

**GI Part 12. Welding and Cutting  
Compared With  
29 C.F.R. 1910 Subpart Q – Welding, Cutting, and Brazing**

**As of February 10, 2016**

**Summary:** The significant differences between GI Part 12. Welding and Cutting and 29 C.F.R. 1910 Subpart Q – Welding, Cutting, and Brazing are in:

- Employer and employee responsibilities
- Working in confined spaces
- Cylinder marking
- Cylinder storage
- General rules for cylinders
- Oxygen manifolding
- Manifolding piping material and assembly
- Hoses and connections
- Fire precautions
- Arc welding and cutting operation
- Nonportable spot and seam welding machines
- Portable welding guns

The comparisons show only those provisions where MIOSHA rules are different than OSHA or where MIOSHA rules are not included in 29 C.F.R.

\*\*\*\*means there is a comparable OSHA rule to this paragraph

MIOSHA	OSHA
<p><b>R 408.11211 Employer and employee responsibilities.</b>  <b>Rule 1211.</b> (1) An employer shall do all of the following:            (a) Give each employee training or a test before allowing him or her to use equipment for arc and gas welding and cutting.            (b) Provide face and eye protection and foot protection as prescribed in general industry safety standard Part 33 “Personal Protective Equipment,” as referenced in R 408.11202.            (c) Provide other personal protective clothing or equipment, such as gloves, aprons, hearing protection devices, respirators, lifelines, safety belts, and lanyards required to protect the employee from injury likely to be caused by the assigned task of welding and cutting. Except for long sleeve shirts required to protect the employee from ultraviolet rays to the arms and ankle length trousers, the personal protective clothing and equipment shall be provided without expense to the employee.            (d) Provide to an employee, at no expense to the employee, protective devices such as, but not limited to, curtains, safety glasses, or face shields to reduce the risk of flash burn, sparks, and foreign bodies to all employees in the area.            (e) Provide ventilation where necessary to protect an employee against toxic materials as prescribed by the Michigan Occupational Safety and Health Administration (MIOSHA) standards.</p>	<p><b>1910.252 General requirements</b>  <b>(a) Fire prevention and protection</b>  <b>(2) Special precautions</b>  <b>(xiii) Management.</b> Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:  <b>(A)</b> Based on fire potentials of plant facilities, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas.  <b>(B)</b> Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes.  <b>(C)</b> Insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process.  <b>(D)</b> Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.  <b>(xiv) Supervisor.</b> The Supervisor:  <b>(A)</b> Shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process.  <b>(B)</b> Shall determine the combustible materials and hazardous areas present or likely to be present in the work location.  <b>(C)</b> Shall protect combustibles from ignition by the following:  <b>(1)</b> Have the work moved to a location free from dangerous combustibles.</p>

MIOSHA	OSHA
<p>(2) An employee shall comply with all of the following:</p> <p>(a) Use welding and cutting equipment as trained and authorized.</p> <p>(b) Use the protective equipment required by the employer or the hazard.</p> <p>(c) Not tamper with safety devices.</p> <p>(3) An employee in charge of the operation of oxygen or fuel-gas supply equipment, of oxygen or fuel-gas systems, including generators, shall be instructed and judged competent by the employer for this work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.</p>	<p><b>(2)</b> If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.</p> <p><b>(3)</b> See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.</p> <p><b>(D)</b> Shall secure authorization for the cutting or welding operations from the designated management representative.</p> <p><b>(E)</b> Shall determine that the cutter or welder secures his approval that conditions are safe before going ahead.</p> <p><b>(F)</b> Shall determine that fire protection and extinguishing equipment are properly located at the site.</p> <p><b>(G)</b> Where fire watches are required, he shall see that they are available at the site.</p>
<b>CONFINED SPACES</b>	
<p><b>R 408.11213. Working in confined spaces.</b>  <b>Rule 1213(1) to (2)****</b></p> <p>(3) The air in a confined space shall be tested with an approved device and purged, if necessary, before any entry.</p> <p>(4)****</p> <p>(5) An employee who is trained in rescue procedures, and with such equipment as is necessary to effect a rescue, if needed, shall be stationed outside the confined space during welding or cutting operations. An employer shall ensure that an effective means of communication is established between employees in the confined space and the attendant. When safety belts and lifelines are used, they shall be provided and used as prescribed in general industry safety standard Part 33 "Personal Protective Equipment," as referenced in R 408.11202, and attached to the welder's body so that his or her body cannot be jammed in a small exit opening.</p> <p>(6)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provisions</b></p> <p>Equivalent</p> <p><b>No comparable OSHA provision.</b></p> <p>Equivalent</p>
<b>CYLINDERS</b>	
<p><b>R 408.11221 Cylinder marking.</b>  <b>Rule 1221.(1)****</b></p> <p>(2) Unlabeled cylinders shall not be used.</p> <p>(3) Empty cylinders shall be so marked at time of depletion.</p>	<p>Equivalent</p> <p><b>No comparable OSHA provision</b></p>

