



DEPARTMENT OF LABOR & ECONOMIC GROWTH
DIRECTOR'S OFFICE
CONSTRUCTION SAFETY STANDARDS

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(as amended June 1, 1995) **(as amended September 10, 2002)**

These rules take effect 7 days after filing with the Secretary of State

(By authority conferred on the director of the department of consumer and industry services by sections 19 and 21 of 1974 PA 154 and Executive Reorganization Order No. 1996-2, MCL 408.1019, 408.1021, and 445.2001)

R 408.41801, R 408.41836, R 408.41837, R 408.41838, R 408.41841, R 408.41842, R 408.41851, R 408.41852, R 408.41853, R 408.41861, R 408.41863, R 408.41864, R 408.41866, R 408.41868, R 408.41869, R 408.41871, R 408.41875, R 408.41876, R 408.41877, and R 408.41884 of the Michigan Administrative Code are amended and R 408.41802 is added to the Code as follows:

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PART 18. FIRE PROTECTION AND PREVENTION

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R 408.41801 Scope.

Rule 1801. This part pertains to all of the following:

- (a) Fire prevention plans.
- (b) Employee emergency plans.
- (c) Fire fighting equipment.
- (d) The storing and dispensing of flammable and combustible materials.
- (e) Heating devices for construction operations.

R 408.41802 Adoption of Standards.

Rule 1802. (1) The standards specified in this rule, except the standards specified in subrule(5) of this rule, are adopted by reference in these rules.

(2) The following standards are adopted by reference in these rules and are available from The National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101, USA; telephone number: 617-770-3000; or via the internet at web-site: www.nfpa.org; or at the Michigan Department of Consumer and Industry Services, MIOSHA Standards Division, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-

8143, at a cost as of the time of adoption of these rules as stated:

- (i) NFPA 13 "Installation Of Sprinkler System" 1991 edition. Cost \$67.50.
- (ii) NFPA 14 "Standard For The Installation Of Standpipe, Private Hydrants And Hose Systems", 2000 edition. Cost \$26.75.
- (iii) NFPA 25 "Inspection, Testing, And Maintenance Of Water-Based Fire Protection Systems", 1998 edition. Cost \$35.25.
- (iv) NFPA 251 "Standard Methods Of Fire Testing Of Building Construction And Materials," 1990 edition. Cost \$13.50.
- (v) NFPA 30 "Flammable And Combustible Liquids Code," 1996 edition. Cost \$29.75.
- (vi) NFPA 385 "Standard For Tank Vehicles For Flammable And Combustible Liquids," 1990 edition. Cost \$22.25.
- (vii) NFPA 58 "Storage And Handling Of Liquefied Petroleum Gases", 1992 edition. Cost 32.25.
- (viii) NFPA 52 "The Compressed Natural Gas Vehicular Fuel Systems," 1992 edition. Cost \$13.00.
- (ix) NFPA 59A "Production, Storage And Handling Of Liquefied Natural Gas," 1990 edition. Cost \$18.00.

(3) Compressed Gas Association Standard CGA C7 "Guide To The Preparation Of Precautionary Labeling And Marking Of Compressed Gas Containers," 2000 edition, which is adopted by reference in these rules and is available from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at web-site: <http://global.ihc.com> at a cost as of the time of adoption of these amendments of \$294.00

(4) The provisions of 49 C.F.R. Parts 186-199, are adopted by reference in these rules and are available from The Superintendent of Documents, P.O. Box 371954, Pittsburgh, Pennsylvania, 15250-7954, USA, telephone number: 1-866-512-1800 or via the internet at web-site: <http://bookstore.gpo.gov> at a cost as of the time of adoption of these amendments of \$2.00; or at the Michigan Department of Consumer and Industry Services, MIOSHA Standards Division, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143.

(5) Michigan Construction Safety Standard Part 22 'Signals, Signs, Tags And Barricades,' being R 480.42201 et seq. which is referenced in R 408.41861, R 408.41863, R 408.41864, and R 408.41869, is available for inspection and distribution at no charge from the Michigan Department of Consumer and Industry Services, MIOSHA Standards Division, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48908-8143, or via the internet at website: www.michigan.gov/cis

R 408.41836 Definitions; A to C.

Rule 1836. (1) "**Approved**" means equipment that has been listed or approved by a nationally recognized testing laboratory which issues approvals for the equipment.

(2) "**Closed container**" means a container which is sealed by means of a lid or other device so that neither liquid nor vapor will escape from it at ordinary temperatures.

(3) "**Combustible**" means capable of burning.

(4) "**Combustible liquid**" means any liquid that has a flash point at or above 100 degrees Fahrenheit (37.8 degrees Celsius) and below 200 degrees Fahrenheit (93.4 degrees Celsius).

(5) "**Container in use**" means a container connected for use.

R 408.41837 Definitions; F.

Rule 1837. (1) "**Fire alarm signaling system**" means an alerting signal which is clearly audible throughout all areas and which would immediately alert employees in case of an emergency.

(2) "**Fire fighting equipment**" means any of the following:

- (a) Portable extinguishers.
- (b) Fixed fire equipment.
- (c) Water barrels and pails.
- (d) Standpipes.
- (e) Fire hose.
- (f) Fire alarms.

(3) "**Fire protection**" means to provide fire fighting equipment, training, and evacuation plans.

(4) "**Fire resistance**" means that quality of a material which renders it so resistant to fire that, for a specified time and under conditions of a standard heat intensity, the material will not fail structurally and will not permit the side away from the fire to become hotter than a specified temperature. For purposes of this part, fire resistance shall be determined by the fire test of building construction and materials, as prescribed in The National Fire Protection Association Standard NFPA 251, "Standard Methods Of Fire Testing Of Building Construction And Materials," 1990 edition, which is adopted by reference in R 408.41802.

(5) "**Fixed fire equipment**" means a fire extinguishing system that is permanently mounted and portable portions of a system, such as a hose and nozzle attached to a fixed supply of extinguishing agent.

(6) "**Flammable**" means to ignite easily and burn intensely or means to have a rapid rate of flame spread.

