

Kansas State University
Hot Work Permit

Notes: This Hot Work Permit is valid only for:

- 1) A specific K-State Supervisor or Contractor
- 2) On the specific day(s) approved

A separate Hot Work Permit must be requested and approved for each supervisor or contractor and each type of Hot Work.

This Hot Work Permit is not valid without the signatures (1 & 2) below and faxed to Public Safety, 785-532-1981

Project:

Project #: _____

Responsible K-State Department: _____

Contractor/Subcontractor: _____

Street Address: _____

City, State, Zip: _____

Phone: _____

Responsible Supervisor: _____

Type of Hot Work: Welder Torch Grinder

Location for Hot Work: _____

Building: _____

Room: _____

Or if outside: Location: _____

Dates of Hot Work: _____

1) KSU Project Manager/Supervisor: _____

2) KSU Employee or Contractor Signature/date: _____

KSU Division of Public Safety Signature/date: _____

- Faxed to Manhattan Fire Dept.
 Hand delivered to KSU Police Dept.

Kansas State University Hot Work Policy

I. Purpose. To eliminate or control potential ignition sources resulting from welding, flame cutting, soldering or similar activities which may produce flames or sparks. Provide a safe work/learning environment in University buildings where temporary hot work may be performed. Potential health, safety and property hazards can result from the fumes, gases, sparks, hot metal and radiant energy produced during hot work. These, and other hazards, can be reduced through the implementation of effective controls as outlined in this Policy.

II. Definitions.

- A. Hot Work. Operations including cutting, welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar situation.
- B. Hot Work Area. The area exposed to sparks, hot slag, radiant heat, or convective heat as a result of the hot work.
- C. Hot Work Equipment. Electric or gas welding or cutting equipment used for hot work.
- D. Hot Work Permit. A document issued by the supervisor to the employee performing the Hot Work that outlines the procedure(s) to be followed, dates, and times of the procedure(s).
- E. Responsible Person. A person trained in the safety and fire safety considerations concerned with hot work. Responsible for reviewing the sites prior to issuing permits as part of the hot work permit program and following up as the job progresses.
- F. Qualified Individual: Supervisory personnel, such as welding superintendents, maintenance foremen, plant engineers or master mechanics, who have specific training, knowledge, experience, or are certified as competent to carry out and oversee welding operations.

III. Scope.

- A. This policy applies to all Kansas State University employees involved in welding, cutting or braising of metals, in areas other than those designated specifically for that purpose.
- B. This policy fixes responsibility for the supervision and enforcement of a hot work permit system which includes work site, methods and equipment inspections as well as worker training and the issuance and use of personal protective equipment.
- C. The following standards are incorporated by reference into this Policy: The National Fire Protection Association (NFPA) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work (NFPA 51B, 2009), the Occupational Safety and Health Administration (OSHA) Standard for Welding, Cutting, and Brazing, Subpart Q (29 CFR 1910.251), the OSHA Standard for the Handling, Storage, and Use of Compressed Gases, contained in Subpart H, Hazardous Materials (29 CFR 1910.101), and the American National Standards Institute (ANSI) Standard Z87.1-2003.

IV. Responsibilities.

- A. It is the responsibility of each University employee engaged in hot work to implement controls that will eliminate or greatly reduce the hazards generated by their work, for the protection of other University employees, students and visitors.

B. It is the responsibility of each supervisor, whose employee(s) engage in hot work, to insure that the guidelines in this Policy are implemented and hazards are controlled so as not to present an exposure to University employees, students and visitors. It is also the responsibility of the supervisor to insure the employee(s) they designate to perform hot work, utilizes the necessary procedures and equipment, so as to minimize that employee's own exposure to the hazards generated.

C. It is the responsibility of the University to provide the necessary equipment to control the hazards generated by hot work, when the work is performed by University employees.