MIOSHA	OSHA
<p><b>R 408.11222 Storage.</b> <b>Rule 1222. (1)****</b></p> <p>(2) A cylinder shall be stored away from heat in excess of 125 degrees Fahrenheit.</p> <p>(3)****</p> <p>(4) Storage shall be set up to ensure first in, first out usage.</p> <p>(5) A cylinder storage area shall be posted with the names of the individual gases stocked, and a warning shall be posted against tampering by an unauthorized employee. An assigned storage area shall be located where a cylinder will not be knocked over or struck by a passing or falling object.</p> <p>(6) Where different gases are stored, they shall be grouped by types. Groupings shall separate the flammable gases from the oxidizing gases as in subrule (1) of this rule.</p> <p>(7) A storage area for cylinders shall be well ventilated. A cylinder shall not be stored in basements or pits, except where ventilation as specified by the Michigan Occupational Safety and Health Administration (MIOSHA) standards is furnished to keep the area purged of any accumulation of gases.</p> <p>(8) Storage of fuel gas in a building in 1 area within 100 feet (30 meters) of another fuel gas storage area and not protected by an automatic sprinkler system shall be limited to a total gas capacity of 2,000 cubic feet (56 cubic meters approximately) or 11.8 cubic feet (.33 cubic meters) of liquefied gas, which is 735 pounds (333 kilograms) water capacity. Storage in excess of this amount shall be in a separate room or compartment with an exterior wall and on the top floor of the building, outside, or in a special building. All walls, floors, and ceilings shall be constructed of noncombustible material having a fire resistance rating of 1 hour. The walls shall be continuous from the floor to the ceiling and shall be securely anchored. The separate room, compartment, or special building shall have no open flame for heat or light and shall be well ventilated. Openings from the separate storage room to other parts of the building shall be protected by a self-closing fire door for a class B opening and shall have a fire-resistance rating of not less than 1 hour. Windows in partitions shall be wired glass and approved metal frames with a fixed sash. Installation shall be in accordance with NFPA 80 "Standard for the Installation of Fire Doors and Windows," 1974 edition, as adopted in R 408.11202.</p>	<p>Equivalent</p> <p><b>No comparable OSHA provisions</b></p> <p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p><b>1910.253 Oxygen-fuel gas welding and cutting.</b> <b>(b) Cylinders and containers</b> <b>(3) Fuel-gas cylinder storage</b> <b>(i)</b> For storage in excess of 2,000 cubic feet (56 cubic meters) total gas capacity of cylinders or 300 (135.9 kg) pounds of liquefied petroleum gas, a separate room or compartment conforming to the requirements specified in paragraphs (f)(6)(i)(H) and (f)(6)(i)(I) of this section shall be provided, or cylinders shall be kept outside or in a special building. Special buildings, rooms or compartments shall have no open flame for heating or lighting and shall be well ventilated. They may also be used for storage of calcium carbide in quantities not to exceed 600 (271.8 kg) pounds, when contained in metal containers complying with paragraphs (g)(1)(i) and (g)(12)(ii) of this section.</p>

