

WELDING – SAFE PRACTICE

Welding Accidents result in electrocution, eye injury, respiratory disease and severe burns.

Welding is also one of the most dangerous occupations because of the likelihood of workplace injury from burns, toxic fumes and electricity. According to the Occupational Safety and Health Administration (OSHA), welding, cutting, and brazing pose safety and health risks to over 500,000 American workers in a wide variety of industries.



Burn from weld splatter

Each year, several deaths from welding and cutting incidents are reported, including deaths related to explosions, electrocutions, asphyxiation, and fall injuries. The occurrence of eye-related traumas leads all occupational injuries in the American workplace, many of which are due to welding accidents. Other than eye injuries, the health hazards associated with welding accidents include burns, brain damage and respiratory illnesses like pulmonary fibrosis from exposure to fumes, gases and ionizing radiation.

Recent studies have shown that toxic chemicals released from welding rods put welders at risk for serious conditions like manganism, or Welders' Parkinson's disease.

Industries with Most Welding Accidents & Injuries

- Construction
- Mining
- Railways
- Oil & Gas operations
- Shipbuilding

Common Sustained Welding Injuries

- **Electric Shock:** this is one of the most common welding accidents welders face, typically caused when two metal parts that have a voltage touch, or by secondary voltage shock where a welder touches part of the welding or electrical circuit while his body touches a part of the metal he is welding.
- **Hearing loss:** Welders can be exposed to excessive noise—above 85 decibels on average throughout a workday without proper ear protection can result in permanent hearing loss.
- **Respiratory Illness:** Due to a likely exposure to toxic metal welding fumes and gases, including harmful metal oxide compounds, base metals, base coatings, beryllium, and manganese, toxins may accumulate in the lungs and lead to a range of adverse effects and long-term conditions like pulmonary fibrosis.
- **Chemical, Electrical & Contact Burns:** Because of the high heat of a welding arc and the hazardous fumes, gases, and chemicals welders work with, they face a serious risk of being injured in a fire or explosion. Welders are exposed to extremely hot materials.
- **Optical hazards:** Eye injuries make up around a quarter of all welding injuries, and can be serious permanent injuries that result from welding sparks, chemical vapors, and “arc eye,” ultraviolet and infrared radiation from the welding electrical arc. “Welder’s flash,” a burn to the eyes accounts for a great deal of construction eye injuries. Arc radiation can penetrate the retina and cause permanent retinal damage, including cataracts, diminished vision, and higher sensitivity to light.
- **Manganism (Welders’ Parkinson’s Disease):** the manganese in welding rods can destroy brain cells and cause nerve damage. Welding releases toxic manganese molecules which can be inhaled and deeply affect the nervous system. Exposure to manganese may reduce dopamine levels—dopamine being neurotransmitter

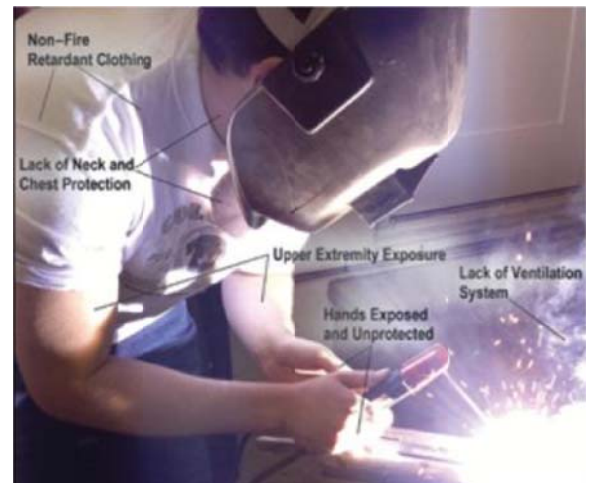


Welder’s dog is blinded

responsible for normal motor function. Patients with manganism exhibit problems with balance, stiffness, and a difficulty moving face muscles. Welders can experience short-term memory loss, slurred speech, sleep disorders, and impaired judgment.

Welding Safety & Accident Prevention

In any welding situation, it is a manager's responsibility to explain workplace hazards to welders and to make sure that at least the minimum safety standards and OSHA welding regulations are met to prevent welding accidents and injuries. Secondary injures often occur as lightheadedness due to inhalation of fumes leads to a risk of falling, and other injuries are linked to excessive fatigue because of overworking.



Common risk factors of welding accidents include poor work conditions and practices, welding in confined spaces, long exposure periods, dangerous types of welding, and appropriate use of personal protective equipment. Welders are usually required to wear welding helmets and shields, safety goggles and protective clothing to guard against optical radiation to the eyes and skin.

Workplace Ventilation Risks and respiratory masks are required to protect welders from harmful fumes produced during the process. Radiation, however, may be reflected into welding helmets and penetrate from the tops and the sides, causing exposure even when preventive measures are taken.

CALIFORNIA FIRE CODE —DEFINITIONS

HOT WORK. Operations including cutting, welding, Thermite welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar activity.

HOT WORK AREA. The area exposed to sparks, hot slag, radiant heat, or convective heat as a result of the hot work.

HOT WORK EQUIPMENT. Electric or gas welding or cutting equipment used for hot work.

HOT WORK PERMITS. Permits issued by the responsible person at the facility under the hot work permit program permitting welding or other hot work to be done in locations referred to in Section 3503.3 and pre-permitted by the fire code official.

HOT WORK PROGRAM. A permitted program, carried out by approved facilities-designated personnel, allowing them to oversee and issue permits for hot work conducted by their personnel or at their facility. The intent is to have trained, on-site, responsible personnel ensure that required hot work safety measures are taken to prevent fires and fire spread.

§6777. Hot Work Procedures and Permits

(e) Hot work permits.

Except for those operations identified in subsection (a)(2), a written and numbered hot work permit shall be completed, signed and issued by the employer or his authorized agent before a source of ignition is used. As part of this hot work permit issuance procedure, the employer shall verify that all of the required actions identified in subsection (b) have been completed before a hot work permit is issued.