V. Program Description.

A. General Cutting and Welding Controls. If possible, perform the hot work in designated shops, only. In the event this is not possible, then areas where hot work is to be performed should be properly prepared prior to work commencement. The following controls should be implemented:

1. Cutting and welding operations are restricted to properly trained and authorized individuals only.
2. Move combustible materials at least 35 feet from the work site. If this is not possible, then protect combustible items with metal guards or flame proof curtains or covers. (Ordinary tarpaulins or cloths are not acceptable protection).
3. Cover floor and wall openings located 35 feet or less to the work site, to prevent hot sparks from entering walls or falling beneath floors to a lower level.
4. Use fire resistant curtains and/or tinted shields to prevent fire, employee burns and ultra-violet light exposure.

B. Ventilation and Atmospheric Testing.

1. Hot work should not be conducted in the presence of flammable gases, vapors, liquids, or dusts (where an explosive concentration can develop). Atmospheric testing prior to work commencement, and periodically there after, should be conducted if the atmosphere in the work area has the potential to become hazardous.
2. Ventilation of the work site, either through local or general exhaust ventilation, should be adequate for the work performed. The vent terminator of a local exhaust system must not be located near operational air intakes to any University building.

C. Fire Protection. A person, other than the operator, should perform fire watch duty. This duty includes remaining on the work site for at least 30 minutes after hot work operations have ended. In addition, the following steps should be taken:

1. Prior to issuing a Hot Work Permit, the authorized individual shall ascertain that a fire extinguisher of the appropriate type and size is readily available and accessible, and that a fire-watch attendant (a second person) will be present during the hot work activity to respond promptly should an incident occur.
2. If a building or area is equipped with a sprinkler system, then that system must be operational when the hot work is performed.

D. Personal Protective Equipment (PPE). PPE specifically designed for hot work should be provided to and utilized by employees performing the hot work. Supervisors should consult the Division of Public Safety if they have a question regarding employee exposure and the PPE necessary to protect them.

E. Hot Work in Confined Spaces. Any hot work done in confined spaces, whether designated as Permit Entry or non-permit entry, will follow Permit Entry Required procedures for confined spaces. The very nature of hot work in a confined space makes the atmospheric hazards of that space a danger to employee health. Consult the Division of Public Safety before conducting hot work in any confined space (labeled or otherwise).

F. Compressed Gas Cylinder Storage and Handling. The safe storage and handling of compressed gas cylinders is an important part of cutting and welding operation. The following steps should be followed:

1. Oxygen and fuel gas cylinders should be stored separately with the protective valve caps in place. Except when in use, oxygen and fuel gas cylinders should be stored at least 20 feet apart or separated by a noncombustible wall at least 5 feet high.
2. Cylinder carts equipped with a cylinder restraint, such as a chain or strap, must be used for the transporting of all compressed gas cylinders.
3. All cylinders must be secured, when stored or in use. Securing devices in storage should prevent the tipping over of the cylinder. When in use, cylinders should remain on a welding cart and be secured to that cart.
4. Regulators must be compatible with the cylinder and its contents. Regulators are gas specific, so make sure the correct regulator is used.

G. Hot Work Permits. No hot work can be done without the issuance and posting of a hot work permit, except in those shops that have areas dedicated to hot work and outdoors areas only in the event of hot work that does not impact combustible or flammable material; fire extinguishers must be readily available within 50 feet. An example of a Hot Work Permit is found in Appendix A.

There are two types of hot work permits that can be issued, In-house Hot Work Permit and the Outside Contractor Hot Work Permit. The Hot Work Permit procedure is as follows:

1. In-House
 - a. The supervisor issues the Hot Work Permit to his/her own employee(s). Each permit is job specific. The supervisor is then responsible for submitting the permit to the Division of Public Safety prior to commencing work. At the end of the job, the supervisor must keep this permit on file for a period of not less than one year.
 - b. The employee(s) assigned to perform the hot work is to hang the Hot Work Permit at the job site.
2. Outside Contractor
 - a. Access to the Kansas State University Hot Work Policy should be provided to all outside contractors that will engage in hot work on campus.

b. Prior to beginning any hot work on University property, the contractor's representative should contact the University project manager and arrange for the issuance of a hot work permit. Once issued, the permit must be displayed on the job site. The contractor's personnel are expected to adhere to all the guide lines set forth in this Policy and make a reasonable effort to insure the health and safety of University employees, students and visitors.

