

## WELDING – BEST PRACTICES

### Why Welding Safety Is So Important

- The International Agency for Research on Cancer has classified all welding fume as a substance that may cause cancer.
- Workers exposed to welding fume and other welding hazards are at risk of serious injury or illness.
- There is no known safe level of exposure to welding fume.
- Effective control measures are critical for managing the risks presented by welding or work related to welding.

As welding presents many potential hazards, it's crucial for welders to practice safety by taking the following steps:

- Analysing surroundings
- Using tools and equipment in the way they are intended
- Following all manufacturer guidelines
- Ensuring others are not in harm's way while working



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### Hazards to Avoid

- Electrocutation
- Exposure to Fumes and Gases
  - Welding fumes contain a variety of potentially harmful metals, including aluminium, beryllium, arsenic, manganese and lead.
  - These fumes and gases, this can lead to serious health problems such as impaired speech and movement, respiratory illness and even cancer.
- Physical Injuries
  - Welders can get eye damage, cuts, burns or even crushed fingers and toes.
- Fire and Explosions
  - A welding arc produces extreme temperatures and can spark fire and explosion hazards if safety procedures are not followed. While the arc itself can reach temperatures up to 10,000 degrees Fahrenheit, the most common cause of fire is when sparks and spatter come in contact with flammable materials around the work area



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### Illnesses Caused By Welding Fume Exposure

- The carcinogenic particles can be suspended in the air for long periods of time.
- Inhalation of these particles can cause them to penetrate deep into the lungs, potentially reaching the bloodstream.
- Welders are at higher risk to lung infections, throat and lung irritation and may also experience flu like symptoms after welding (metal fume fever which is usually linked to welding on galvanized metals, as well as mild steel).
- Stainless steel welding can potentially generate hexavalent chromium, that when inhaled, acts as a carcinogen, as well as chromium oxide and nickel oxide, both of which are causes of asthma.
- Most forms of welding fume contain iron, and when inhaled, can cause siderosis (the deposition of iron oxides in lung tissue).



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### Local exhaust ventilation (LEV) as a control measure

- LEV is an engineering control that captures hazardous fumes and removes them from the workplace.
- The hood captures the fumes at the source. To be effective:
  - The hood should be positioned as close as possible to the source, ideally less than one hood diameter away
  - The welding area should be enclosed as much as possible to avoid drafts that will blow the fumes away from the hood and/or further into the workplace
  - Ensure the hood is the right design for the process and type of fumes
  - Install an airflow indicator such as a manometer to check that the LEV is working properly – the welder must not be positioned between the fumes and the hood.
- There are several types of capturing hood used for welding processes: on-tool, moveable capturing hood fixed capturing hood and extracted workbench.

### Key points to remember

1. Conduct a thorough risk assessment.
2. Engage a professional to help you select and install the right LEV system.
3. Train workers on how to use and check the LEV system.
4. Get advice on exposure and health monitoring requirements from an occupational health professional.



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### Wear the Right PPE

*PPE is generally considered the last resort when protecting workers from harm*

Here's a quick look at the types of PPE welders should wear:

- **Ear protection**
  - If readings of noise average above 85 dB for eight continuous hours, you are required to use hearing protection at all times.
- **Eye and face protection**
  - This includes safety glasses, face shields and depending on the project, helmets. Correct filters need to be used.
- **Heat and radiation protection**
  - In order to protect themselves from heat and radiation, welders must wear flame-resistant outerwear, gloves to protect hands and lower parts of the arms, and welding hoods and goggles.
- **Fume protection**
  - Fume extraction systems and respirators can help to protect welders from exposure to harmful fumes.
- **Electrical shock protection**
  - In addition to taking the safety precautions in welding welders must wear insulated clothing to protect themselves from electrocution.
- **Foot protection**
  - Leather shoes that are spark and heat resistant with coverage above the ankle are best for foot protection. Pant legs should go over the shoes.

