveillance for Underground Coal Miners: Regulation Title 30; Chapter I Subchapter O Part 72**

<https://www.ecfr.gov/compare/2024-04-18/to/2024-04-17/title-30/chapter-I/subchapter-O/part-72>

### **Ref 4. ASTM F3387-19 replaces ANSI for respiratory protection standard practices**

This is a standard based on the most recent consensus standards recognized by experts in government and professional associations on the selection, use, and maintenance for respiratory protection equipment. The ASTM Standard would replace American National Standards Institute's ANSI Z88.2-1969, "*Practices for Respiratory Protection*" (ANSI Z88.2-1969), which is incorporated in the existing standards.

ASTM is referenced in CDC document: <https://www.astm.org/f3387-19.html> includes Subpart B, Medical Surveillance for coal miners)