H. Training.

1. It is expected that any University employee engaged in hot work has received training and developed the skills necessary to work in a safe and professional manner.
2. The Division of Public Safety will train and consult with any employee, at the request of their supervisor, on the topic of personal and fire safety as it relates to hot work.
3. All supervisors with a need to issue hot work permits will be trained in their completion, and the guidelines of this Policy, with the assistance of the Division of Public Safety.

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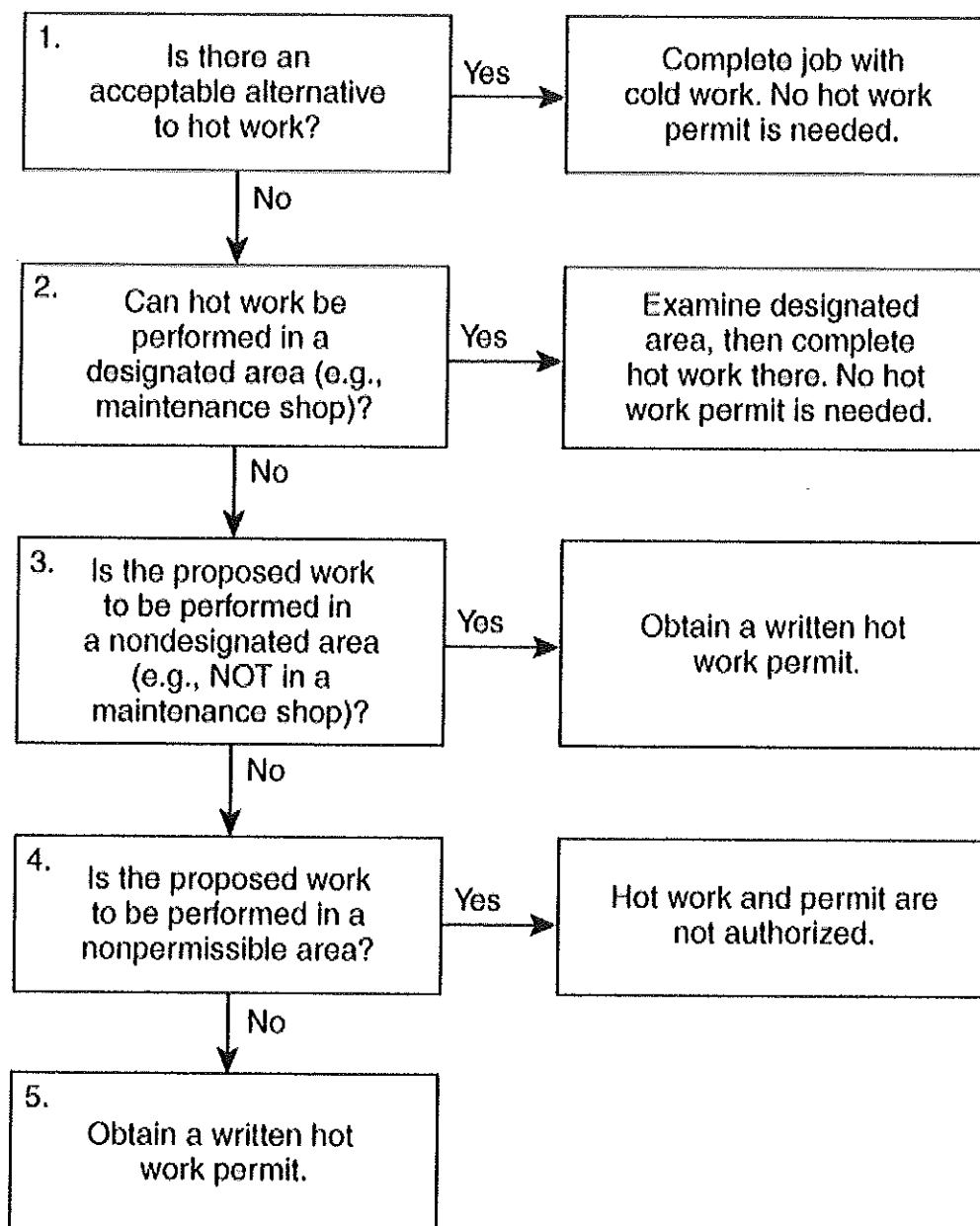


