## DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

## DIRECTOR'S OFFICE

## CONSTRUCTION SAFETY STANDARDS

By authority conferred on the director of the department of licensing and regulatory affairs by sections 19 and 21 of 1974 PA 154, MCL 408.1019 and 408.1021, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, and 2011-4, MCL 445.2001, 445.2011, 445.2025, and 445.2030)

## PART 7. WELDING AND CUTTING

## GENERAL PROVISIONS

### R 408.40701 Scope.

Rule 701. With respect to construction operations, the intent of this part is to provide reasonable safety to employees involved in welding operations and to persons exposed to welding operations, welding equipment, and the compressed gases used.

History: 1979 AC; 1980 AACS.

### R 408.40705 Definitions; A to C.

Rule 705. (1) "AC" means alternating current.

(2) "Arc welding" means a process for joining metals by melting with an electric arc with or without the use of pressure and with or without a filler material.

(3) "Brazing" means a process of joining metals, without melting them, with a filler metal melting above 800 degrees Fahrenheit (427 degrees Celsius).

(4) "Cutting" means a process in which the severing or removing of metal is effected by the use of an arc or flame.

(5) "Cylinders" means containers for storing compressed gases.

History: 1980 AACS; 2005 AACS; 2015 AACS.

### R 408.40706 Definitions; D to N.

Rule 706. (1) "DC" means direct current.

(2) "Fire resistance" means the property of a material or assembly to withstand fire or give protection from it.

(3) "Fuel gas" means a gas, such as acetylene and propane that is used to generate heat to perform a welding operation.

(4) "Gas welding" means a process for joining metals by heating with a gas flame with or without the use of pressure and with or without the use of a filler material.

(5) "Inert gas" means argon, carbon dioxide, helium, or nitrogen gas.

(6) "Manifold" means an assembly of pipe and fittings to interconnect either single or multiple sources of fuel gas or oxygen to single or multiple outlets.

(7) "Noncombustible" means having properties that do not support combustion.

History: 1980 AACS.

**R 408.40707 Definitions; P to W.**

Rule 707. (1) "Psig" means pounds per square inch as measured by a gauge.

(2) "Soldering" means a process of joining metals, without melting them, using a filler metal melting at 800 degrees Fahrenheit (427 degrees Celsius) or below.

(3) "Storage" means the storage of a filled or empty cylinder not in use.

(4) "Welding" means the process of joining metals by melting them.

(5) "Welding operations" means the cutting, welding, brazing, or soldering of materials.

(6) "Welder" means a person performing welding operations.

History: 1980 AACS; 2005 AACS.

**R 408.40709 Adopted and referenced standards.**

Rule 709. (1) The following standards are adopted by reference in these rules and are available from IHS Global, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at website: http://global.ihs.com; at a cost as of the time of adoption of these rules, as stated in this subrule.

(a) American National Standard Institute Standard ANSI/AWS Z49.1, “Safety in Welding and Cutting and Allied Processes,” 1973 edition. Cost: $96.00

(b) American National Standard Institute Standard ANSI/ASA B57.1, “Compressed Gas Cylinder Valve Outlet and Inlet Connections,” 1965 edition. Cost $29.00

(2) This standard is adopted by reference in these rules, National Fire Protection Association NFPA 50 “Standards for Bulk Oxygen Systems at Consumer Sites,” 1974 edition. This standard is available from National Fire Prevention Association, 1 Batterymarch Park, Quincy, Massachusetts, USA, 02169-7471, telephone number: 1-617-770-3000 or via the internet at website: www.nfpa.org; at a cost as of the time of adoption of these rules of $27.00.

(3) The Code of Federal Regulations, Title 49 Transportation, Parts 186-199, “Subchapter D-Pipeline Safety” is available from the United States Government Printing Office website: www.ecfr.gov, at no charge as of the time of adoption of these rules.

(4) The standards adopted in these rules are available for inspection at the Department of Licensing and Regulatory Affairs, MIOSHA Regulatory Services Section, 7150 Harris Drive, Lansing, Michigan, 48909-8143.

(5) The standards adopted in these rules may be obtained from the publisher or may be obtained from the Department of Licensing and Regulatory Affairs, MIOSHA Regulatory Services Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost of the standard plus $20.00 for shipping and handling.