(7) "**Flammable liquid**" means any liquid which has a flash point below 100 degrees Fahrenheit (37.8 degrees Celsius) and which has vapor pressure of not more than 40 pounds per square inch (absolute) at 100 degrees Fahrenheit (37.8 degrees Celsius).

(8) "**Flash point**" means the temperature at which a liquid gives off vapor sufficient to form an ignitable mixture with air near the surface of the liquid or within the vessel used, as determined by the following appropriate test procedure and apparatus:

- (a) The flash point of liquids having a viscosity less than 45 Saybolt Universal Second(s) at 100 degrees Fahrenheit (37.8 degrees Celsius) and a flash point below 175 degrees Fahrenheit (79.4 degrees Celsius).
- (b) The flash point of liquids having a viscosity of 45 Saybolt Universal Second(s) or more at 175 degrees Fahrenheit (79.4 degrees Celsius).

R 408.41838 Definitions; L to V.

Rule 1838. (1) "**Liquefied petroleum gas,**" "**L.P.G.,**" or "**L.P. gas**" means any material which is composed predominately of any of the following hydrocarbons or mixtures of hydrocarbons:

- (a) Propane.
- (b) Propylene.
- (c) Butane.
- (d) Isobutene.
- (e) Butylene.

(2) "**Means of egress**" means a continuous path of travel from any part within a building to the open air outside at ground level.

(3) "**Portable container --- L.P.G.**" means a container designed to be readily moved and transported, either filled or partially filled. The containers shall have all container appurtenances protected so that they can be safely handled as a package.

(4) **“Portable tank---flammable and combustible liquid”** means a closed container which is made of metal, which has a liquid capacity of more than 60 United States gallons, which is not intended for fixed installation, and which is designed so that it will safely relieve internal pressure when exposed to fire.

(5) **“Safety can”** means an approved metal or nonmetallic container which has a capacity of not more than 5 gallons, which has a flash-arresting screen, spring closing lid and spout cover, and which is designed so that it will safely relieve internal pressure when exposed to fire.

(6) **“Temporary building”** means a structure erected or placed for a period not longer than the project construction time.

(7) **“Temporary heating device”** means a heating unit to provide heat for a period not longer than the project construction time.

(8) **“Vapor pressure”** means the pressure, measured in pounds per square inch (absolute), exerted by a volatile liquid.

R 408.41841 Employer Responsibility.

Rule 1841. (1) An employer shall be responsible for the development and maintenance of a fire protection and prevention program to be followed during all phases of construction to reduce the chance of fire and injury to employees.

(2) The fire protection portion of the program shall include all of the following:

- (a) Establishing and maintaining a means of egress from all areas of the building occupied by employees to provide free and unobstructed egress from all parts of the building or structure at all times when the building or structure is occupied. A lock or fastening that prevents free escape from the inside of any building shall not be installed, except in mental, penal, or corrective institutions where supervisory personnel is continually on duty and effective provisions are made to remove occupants in case of fire or other emergency.
- (b) Posting fire rules or, by other means, informing the employees of the evacuation signal, escape routes, and emergency phone numbers. Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or way to reach the exit is not immediately visible to the occupants.
- (c) A requirement that means of egress shall be continually maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

(3) The fire prevention portion of the program shall include both of the following:

- (a) A housekeeping policy designed to keep a means of egress free from the accumulation of stored materials and debris and to reduce the likelihood of fire.
- (b) A policy for the storage of combustible and flammable liquids and materials and for the use of proper heating equipment as prescribed in this part.

(4) Fire fighting equipment shall be provided by the employer and meet all of the applicable requirements of this part as to location, accessibility, inspection, testing, and maintenance. Defective equipment shall be immediately replaced.

(5) The requirements of this rule may be satisfied by 1 employer who is designated by all of the employers on the job if an agreement to that effect is reduced to writing and posted for all employees, employers, and representatives of

the department of consumer and industry services to see. The agreement shall include authority for the designated employer to comply with this rule.

(6) An employer shall furnish training to an employee before the employer assigns an employee to perform maintenance on a fixed fire system.

(7) An employer shall ensure that fire walls and exit stairways required for the completed buildings are given construction priority. Fire doors with automatic closing devices shall be hung on openings as soon as practicable.

(8) An employer shall retain existing fire separations in buildings undergoing alterations or demolition until operations necessitate their removal.

R 408.41842 Employee Emergency Action Plans.

Rule 1842. (1) This rule applies to all emergency action plans required by a particular MIOSHA or OSHA safety or health standard. The emergency action plan shall be in writing, except as provided in subrule (6) of this rule, and shall cover the designated actions that employers and employees must take to ensure employee safety from fire and other emergencies.

(2) All of the following elements, at a minimum, shall be included in an employee emergency action plan:

- (a) Emergency escape procedures and emergency escape route assignments.
- (b) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate.
- (c) Procedures to account for all employees after emergency evacuation has been completed.
- (d) Rescue and medical duties for those employees who are to perform them.
- (e) The preferred means of reporting fires and other emergencies.
- (f) Names or regular job titles of persons of departments that can be contacted for further information or an explanation of duties under the plan.

(3) An employer shall establish, in the emergency action plan, the types of evacuation to be used in emergency circumstances.

(4) Before implementing the emergency action plan, an employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(5) An employer shall review the plan at the following times with each employee who is covered by the plan:

- (a) Initially when the plan is developed.
- (b) When the employee's responsibilities or designated actions under the plan change.
- (c) When the plan is changed.

(6) Upon initial assignment, an employer shall review, with each employee, the parts of the plan that an employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review. For employers that have 10 or fewer employees, the plan may be communicated orally to employees and the employer need not maintain a written plan.

(7) An employer shall provide, as warranted by the project, a trained and equipped fire fighting organization (fire brigade) to assure adequate protection to life.

R 408.41850 Training.

Rule 1850. (1) If an employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an education program to familiarize employees with the general principles of fire

extinguisher use and the hazards involved with incipient stage fire fighting.

(2) An employer shall provide the education required in this rule upon initial employment and at least annually thereafter.

