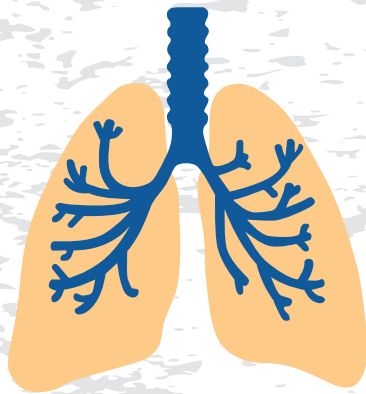


FAST Guide: Respirator Selection

Protect Your Respiratory Health



Respirators are among the most important pieces of protective equipment for working in hazardous environments. Are you sure if you are providing the proper equipment or just not sure where to start when selecting new equipment to protect your employees?

In order to provide proper protection you must assess the hazards that are present in your specific workplace. Use this guide to help understand what protection is available and where to get started.

In 2014 **385 workplace fatalities** were reported due to exposure to harmful substances or environments.



An estimated **5 million workers** are required to wear respirators in **1.3 million workplaces** throughout the United States.



Violations pertaining to respiratory equipment was **number four** on the list of most cited violations by OSHA in 2016.



Know your hazards

In order to provide proper protection, the first and most important step you must take is to identify the hazards that are present in your specific workplace. Start by asking yourself these questions:



What is the type and physical form of the hazard?
How much of the hazard is present?
Are there multiple hazards present?



Is there sufficient oxygen in the atmosphere?
Is the atmosphere Immediately Dangerous to Life or Health (IDLH)?



What kind of work is being done in the hazardous environment?
How long are employees exposed to the hazard during their workday?

Need help with a hazard assessment?

Hazard assessments should be conducted by experienced safety personnel or by an industrial hygienist. Fastenal's qualified team of safety specialists can help or check out ABIA.org for a list of industrial hygienists in your area.

Assigned Protection Factors

The measure of a respirator's protection capability is called the Assigned Protection Factor (APF). This is a number that OSHA has assigned to each class of respirator and it represents the level of protection against airborne exposure each respirators is expected to provide. The larger the number, the greater the protection.



For Example:

$$APF = 10 = \frac{1}{10}$$

contaminant concentration remaining

When used properly, a respirator with an APF of 10 will reduce your exposure to 1/10th of the concentration of the contaminant in the air.

Type of Respirator	Quarter Mask	Half Mask	Full Facepiece	Helmet/Hood	Loose-Fitting Facepiece
Air-Purifying Respirator	5	10	50	—	—
Powered Air-Purifying Respirator (PAPR)	—	50	1,000	25/1,000	25
Supplied-Air or Airline Respirator					
• Demand mode	—	10	50	—	—
• Continuous flow mode	—	50	1,000	25/1,000	25
• Pressure-demand or other positive pressure	—	50	1,000	—	—
Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	—	10	50	50	—
• Pressure-demand or other positive pressure mode (e.g. open/closed circuit)	—	—	10,000	10,000	—

*For full chart with exceptions and regulations see OSHA Standard 1910.134

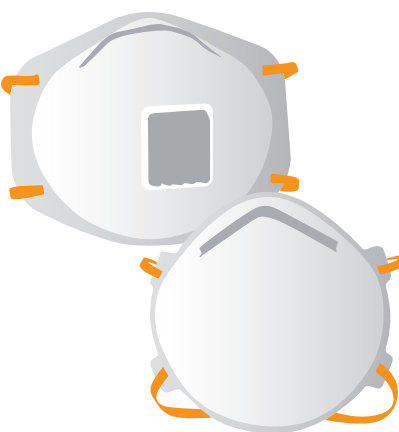
Respirator Types

Air-Purifying Respirators

Remove airborne contaminants such as particles, toxic vapors, and/or gases. They are appropriate for environments with low-level contamination and sufficient oxygen.

Disposable Filtering Facepiece Respirators

Assigned Protection Factor = 3-5



Advantages:

- ✓ Lightweight and comfortable
- ✓ Inexpensive and disposable
- ✓ Filters out particles in the air

Limitations:

- ✗ Minimal amount of protection
- ✗ Cannot be worn by users with facial hair

There are nine classes of particulate filters. They are broken down into three series (N, R and P) and each series is available with three levels of efficiency (95%, 99%, 99.97%).

N Series or "non-oil resistant", are not resistant to oil and be used environments free of oil mists.

R Series or "oil resistant", are relatively oil resistant and can be exposed to oil mist but should be worn only once.

P Series or "oil proof", can be exposed to oil mists for longer than one work shift.

Reusable Elastomeric Respirators

Assigned Protection Factor = 10-50

Advantages:

- ✓ Lightweight and easy to use
- ✓ Long-lasting when properly maintained
- ✓ Filters are available to protect against multiple contaminants at once

Limitations:

- ✗ Negative pressure makes inhaling through the filter media a little more difficult
- ✗ Does not protect against all hazards, protection depends on the filter/cartridge used



Cartridges, canisters and filters are color coded for easier identification based on the type of hazard they are designed to provide protection against. Some commonly used examples are:

Organic Vapors - Black **Particulates - Purple**
Carbon Monoxide - Blue **Multi-Contaminant - Olive**
Acid Gases - White **Acid Gases & Organic Vapors - Yellow**

Powered Air-Purifying Respirator (PAPR)