(6) The following Michigan occupational safety and health standards (MIOSHA) are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge

from the Michigan department of licensing and regulatory affairs, MIOSHA Regulatory Services Section, 7150 Harris Drive, P.O. Box 30643, Lansing, MI, 48909-8143 or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, at the time of adoption of these rules, is 4 cents per page.

(a) Construction Safety Standard Part 1 "General Rules," R 408.40101 to R 408.40134.

(b) Construction Safety Standard Part 6 "Personal Protective Equipment," R 408.40601 to R 408.40641.

(c) Construction Safety Standard Part 35 "Confined Space in Construction," R 408.43501 to R 408.43510.

(d) Construction Safety Standard Part 45 "Fall Protection," R 408.44501 to R 408.44502.

History: 2005 AACS; 2013 AACS; 2015 AACS.

**R 408.40711 Employer and employee responsibilities.**

Rule 711. (1) An employer shall do all of the following:

(a) Assure that each employee has received safety training in the use of equipment for welding operations and instruction in the rules of this part before allowing the employee to use the equipment.

(b) Assure that an employee in charge of the operation of oxygen or fuel gas supply equipment or of oxygen or fuel gas systems is instructed and judged competent for this work by the employer before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel gas distribution piping systems shall be readily available.

(2) Welding operations shall not be permitted in the following situations:

(a) In an area not authorized by the building or structure occupant.

(b) In a sprinklered building while the sprinkler system is impaired, unless a fire watch is provided.

(c) In the presence of a potentially explosive atmosphere, such as mixtures of flammable gases, vapors, liquids, or dusts with air.

History: 1980 AACS; 2005 AACS; 2013 AACS.

**R 408.40712 Requirements generally.**

Rule 712. (1) Only apparatus designed for use with fuel gas or oxygen, such as a torch, regulator, pressure-reducing valve, acetylene generator, and manifold, shall be used for welding or cutting.

(2) Fuel gas, oxygen, or compressed air shall not flow from a cylinder or manifold through a torch or other device equipped with a shutoff valve unless the pressure is reduced by a regulator attached to the cylinder or manifold.

(3) An oxygen cylinder, fuel gas cylinder, cylinder valve, coupling regulator, hose, and apparatus shall be kept in good operating condition and shall be kept free from defects.

(4) An oxygen cylinder, fuel gas cylinder, cylinder valve, coupling regulator, hose, and apparatus shall be kept free from oily or greasy substances and shall not be handled with oily hands or gloves. A jet of oxygen shall not be permitted to strike oily surfaces or greasy clothes and shall not be permitted to enter a fuel, oil, or other storage tank.

(5) Oxygen shall only be used for welding or cutting.

(6) Welders shall place welding cable, hose, and other equipment so that it is clear of passageways, ladders, and stairways, or shall assure that it is protected against damage and does not create a hazard to an employee.

History: 1980 AACS; 2005 AACS; 2013 AACS.

**R 408.40713 Working in confined spaces.**

Rule 713. (1) Before the start of a welding operation in a confined space, the employer shall ensure that the atmosphere is tested and recorded. Ventilation shall be provided and maintained in accordance with the requirements of the department of licensing and regulatory affairs.

(2) For specific confined space rules, see Construction Safety Standard Part 35 “Confined Space in Construction.” as referenced in R 408.40709.

(3) When working in a confined space, the torch valves, the gas supply valve, and oxygen valve outside the confined space shall be shut off during the lunch period, overnight, or during any other prolonged period and the torch and hose shall be removed from the confined space. Open-end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.

(4) When electrodes are used in a confined space and welding is suspended during the lunch period, overnight, or during any other prolonged period, the electrode shall be removed from the holder and the machine shall be shut off. The holders shall be placed or protected so that they cannot make electrical contact with employees or conducting objects.

(5) A gas cylinder or a welding machine used for welding operations in a confined space shall be placed on the outside of the space where work is being performed.

(6) If an employee must enter a confined space through a small opening to perform welding operations, another employee trained in rescue procedures and equipped with the means necessary to effect a rescue shall be stationed outside the confined space in position to watch the welder. When a safety harness and lifeline are used, they shall be provided for as prescribed in Construction Safety Standard Part 45 “Fall Protection,” as referenced in R 408.40709, and shall be attached to the welder's body so that his or her body cannot be jammed in a small exit opening.