R 408.41851 Portable Fire Extinguishing Equipment; Selection and Installation.

Rule 1851. (1) All portable fire extinguishers shall bear an approved label of a nationally recognized testing laboratory. A fire extinguisher or extinguishing device that contains an active agent or propellant which has thermal decomposition products that have a level of vapor toxicity equal to or greater than any of the following listed materials shall not be used, installed for use, or allowed to remain installed for use:

- (a) Carbon tetrachloride, CCL₄.
- (b) Chlorobromomethane, CH₂BrCl.
- (c) Azeotropic chloromethane, CM₇.
- (d) Dibromodifluoromethane, CBr₂F₂.
- (e) 1, 2-dibromo-2-chloro-1, 1, 2-trifluoroethane, Cbr-F₂, CBrClF.
- (f) 1, 2-dibromo-2, 2-difluoroethane, CH₂BrCbrF₂.
- (g) Methylbromide, CH₃Br.
- (h) Ethylene dibromide, CH₂BrCH₂Br.
- (i) Hydrogen bromide, HBr.
- (j) Methylene bromide, CH₂Br₂.
- (k) Bromodifluoromethane, CHBrF₂.

(2) A portable fire extinguisher that has a rating of not less than 2A shall be provided for each 3,000 square feet of the protected building area at each floor level and along the means of egress to facilitate the evacuation of employees, unless otherwise required by this part. The travel distance to the nearest fire extinguisher shall be not more than 100 feet. In multistory buildings, at least 1 fire extinguisher shall be located adjacent to a stairway.

(3) Fire fighting equipment shall be located where it will be readily seen and accessible along normal paths of travel in the protected area.

(4) One 55-gallon open drum of water and 2 fire pails may be substituted for a fire extinguisher that has a 2A rating. The water shall be protected from freezing.

(5) A 1/2 inch or larger interior diameter garden hose which is not more than 100 feet in length and which is equipped with a nozzle may be substituted for a 2A fire extinguisher if it is capable of reaching all points in the area that would be covered by the replaced extinguisher and is capable of discharging not less than 5 gallons per minute with a horizontal hose stream of not less than 30 feet. The hose line shall be mounted on a rack or reel. Not more than 1/2 of the total number of required fire extinguishers may be replaced by the hose.

(6) In addition to the general requirements of this rule, fire extinguishers shall be supplied as follows:

- (a) Not less than 1 portable fire extinguisher that has a rating of not less than 20 BC units shall be located as follows:
 - (i) Outside of, but not more than 10 feet from, a door opening to a room used for the storage of flammable or combustible liquids.
 - (ii) Not less than 25 feet, nor more than 75 feet, from an outside storage area.
 - (iii) On each tank truck or other vehicle used to transport or dispense flammable or combustible liquids.
- (b) Each service or fueling area shall have at least 1 portable fire extinguisher which has not less than a 20 BC unit rating and which is located within 75 feet of each pump, dispenser, underground fill opening, and lubricating or service area.
- (c) Storage locations for liquefied petroleum gas (L.P.G.) shall be provided with at least 1 approved portable fire extinguisher that has a rating of not less than 20 BC.
- (d) Each site of a hazardous process shall be provided with a portable fire extinguisher of an appropriate size and type. Other means for safety or control may be provided if approved or required by the process.

(7) Table 1 may be used in selecting and providing an extinguisher.

(8) Table 1 reads as follows:

TABLE 1

HAZARD	DESCRIPTION	EXTINGUISHER TYPE AND CONTENTS
Class "A" Fire	Combustible Material	Loaded stream, Multipurpose dry chemical, Pressure-operated water, Water pump tanks, Water mist, Halon 1211.
Class "B" Fire	Flammable Liquids, Gas, Or Grease	Carbon dioxide, Dry chemical, Foam, Loaded stream, Multipurpose dry chemical, Halon 1211.
Class "C" Fire	Electrical Equipment	Carbon dioxide with plastic horn only, Dry chemical, Multipurpose dry chemical, Water mist, Halon 1211.
Class "D" Fire	Combustible Metal	Extinguishing agent listed for use on a specific combustible metal hazard.

R 408.41852 Portable Fire Extinguishing Equipment; Inspection, Testing, and Maintenance.

Rule 1852. (1) An extinguisher shall be inspected monthly, or at more frequent intervals when circumstances require. Inspections shall check for all of the following:

- (a) That the extinguisher is in its designated place.
- (b) That the extinguisher has not been actuated or tampered with.
- (c) That the extinguisher does not have obvious damage, physical damage, external corrosion, or other impairment.

(2) An extinguisher that shows defects which could possibly affect its operation shall be removed from service and given a complete check. An employer shall attach a tag to an extinguisher or keep a record documenting extinguisher maintenance or discharge dates and the initials or signature of the person who performed the service. Records shall be readable, kept on file or in an electronic system (for example, bar coding), and shall be available for inspection by a representative of the department of consumer and industry services. An employer shall keep a record of extinguisher maintenance or recharge dates and the initials or signature of the person who performed the service.

(3) An extinguisher shall receive a thorough inspection at least once a year to ensure operability. An extinguisher that requires recharging or weighing shall be maintained at least annually.

(4) An extinguisher that shows evidence of corrosion or mechanical damage shall be subjected to an approved hydrostatic test as prescribed in subrule (6) of this rule or shall be replaced.

(5) An extinguisher shall be given an approved hydrostatic test every 5 years, except for the following extinguishers, which shall be tested every 12 year:

- (a) A dry chemical extinguisher that has a brazedbrass, aluminum, or mild steel shell.
- (b) An extinguisher that used bromotrifluoromethane.
- (c) A dry powder extinguisher that is for metal fires. The hydrostatic test date shall be recorded on a suitable metallized decal or on an equally durable material which has been affixed by a heatless process to the shell of the extinguisher and which shows the date of the test, the test pressure, and the name of the person or agency making the test. An extinguisher tested after the effective date of this part shall have a label that will not retain its original condition when removal from an extinguisher is attempted. An extinguisher manufactured under the department of transportation specifications adopted by reference in subrule (7) of this rule may have the inspection date and serviceman's or firm's name, initials, or symbol stamped into the cylinder.