MIOSHA	OSHA
<p>(9) Where a liquid or gaseous oxygen system is used to supply gaseous oxygen for welding and cutting and the system has a storage capacity of more than 20,000 cubic feet (560 cubic meters), measured at 14.7 psia (101.34 kPa) and 70 degrees Fahrenheit (21.1 degrees Celsius), including unconnected reserves at the site, the system shall be as prescribed in NFPA 50 "Bulk Oxygen Systems," 1971 edition, as adopted in R 408.11202.</p> <p>(10) A cylinder used for methylacetylene-propadiene, stabilized, shall be constructed of materials suitable for this fuel gas in the gaseous or liquid phases.</p>	<p><b>1910.253 Oxygen-fuel gas welding and cutting.</b>  <b>(b) Cylinders and containers.</b>  <b>(4) Oxygen storage.</b>  <b>(iv)</b> Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than 13,000 cubic feet (364 cubic meters) of oxygen (measured at 14.7 psia (101 kPa) and 70 degrees F (21.1 degrees C)), including unconnected reserves on hand at the site, it shall comply with the provisions of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566 – 1965, which is incorporated by reference as specified in 1910.6.</p> <p><b>No comparable OSHA provision</b></p>
<p><b>R 408.11223 General rules for cylinders--I.</b>  <b>Rule 1223.</b> (1) A chain, bracket or other restraining device shall be used at all times to prevent cylinders from falling.</p> <p>(2) to (4)****</p> <p>(5) A frozen or ice-clogged valve shall be thawed either by warm air or use of warm water and dried before using. Boiling water or a flame shall not be used. Force shall not be applied to a valve or cap to loosen a cylinder frozen in place.</p>	<p><b>No comparable OSHA provision</b></p> <p>Equivalent</p> <p><b>1910.253 Oxygen-fuel gas welding and cutting.</b>  <b>(b) Cylinders and containers.</b>  <b>(5) Operating procedures.</b>  <b>(C)</b> Valve-protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; the use of warm (not boiling) water is recommended. Valve-protection caps are designed to protect cylinder valves from damage.</p>
<p><b>R 408.11224 General rules for cylinders--II.</b>  <b>Rule 1224</b> (1) to (2)****</p> <p>(3) A regulator, gauge, or hose shall not be interchangeable between fuel gas, oxidizing gas or inert gas. Connections for compressed gas cylinders shall be as prescribed in ANSI B57.1- "Compressed Gas Cylinder Valve Outlet and Inlet Connections," 1965 edition, as adopted in R 408.11202.</p> <p>(4) to (6)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provisions</b></p> <p>Equivalent</p>
<p><b>R 408.11225 Cylinders; keys, handles, or wrenches; use as roller or support prohibited; repair; placing items on top prohibited.</b>  <b>Rule 1225.</b> (1) to (3)****</p> <p>(4) Nothing shall be placed on top of a cylinder which would damage a safety device or interfere with the quick closing of the valve.</p>	<p>Equivalent</p> <p><b>1910.253 Oxygen-fuel gas welding and cutting.</b>  <b>(b) Cylinders and containers.</b>  <b>(5) Operating Procedures.</b>  <b>(iii)(E)</b> Nothing shall be placed on top of an acetylene cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.</p>

