



INTRODUCTION

Electric shock from welding and cutting equipment can kill, cause severe burns, and cause serious injury if falling happens because of the shock. The electrode and work circuit are electrically energized when the output is on. The input power circuit and machine internal circuits are also electrically energized when the power is on. When wire welding, the wire, wire reel, drive rolls, and all other metal parts touching the wire are electrically energized.

HOW TO AVOID ELECTRIC SHOCKS

Use proper precautionary measures, recommended safe practices, and train personnel using welding and cutting equipment to avoid injuries, fatalities, and electrical accidents as follows:

- Read the instruction manual before installing, operating, or servicing the equipment.
- Have all installation, operation, maintenance, and repair work performed only by qualified people.
- Properly install and ground the equipment according to the instruction manual and national, state, and local codes.
- Do not touch live electrical parts.
- Wear dry, insulating gloves in good condition and protective clothing.
- Insulate yourself from the workpiece and ground by wearing rubber soled shoes or standing on a dry insulated mat or platform.
- Use fully insulated electrode holders. Never dip the holder in water to cool it or lay it on conductive surfaces or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.

- Do not use worn, damaged, undersized, or poorly spliced cables, welding gun cables, and torch cables. Make sure all connections are tight, clean, and dry.
- Do not wrap cables carrying welding current around your body.
- Ground workpiece if required by codes.
- If required, ground the workpiece to a good electrical earth ground. The work lead is not a ground lead. Use a separate connection to ground the workpiece to earth.
- Do not touch an energized electrode while you are in contact with the work circuit.
- In confined spaces or in electrically hazardous locations due to water or perspiration, do not use a welder with AC output unless it is equipped with a voltage reducer and remote output control. Use equipment with DC output.
- Wear a safety harness to prevent falling if working above floor level where there are no other protective measures such as railings, walls, guard fences, or the like.
- Turn off all equipment when not in use. Disconnect the power to equipment if it will be left unattended or out of service.
- Disconnect the input power or stop the engine before installing or servicing the equipment. Lock the input disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
- Use only well maintained equipment. Repair or replace damaged parts before further use.
- Keep all covers and panels securely in place.
- Follow lockout procedures as required by OSHA.

WEARERS OF PACEMAKERS

The technology of heart pacemakers and the extent to which these devices are affected by other electrical devices changes frequently. Have wearers of pacemakers or other electronic equipment vital to life check with the device manufacturer or their doctor to determine if any hazard exists when near welding or cutting operations. See Fact Sheet No. 16 for additional information about pacemakers and welding.

TREATMENT FOR ELECTRIC SHOCK

- Turn off the power.

- Use nonconducting material, such as wood, to pull the victim away from contact with live parts or wires.
- If the victim is not breathing, administer cardiopulmonary resuscitation (CPR) after breaking contact with the electrical source.
- Call a physician and continue CPR until breathing starts or until a physician arrives.
- Treat an electrical burn as a thermal burn by applying clean, cold (iced) compresses. Prevent contamination, and cover with a clean, dry dressing.

INFORMATION SOURCES

American National Standards Institute (ANSI). *Safety in Welding, Cutting, and Allied Processes*, Z49.1, available from American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

Occupational Safety and Health Administration (OSHA). *Code of Federal Regulations*, Title 29 Labor, Chapter XVII, Parts 1901.1 to 1910.1450, Order No. 869-019-00111-5, available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

National Fire Protection Association (ANSI/NFPA 70). *National Electrical Code*, available from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

National Fire Protection Association. *Cutting and Welding Processes*, NFPA Standard 51B, available from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Mine Safety and Health Administration (MSHA). *Code of Federal Regulations*, Title 30 Mineral Resources, Parts 1-199, available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 02402.

American Welding Society (AWS). *Safety and Health Fact Sheets*, available from American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.