History: 1980 AACS; 1982 AACS; 1996 AACS; 2005 AACS; 2015 AACS.

**R 408.40714 Rescinded.**

History: 1980 AACS; 2005 AACS; 2013 AACS.

**R 408.40715 Torches generally.**

Rule 715. (1) A torch shall be inspected before each shift for leaking shutoff valves, hose and tip connections, and clogged tips. A defective torch shall not be used.

(2) A clogged tip opening shall be cleaned with a device, such as a drill or cleaning wire, designed for this purpose.

(3) A torch shall be lighted by a friction lighter and not by a match or hot work.

History: 1980 AACS.

## CYLINDERS

**R 408.40721 Cylinders manufacturing, labeling, periodic testing, and marking.**

Rule 721. (1) A cylinder shall be manufactured, labeled, and periodically tested in accordance with the specifications of the federal department of transportation requirements published in 49 C.F.R. Part 178, Subpart C, "Specification for Cylinders," which are adopted by reference in R 408.40709.

(2) A cylinder shall be legibly marked with either the chemical or trade name. Marking shall be by stenciling, stamping, or labeling and shall not be tampered with or be readily removable. Whenever practical, the marking shall be located on the shoulder of the cylinder.

History: 1980 AACS; 2005 AACS; 2013 AACS; 2015 AACS.

**R 408.40722 Storage.**

Rule 722. (1) An oxygen cylinder shall be stored not less than 20 feet from fuel gas cylinders or any highly combustible material, such as, but not limited to, oil, grease, excelsior, flammable gas, or a source of ignition, or shall be separated from the material by a noncombustible wall not less than 5 feet (1.6 meters) high which has a fire resistance rating of 30 minutes.

(2) A cylinder shall be stored away from any source of heat more than 125 degrees Fahrenheit.

(3) A cylinder, whether full or empty, in storage or during shipment, or with the regulator removed, shall have the valve closed and the cap connected in place if a cap is provided in the design, or shall be otherwise protected.

(4) Where different gases are stored, they shall be grouped by types. Groupings shall separate the fuel gases from the oxidizing gases as specified in subrule (1) of this rule.

(5) A storage area for cylinders shall be well ventilated.

(6) A cylinder shall not be stored in basements or pits.

(7) 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 and 70 degrees Fahrenheit, including unconnected reserves at the site, the system shall be as prescribed in National Fire Protection Association Standard NFPA 50, "Standards for Bulk Oxygen Systems at Consumer Sites," 1974 edition, which is adopted by reference in R 408.40709.

History: 1980 AACS; 2005 AACS; 2013 AACS; 2015 AACS.

**R 408.40723 Cylinders generally.**

Rule 723. (1) A chain, bracket, or other restraining device shall be used at all times to prevent cylinders from falling.

(2) A cylinder shall stand valve end up at all times.

(3) A cylinder shall not be dropped, dragged, rolled on its side, or struck violently.

(4) When using a crane or hoisting device, a cylinder shall be lifted only by cradles or enclosed platforms. An electromagnet, hook, rope, or sling shall not be used.

(5) A frozen or ice-clogged valve shall be thawed either by warm air or warm water and shall be 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.

(6) Gases shall not be mixed within a cylinder except by the supplier. Only the owner of the cylinder, if the owner is qualified, or a person trained, qualified, and authorized by the owner, shall refill a cylinder. The contents of a cylinder shall be used only for those purposes intended by the supplier.

(7) A cylinder shall not be placed where it will become a part of the electrical circuit by accidental grounding or where it may be burned by an electric welding arc. A cylinder shall not be placed so that hot slag or flame can reach it unless the cylinder is protected by a fire-resistant shield. An electrode shall not be tapped against a cylinder to strike an arc.

(8) 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 American National Standard Institute Standard ANSI/ASA B57.1, 1965 edition, "Compressed Gas Cylinder Valve Outlet and Inlet Connections," which is adopted by reference in R 408.40709.

(9) A cylinder valve shall be opened slightly for an instant and then closed before connecting to a regulator or manifold to clear the valve of dust and dirt. The employee opening the valve shall stand to one side of the outlet, not in front of it. The employee shall not open the valve near a source of ignition. Pressure to a regulator shall be introduced by slowly opening the cylinder valve. An acetylene cylinder valve shall only be opened enough to allow proper working pressure, but shall not be opened more than 1 1/2 turns of the spindle.

