



Find health and safety solutions for manganese hazards in construction.

Airborne particles may present invisible hazards for construction workers involved in:



Welding



Grinding



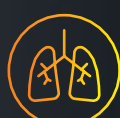
Cutting



Polishing



These processes may create metal fumes and hazardous particles that contain **manganese** – an element with the potential to **damage the lungs and central nervous system** if workers are unprotected.



While manganese is a useful material in welding application which adds durability to steel, **uncontrolled exposure to this hazardous substance can cause adverse health effect**. Even when local ventilation or works practices are implemented, the use of appropriate Respiratory Protective Equipment (RPE) may be necessary to further reduce exposure to manganese dust.

Understand manganese exposure limits.

Manganese, a naturally occurring metal, is often used with steel to improve hardness and durability. Workers typically interact with manganese when using welding rods or filler metals. This type of metal can lead to harmful health effects during welding. When it's heated, it reacts with oxygen in the air and creates manganese oxide fumes – a dangerous compound that poses a real hazard to workers if too much is inhaled.

Cutting, welding, grinding and polishing metal containing manganese can all lead to potential manganese exposures. Over long periods of time, overexposure to this metal can lead to serious health concerns. In 2017, manganese had been assigned an occupational exposure limit of 0.2 mg/m³ (for total inhalable dust) and 0.05mg/m³ (for respirable dust) in accordance with the European Council Directive 2017/164/EU based on 8 hour time weighted average. This is a significant change as much of the manganese in the welding fume is respirable.

Help reduce manganese exposure levels and demonstrate your commitment to worker health and safety with proven respiratory PPE solutions.

When heated, manganese reacts with oxygen in the air to produce manganese oxide fume which can lead to adverse health effects. In order to protect the worker's health, more stringent occupational exposure limit values were introduced in the European Council Directive 2017/164/EU. A study published by the British Occupational Hygiene Society (BOHS) suggests that exposure to even low level of manganese can damage the nervous system.¹



This is a graphical illustration constructed by 3M for the estimated annual dose. The illustration is based on certain important assumptions. Learn more at: <http://go.3M.com/welding-safety-centre>.

¹<https://breathefreely.org.uk/guidance-on-exposure-to-manganese-hazards-and-controls/>

Not all respirators provide the same amount of protection.

Use the guide below to help determine what respirator options are right for your work environment.

Assigned Protection Factor (APF)	20	40	40
	Suggested Respiratory PPE Options to Consider		
	Use in combination with welding shield or face protection (grinding)	Respiratory and face protection (grinding)	Respiratory and face protection (welding and grinding)
<p>Assigned Protection Factor:</p> <p>This is the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection programme.</p> <p>For further information see HSE document HSG53</p>	<p>3M™ Aura™ Particulate Respirator, FFP3, Valved, 9332+Gen3</p>	<p>3M™ Reusable Full Face Mask 6000 Series</p>	<p>Welding & Grinding: 3M™ Speedglas™ Welding Helmet 9100 MP</p>
	<p>3M™ Reusable Half Mask 6500QL Series</p>	<p>Pair with 3M™ Particulate Filter 2135_P3 or 3M™ Particulate Filters 6035_P3</p>	<p>Welding & Grinding: 3M™ Speedglas™ Heavy Duty Welding Helmet G5-01 G5-01</p>
	<p>3M™ Secure Click™ Reusable Half Mask HF-800 Series</p>	<p>3M™ Versaflor™ M-Series Helmet with flame resistant faceseal M-307</p>	<p>When used as part of an approved PAPR.</p> <p>3M™ Versaflor™ Powered Air Turbo Starter Kit TR-315+</p>
<p>3M™ Half and Full Facepiece respirators can be combined with a variety of particulate filters with optional nuisance level acid gas and organic vapor relief. Please visit www.3M.com to find options.</p>	<p>Pair 6500QL with 3M™ P3 Particulate Filter 2135 or 6035.</p> <p>Pair HF-800 with 3M™ P3 Particulate Filter D3135 or D9035.</p>		



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Always read and follow all User Instructions.

Certain 3M Hearing protection, communication solutions and other accessories can be used with some solutions above - please reach out to your 3M contact for further information.