

Respirators: Proper Selection and Fitting

By NASSCO Technical Advisory Council Member Kaleel Rahaim

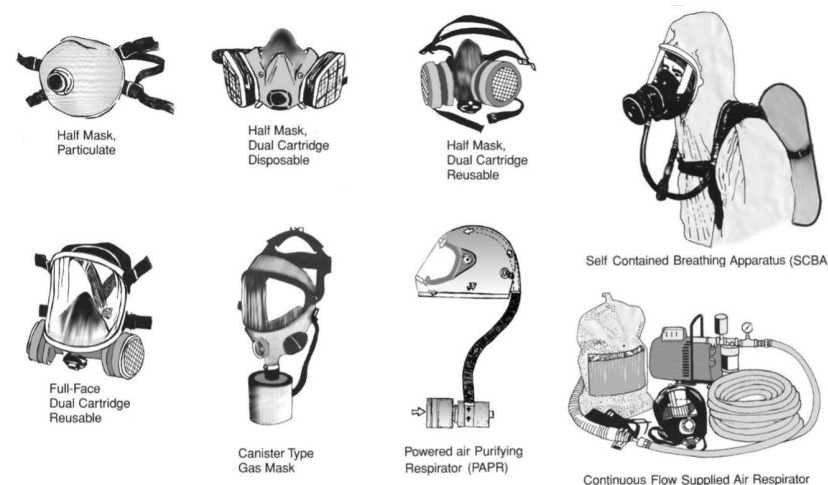
Personal protective equipment (PPE) for employees exists to prevent injury and illness. This goal can only happen when the proper equipment is chosen and properly fitted to the employee. Respiratory protection is one type of PPE designed for this purpose.

OSHA requires the employer to select the appropriate respirator for the worker's situation based upon respiratory hazards in the employee's workplace. The employer must provide the respirator at no cost, provide training and fitting of the respirator, and a medical evaluation to determine if the employee can wear a respirator. OSHA regulations regarding respirators may be found in 29CFR1910.134.

Respirators come in many shapes and sizes. They may be tight fitting or loose fitting; they may be air purifying or atmospheric supplying. Respirators are designed to remove the hazard of inhaling particulate matter, noxious or hazardous fumes, mists or gases, or both. Each type of respirator has advantages and disadvantages.

All tight-fitting respirators must be fit tested to the employee and must be retested every 12 months. Loose fitting respirators do not need fit testing. Fit testing is different from user seal checks which are conducted by the employee at each use. For tight fitting respirators, encumbrances to the seal such as facial hair, jewelry, etc. are not allowed.

Respirators are rated by an assigned protection factor (APF). For an APF=10, 1/10th of the particulate matter or gas, mist or fume may pass through the filter. For an APF=50, only 1/50th may pass through the filter. For particulate matter only, some respirators may be labeled as HEPA or high efficiency particulate air filters, meaning that at least 99.7% of the particulate matter does not pass through the filter. All respirators must have passed and be designated as National Institute of Occupational Safety and Health (NIOSH) tested. Respirators may have filters, cartridges or canisters depending on the desired function of the filter.



Filter specifics are as follows:

- **Filtering Face Piece** – tight fitting, APF=10, requires fit testing, for particulate use
- **Half-Face Piece Elastomeric Respirator** – tight fitting, APF=10, requires fit testing, for particulate use or gas use, may have filters, cartridges, or cannisters
- **Full-Face Piece Elastomeric Respirator** – tight fitting, APF=50, requires fit testing, for particulate use or gas use, may have filters, cartridges, or cannisters, provides eye and face protection
- **Loose Fitting Face Piece Powered Air Purifying (PAPR)** – loose fitting, no fit test required, APF=25, for particulate or gas use
- **Tight Fitting Face Piece Powered Air Purifying (PAPR)** – loose fitting, fit test required, APF=25, for particulate or gas use
- **Airline Respirator** – independent air source, for use in an independently dangerous to life or health (IDLH) environment
- **Self-Contained Breathing Apparatus – (SCBA)** -independent air source, for use in an independently dangerous to life or health (IDLH) environment

Fit testing of a respirator is an important part of respirator safety. Prior to completing a fit test, the employee must undergo a medical evaluation to determine if the employee can wear a respirator.

The initial step in respirator fitting is to determine if the employee is sensitive to odors without a respirator and if the respirator used prevents the employee from smelling those odors. If the respirator is a positive-pressure system, it must be converted to a negative pressure system.

Initially, the employee has a hood placed over their head. The hood has a hole in the clear face portion. The instructor will spray an odiferous material through the hood in 10 pump sequences. The ability of the employee to smell the material gives the employee a rating. If the employee cannot smell the material, the employee may not be able to work in an area requiring a respirator. If the employee can smell the material, the test continues with the employee wearing a respirator that has been user seal checked. If the employee smells the material while wearing the respirator, the respirator may need to be rechecked or another respirator used. If the employee cannot smell the material, the fit testing was successful.

[CLICK HERE for additional information on respirator selection.](#)

[CLICK HERE for a video link for fit testing a respirator.](#)

TECH TIPS IS A BI-MONTHLY ARTICLE ON TRENDS, BEST PRACTICES AND INDUSTRY ADVICE FROM NASSCO'S TRENCHLESS TECHNOLOGY MEMBERSHIP PROFESSIONALS



Follow us on social media or visit [NASSCO.org](https://nassco.org)



NASSCO