(10) Acetylene shall not be utilized or piped, except in cylinder manifolds, at a pressure in excess of 15 psig.

(11) A cylinder to which a regulator is attached shall not be moved unless secured to a hand or powered truck designed or equipped for this purpose.

(12) A cylinder valve must be closed in any of the following situations:

(a) When moving the cylinder.

(b) When the work is finished or is left unattended during the lunch period, overnight, or any other prolonged period.

(c) When the cylinder is empty.

(d) When the regulator is removed.

(13) A cylinder without fixed handwheels shall have keys, handles, or nonadjustable wrenches on valve stems while in service. A multiple cylinder installation shall require only 1 key or handle for each manifold.

A hammer shall not be used to open a cylinder valve or loosen a cap.

(14) A cylinder, whether full or empty, shall not be used as a roller or support.

(15) A damaged or a leaking cylinder, a cylinder with a valve stuck open, or a valve in need of repair shall be taken outdoors away from sources of ignition, tagged with a warning

sign, and the manufacturer or distributor notified. Complete removal of the stem from the cylinder valve shall be avoided.

(16) Nothing shall be placed on top of the cylinder.

History: 1980 AACS; 2005 AACS; 2015 AACS.

**R 408.40729 Rescinded.**

History: 1980 AACS; 2005 AACS; 2013 AACS.

## HOSES AND REGULATORS

**R 408.40731 Hoses and connections.**

Rule 731. (1) Hose and hose connections used for a welding operation shall be as prescribed in paragraph 3.5.6 of the American National Standard Institute Standard ANSI/AWS Z49.1, "Safety in Welding and Cutting and Allied Processes," 1973 edition, which is adopted by reference in R 408.40709.

(2) Parallel lengths of hose taped together shall have not more than 4 inches out of each 12 inches covered by tape.

(3) Parallel hoses shall be color coded as follows:

(a) Red-fuel gases. See subrule (4) of this rule.

(b) Green-oxygen.

(c) Black-inert gas or air.

(4) The employer shall assure that only approved hose is used for LP gas.

(5) A hose and its connections shall be inspected before each shift for burns, leaks, worn places, or other defects which could affect the safety of an employee. Suspected leaks shall be checked by use of a grease-free soap solution.

(6) A defective hose shall not be used, but shall be repaired or replaced.

(7) A hose that has been subject to a flashback or has been repaired or spliced shall be tested at twice the normal pressure, but not less than 300 psig.

(8) A box used for the storage of gas hose shall be ventilated.

History: 1980 AACS; 2005 AACS; 2015 AACS.

**R 408.40732 Regulators and protective devices.**

Rule 732. (1) The use of regulators shall comply with the following requirements:

(a) Regulators shall be used only for the gas and pressure for which they are intended.

(b) Regulators shall be repaired by authorized and trained personnel or shall be returned to the supplier for calibration or repairs.

(c) Regulators shall not be removed until the cylinder valve is closed and the regulator drained.

(d) Regulators shall have gauges marked "Use No Oil" when used for oxygen.

(2) Backflow prevention devices shall be installed on the fuel gas and oxygen hoses.

(3) A cylinder equipped with a shutoff valve shall have a regulator attached to the cylinder valve or manifold during use.

History: 1980 AACS.

## ARC WELDING AND CUTTING

### R 408.40741 Arc welding machines.

Rule 741. (1) An arc welding machine shall be capable of operating safely in the environment in which it is located. The design and construction shall enable the machine to carry its rated load with rated temperature rise where the temperature of the cooling air is not more than 104 degrees Fahrenheit and where the altitude is not more than 3300 feet (1000 meters approx.).

(2) Where unusual service conditions exist, such as corrosive fumes, steam, oil vapor, flammable gases, vibration, shock, dust, or weather, a specially designed arc welding machine shall be used.

History: 1980 AACS.

### R 408.40742 Rescinded.

History: 1980 AACS; 2013 AACS.

### R 408.40743 Design requirements for arc welding machines.

Rule 743. (1) A controller integrally mounted in an electric motor-driven welding machine shall have the capacity for carrying rated motor current and shall be capable of making and interrupting stalled rotor current of the motor.

