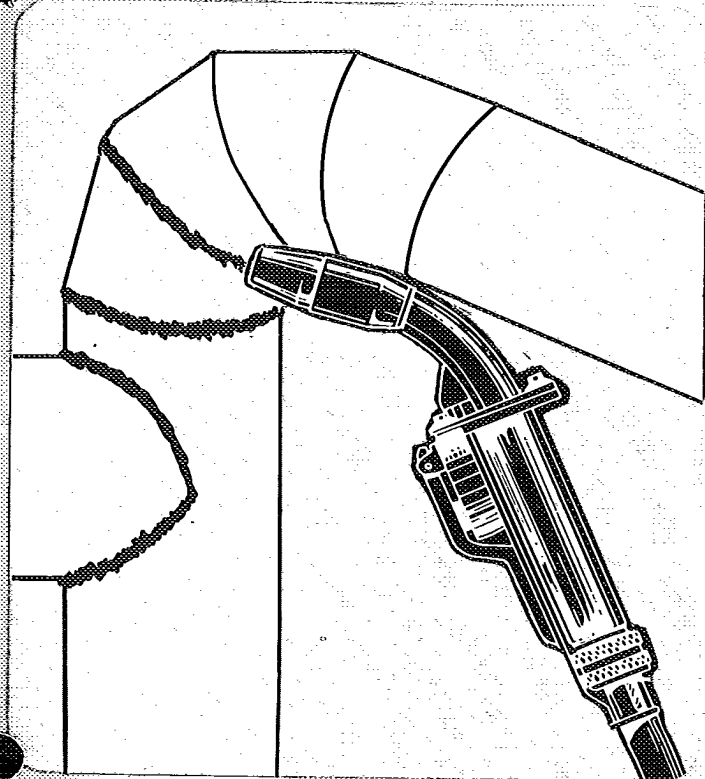
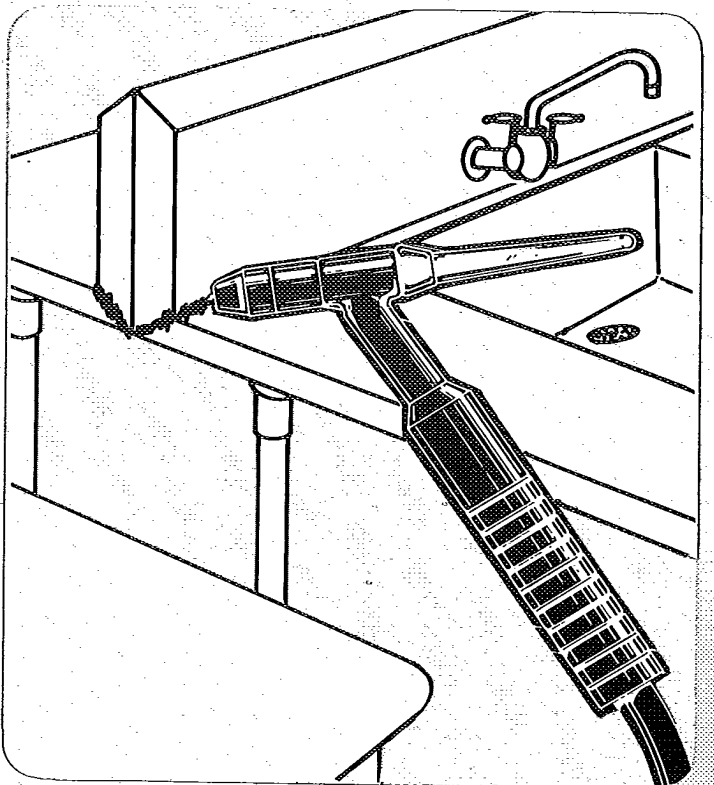
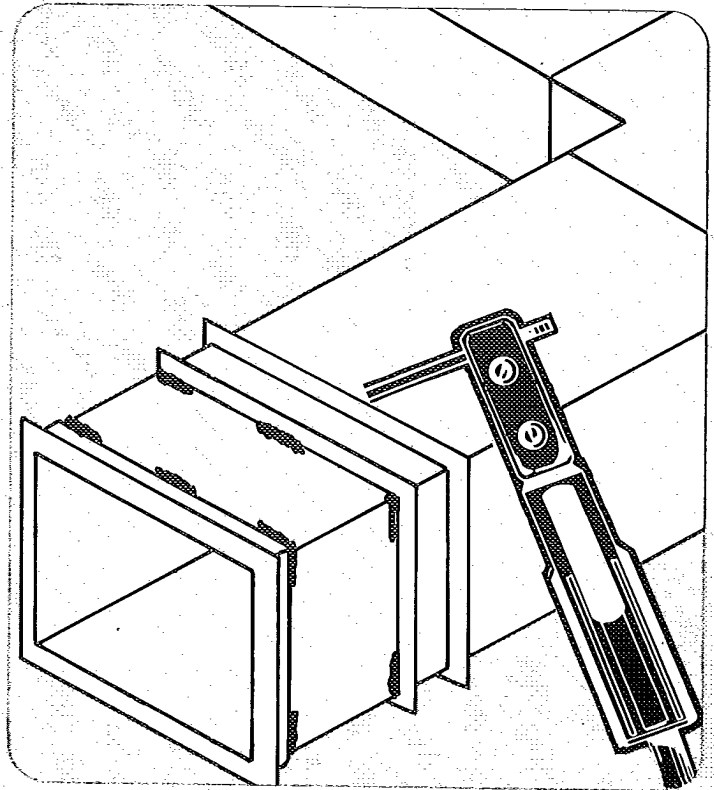


