

Know your hazard: Manganese

What is manganese?

Manganese is a grey-white metal, widely used in metal alloys, particularly in steel and aluminium.

It is used to enhance hardness and durability in steel and helps resist galvanic corrosion in aluminium alloys.

Manganese makes up for:

Up to
1.5%
Aluminium alloy



Up to
2.5%
Steel alloy



Welding
rods
and filler



Insight: Manganese oxide is used in many welding consumables.

Where is manganese used?

Manganese is utilised in metal production, metal fabrication and related applications, such as:



Mining, smelting,
and refining



Production of alloys,
melting and foundry
operations




Welding, grinding,
and polishing of
aluminum, steel and
manganese alloys




Production of
ferromagnetic alloys

Sources of exposure to manganese


Workers are exposed to manganese during the production and processing of its alloys. They can be affected by:



Inhaling dust and fumes from the production and working of elemental manganese and alloys.



Handling or application of powdered or liquid chemicals which contain manganese.




Inhaling metal particles and metal oxides created during “hot work” processes**.


Harmful effects of manganese

Exposure to manganese in the workplace can occur through inhalation, dermal contact, and ingestion. The health effects may vary from acute to chronic:

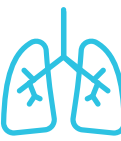
Irritation in:



Nose




Throat




Respiratory tract


Chronic exposure* can cause:



Male fertility issues




Central nervous system damage, commonly known as “Manganism”




Pneumonitis

How can one protect against it?


In order to reduce exposure and risks to workers, you can:



Contact risk assessment to compare exposure levels with Malaysia OSHA Permissible Exposure Limit (PEL).















Implement engineering controls such as local exhaust ventilation (LEV).




Get Respiratory Protective Equipment (RPE).

What RPE does 3M recommend for protection against manganese?

3M has a range of RPE that can help reduce your exposure to dusts, mists, metal fume, as well as gases and vapours commonly encountered in metal production and fabrication.

Type of Respirators	Recommended 3M Respiratory Protective Equipment***	
 Powered Air Respirator	<div><div>3M™ Versaflo™ Heavy Industry PAPR Kit, TR-600E-HIK</div></div> <div>+</div> <div><div>3M™ Versaflo™ Particulate Filter, TR-6710E for TR-600 PAPR</div></div> <div>OR</div> <div><div>3M™ Versaflo™ ABE2K1HgP Filter TR-6580E for TR-600 PAPR</div></div>	
 Supplied Air Respirator	 <div>3M™ Versaflo™ Vortex Cooling Assembly V-100</div>	
 Reusable Respirator	<div><div>3M™ Secure Click™ Full Facepiece Reusable Respirator FF-800 or Half Facepiece HF-800 Series</div></div>	<div><div>3M™ Secure Click™ Particulate Filter D3138, P3 R, with Nuisance Level Organic Vapour/Acid Gas Relief and Ozone</div></div>
 Disposable Respirator	 <div>3M™ Particulate Respirator 8511, N95</div>	 <div>3M™ Particulate Respirator for Welding 8515, N95</div>


*Early-stage symptoms of chronic exposure to manganese range from sleepiness and weakness to mood swings, while late-stage symptoms manifest as slowed speech, tremors, and motor control issues. **Hot work processes include cutting, grinding, and even polishing metals, which can create particles of metal and metal oxides that can be inhaled. ***This is only recommendation for minimum PPE required. Each work application must be evaluated by a competent person as required by local law and regulation for the hazard and risk before selection of right PPE. Workplace rules and regulations must take precedent, if more stringent.



REQUEST A DEMO
To know which respiratory protection is best suited for your work environment, scan the QR code.



READ MORE
For more information on the hazard and product disclaimers, scan the QR code for the technical bulletin.



EXPLORE MORE
To discover variety of respiratory protection equipment from 3M, for your workers, scan the QR code.