(2) Input power terminals, tap change devices, and live metal parts connected to input circuits shall be completely enclosed and shall be accessible only by use of tools.

(3) Welding lead terminals shall be protected from accidental electrical contact by personnel or metal objects. If a welding lead terminal normally used for connection to the work is connected to a grounded enclosure, it shall be done by a conductor not less than 2 sizes smaller than the grounding conductor and it shall be so marked.

(4) Portable control devices, such as push buttons, shall not be connected to an AC circuit of more than 120 volts. Exposed metal parts of a portable control device operating above 50 volts shall be grounded.

(5) Auto transformers or AC reactors shall not be used to draw welding current directly from any AC power source having a voltage of more than 80 volts.

History: 1980 AACS; 2013 AACS.

### R 408.40744 Installation.

Rule 744. (1) The frame or case of a welding machine shall be grounded, unless the manufacturer does not recommend it.

(2) The work on which the operator welds shall be grounded. A wire used to ground a workpiece shall be capable of carrying the full welding current. Connections of the ground shall be mechanically sound and strong. When a single ground return cable services more than 1 unit, the safe current-carrying capacity of the cable shall equal or exceed the total maximum output capacities of all units which it services.

(3) A conduit containing an electrical conductor shall not be used for completing a work-lead circuit.

(4) A pipeline in service shall not be used as a permanent part of a work-lead circuit, but may be used during construction, extension, or repair if current is not carried through threaded joints, flanged bolted joints, or caulked joints and if special precautions are used to avoid sparking at the connection of the work-lead cable.

(5) Chains, wire ropes, cranes, hoists, and elevators used for carrying loads shall not be used to carry a welding current.

(6) A welding cable shall be protected against damage, entanglement, or contact with power supply or high-tension wires.

(7) A welding machine that is not provided with a controller or disconnect switch as an integral part shall have a controller or disconnect switch with overload protection provided. A disconnect switch with overload protection or overload disconnect protection, or equivalent, shall be provided for each outlet used by a portable welding machine, unless the machine is equipped with a disconnect switch and overload protection.

(8) The rated current-carrying capacity of the supply conductors for individual machines shall not be less than the rated primary current for the welding machine. The rated current-carrying capacity of the conductors for a group of welding machines may be less than the sum of the rated primary current of the welding machines supplied. The conductor rating shall be determined in each case according to the machine loading based on the use to be made of each welding machine and the allowance permissible if all the machines supplied by the conductor will not be in use at the same time.

(9) Where a welding machine is working sufficiently close to another machine so that a welding operator is likely to touch the exposed parts of more than 1 electrode holder simultaneously, the machine shall be connected so as to minimize shock hazard as follows:

(a) DC machine shall be connected with the same polarity.

(b) AC machine shall be connected to the same phase of the supply circuit and with the same instantaneous polarity.

(10) A current-carrying part passing through the portion of the holder that the employee grips by hand and the outer surface of the jaws of the holder shall be insulated against the maximum voltage encountered to ground.

History: 1980 AACS; 2005 AACS; 2013 AACS.

**R 408.40745 Welding cables and electrode holders.**

Rule 745. (1) An arc welding and cutting cable shall be of the completely insulated, flexible-type and shall be capable of handling the maximum current requirements of the work, taking into account the duty cycle under which the welder is working.

(2) A manual electrode holder shall be specifically designed for arc welding and cutting and shall be capable of handling the maximum rated current required by the electrode.

History: 1980 AACS.

**R 408.40746 Operation.**

Rule 746. (1) Engine fuel, cooling water, or shielding gas shall not be allowed to leak.

(2) A welding machine shall be disconnected when being moved and shall be turned off when not in use.

(3) Electrodes shall be retracted or removed when not in use. Electrode holders not in use shall be placed so that they cannot make electrical contact with an employee, fuel, gas tanks, or conducting objects.

(4) A welder shall not let live electrodes or holders touch his 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.

(5) Electrode holders shall not be cooled by immersion in water.

(6) Welding shall not be permitted where fumes of chlorinated hydrocarbons are present or will reach or be drawn into the atmosphere surrounding the welding operation.