FIGURE A.5.4
Hot Work Permit Decision Tree.

CHAPTER 26

WELDING AND OTHER HOT WORK

SECTION 2601 GENERAL

2601.1 Scope. Welding, cutting, open torches and other hot work operations and equipment shall comply with this chapter.

2601.2 Permits. Permits shall be required as set forth in Section 105.6.

2601.3 Restricted areas. Hot work shall only be conducted in areas designed or authorized for that purpose by the personnel responsible for a Hot Work Program. Hot work shall not be conducted in the following areas unless approval has been obtained from the fire code official:

1. Areas where the sprinkler system is impaired.
2. Areas where there exists the potential of an explosive atmosphere, such as locations where flammable gases, liquids or vapors are present.
3. Areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, dust or loose combustible materials.
4. On board ships at dock or ships under construction or repair.
5. At other locations as specified by the fire code official.

2601.4 Cylinders and containers. Compressed gas cylinders and fuel containers shall comply with this chapter and Chapter 30.

2601.5 Design and installation of oxygen-fuel gas systems. An oxygen-fuel gas system with two or more manifolded cylinders of oxygen shall be in accordance with NFPA 51.

SECTION 2602 DEFINITIONS

2602.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

HOT WORK. Operations including cutting, welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar activity.

HOT WORK AREA. The area exposed to sparks, hot slag, radiant heat, or convective heat as a result of the hot work.

HOT WORK EQUIPMENT. Electric or gas welding or cutting equipment use for hot work.

HOT WORK PERMITS. Permits issued by the responsible person at the facility under the hot work permit program permitting welding or other hot work to be done in locations referred to in Section 2603.3 and pre-permitted by the fire code official.

HOT WORK PROGRAM. A permitted program, carried out by approved facilities-designated personnel, allowing them to oversee and issue permits for hot work conducted by their personnel or at their facility. The intent is to have trained, on-site, responsible personnel ensure that required hot work safety measures are taken to prevent fires and fire spread.

RESPONSIBLE PERSON. A person trained in the safety and fire safety considerations concerned with hot work. Responsible for reviewing the sites prior to issuing permits as part of the hot work permit program and following up as the job progresses.

TORCH-APPLIED ROOF SYSTEM. Bituminous roofing systems using membranes that are adhered by heating with a torch and melting asphalt back coating instead of mopping hot asphalt for adhesion.

SECTION 2603 GENERAL REQUIREMENTS

2603.1 General. Hot work conditions and operations shall comply with this chapter.

2603.2 Temporary and fixed hot work areas. Temporary and fixed hot work areas shall comply with this section.

2603.3 Hot work program permit. Hot work permits, issued by an approved responsible person under a hot work program, shall be available for review by the fire code official at the time the work is conducted and for 48 hours after work is complete.

2603.4 Qualifications of operators. A permit for hot work operations shall not be issued unless the individuals in charge of performing such operations are capable of performing such operations safely. Demonstration of a working knowledge of the provisions of this chapter shall constitute acceptable evidence of compliance with this requirement.

2603.5 Records. The individual responsible for the hot work area shall maintain "prework check" reports in accordance with Section 2604.3.1. These reports shall be maintained on the premises for a minimum of 48 hours after work is complete.