Sheet Metal Welding Code



American Welding Society

examination for evidence of fire. Remember that easily visible smoke or flame may not be present for some time after the fire has started.

Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

Do not weld or cut in atmospheres containing dangerously reactive or flammable gases, vapors, liquids, or dust. Do not apply heat to a container that has held an unknown substance or a combustible material whose contents when heated can produce flammable or explosive vapors. Heat should not be applied to a workpiece covered by an unknown substance or whose coating can produce flammable, toxic or reactive vapors when heated. Adequate procedures should be developed and proper equipment used to do the job safely. Provide adequate ventilation in work area to prevent accumulation of flammable gases, vapors or dusts. Clean and purge containers before applying heat.

Closed containers, including castings, should be vented before preheating, welding or cutting. Venting will prevent the buildup of pressure and possible explosion due to the heating and the resultant expansion of gases. See References 1, 3, 4, 10, and 11.

J1.6 Burn Protection. Molten metal, sparks, slag, and hot work surfaces are produced by the welding, cutting, and allied processes. These can cause burns if precautionary measures are not used.

Workers should wear protective clothing made of fire resistant material. Do not wear pant cuffs or have open pockets or other places on clothing that can catch and retain molten metal or sparks. Wear high top shoes or leather leggings and fire resistant gloves. Pant legs should be worn over the outside of high top boots. Use helmets or hand shields that provide protection for the face, neck, and ears, and wear a head covering to protect the head.

In addition, appropriate eye protection should be used. When welding overhead or in confined spaces, wear ear plugs to prevent weld spatter from entering the ear canal and goggles or equivalent to give added eye protection. Keep clothing free of grease and oil. Do not carry combustible materials in pockets. If any combustible substance has been spilled on clothing, change to clean fire resistant clothing before working with open arcs or flame.

Use aprons, cape-sleeves, leggings, and shoulder covers and bibs designed for welding service. Where usually heavy welding or cutting is involved, sheet metal shields

should be used for extra protection. Mechanization of highly hazardous processes or jobs should be considered.

