Welding, Cutting, & Brazing: Ventilation

5-Minute Talk

Overview

Welders can be exposed to a number of fumes, gases, and dusts. These contaminants can harm the health of your workers and/or accumulate to the point of causing a fire. Fortunately, ventilation can help to reduce the concentration of these contaminants. Welding ventilation techniques vary. Often, however, a relatively simple ventilation method like the appropriate use of fans will be all that is required to provide good ventilation during welding operations. OSHA's 29 CFR 1910.252(c) specifies that if mechanical ventilation is used, it must consist of either of these:

Ventilation method:	Requirements:	Used for welding/cutting/heating involving:
General mechanical ventilation system	Requires sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits defined in §1910.252(c).	1.Enclosed spaces and: • Zinc-bearing base or filler metals or metals coated with zinc-bearing materials. • Lead base metals. • Cadmium-bearing filler materials. • Chromium-bearing metals or metals coated with chromium-bearing materials. • Confined spaces, unless metals listed in number 2 of local exhaust systems below are involved.

Ventilation method:	Requirements:	Used for welding/cutting/heating involving:
Local exhaust system	Requires a freely movable hood intended to be placed by the welder or burner as close as practical to the work. It must be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits defined by §1910.252(c).	1. Enclosed spaces in number 1 above. 2. Enclosed spaces and: • Metals containing lead, other than as an impurity, or metals coated with lead- bearing materials. • Metals coated with mercury-bearing metals. • Cadmium-bearing or cadmium-coated base metals. • Beryllium-containing base or filler metals. Both local exhaust ventilation and an air line respirator are required. 3. Inert-gas metal-arc welding on stainless steel. 4. Confined spaces.

Employee Training

Training Tips

Contaminated air exhausted from the working space must be discharged into open air or otherwise clear of the source of intake air. All air replacing the withdrawn air must be clean and respirable.

Oxygen must not be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.

In addition to ventilation, specific respirators are required by the rule for confined space, enclosed space, and open air welding, cutting, or heating work. Also, means (i.e., lifeline) of quickly removing confined space welders, cutters, or heaters are required in case of an emergency. Be sure to protect employees exposed to the same atmosphere as the welders or burners in the same manner as the welder or burner.

You must provide hazard communication training for the materials which produce air emissions and fumes, and areas of such exposure. According to §1910.146(g), training is also required for those employees who enter into confined or enclosed spaces. They must be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required.

Train welders so they can:

- Use and maintain any required air line respirators, filter-type respirators, filter lens goggles and other eye protection, welding helmets, and hand shields.
- Be an attendant for a confined space and maintain communication, know and implement the pre-planned rescue procedure, and use rescue equipment.
- Properly use the appropriate ventilation system for the job.

Present examples of personal protective equipment (PPE) used at the site.

Where To Go For More Information

1910.252 — General Requirements 1910.146 — Permit-required confined spaces