

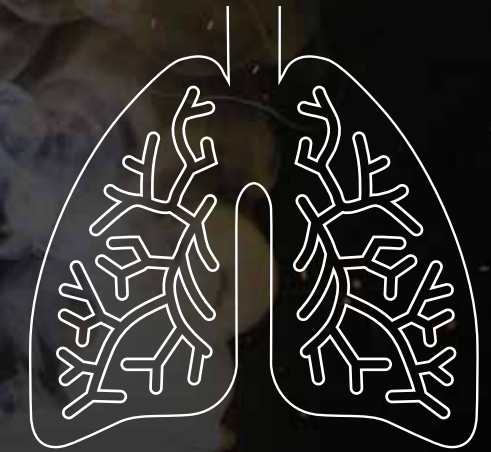
# Your respiratory system

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## Health effects of welding fumes

The respiratory hazards of metalworking are real. Welding fumes swirling around in your work environment can potentially result in health-related issues. Some exposure limits for welding fumes are set by regulations, and others are advisory. These limits aren't always the same.



### When good enough isn't enough...

To help reduce the risk of adverse health effects caused by exposures to airborne materials such as manganese, the United States Occupational Safety and Health Administration (OSHA) has established permissible exposure limits (PELs) which are law. In addition, the American Conference of Governmental Industrial Hygienists (ACGIH) sets threshold limit values (TLVs) which are airborne exposure limit guidelines.

### PEL 5.0 mg/m<sup>3</sup>

Current Federal OSHA PEL for manganese compounds, including manganese fume, is 5 milligram per cubic meter of air.<sup>1)</sup>

### TLV 0.02 mg/m<sup>3</sup>

Since 2013 ACGIH Threshold Limit Value for Manganese exposure is 0.02 milligram per cubic meter of air.<sup>1)</sup>



<sup>1)</sup> This is a graphical illustration constructed by 3M for the estimated annual dose. The illustration is based on certain important assumptions. Learn more at: [3M.com/resp/manganese](https://www.3m.com/resp/manganese).

# Reducing welding fumes & exposure

Welding creates a mixture of respirable gases and/or fumes (particles). To address these hazards and risks, it is best practice to use a hierarchy of controls. The idea is that the highest priority items on the hierarchy not only do the most to reduce

fumes and worker exposure, but that they also put the least burden of responsibility on the welder. However, every welding fume control has its limitations; here are some examples:

## 1

**Modify or substitute your welding process** to other processes that generate less fumes and/or reduce exposure to airborne contaminants.

**Control Limitations:** Substitutions may not be possible. For example, when the end-product requires stainless steel (chromium).

## 2

**Engineering controls** include actions such as modifying enclosures around the welder, or the general ventilation of the workshop, or local exhaust controls.

**Control Limitations:** Ventilation can be difficult to achieve due to conflicting needs, for instance heating/cooling or shielding gases.

## 3

**Work practices** include having the welder keep their head out of the plume.

**Control Limitations:** Space-restricted workpieces or the welding situation may not allow alternative placement of the welder's head.

## 4

**Personal respiratory protection.** If steps 1 through 3 do not eliminate the respiratory hazards, respiratory protection for the welder can provide protection and comfort.

**Control Limitations:** Companies must establish a respiratory protection program in accordance with 29 CFR 1910.134 that includes selection of respirators and their filters, training and maintenance.

## FACTS:

Inadequate respiratory protection is the 4th most frequently cited workplace violation.<sup>1)</sup>

# Which style of respirator best suits you?

The following is an overview of the four general types of 3M respiratory protection found in this catalog. In addition to your application's specific filtration requirements, your selection process

may include factors such as equipment style/configuration, personal preference/comfort, and maintenance considerations.

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## 3M™ Adflo™ Powered Air Respirator

- APF<sup>1)</sup> of up to 1000 based on headtop configuration.
- Can be used specifically for particle filtration (only), or for the filtration of both particulates and gases, depending on filter selection.
- Four welding helmet and three protective visor configurations to pick from.
- Provides a constant nominal airflow rate of 205 lpm.
- The respirator's slim turbo design allows highly mobile use.

Read more on page 52



## 3M™ Speedglas™ Fresh-air III Supplied Air Regulators

- APF<sup>1)</sup> of up to 1000 based on headtop configuration.
- Can be used to protect against substances including particle or gas/vapor.
- Four welding helmet and three protective visor configurations to pick from.
- Belt-mounted regulator with user control over airflow: from 170 lpm to 424 lpm.
- Requires Grade D breathable air, filter and regulator panel, and approved 3M supplied air hoses.

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## 3M™ Reusable Respirators

- APF<sup>1)</sup> for half facepiece reusable respirators is 10.
- Helps provide respiratory protection against a variety of gases, vapors, and particulate hazards when used with 3M cartridges and filters according to NIOSH approvals.
- Available resilient silicone faceseal styles provide comfort, durability, and stability
- Low profile designs enable fit under all 3M™ Speedglas™ Welding Helmet Series 9100.

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## 3M™ Disposable Welding Respirators

- APF<sup>1)</sup> 10.
- Lightweight and comfortable.
- No maintenance—disposable.
- Fits under virtually any welding helmet.
- Adjustable noseclips to help provide a custom seal.