(6) A nitrogen cylinder or other cylinder for inert gas, such as found on a wheeled extinguisher, shall be hydrostatically tested at not more than 5-year intervals.

(7) An extinguisher, cylinder, or cartridge which is used for the storage of a compressed gas and which is manufactured as prescribed in department of transportation specifications shall by hydrostatically tested in accordance with the provisions of C.F.R. 49 Parts 186- 199, which are adopted by reference in R 408.41802.

(8) The hose and couplings on an extinguisher equipped with a shutoff nozzle at the outlet end of the hose shall have a hydrostatic test without the nozzle at the test intervals prescribed for the unit on which the hose is installed.

(9) A dry chemical and dry powder hose assembly that requires a hydrostatic test shall be at a test pressure of 300 pounds per square inch for 1 minute.

(10) An extinguisher subjected to an original factory test pressure of 350 pounds per square inch or more shall be tested at 75% of the factory test pressure, but not less than 300 pounds per square inch. See table 2.

(11) An extinguisher shall be suitable for use within a temperature range from plus 40 degrees to plus 120 degrees Fahrenheit. An extinguisher installed at a location subject to temperature extremes shall be of a type listed for the temperature to which it will be exposed or shall be placed in an enclosure capable of maintaining the temperature.

(12) Table 2 reads as follows:

TABLE 2

HYDROSTATIC TEST PRESSURE REQUIREMENTS -NON-ICC SHELLS SHELLS NOT SPECIFIED IN UNITED STATES DEPARTMENT OF TRANSPORTATION REGULATIONS (formerly Interstate Commerce Commission)		
EXTINGUISHER TYPE	ORIGINAL FACTORY TEST PRESSURE	REQUIRES HYDROSTATIC TEST PRESSURE
All dry chemical and Dry powder	400 psi or greater	75% of factory test pressure
	350-399 psi below 350 psi	300 psi 75% of factory test pressure
Foam - 500 psi factory test	500	375
Foam - 350 psi factory test	350	300
Stored-pressure or cartridge-operated water-type, including antifreeze And loaded stream	400 psi or greater	75% of factory test pressure
	350-399 psi below 350	300 psi 75% of factory test pressure

R 408.41853 Fixed Fire Equipment.

Rule 1853. (1) If the structure being constructed includes the installation of an automatic sprinkler or standpipe and hose system, then the installation shall be made during the construction of each story or section and shall be placed in service for each story or section that is completed. The standpipes shall be provided with Siamese fire department connections which shall be on the outside of the structure, at street level, conspicuously marked, and free from obstruction.

(2) During demolition or alterations, an existing sprinkler or standpipe system shall be maintained in service in any portion of a structure that is not subject to demolition or alteration. The operation of a sprinkler control valve shall be permitted only by a properly authorized person. Modification

of a sprinkler system to permit alterations or additional demolition shall be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at the close of work to ascertain whether the protection is in service. When the sprinkler or standpipe system is out of service for other than routine maintenance, the local fire department and the building manager or designated representative shall be notified. A sign shall be posted on each fire department connection that is out of service and the balance of the service shall be tested and resealed in operable condition, where required, and both the fire department and the building manager or designated representative shall be advised that the system is again in service.

(3) A standpipe and hose system shall have not less than 1 outlet per story.

(4) An automatic sprinkler system shall be installed and maintained as prescribed in The National Fire Protection Association Standards NFPA 13 "Installation of Sprinkler Systems," 1991 edition; NFPA 14 "Standard For The Installation Of Standpipe, Private Hydrants And Hose Systems," 2000 edition; and NFPA 25 "Inspection, Testing, And Maintenance Of Water-Based Fire Protection Systems," 1998 edition. The standards are adopted by reference in R 408.41802.

R 408.41854 Water Supply.

Rule 1854. (1) A water supply shall be available to maintain a fire protection system at full rated capacity when combustible materials are present.

(2) Where an underground water main is to provide water for fire protection equipment, the main shall be installed, completed, and made available for use as soon as practicable.

R 408.41855 Fire Hose and Connections.

Rule 1855. (1) One-hundred feet or less of 1-1/2 inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute supplied from an approved standpipe system may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

(2) An approved hose valve shall be provided at each outlet for attachment of hose.

(3) The employer shall contact the local fire fighting organization to assure that fire hose connections on the jobsite are compatible with their fire fighting equipment. If a connection is not compatible, the employer shall install an adapter, or equivalent, to permit connection of local fire fighting equipment.

(4) During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

R 408.41856 Fire Alarms.

Rule 1856. An alarm system shall be established whereby all employees on the site can be alerted for an emergency. The signaling device shall be audible throughout the structure.

R 408.41861 Ignition Hazards.

Rule 1861. (1) Internal combustion engine powered equipment shall be so located that the exhaust piping is at a distance away from flammable and combustible materials to prevent ignition. When the exhaust is piped to outside the building under construction, a clearance of not less than 6 inches shall be maintained between the piping and flammable and combustible material.

(2) Smoking shall be prohibited within 25 feet of flammable material. The area shall be posted with a sign "No Smoking or Open Flame." The sign shall be as prescribed in the construction safety standard, Part 22 'Signals, Signs, Tags and Barricades,' being R 408.42201 et seq., which is referenced in R 408.41802.

(3) Electrical wiring equipment and portable battery-powered lighting equipment used in connection with the storage, handling, or use of flammable material shall be of the type approved for the hazardous location.

(4) The nozzle of an air, inert gas, and steam line or hose, when used in the cleaning or ventilation of tanks and vessels that contain flammable gases or vapors, shall be bonded to the tank or vessel shell.

(5) When a hazardous concentration of flammable gas or vapor exists in the area outside of the tank or vessel, the external bonding connection shall be made to the tank or vessel with the non-sparking device. The final bonding connection shall be made outside the hazardous concentration.

R 408.41862 Transportation of Flammable and Combustible Liquids.