MIOSHA	OSHA
<b>MANIFOLDING</b>	
<p><b>R 408.11231 Oxygen manifolding.</b>  <b>Rule 1231.</b> (1) to (2)****</p> <p>(3) Each container and manifold unit shall be labeled to show the name of the gas contained.</p> <p>(4)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provisions</b></p> <p>Equivalent</p>
<p><b>R 408.11232 High-pressure oxygen manifolds.</b>  <b>Rule 1232.</b>(1) to (3)****</p> <p>(4) An oxygen manifold or oxygen bulk supply system with a storage capacity of more than 20,000 cubic feet (560 cubic meters), including unconnected reserves, shall be as prescribed in R 408.11222(9).</p>	<p>Equivalent</p> <p><b>1910.253 Oxygen-fuel gas welding and cutting.</b>  <b>(c) Manifolding of cylinders</b>  <b>(2)</b> High-ressure oxygen manifolds (for use with cylinders having a Department of Transportation service pressure above 200 psig (1.36 Mpa)).  <b>(v)</b> An oxygen manifold or oxygen bulk supply system which has storage capacity of more than 13,000 cubic feet (364 cubic meters) of oxygen (measured at 14.7 psia (101 kPa) and 70 degrees F (21.1 degrees C)), connected in service or ready for service, or more than 25,000 cubic feet (700 cubic meters) of oxygen (measured at 14.7 psia (101 kPa) and 70 degrees F (21.1 degrees C)), including unconnected reserves on hand at the site, shall comply with the provisions of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.</p>
<b>MANIFOLDING – SERVICE PIPING</b>	
<p><b>R 408.11241. Piping material.</b>  <b>Rule 1241.</b> (1) Piping for acetylene shall be limited to steel and ductile iron.</p> <p>(2) to (3)****</p> <p>(4) Gray or white cast iron fittings shall not be used</p> <p>(5) to (7)****</p>	<p><b>1910.253 Oxygen-fuel gas welding and cutting.</b>  <b>(d) Service piping systems</b>  <b>(1) Materials and design</b>  <b>(iii)(A)</b> Piping for acetylene or acetylenic compounds shall be steel or wrought iron.</p> <p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p>
<p><b>R 408.11242. Piping assembly</b>  <b>Rule 1242.</b> (1) to (5)****</p> <p>(6) Pressure testing of a pipe line shall be done in a manner to protect an employee from injury due to blowing out of closures and other pressure restraining devices.</p> <p>(7) to (11)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p>

MIOSHA	OSHA
<p><b>R 408.11244. Station outlets.</b>  <b>Rule 1244. (1) to (4)****</b></p> <p>(5) The total volume of acetylene used per hour shall not exceed 1/ 7 of the total volume of the acetylene supply in the system.</p>	<p>Equivalent</p> <p><b>No comparable OSHA provision</b></p>
<b>PROTECTIVE DEVICES</b>	
<p><b>R 408.11252. Protective devices.</b>  <b>Rule 1252. (1) to (4)****</b></p> <p>(5) .....A shut off valve shall not be installed in the vent line.</p> <p>(6) to (7)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p>
<b>HOSES AND REGULATORS</b>	
<p><b>R 408.11253. Hoses and connections.</b>  <b>Rule 1253. (1) to (2)****</b></p> <p>(3) Parallel hoses shall be color coded as follows:  (a) Red – fuel gases  (b) Green – oxygen  (c) Black – inert gas or air</p> <p>(4)****</p>	<p>Equivalent</p> <p><b>1910.253 Oxygen-fuel gas welding and cutting.</b>  <b>(e) Protective equipment, hose, and regulators</b>  <b>(5) Hose and hose connections.</b>  <b>(i)</b> Hose for oxy-fuel gas service shall comply with the Specification for Rubber Welding Hose, 1958, Compressed Gas Association and Rubber Manufacturers Association, which is incorporated by reference as specified in 1910.6.</p> <p>Equivalent</p>

MIOSHA	OSHA
<b>GENERAL FIRE RULES</b>	
<p><b>R 408.11261 Fire precautions.</b>  <b>Rule 1261.</b> (1) to (2)****</p> <p>(3) Welding and cutting by gas utility firms on live mains is exempt from this rule when the main is filled under positive pressure with natural or manufactured gas and air movers are used to ventilate areas where fumes might accumulate.</p> <p>(4) Welding or cutting shall not be permitted in the following situations:</p> <p>(a) to (c)****</p> <p>(d) In an area nearer than 35 feet of storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper or cotton.</p> <p>(5)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p> <p><b>1910.252 General requirements.</b>  <b>(a) Fire prevention and protection.</b>  <b>(2) Special precautions.</b>  <b>(vi) Prohibited areas.</b>  <b>(D)</b> In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper, or cotton.</p> <p>Equivalent</p>
<p><b>R 408.11262 Welding drums, barrels, tanks, or other containers.</b>  <b>Rule 1262.</b> (1) Welding or cutting shall not be performed on drums, barrels, tanks, or other containers until they have been cleaned of all flammable combustible or toxic materials or fumes.</p> <p>(2) All pipe lines or other connections to drums, barrels, or tanks shall be disconnected or blanked.</p> <p>(3) Hollow spaces or cavities shall be vented and either filled with water or purged with an inert gas before preheating, cutting or welding.</p> <p>(4) An opening shall be maintained during welding and cutting to vent gases or vapors.</p> <p>(5) The welded construction of a transmission pipeline shall be conducted in accordance with API 1104 "Standard for Welding Pipe Lines and Related Facilities," 1973 edition, as adopted in R 408.11202.</p> <p>(6) The connection, by welding, of branches to a pipeline carrying a flammable substance shall be performed in accordance with API PSD 2201 "Welding or Hot Tapping on Equipment Containing Flammables," 1963 edition, as adopted in R 408.11202.</p>	<p><b>1910.252 General requirements.</b>  <b>(a) Fire prevention and protection.</b>  <b>(3) Welding or cutting containers.</b>  <b>(i)</b> Used containers. No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.</p> <p><b>(ii)</b> Venting and purging. All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.</p>