2603.6 Signage. Visible hazard identification signs shall be provided where required by Chapter 27. Where the hot work area is accessible to persons other than the operator of the hot work equipment, conspicuous signs shall be posted to warn others before they enter the hot work area. Such signs shall display the following warning:

CAUTION
HOT WORK IN PROGRESS
STAY CLEAR.

SECTION 2604 FIRE SAFETY REQUIREMENTS

2604.1 Protection of combustibles. Protection of combustibles shall be in accordance with Sections 2604.1.1 through 2604.1.9.

2604.1.1 Combustibles. Hot work areas shall not contain combustibles or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

2604.1.2 Openings. Openings or cracks in walls, floors, ducts or shafts within the hot work area shall be tightly covered to prevent the passage of sparks to adjacent combustible areas, or shielded by metal fire-resistant guards, or curtains shall be provided to prevent passage of sparks or slag.

2604.1.3 Housekeeping. Floors shall be kept clean within the hot work area.

2604.1.4 Conveyor systems. Conveyor systems that are capable of carrying sparks to distant combustibles shall be shielded or shut down.

2604.1.5 Partitions. Partitions segregating hot work areas from other areas of the building shall be noncombustible. In fixed hot work areas, the partitions shall be securely connected to the floor such that no gap exists between the floor and the partition. Partitions shall prevent the passage of sparks, slag, and heat from the hot work area.

2604.1.6 Floors. Fixed hot work areas shall have floors with noncombustible surfaces.

2604.1.7 Precautions in hot work. Hot work shall not be performed on containers or equipment that contains or has contained flammable liquids, gases or solids until the containers and equipment have been thoroughly cleaned, inerted or purged; except that "hot tapping" shall be allowed on tanks and pipe lines when such work is to be conducted by approved personnel.

2604.1.8 Sprinkler protection. Automatic sprinkler protection shall not be shut off while hot work is performed. Where hot work is performed close to automatic sprinklers, noncombustible barriers or damp cloth guards shall shield the individual sprinkler heads and shall be removed when the work is completed. If the work extends over several days, the shields shall be removed at the end of each workday. The fire code official shall approve hot work where sprinkler protection is impaired.

2604.1.9 Fire detection systems. Approved special precautions shall be taken to avoid accidental operation of automatic fire detection systems.

2604.2 Fire watch. Fire watches shall be established and conducted in accordance with Sections 2604.2.1 through 2604.2.6.

2604.2.1 When required. A fire watch shall be provided during hot work activities and shall continue for a minimum of 30 minutes after the conclusion of the work. The fire code official, or the responsible manager under a hot work program, is authorized to extend the fire watch based on the hazards or work being performed.

Exception: Where the hot work area has no fire hazards or combustible exposures.

2604.2.2 Location. The fire watch shall include the entire hot work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual shall have additional personnel assigned to fire watches to ensure that exposed areas are monitored.

2604.2.3 Duties. Individuals designated to fire watch duty shall have fire-extinguishing equipment readily available and shall be trained in the use of such equipment. Individuals assigned to fire watch duty shall be responsible for extinguishing spot fires and communicating an alarm.

2604.2.4 Fire training. The individuals responsible for performing the hot work and individuals responsible for providing the fire watch shall be trained in the use of portable fire extinguishers.

2604.2.5 Fire hoses. Where hoselines are required, they shall be connected, charged and ready for operation.

2604.2.6 Fire extinguisher. A minimum of one portable fire extinguisher complying with Section 906 and with a minimum 2-A:20-B:C rating shall be readily accessible within 30 feet (9144 mm) of the location where hot work is performed.

2604.3 Area reviews. Before hot work is permitted and at least once per day while the permit is in effect, the area shall be inspected by the individual responsible for authorizing hot work operations to ensure that it is a fire safe area. Information shown on the permit shall be verified prior to signing the permit in accordance with Section 105.6.