Rule 1862. (1) A container used for the transportation of a flammable and combustible liquid shall be of substantial construction or be substantially packed so they will not be readily broken or punctured during transportation or handling.

(2) A container shall be of sound metal or nonmetallic construction, having a tight closure with a screwed or spring cover.

(3) A safety can shall be used for the transportation of a flammable liquid in a quantity greater than 1 gallon, except that this requirement shall not apply to those flammable liquid materials which are highly viscid (extremely hard to pour), which may be stored and transported in original shipping containers.

(4) Only the original container or a safety can shall be used for transportation of flammable liquid in quantities of 1 gallon or less.

(5) A container used for the transportation of a flammable or combustible liquid shall be tightly closed to prevent the escape of liquid or vapor.

R 408.41863 Flammable and Combustible Liquids; Inside Storage.

Rule 1863. (1) Not more than 25 gallons of flammable or combustible liquid shall be stored within a room outside of an approved wood or metal cabinet.

(2) Not more than 60 gallons of flammable liquids or 120 gallons of combustible liquids shall be stored in any 1 storage cabinet. Not more than 3 such cabinets shall be located in a single storage area. Quantities of more than 60 gallons of flammable liquids or 12 gallons of combustible liquids shall be stored in an inside storage room as prescribed in R 408.41864.

(3) A wood cabinet, when used to store flammable or combustible liquids, shall have the bottom, back, sides, and top constructed of not less than 1-inch exterior plywood which shall not break down or delaminate under fire test conditions. All joints shall be rabbeted and secured in 2 directions by flathead wood screws. When more than 1 door is provided, there shall be a rabbeted overlap of not less than 1 inch. Steel hinges shall be mounted so that the holding capacity is not lost due to loosening or burnout of the screws. The cabinet shall be painted inside and out with a fire-retardant paint.

(4) A cabinet used to store flammable and combustible liquids shall be labeled with conspicuous lettering, "Flammable---Keep Fire Away," as prescribed in the construction safety standard, Part 22 'Signals, Signs, Tags and Barricades,' being R 408.42201 et seq. which is referenced in R 408.41802.

(5) A flammable or combustible liquid shall not be stored in a building in an area used as a means of egress.

R 408.41864 Inside Storage Room.

Rule 1864. (1) An inside storage room shall be constructed to meet the required fire resistance rating for its use. The construction shall meet the test specifications in The National Fire Protection Association Standard NFPA 251 "Standard Methods of Fire Testing of Building Construction and Materials," 1990 edition, which is adopted by reference in R 408.41802.

(2) Either an opening from an inside storage room to another room or building shall be provided with noncombustible liquid-tight raised sill or ramp not less than 6 inches in height or else the floor in the storage area shall be not less than 6 inches below the surrounding floor. The opening shall be provided with an approved self-closing fire door that is labeled with the words "Flammable ---- Keep Fire Away" in conspicuous lettering as prescribed in the construction safety standard, Part 22 'Signals, Signs, Tags, and Barricades,' being R 408.42201 et seq. which is referenced in R 408.41802.

(3) If wood shelving, racks, dunnage, or floor overlay is used in the room, it shall be not less than 1 inch nominal thickness.

(4) If another portion of the building or another building is exposed and a window covers an opening, the window shall be of a type approved for the hazard exposure.

(5) A material that will react with water to create a fire hazard shall not be stored in the same room with a flammable or combustible liquid.

(6) Quantities of flammable and combustible liquids stored in an inside storage room shall be limited in accordance with the criteria prescribed in table 3.

(7) Every inside storage room shall be provided with a mechanical ventilating system and meet all of the following provisions:

- (a) A switch located outside of the door of the inside storage room shall control the mechanical exhausting system and any lighting fixtures.
- (b) An electric pilot light shall be installed adjacent to the switch if flammable liquids are dispensed within the room.
- (c) The ventilation system shall commence not more than 12 inches above the floor and be designed to provide for a complete change of air within the room not less than 6 times per hour when flammable and combustible liquids are stored in the room.
- (d) The exhausting outlet from the room shall be on the exterior of the building in which the room is located and away from any source of ignition.
- (8) An inside storage room shall have at least 1 aisle which shall be not less than 3 feet in width and which shall be maintained free of obstructions.
- (9) Containers that have more than a 30-gallon capacity shall not be stacked one upon another.
- (10) Table 3 reads as follows:

TABLE 3

INSIDE STORAGE ROOM			
Fixed Fire Protection Provided	Fire Resistance Rating of Room	Maximum Size Of Storage Area	Total Allowable Quantities Gallons/Square Foot/Floor Area
Yes	2 hours	500 square feet	10
No	2 hours	500 square feet	4
Yes	1 hour	150 square feet	5
No	1 hour	150 square feet	2

R 408.41865 Flammables and Combustibles; Outside Storage.

Rule 1865. (1) Containers of flammable and combustible liquids with not more than 60 gallons in each container shall not be stored in excess of 1,100 gallons in any outside storage area.

(2) Portable tanks stored outside shall not be closer than 20 feet from any building. Two or more portable tanks, grouped together, having a combined capacity in excess of 2,200 gallons, shall be separated by a 5-foot clear area.

(3) Within 200 feet of each portable tank, there shall be a 12-foot wide access way to permit approach of fire control apparatus.

(4) A flammable and combustible liquid in an out door storage area shall be stored not less than 20 feet from a building.

(5) Within 200 feet of each pile or group of flammable or combustible containers, a 12-foot wide access way shall be maintained to permit the approach of fire control equipment.

(6) An outside storage area for flammable and combustible liquids shall be graded in a manner to divert a possible spill away from a building or other hazard, or shall be surrounded by a curb or earth dike not less than 12 inches high. When a curb or dike is used, provisions shall be made to drain off accumulations of water or a spill of a flammable or combustible liquid in such a manner that the spill cannot create another hazard.

(7) An outside storage area for flammable or combustible liquid shall be kept free of weeds, papers, debris, and other combustibles not necessary to the storage.