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<p><b>R 408.11272 Open circuit and no-load voltages of arc welding machine.</b>  <b>Rule 1272.</b> (1) When an arc welding machine is operated without being connected to a load, the open circuit voltage shall not exceed the values shown in Table 1 when rated voltage is applied to the primary winding or when a generator type arc welding machine is operating at maximum rated no-load speed.</p> <table border="1" data-bbox="103 499 794 1081"> <thead> <tr> <th colspan="3" data-bbox="103 499 794 575">Table 1</th> </tr> <tr> <th colspan="3" data-bbox="103 575 794 653">MAXIMUM OPEN CIRCUIT VOLTAGES OF WELDING MACHINES</th> </tr> <tr> <th data-bbox="103 653 342 730" rowspan="2">Welding Current</th> <th colspan="2" data-bbox="342 653 794 730">Max. Open Circuit (no-load) Voltage</th> </tr> <tr> <th data-bbox="342 730 570 846">Manual &amp; Semiautomatic Machines</th> <th data-bbox="570 730 794 846">Automatic Machines</th> </tr> <tr> <td data-bbox="103 846 342 924">Ac</td> <td data-bbox="342 846 570 924">80 rms</td> <td data-bbox="570 846 794 924">100 rms</td> </tr> <tr> <td data-bbox="103 924 342 1001">dc &gt; 10% Ripple Voltage</td> <td data-bbox="342 924 570 1001">80 rms</td> <td data-bbox="570 924 794 1001">100 average</td> </tr> <tr> <td data-bbox="103 1001 342 1081">dc &lt; 10% Ripple Voltage</td> <td data-bbox="342 1001 570 1081">100 average</td> <td data-bbox="570 1001 794 1081">100 average</td> </tr> </thead> </table> <p>(2) to (4)****</p>	Table 1			MAXIMUM OPEN CIRCUIT VOLTAGES OF WELDING MACHINES			Welding Current	Max. Open Circuit (no-load) Voltage		Manual & Semiautomatic Machines	Automatic Machines	Ac	80 rms	100 rms	dc > 10% Ripple Voltage	80 rms	100 average	dc < 10% Ripple Voltage	100 average	100 average	<p><b>1910.254 Arc Welding and cutting.</b>  <b>(b) Application of arc welding equipment</b>  <b>(3) Voltage.</b> The following limits shall not be exceeded:  <b>(i) Alternating-current machines</b>  <b>(A) Manual arc welding and cutting – 80 volts.</b>  <b>(B) Automatic (machine or mechanized) arc welding and cutting – 100 volts.</b>  <b>(ii) Direct-current machines</b>  <b>(A) Manual arc welding and cutting – 100 volts.</b>  <b>(B) Automatic (machine or mechanized) arc welding and cutting – 100 volts.</b>  <b>(iii) When special welding and cutting processes require values of open circuit voltages higher than the above, means shall be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.</b>  <b>(iv) For a.c. welding under wet conditions or warm surroundings where perspiration is a factor, the use of reliable automatic controls for reducing no load voltage is recommended to reduce the shock hazard.</b></p> <p>Equivalent</p>
Table 1																					
MAXIMUM OPEN CIRCUIT VOLTAGES OF WELDING MACHINES																					
Welding Current	Max. Open Circuit (no-load) Voltage																				
	Manual & Semiautomatic Machines	Automatic Machines																			
Ac	80 rms	100 rms																			
dc > 10% Ripple Voltage	80 rms	100 average																			
dc < 10% Ripple Voltage	100 average	100 average																			
<p><b>R 408.11274. Installation.</b>  <b>Rule 1274(1) to (5)****</b></p> <p>(6) A welding cable shall be protected against damage, entanglement, or contact with power supply or high tension wires.</p> <p>(7) to (9)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p>																				
<p><b>R 408.11275. Operation.</b>  <b>Rule 1275. (1)****</b></p> <p>(2) A welding machine shall be disconnected when being moved and turned off when not in use.</p> <p>(3)****</p> <p>(4) A welder shall not let live electrodes or holders touch his or her bare skin or damp clothing. When arc welding is performed in wet conditions or under a condition of high humidity, the welder shall be protected against electric shock.</p> <p>(5) Electrode holders shall not be cooled by immersion in water.</p> <p>(6) to (8)****</p>	<p>Equivalent</p> <p><b>No comparable OSHA provisions</b></p> <p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p>																				

