

Welding Fumes

Do you know the risks?

Welding fumes pose significant health risks to welders and others in the vicinity. The workplace exposure standard (WES) for welding fumes has been reduced by Safe Work Australia from 5 mg/m³ to 1 mg/m³. All workers must not be exposed to levels of welding fumes greater than 1 mg/m³ over an eight-hour working day, based on a five-day working week. (Source: <https://www.safeworkaustralia.gov.au/safety-topic/hazards/welding-fumes>)

Here are some of the key health issues associated with welding fumes:

1. **Respiratory Issues:** Inhaling welding fumes can lead to acute and chronic respiratory problems such as bronchitis, pneumonia, and asthma. This is primarily due to the fine particulate matter and gases present in welding fumes.
2. **Metal Fume Fever:** This is a specific condition caused by inhaling metal fumes, particularly from zinc, magnesium, and copper. Symptoms include fever, chills, muscle aches, and shortness of breath, resembling flu-like symptoms.
3. **Long-term Lung Damage:** Prolonged exposure to welding fumes can lead to serious lung diseases such as lung cancer, pneumoconiosis (including siderosis and silicosis), and chronic obstructive pulmonary disease (COPD).
4. **Neurological Effects:** Some welding fumes contain manganese, which can accumulate in the brain and cause neurological symptoms resembling Parkinson's disease. This condition is known as manganism.
5. **Eye and Skin Irritation:** Welding fumes can irritate the eyes and skin, leading to discomfort, redness, and in some cases, dermatitis.
6. **Reproductive Effects:** There is evidence suggesting that welding fumes may have adverse effects on reproductive health, including reduced fertility and potential risks to the developing foetus.

To mitigate these risks, it's crucial for welders and employers to implement proper safety measures such as adequate ventilation, using respirators (where necessary), employing fume extraction systems, and ensuring regular medical monitoring of workers exposed to welding fumes. Training on safe welding practices and awareness of the potential hazards are also essential for minimizing health risks associated with welding fumes.

Welding fumes contain substances that are carcinogenic, meaning they have the potential to cause cancer. Some of the metals and compounds found in welding fumes that are known to be carcinogenic include:

1. **Hexavalent Chromium:** Often found in stainless steel welding fumes, hexavalent chromium is a known human carcinogen associated with lung cancer.
2. **Nickel:** Found in stainless steel and other alloys, nickel and its compounds are classified as human carcinogens, particularly associated with lung and nasal cancer.
3. **Arsenic:** Present in some welding rods and associated with lung cancer.
4. **Beryllium:** Found in certain alloys and can cause lung cancer and chronic beryllium disease, a debilitating lung condition.
5. **Cadmium:** Found in some welding rods and fumes, cadmium is a known carcinogen associated with lung cancer.
6. **Polycyclic Aromatic Hydrocarbons (PAHs):** These are formed during welding processes involving carbon-containing materials and can be carcinogenic.
7. **Lead:** Although less common in modern welding processes, lead exposure from certain applications can still occur and lead is a known carcinogen.

The International Agency for Research on Cancer (IARC), a specialized cancer agency of the World Health Organization (WHO), has classified several welding fume components as Group 1 carcinogens (carcinogenic to humans) or Group 2A (probably carcinogenic to humans).

Due to these carcinogenic risks, it is critical for welders and employers to implement stringent safety measures to reduce exposure, such as adequate ventilation, use of personal protective equipment (PPE) like respirators, and substitution of less hazardous materials or processes where feasible. Regular monitoring and health surveillance of workers exposed to welding fumes are also essential to mitigate long-term health risks, including cancer.

Innovent Engineering can provide engineered solutions to assist in keeping your valued employees safe from harm. For further information, please visit our website or contact Brian Hooker at (bhooker@innoventeng.com or 0498 317 585) or David Higgins at (dhiggins@innoventeng.com or 0476 493 160).