(8) An above ground tank or loading operation shall not be installed closer than 25 feet plus 1 inch per 1,000 volts, measured horizontally, from the center line of electric power lines, or under an electric power line, except that service entrance and service lines may be closer than 25 feet but not over the tanks or loading area. This prohibition shall not apply to a fuel oil tank with up to a 275-gallon individual capacity or a 550-gallon aggregate capacity that is used for heating purposes.

(9) A flammable or combustible liquid outdoor storage area shall not occupy any area used as a means of egress.

R 408.41866 Emergency Venting of Outside Portable Tanks.

Rule 1866. A portable tank that has a capacity of 660 gallons or less of flammable or combustible liquid shall be in compliance with the provisions of chapters III, IV, and V of The National Fire Protection Association Standard NFPA 30, "Flammable and Combustible Liquids Code," 1996 edition, which is adopted by reference in R 408.41802. A portable tank and its piping system that has a capacity of more than 660 gallons of flammable or combustible liquid shall be designed, constructed, and tested as prescribed in chapters II and III of The National Fire Protection Association Standard NFPA 30, "Flammable and Combustible Liquids Code," 1996 edition, which is adopted by reference in R 408.41802.

R 408.41867 Flammable and Combustible Liquids; Dispensing.

Rule 1867. (1) An area where a flammable or combustible liquid is transferred at one time, in a quantity of more than 5 gallons from one tank or container to another tank or container, shall be separate from other operations or a building by a distance of 25 feet or by a wall not less than 5 feet high having a fire resistance of not less than 1 hour.

(2) Provisions shall be made to neutralize spills of flammable and combustible liquids. Natural or mechanical ventilation shall be capable of maintaining vapor below 10% of the lower explosive limit.

(3) Transfer of a flammable and combustible liquid from one container to another shall be done only when the containers are electrically bonded.

(4) A flammable or combustible liquid shall be transferred from or drawn into containers by 1 of the following:

- (a) Through a closed piping system.
- (b) From a safety can.
- (c) By a device drawing through the top from a closed container or portable tank, by gravity or a pump, through a self-closing valve. Air pressure shall not be used.

(5) A dispensing device, hose, and nozzle shall be an approved type and the dispensing unit shall be protected from collision damage. The nozzle shall be an automatic closing-type without a latch open device.

R 408.41868 Flammable and Combustible Liquids; Handling At Point Of Use.

Rule 1868. (1) Not more than 1 day's supply, but not to exceed 25 gallons, of flammable or combustible liquid shall be permitted to stand outside a cabinet at a place of usage.

(2) A flammable or combustible liquid shall not be used where there is an open flame or source of ignition within 50 feet of the liquid.

(3) Leakage or spillage of a flammable or combustible liquid shall be disposed of without creating another hazard.

(4) An open container containing a flammable liquid shall be equipped with a cover that has a fused link which will automatically close if the liquid is ignited.

(5) Natural or mechanical ventilation capable of maintaining the vapor below 10% of the lower explosive limit shall be provided and used when a flammable liquid is used or handled.

(6) Flammable liquids shall be kept in closed containers when not in use.

R 408.41869 Flammable and Combustible Liquids; Service and Refueling Areas.

Rule 1869. (1) A tank truck shall be designed, constructed, and maintained as prescribed in The National Fire Protection Association Standard NFPA 385 "Standard For Tank Vehicles For Flammable And Combustible Liquids," 1990 edition, which is adopted by reference in R 408.41802.

(2) An emergency switch that is clearly identified and accessible shall be available to shut off all power to all dispensing devices in an emergency and shall be in a location that is remote from the dispensing device.

(3) Sources of ignition, such as smoking, open flame, cutting and welding, frictional heat, sparks, and heating equipment, shall not be permitted within 25 feet in any direction of where an internal combustion engine is fueled or where a flammable or combustible liquid is dispensed. A warning sign shall be posted as prescribed in construction safety standard Part 22 'Signals, Signs, Tags, and Barricades,' being R 408.42201 et seq. which is referenced in R 408.41802. The motor of any equipment being fueled shall be shut off during the fueling operation.

R 408.41871 Liquefied Petroleum Gas.

Rule 1871. (1) The storage and handling of L.P.G. shall be as prescribed in The National Fire Protection Association Standards, NFPA 58 "Storage and Handling of Liquefied Petroleum Gases," 1992 edition; NFPA 52 "The Compressed Natural Gas Vehicular Fuel Systems," 1992 edition; and NFPA 59A "Production, Storage and Handling of Liquefied Natural Gas," 1990 edition. The standards are adopted by reference in R 408.41802.

(2) An employer shall also contact the Michigan Department Of Environmental Quality, Storage Tank Division, for additional rules concerning the installation, use, and storage of liquefied petroleum gases. The Storage Tank Division can be reached at The Town Center, 333 South Capital, Lansing, Michigan, 48909-7657 or via website: www.michigan.gov/deq

R 408.41872 L. P. Pipe, Fittings, and Hose.

Rule 1872. (1) Piping, pipe and tubing fittings, and valves used to supply utilization equipment within the scope of this standard shall be acceptable for services as approved by the manufacture of the equipment.

(2) Pipe shall be wrought iron, steel, brass, or copper.

(3) Aluminum piping or tubing is prohibited.

(4) Fittings shall be steel, brass, copper, malleable iron, or ductile iron. Cast iron fittings shall not be used.

(5) Tubing shall be steel, brass, or copper.

(6) Hose, hose connections, and flexible connections shall be fabricated of approved materials resistant to the action of L. P. gas, both as a liquid and vapor.

(7) Hose, hose connections, and flexible connectors shall be designed for a working pressure of not less than 350 psig and shall be as short as practical.

(8) Fittings at pressures higher than container pressures shall be suitable for a working pressure of 350 psig.

(9) Fittings used at operating pressures over 125 psig shall be suitable for a working pressure of 250 psig.

(10) Fittings used with vapor at pressure not exceeding 125 psig shall be suitable for a working pressure of 125 psig.

R 408.41873 L. P. Safety Devices.

Rule 1873. (1) Every container and every vaporizer shall be provided with 1 or more approved safety relief valves or devices. These valves shall be arranged to afford free vent to the outer air with discharge not less than 5 feet away, horizontally, from any opening into a building which is below such a discharge.