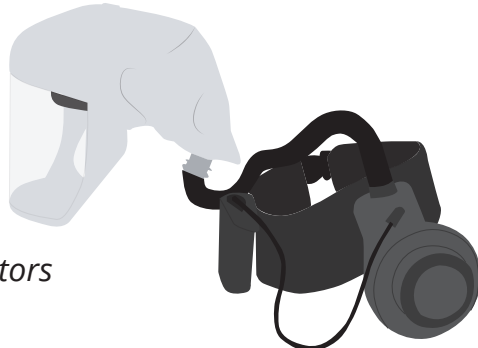
Assigned Protection Factor = 25-1,000

Advantages:

- ✓ Lightweight and portable
- ✓ Offers good protection from a wide variety of airborne contaminants
- ✓ Positive pressure makes breathing easier than other particulate respirators

Limitations:

- ✗ Does not protect against all hazards, protection depends on the filter/cartridge used
- ✗ Relies on a charged battery at all times



Atmosphere-Supplying Respirators

Provide the wearer with clean air from either a portable cylinder or remote source such as a compressor. These are used in environments with high levels of contamination.

Supplied-Air or Airline Respirator

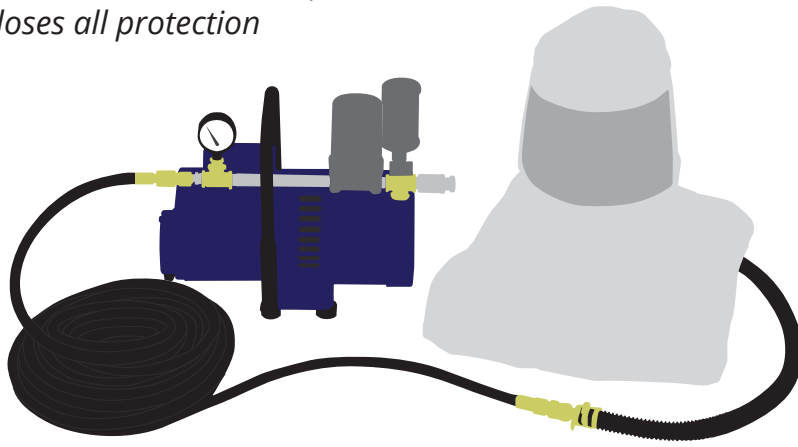
Assigned Protection Factor = 1-1,000

Advantages:

- ✓ Can be used for extended periods of time
- ✓ Provide a high level of protection in hazardous environments
- ✓ Lightweight, low bulk and low operating costs

Limitations:

- ✗ Hoses may get tangled or crimped
- ✗ If a problem occurs with the airline, the wearer loses all protection



Self-Contained Breathing Apparatus (SCBA)

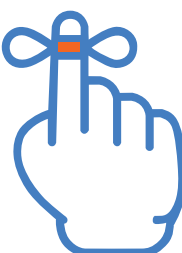
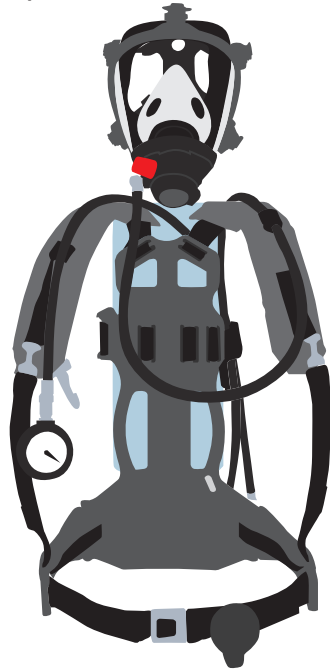
Assigned Protection Factor = 10-10,000

Advantages:

- ✓ Free range of motion while working
- ✓ Highest level of protection against all airborne contaminants
- ✓ Can be used in IDLH environments

Limitations:

- ✗ Heavy and bulky, often requiring the wearer to carry and extra 20 -30 lbs
- ✗ Expensive to purchase and maintain
- ✗ Facial hair and other factors can affect respirator fit



Don't Forget:

Offer employees a number of different respirator models and sizes so they are able to find a respirator that **fits properly** and is as comfortable as possible.

Things such as **facial hair**, **earrings**, **long side burns** and **dentures** can affect the fit of a respirator with a tight-fitting facepiece. If the fit is affected, so is the protection.



All respirators and respirator parts **must be certified** by the National Institute for Occupational Safety and Health (NIOSH).



Accessories are also available for some facepieces such as: nose cups to reduce lens fogging, lens covers to protect from paint and scratches, or spectacle kits for employees who wear corrective lenses.

Fit Testing

In order for a respirator with a **tight-fitting facepiece** to provide protection, it must properly fit the wearer. This means it must be able to create a proper seal between the wearer's face and the facepiece. To be sure this fit is achieved you must fit test all employees that will be required to wear a respirator with a tight-fitting facepiece **before** they enter a hazardous environment.

QLFT

Qualitative Fit Testing

A non-numeric pass/fail test that relies on the wearer's response to a substance, or test agent, used to determine fit.

QNFT

Quantitative Fit Testing

A method that provides a numeric assessment of how well a respirator fits by using probes or other measuring devices inside and outside the respirator.



Fastenal Safety Specialists

Looking for help selecting the proper respirator for your workplace? Contact our safety specialists for help today by emailing: safetyquestions@fastenal.com

Safety Product Expertise

Respirator Fit Testing

Cost Savings Ideas