MIOSHA	OSHA
<p><b>R 408.11276. Maintenance of arc welding machines.</b>  <b>Rule 1276.(1) to (2)****</b></p> <p>(3) Cut insulation on work and lead cable or exposed bare conductors of an arc welding machine shall be protected by electrical tape and made water tight or the conductor shall be replaced. Splices shall be made by insulated welded joints or pressure connectors.</p> <p>(4)****</p>	<p>Equivalent</p> <p><b>1910.254 Arc welding and cutting.</b>  <b>(d) Operation and maintenance</b>  <b>(9) Maintenance.</b>  <b>(iii)</b> Cables with damaged insulation or exposed bare conductors shall be replaced. Joining lengths of work and electrode cables shall be done by the use of connecting means specifically intended for the purpose. The connecting means shall have insulation adequate for the service conditions.</p> <p>Equivalent</p>
<p><b>R 408.11282. Nonportable spot and seam welding machines.</b>  <b>Rule 1282.</b> (1) An external weld initiating control circuit for a nonportable spot or seam welding machine shall operate at not more than 120 volts for stationary equipment and not more than 36 volts for portable equipment.</p> <p>(2)****</p> <p>(3) A door or access panel shall be considered locked if a key or wrench is required to open it.</p> <p>(4)****</p> <p>(5) One or more safety emergency stop devices shall be provided on all multispot welding machines with a minimum of 1 stop device at each operator position.</p> <p>(6) to (7)****</p>	<p><b>1910.255 Resistance welding.</b>  <b>(b) Spot and seam welding machines (nonportable)</b>  <b>(1) Voltage.</b> All external weld initiating control circuits shall operate on low voltage, not over 120 volts, for the safety of the operators.</p> <p>Equivalent</p> <p><b>No comparable OSHA provision</b></p> <p>Equivalent</p> <p><b>(7) Stop buttons.</b> Two or more safety emergency stop buttons shall be provided on all special multispot welding machines, including 2-post and 4-post weld presses.</p> <p>Equivalent</p>
<p><b>R 408.11283 Portable welding guns.</b>  <b>Rule 1283.</b> (1)****</p> <p>(2) All suspended portable welding gun equipment, except the gun assembly, shall be equipped with a safety chain or cable capable of supporting the total shock load in event of failure of any component of the supporting system.</p> <p>(3) When a trolley is used to support a portable welding machine with a clevis for attachment to a safety chain, the clevis shall be wrought or forged steel and capable of supporting the shock load in event of failure of the trolley.</p> <p>(4) to (5)****</p>	<p>Equivalent</p> <p><b>1910.255 Resistance welding</b>  <b>(c) Portable welding machines -</b>  <b>(2) Safety chains.</b> All portable welding guns, transformers and related equipment that is suspended from overhead structures, eye beams, trolleys, etc. shall be equipped with safety chains or cables. Safety chains or cables shall be capable of supporting the total shock load in the event of failure of any component of the supporting system.</p> <p><b>(3) Clevis.</b> Each clevis shall be capable of supporting the total shock load of the suspended equipment in the event of trolley failure.</p> <p>Equivalent</p>

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