(2) Shutoff valves shall not be installed between the safety relief device and the container, or the equipment or piping to which the safety relief device is connected, except that a shutoff valve may be used where the arrangement of this valve is such that the full required capacity flow through the safety relief device is always afforded.

(3) Container safety relief devices and regulator relief vents shall be located not less than 5 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

R 408.41874 L. P. Gas Appliances.

Rule 1874. (1) L. P. gas consuming appliances shall be approved types, which have been manufactured for L. P. gas, or if an appliance is converted or adapted to L. P. gas service, the appliance shall be tested for performance by a knowledgeable employee or outside service before use.

(2) Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.

R 408.41875 L.P. Containers and Equipment.

Rule 1875. (1) Containers in use shall be in compliance with all of the following provisions:

- (a) Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.
- (b) Containers of more than 2 1/2 pounds water capacity shall be equipped with a shutoff valve and excess flow valve.
- (c) Valves on containers shall be protected against physical damage.
- (d) Containers that have a water capacity of more than 2 1/2 pounds shall stand on a firm and substantially level surface. If necessary, the containers shall be secured in an upright position.
- (e) Regulators, if used, shall be suitable for use with L.P. gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for not less than 250 psig service pressure.
- (f) Piping, fittings, and hose shall be in compliance with R 408.41872.
- (g) Filling of fuel containers for trucks or motor vehicles from bulk storage containers shall be performed not less than 10 feet from the nearest masonry-walled building, or not less than 25 feet from the nearest building or other construction and, in any event, not less than 25 feet from any building opening.
- (h) Filling of portable containers or containers mounted on skids from storage containers shall be performed not less than 50 feet from the nearest building.
- (i) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds L.P. gas capacity).
- (j) All of the following provisions apply to multiple container systems:
 - (i) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system. This provision shall not be construed as requiring an automatic changeover device.
 - (ii) Heaters shall be equipped with an approved regulator in the supply line between the fuel cylinder and the heater unit. Cylinder connectors shall be provided with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.
 - (iii) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls, or otherwise rigidly secured, and shall be so installed or protected from the elements.

(2) Containers may be used in unoccupied portions of a building during the hours of the day that the public normally is in the building in accordance with all of the following provisions:

- (a) The maximum water capacity of individual containers shall be 50 pounds (nominal 20 pounds L.P. gas capacity) and the number of containers in the building shall not exceed the number of workmen assigned to using L.P. gas.
- (b) Containers that have a water capacity of more than 2 1/2 pounds (nominal 1 pound L.P. gas capacity) shall not be left unattended.
- (c) During the hours of the day when the building is not open to the public, containers may be used as prescribed in subrule (1) of this rule; however,

containers that have a water capacity of more than 2 1/2 pounds shall not be left unattended.

R 408.41876 Piping Liquid or Vapor L.P. Gas Into Buildings and Structures.

Rule 1876. The piping of liquid or vapor L.P. gas into buildings that are under construction or major renovation shall be in compliance with all of the following provisions:

- (a) Piping used at pressures higher than container pressure shall be suitable for a working pressure of not less than 350 psig.
- (b) Liquid piped at container pressure or lower shall be suitable for a working pressure of not less than 250 psig.
- (c) Vapor L.P. gas that has an operating pressure of more than 125 psig shall be suitable for a working pressure of not less than 250 psig.
- (d) Vapor piped at a pressure of not more than 125 psig shall be suitable for a working pressure of not less than 125 psig.
- (e) Metallic pipe joints may be threaded, flanged, welded, or brazed.
- (f) Joints shall be made with a material that has a melting point of 1,000 degrees Fahrenheit.
- (g) When joints are threaded or threaded and back welded for vapors of liquid at pressures of more than 125 psig, schedule 80 or heavier pipe shall be used; however, at pressures of less than 125 psig, schedule 40 or heavier pipe may be used.
- (h) Piping, if welded, shall be made with a suitable type of welding fittings and shall be at least schedule 40 pipe.
- (i) Piping shall not be more than 3/4-inch pipe interior diameter. Type K or L copper tubing which is in compliance with section 232 of The National Fire Protection Association Standard NFPA 58, "Storage And Handling Of Liquefied Petroleum Gases," 1992 edition, which is adopted by reference in R 408.41802, and which has a maximum 3/4-inch pipe outside diameter may be used.
- (j) Piping shall be securely fastened to walls or other surfaces, protected against physical damage, and located to avoid high temperatures.
- (k) A shutoff valve shall be located at each branch line where it leaves the main line. A second shutoff valve shall be located at the appliance end of the branch and upstream of any flexible appliance connector.
- (l) Excess flow valves shall be installed where pipe size is reduced.
- (m) Hydrostatic relief valves shall be installed in liquid lines between shutoff valves.
- (n) All piping and fittings shall be in compliance R 408.41872.

R 408.41877 Storage of Portable Containers.

Rule 1877. (1) This rule applies to the storage of portable containers whether filled or empty if they have been in service.

(2) Storage of L.P. gas within buildings is prohibited.

(3) Storage outside of buildings, for containers awaiting use, shall be located away from the nearest building or group of buildings as specified in table 4.

(4) Table 4 reads as follows:

TABLE 4

QUANTITY OF L.P. GAS STORED	DISTANCE (FEET) FROM A BUILDING
500 lbs. or less	0
501 to 6,000 lbs.	10
6,001 to 10,000 lbs.	20
over 10,000 lbs.	25

(5) Containers shall be stored within a suitable ventilated enclosure or otherwise protected against tampering, and located as specified in table 4.

(6) When L.P. gas and 1 or more other gases are stored or used in the same area, the containers shall be marked to identify their content. Marking shall be in compliance with The Compressed Gas Association Standard CGA C7 "Guide To The Preparation Of Precautionary Labeling And Marking Of Compressed Gas Containers," 2000 edition, which is adopted by reference in R 408.41802.

R 408.41878 Location of Containers.

Rule 1878. (1) Located as to minimize exposure to excessive temperature rise, physical damage, or tampering.