(7) Before starting an arc welding operation, the welder shall do all of the following:

(a) Assure the work lead is secured to the work.

(b) Assure the magnetic work clamps are free of spatter on the contact surfaces.

(c) Spread out the welding cable, if necessary, to prevent overheating and damage.

(d) Assure grounding connections are secured to a good ground.

(e) Assure the required switching equipment for shutting down the machine has been provided.

(8) A welder shall not curl or loop welding cable around his or her body.

History: 1980 AACS; 1982 AACS; 2005 AACS; 2013 AACS.

**R 408.40747 Maintenance of arc welding machines.**

Rule 747. (1) Spliced welding cable shall not be used within 10 feet (3.05 meters) of an arc welding machine.

(2) Equipment in need of repair that constitutes a safety hazard shall not be used or put in use until repairs are made by a knowledgeable employee or an outside service.

(3) Cut insulation on work and lead cable or exposed bare conductors of an arc welding machine shall be protected by electrical tape and shall be made watertight or the conductor shall be replaced. Splices shall be made by insulated welded joints or pressure connectors.

(4) An arc welding machine that has become wet shall be thoroughly dried and tested before use.

History: 1980 AACS.

## PERSONAL PROTECTIVE EQUIPMENT

**R 408.40751 Personal protective equipment.**

Rule 751. (1) A welder shall wear face and eye protection when performing welding operations and by other employees exposed to a risk of injury from spatter or flash, or both. The protective devices shall be provided for as prescribed in Construction Safety Standard Part 6 "Personal Protective Equipment," as referenced in R 408.40709.

(2) The employer shall provide welding gloves at no expense to the employee and the employee shall wear them to protect their hands and wrists.

(3) The employer shall provide other protective devices, such as, but not limited to, body protection, chaps, and curtains, at no expense to the employee, and the employee shall use them when exposed to a risk of injury by flash burn, sparks, and foreign bodies.

History: 1980 AACS; 1982 AACS; 2005 AACS; 2013 AACS; 2015 AACS.

## GENERAL FIRE RULES

**R 408.40761 Fire precautions.**

Rule 761. (1) Welding operations shall not be performed within 50 feet of explosives, stored cylinders, or stored fuel. Combustible and flammable materials located within 35 feet of a welding operation shall either be removed or covered with fire-resistant material.

(2) Cracks or openings through which sparks could pass in the floor or wall that are within 35 feet of a welding operation shall be covered with a fire-resistant material.

(3) A wood floor within 10 feet of a welding operation shall be protected by either wetting down, covering with sand, or covering with a fire-resistant material.

(4) A minimum of 1 2A-10BC portable fire extinguisher shall be immediately available to the work area during welding operations.

(5) An employer shall designate a person as responsible for fire safety during a welding operation where a fire could start or where 1 of the following conditions exists:

(a) Appreciable combustible and flammable materials are more than 35 feet from a welding operation but are easily ignited.

(b) Combustible and flammable material is adjacent to the opposite side of a metal partition, wall, ceiling, or roof that is likely to ignite by conduction or radiation.

(c) If there is a possibility that a smoldering fire may have started, the person shall remain at the scene of the work for not less than 30 minutes after the welding operation has stopped. Personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.

(6) The connection, by welding, of branches to a pipeline carrying a flammable substance shall be performed in accordance with the regulations of the department of transportation, 49 C.F.R. Part 192, "Minimum Federal Safety Standards for Gas Pipelines," which are adopted by reference in R 408.40709.

(7) Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

History: 1980 AACS; 2005 AACS; 2013 AACS; 2015 AACS.

**R 408.40762 Welding drums, barrels, tanks, or other containers.**

Rule 762. (1) Welding operations 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.

(2) All pipelines or other connections to drums, barrels, or tanks shall be disconnected or blanked before performing welding operations.

(3) Hollow spaces or cavities shall be vented and either filled with water or purged with an inert gas before preheating, cutting, or welding.

(4) An opening shall be maintained during welding and cutting to vent gases or vapors.

(5) Welding on natural gas pipelines shall be as prescribed by the regulations of the department of transportation, 49 C.F.R. Part 192, "Minimum Federal Safety Standards for Gas Pipelines," which are adopted by reference in R 408.40709.

History: 1980 AACS; 2005 AACS; 2015 AACS.