

## How to choose the right respiratory protection for mining applications

### Q. What type of RP is required for mining applications?

A. Overall, the nature of RP required does not differ from most other industrial applications. The choice and selection of the RPD requires a clear decision by the user based on a risk assessment process:

- **Define:** What is the application?
- **Identify:** What are the contaminants?
- **Measure:** What are the concentrations in the workplace?
- Other factors important to consider are ambient conditions, such as temperature, humidity, ...



The variety of applications (underground mining, surface mining or processing operations), as well as the nature of the potential risks, such as toxic gases, oxygen deficiency or dust and fumes, should direct the user to one of the solutions offered by MSA.

Also, whether the device is to be used for work or escape should also determine the type of equipment required.

### Q. How do we select the proper equipment?

A. First and foremost, any local or national regulations, restrictions and specifications must be followed. Selection should then be based on the oxygen concentration. With an oxygen concentration between 17% and 21%, an air purifying respirator can be selected (% varies by country).

**In the case of oxygen deficiency, where there is doubt or if conditions are unknown, a supplied-air device MUST always be selected.**

Self-contained rescue devices are required when it comes to unexpected hazardous events in underground mining. MSA's comprehensive range of oxygen self-rescuers is used to help miners to escape from mines in the event of a mine fire, explosion, lack of oxygen or toxic atmosphere.

### Q. What are the risks requiring respiratory protection in mining?

A. Exposure to harmful fumes, dust and working for long periods of time in unhealthy, dusty and often toxic environments require the highest standard of respiratory equipment. The most common form of respiratory protection in mining operations is dust protection. Exposure to rock dust, including coal dust and silicon dust can lead to long-term lung problems. In addition, the storage and transport of chemicals within the mining area and between mines can be harmful to workers if not handled properly. Smoke or fumes from smelters affect air quality and may therefore cause respiratory problems

### Q. What is the most commonly required respiratory protection in mining?

A. One of the most common forms of respiratory protection in mining operations is dust protection. Particulate filters can be used to effectively filter coal dust as well as most other ambient dusts.

MSA's comprehensive range of air-purifying respirators include disposable respirators (Affinity 1100, Affinity 2100), half masks (Advantage 200 LS, Advantage 420, Advantage 410), full-face masks (Advantage 3100, Advantage 3200, 3S) and respiratory filters (Advantage cartridges, particle filters, 90/92/93 Series) that provide effective breathing protection with unparalleled comfort and ease of use.

Welding, flame cutting, the use of solvents and handling of fuels, blasting and other operations may produce airborne contaminants that require the use of respirators equipped with cartridge(s) to remove combinations of dust, mists, fumes, organic vapours and acid gases. In such cases, the level of protection required for the miner will be determined by measuring the contaminants. This is usually performed locally, using detector tubes or portable instruments.

Certain types of particulate encountered in mines, such as asbestos fibres found in asbestos mines, coal fines produced in longwall mining and radionuclides found in uranium mining, may require the use of a positive pressure respirator equipped with a high-efficiency particulate absolute filter. Powered air-purifying respirators (PAPRs) which supply the filtered air to a hood, tight-fitting facepiece or integrated helmet facepiece meet this requirement.

**Q. How can we check if the respirator is worn properly?**

A. Whenever possible, each wearer should carry out a positive and negative pressure check of the device when worn (see user instructions). It is recommended, and sometimes mandatory, that each wearer is subject to a fit test, as specified in EN 529, to ensure that the device is appropriately adapted to the user's face.

**Q. When should you change your filters?**

A. A particle filter carries a specific marking to indicate whether it can be used once or several times. Filtering facepieces are usually marked as NR (not reusable) which means that their use is limited to one single shift only and that their performance may decrease under certain conditions. They must be replaced at least every 8 hours in accordance with the manufacturer's instructions.

Particle filters marked as R (Reusable) are intended to be used for more than a single shift. Over time the filter will become clogged and must be replaced when the breathing resistance increases significantly.