(2) Containers having greater than 2 1/2 pounds water capacity shall be positioned so that the safety relief valve is in direct communication with the vapor space of the container.

(3) Containers not connected for use shall not be stored on roofs.

(4) Provisions shall be made to prohibit containers from falling over the edge of openings or roofs.

(5) Containers with a maximum water capacity of 2 1/2 pounds may be used in the buildings as a part of an approved self-contained torch assembly.

R 408.41879 Container Valve Protection.

Rule 1879. Screw-on-type caps or collars shall be securely in place on all stored containers regardless of whether they are full, partially full, or empty and container outlets shall be closed.

R 408.41881 Temporary Buildings.

Rule 1881. (1) A temporary building shall not be erected where it will adversely affect a means of egress.

(2) A temporary building erected within another building shall be constructed of noncombustible material or material having a fire resistance rating of not less than 1 hour.

(3) A temporary building, except an enclosure used to house a hoist operator, located outside another building shall be located not less than 10 feet from a building or structure. A group of temporary buildings not exceeding 2,000 square feet in aggregate shall, for the purposes of this part, be considered a single temporary building.

R 408.41882 Open Yard Storage; Combustible Materials.

Rule 1882. (1) Combustible materials stored in an open yard shall be in piles not more than 20 feet high and located not less than 10 feet from a building or structure.

(2) A driveway in combustible material storage area shall be spaced so that a grid system unit of not more than 50 by 150 feet is produced. A driveway between piles of combustible material shall be not less than 15 feet wide.

(3) Housekeeping in an open yard storage area shall include keeping rubbish, weeds, and scrap material picked up.

(4) Piling of combustible material in an open yard is prohibited where a danger of underground fire exists.

R 408.41883 Indoor Storage.

Rule 1883. (1) A path of travel to an exit shall not be blocked by the storage of material.

(2) Incompatible materials shall be separated by a distance of not less than 50 feet or a barrier having fire resistance of not less than 1 hour.

(3) Aisle width shall be maintained to safely accommodate the widest vehicle that may be used within that part of the structure for fire fighting purposes.

(4) Unless separated by a barrier, a clearance around the path of travel of a fire door shall be not less than 2 feet. Material shall not be stored within 36 inches of a fire door opening.

(5) Material shall be piled in a manner so as to prevent the spread of fire and to permit access for fire fighting.

(6) A clearance of not less than 3 feet shall be maintained between stored material and sprinklers.

(7) Clearance shall be maintained around lights and heating units to prevent ignition of a flammable or combustible material and liquids.

(8) Materials shall be stored, handled, and piled with due regard to their fire characteristics.

R 408.41884 Heating Devices.

Rule 1884. (1) A temporary heating device shall not produce combustion products that will increase the air contaminants above the maximum allowable limits established by the occupational health division of the Michigan department of consumer and industry services.

(2) A heating device, including a temporary heating device, shall be located at a distance sufficient to prevent ignition of any material in its proximity or the material shall be insulated.

(3) A temporary heating device shall not be located less than 50 feet from a point where a flammable or combustible liquid is used or dispensed.

(4) A temporary heating device that is set on a combustible floor shall be separated from the floor by an insulating material or 1 inch of concrete. The insulating material shall extend not less than 2 feet beyond the heater in all directions.

(5) A temporary heating device shall be located not less than 10 feet from a combustible covering, such as, but not limited to, canvas or tarpaulins, unless the covering is fastened to prevent its dislodgement due to wind action.

(6) A temporary heating device using L.P. gas, other than in an integral heater-container unit, shall be located not less than 6 feet from any L.P. gas container.

(7) Integral heaters may be used if designed and installed so as to prevent direct or radiant heat application to the container.

(8) Blower-and radiant-type units shall not be directed toward any L.P. gas container that is less than 20 feet away.

(9) If 2 or more heater units are located within the same unpartitioned area, then the containers of each unit shall be separated from the containers of any such other unit by not less than 20 feet.

(10) If containers are manifolded together and serve 1 heater on the same floor, then the total water capacity of the containers shall not be more than 735 pounds (nominal 300 pounds L.P. gas capacity). If more than 1 such manifold is used they shall be separated by not less than 20 feet.

(11) On floors on which no heaters are connected for use, containers may be manifolded together if the total water capacity is not more than 2,450 pounds (nominal 1,000 pounds L.P. gas capacity). Manifolds of more than 735 pounds water capacity shall be separated by not less than 50 feet.

(12) Heating devices, including portable heaters and salamanders using a liquid flammable fuel such as, but not limited to, fuel oil or kerosene, shall be equipped with an approved automatic shutoff safety control device which will, in the event of flame failure, shut off the flow of fuel to the main burner and pilot if used. The device shall not be relit while the combustion chamber is hot.

(13) Portable heaters including salamanders that have inputs above 50,000 British thermal unit's (B.T.U.) per hour, shall be equipped with either a pilot, that is lighted and proved before the main burner can be turned on, or an electric ignition system, except the provisions of this rule do not apply to any of the following:

- (a) Tar kettles, hand torches, melting pots, or portable heaters of less than 7,500 British thermal unit's (B.T.U.), if used with 2 1/2 pound containers.

- (b) Manufactured tent heaters, as utilized by, and in applications common to, public utilities or telecommunication companies, with 12,000 British Thermal Unit's (B.T.U.) input or less, when used out-of-doors and if constantly attended.

(14) A temporary heating device shall be installed horizontally level.

(15) A solid fuel salamander shall not be used in a building or on a scaffold.

(16) L.P. gas containers valves, connectors, regulators and manifolds, piping, and tubing shall not be used as structural supports for heaters and shall be located to minimize exposure to high temperatures or physical damage.

(17) A heating device, including a temporary heating device, designed for barometric or gravity oil feed shall be used only with an integral tank.

(18) Heaters specifically designed and approved for use with separate supply tanks may be connected for gravity feed, or an automatic pump, from a supply tank.

(19) L.P. containers may be used in buildings for temporary emergency heating as provided in this rule and the equipment shall not be left unattended.

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