Other personnel in the work area should be protected by the use of noncombustible screens or by the use of appropriate protection as described in the previous paragraph. Before leaving a work area, mark hot work pieces to alert other persons of this hazard. Do not attempt to repair or disconnect electrical equipment under load. Disconnecting under load produces arcing of the contacts and may cause burns and/or shocks. (Note: Burns can be caused by touching hot equipment such as electrode holders, tips and nozzles. Therefore, insulated gloves should be worn when these items are handled unless an adequate cooling period has been allowed before touching.) See References 1, 4, 8, and 9.

J1.7 Mechanical Hazards. The use of, or the proximity to, mechanical equipment can present hazards to the welder. A knowledge of the proper use of power tools, such as grinders, chippers, drills and various hand tools, is important to welder safety. Know and understand the safe limits and proper use of cranes, positioners, and other material handling equipment, and use the appropriate guards and personal protective equipment.

(1) Adhere to grinding wheel speed limitations. Don't grind on the side of a wheel not designed for such service. When starting a new wheel, stand to the side until it reaches speed and correct any abnormalities noted. Be sure guards are in place and used.

(2) Wear proper eye and hand protection. Use face shields, safety glasses and goggles as appropriate. Watch out for sharp objects, pinch points, and moving objects.

(3) Avoid wearing items that can be caught in machinery such as rings, necklaces, bracelets, long hair, loose clothing, etc.

(4) Use the right tool for the job. Keep a firm grip on tools to prevent their slipping away. Do not overload or force a tool beyond its expected capabilities. Foresee results of unexpected occurrences such as tools getting away, binding, or coming loose from their handles. Any tool that has become jammed or otherwise overstressed should be checked for damage before reuse. Anticipate the reactive force from tools. See References 1, 4, and 12.

J1.8 Tripping and Falling. Trips and falls are a frequent cause of occupational injury and can result in serious injury or death. Welding, cutting and heating can take place in a variety of locations. Therefore, welders are exposed to the same tripping and falling hazards as those in other occupations. Proper precautions should be observed. Be alert to the conditions in the work area. Good housekeeping is essential to minimize tripping and falling. Actions to prevent falls include the use of safety

belts and harnesses that are tied off, secured ladders, guardrails, proper scaffolding, and nets. Scaffolds and other climbing and elevating equipment must be installed and used properly. Do not carry items which obstruct your view. Proper protective wear, such as skid resistant soles on shoes, should be used when conditions warrant. Electrical equipment should be grounded and other precautions taken to prevent shock. Shock can cause a fall due to involuntary movements.

An alert, professional approach needs to be taken at all times. Do not tolerate horseplay, tossing tools to each other, bumping someone in a precarious position, or other distractions such as shouting when there is no reason to shout. All these acts can contribute to tripping and falling. See References 1 and 4.

J1.9 Confined Spaces. Welding, cutting and heating operations can take place in a variety of locations. Some of these locations may be considered "confined spaces" having characteristics such as:

- (1) limited space, entry or exit, or

- (2) unfavorable ventilation which could contain or trap hazardous air contaminants and/or prevent replenishment of safe breathing air, or both.

Typical confined spaces include small rooms, storage tanks, compartments of ships, process vessels, pits, silos, vats, degreasers, reactor vessels, boilers, ventilation and exhaust ducts, sewers, tunnels, underground utility vaults, and pipelines. They can also include even the unventilated corner of a room. Death and serious injury have resulted from welding operations in confined spaces due to fire, explosions, asphyxiation, and exposure to hazardous air contaminants.

- (1) Open all covers and secure them from closing.
- (2) Test the atmosphere of the confined space to assure
 - (a) The oxygen content is suitable for breathing.
 - (b) The atmosphere is not combustible or reactive.
 - (c) The atmosphere is not toxic.

For detailed precautions see References 4 and 13.

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17. Federal Standard No. 21-*Code of Federal Regulations*, 1020.40 Safety Requirements for Cabinet X-Ray.