Welding Fumes Meeting Kit

BASICS OF WELDING

Welding processes are classified into two groups: fusion welding, which is heat alone, and pressure welding, which uses heat and pressure. Fusion welding involves three types: electric arc, gas, and thermit.

Welding masks may protect the eyes and face from flashes and sparks, but they do not guard against toxic fumes. Welding produces a chemical reaction as heat and flame melt materials together. This reaction produces harmful gases and other fumes that rise into the air. Without proper controls, fumes surround the welder, get inside the mask, and right into his/her breathing space. Workers could develop cancer, lung damage, or different breathing ailments if overexposed to welding fumes.

WHAT ARE WELDING FUMES

Welding fumes are a complex mixture of metallic oxides, silicates, and fluorides. Fumes are formed when a metal is heated above its boiling point and its vapours condense into very fine, particles (solid particulates). Welding fumes generally contain particles from the electrode and the material being welded.

WELDING GASES HAZARDS

- asphyxiation (lack of oxygen)
- fire or explosion
- toxicity

DANGERS TO WORKERS

Welding fumes are made of many different metallic components. Each fume will be different depending on the material being welded, the electrode, and the type of welding. The airborne gases and fumes produced or present during welding can include:

- Nitrous oxide
- Carbon dioxide
- Carbon monoxide
- Shielding gases like argon or helium
- Ozone
- Metal fumes such as manganese and chromium

HOW WORKERS ARE EXPOSED

Welding gases and fumes pose a serious threat to anyone who inhales them. Every welding project emits a different combination of gases. The fumes can cause occupational asthma and damage the nervous system. Keeping your head out of the plume while welding is one of the best ways workers can protect themselves from harmful exposure.

Only work in areas with proper ventilation. A local exhaust system pulls fumes away from the welder's breathing zone. Devices like a fume hood or vacuum nozzle positioned right next to the work that is being done produce the best results.

If local exhaust systems are not available, general ventilation—natural or forced movement of air—can reduce the exposure to fumes in the work area. Failing these two options, workers must wear respirators.

HOW EMPLOYEES CONTROL WELDING FUMES

Before firing up the welding torch, clean all surfaces. This helps remove any coatings or substances that could produce additional toxic exposures. Other steps for employees include:

- Whenever possible, use a local exhaust system.
- Know how general ventilation works, its limitations, and how to use it correctly.
- Know where to find respirators if local exhaust and general ventilation are not available.
- Workers should position themselves in such a way to keep fumes out of their breathing space. An outdoor worker should stand upwind of the fumes, so they move away from him or

her. An indoor worker should stand on the opposite side of where the smoke is moving.

IMPORTANT TIPS FOR WELDERS

- Thoroughly understand the hazards associated with welding.
- Clean welding surfaces regularly to remove coatings that could potentially result in toxic exposure levels.
- Stay upwind of welding fumes when working in open or outdoor areas. Be aware, however, that working outdoors or in open work environments does not guarantee safe ventilation.
- Use local exhaust ventilation systems for indoor welding. Be sure to keep exhaust ports away from other workers.
- Never weld in a confined space that does not have ventilation.
- Wear respiratory protection if ventilation and work practices do not adequately reduce welding fume exposure to safe levels.
- Work practices of welder (e.g., remove coatings, clean surfaces, stay upwind when welding in open or outdoor.

FINAL WORD

Welding fumes are often underrated. While everyone is strictly told about not watching the welding light with bare eyes, safety from welding fumes is hardly addressed. Perhaps because the fumes look harmless or just the lack of options to control these fumes, the result in most cases is welding fumes are just left out open in the air.