Arc Welding Safely

Welders shall follow safe welding practices. Employers shall provide safe working conditions and safety training.

As in most trades, welders are exposed to certain hazards. Hazards exist with all arc welding processes. Welding is safe when safe practices are followed.

This information is a brief outline of precautionary measures that will help avoid the hazards of arc welding. Read and understand the manufacturer’s instructions and your employer’s safe practices. Your Safety Director or Supervisor should be consulted when specific questions arise.

**WARNING:**

**PROTECT YOURSELF AND OTHERS.**

**READ AND UNDERSTAND THIS BOOKLET.**

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**FUMES AND GASES**

**CAN BE DANGEROUS TO YOUR HEALTH**

- **KEEP** your head out of the fumes.
- **DON’T** get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.
- **READ** and obey the warning label that appears on all containers of welding materials.

**USE ENOUGH VENTILATION** or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

**IN A LARGE ROOM OR OUTDOORS,** natural ventilation may be adequate if you keep your head out of the fumes. (See below.)

**USE NATURAL DRAFTS** or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

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**SOME VENTILATION SUGGESTIONS**

- **BE SURE** adequate ventilation is available when welding in confined areas or where there are barriers to air movement.
- **SMOKE EXTRACTOR** welding gun. For semiautomatic or automatic welding processes, equipment exists for exhausting the fumes at the arc.

**WEAR CORRECT EYE, EAR, AND BODY PROTECTION**

- **PROTECT** your eyes and face with welding helmet properly fitted and with proper grade of filter plate (see ANSI Z49.1).
- **PROTECT** your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather legging, and high boots.
- **PROTECT** others from spatter, flash, and glare with protective screens or barriers.

**IN SOME AREAS,** protection from noise may be appropriate.

**BE SURE** protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**

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**DO NOT TOUCH LIVE ELECTRICAL PARTS**

**ELECTRIC SHOCK CAN KILL**

- **BE SURE** you are insulated from live electrical parts.
- **BE SURE** equipment is adequate for the job.
- **BE SURE** equipment is installed according to prevailing codes.
- **BE SURE** damaged parts are repaired or replaced.
- **BE SURE** welding machine is properly grounded.
- **BE SURE** gloves have no holes.
- **BE SURE** to stay dry; do not weld when you are wet.
- **BE SURE** equipment is turned off when not in use.
- **DO NOT** use cables that are too small, damaged, or poorly spliced.
- **DO NOT** wrap cables around your body.

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**ADDITIONAL PRECAUTIONARY MEASURES**

- **PROTECT** compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.
- **BE SURE** cylinders are never grounded or part of an electrical circuit.
- **REMOVE** all potential fire hazards from welding area.
- **ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.**

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**COOPERATING FOR SAFETY**

Cooperation between management and employees is vital to the success of every company. By working together toward the common goal—**SAFETY IN WELDING**—everyone wins!

Welders and their supervisors should have adequate safety training.

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For further information refer to American National Standard Z49.1, "Safety in Welding and Cutting," available from the American Welding Society, P.O. Box 351040, Miami, FL 33125.

Other details are given in Title 29, Code of Federal Regulations, Section 1910 (Occupational Safety and Health Administration Document 2006), available from U.S. Department of Labor, Washington, DC 20210, and the booklet "T.L.V.s, Threshold Limit Values..." American Conference of Governmental Industrial Hygienists, P.O. Box 1937, Cincinnati, OH 45201.
WARNING

1. CALIFORNIA PROPOSITION 65

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The exhaust fumes from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the Welding Society.

P.O. Box 351040, Miami, Florida 33135 or CSA Standard W17.2-1974. A Free copy of "Arc Welding Safety" booklet 2E05 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1499.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

1a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1b. Operate engines in open, well-ventilated areas and avoid the engine exhaust fumes outdoors.

2a. Do not add the fuel near an open flame welding arc or when the engine is running. Shut off the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing and contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

1d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from moving parts while starting, operating or repairing engines.

1e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest caution when working near moving parts.

1f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

ELECTRIC AND MAGNETIC FIELDS may be dangerous


2b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2c. Exposure to EMF fields in welding may have other health effects which are not now known.

2d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit.

2d.1 Route the electrode and work cables together. Secure them with tape when possible.

2d.2 Never coil the electrode lead around your body.

2d.3 Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2d.4 Connect the work cable to the workspace as close as possible to the area being welded.

2d.5 Do not work next to welding power source.

2e. Smoke and fumes can be dangerous. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation in confined areas, to assure breathing air is safe.

2f. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. In case of a welder's health, contact your welding distributor or from the manufacturer.

5a. Shielding gases used for arc welding may contain oxygen or act as an oxidizing agent.

5b. Do not rely on exhaust fumes from welds to displace arc welding gases.

WELDING SPARKS can cause fire or explosion.

6a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot metal can ignite materials from welding. Do not let welding sparks contact wood, cloth, flammable, oily materials, dusts or vapors in small cracks and crevices.

6b. Where compressed gases are used to be at the job site, special precautions should be used to prevent hazardous situations. Refer to Safety in Welding & Cutting (ANSI Standard Z49.1) and the operating information for the equipment being used.

6c. When not welding, make certain no part of the electrode circuit is touching metal and that the welding equipment is turned off.

6d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to ensure that such procedures will not cause a fire or explosion.

6e. Place damaged insulation.

6f. Inert gas atmosphere or water quenching, the electrode, electrode reel, welding head, nozzle or semi-automatic welding gun are installed on the system, the explosion can cause an explosion even though they have been properly protected. Inert gas atmosphere, water quenching, inert gas atmosphere or water quenching, the electro- fuse and shrouds, high shrouds, high shroud or cap over your hair. Wear your cap over your hair. Wear your store, current conducted through the welding equipment, can cause fire or explosion.

6g. Do not over-heat, cut or weld tanks, drums or containers until the proper steps have been taken to ensure that such procedures will not cause a fire or explosion.

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CYLINDER May explode and/or damaged.

7a. Use only compressed gas cylinders containing makeup regulators or makeup regulators designed for the gas and pressure used. Make sure all cylinders are properly sized, and are safe to be used. Always check the cylinder valves, cylinder bodies, and all connections for any signs of wear or defects.

7b. Always keep cylinders in an upright position securely chained or secured to the ground or fixed support.

7c. Cylinders should be located:

7c.1. Away from areas where they may be struck or subjected to physical damage.

7c.2. A safe distance from arc welding or cutting operations and any other sources of heat, sparks, or flame.

7d. Never allow the electrode, electrode holder or other electrically "hot" parts to touch damaged gas, water or other materials.

7e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.


7h. Ground the equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8a. Turn OFF input power using the disconnect switch at the fuse box before working on any equipment.

8b. Install equipment in accordance with the U.S. National Electric Code, all local codes and the manufacturer's recommendations.

8c. Ground the equipment in accordance with the U.S. National Electric Code.