2604.3.1 Pre-hot-work check. A pre-hot-work check shall be conducted prior to work to ensure that all equipment is safe and hazards are recognized and protected. A report of the check shall be kept at the work site during the work and available upon request. The pre-hot-work check shall determine all of the following:

1. Hot work equipment to be used shall be in satisfactory operating condition and in good repair.
2. Hot work site is clear of combustibles or combustibles are protected.
3. Exposed construction is of noncombustible materials or, if combustible, then protected.
4. Openings are protected.
5. Floors are kept clean.
6. No exposed combustibles are located on the opposite side of partitions, walls, ceilings or floors.
7. Fire watches, where required, are assigned.
8. Approved actions have been taken to prevent accidental activation of suppression and detection equipment in accordance with Sections 2604.1.8 and 2604.1.9.
9. Fire extinguishers and fire hoses (where provided) are operable and available.

SECTION 2605 GAS WELDING AND CUTTING

2605.1 General. Devices or attachments mixing air or oxygen with combustible gases prior to consumption, except at the burner or in a standard torch or blow pipe, shall not be allowed unless approved.

2605.2 Cylinder and container storage, handling and use. Storage, handling and use of compressed gas cylinders, containers and tanks shall be in accordance with this section and Chapter 30.

2605.3 Precautions. Cylinders, valves, regulators, hose and other apparatus and fittings for oxygen shall be kept free from oil or grease. Oxygen cylinders, apparatus and fittings shall not be handled with oily hands, oily gloves, or greasy tools or equipment.

2605.4 Acetylene gas. Acetylene gas shall not be piped except in approved cylinder manifolds and cylinder manifold connections, or utilized at a pressure exceeding 15 pounds per square inch gauge (psig) (103 kPa) unless dissolved in a suitable solvent in cylinders manufactured in accordance with DOTn 49 CFR. Acetylene gas shall not be brought in contact with unalloyed copper, except in a blowpipe or torch.

2605.5 Remote locations. Oxygen and fuel-gas cylinders and acetylene generators shall be located away from the hot work area to prevent such cylinders or generators from being heated by radiation from heated materials, sparks or slag, or misdirection of the torch flame.

2605.6 Cylinders shutoff. The torch valve shall be closed and the gas supply to the torch completely shut off when gas welding or cutting operations are discontinued for a period of 1 hour or more.

2605.7 Prohibited operation. Welding or cutting work shall not be held or supported on compressed gas cylinders or containers.

2605.8 Tests. Tests for leaks in piping systems and equipment shall be made with soapy water. The use of flames shall be prohibited for leak testing.

SECTION 2606 ELECTRIC ARC HOT WORK

2606.1 General. The frame or case of electric hot work machines, except internal-combustion-engine-driven machines, shall be grounded. Ground connections shall be mechanically strong and electrically adequate for the required current.

2606.2 Return circuits. Welding current return circuits from the work to the machine shall have proper electrical contact at joints. The electrical contact shall be periodically inspected.

2606.3 Disconnecting. Electrodes shall be removed from the holders when electric arc welding or cutting is discontinued for any period of 1 hour or more. The holders shall be located to prevent accidental contact and the machines shall be disconnected from the power source.

2606.4 Emergency disconnect. A switch or circuit breaker shall be provided so that fixed electric welders and control

equipment can be disconnected from the supply circuit. The disconnect shall be installed in accordance with the ICC *Electrical Code*.

2606.5 Damaged cable. Damaged cable shall be removed from service until properly repaired or replaced.

SECTION 2607 CALCIUM CARBIDE SYSTEMS

2607.1 Calcium carbide storage. Storage and handling of calcium carbide shall comply with Chapter 27 of this code and Chapter 9 of NFPA 51.

SECTION 2608 ACETYLENE GENERATORS

2608.1 Use of acetylene generators. The use of acetylene generators shall comply with this section and Chapter 4 of NFPA 51A.

2608.2 Portable generators. The minimum volume of rooms containing portable generators shall be 35 times the total gas-generating capacity per charge of all generators in the room. The gas-generating capacity in cubic feet per charge shall be assumed to be 4.5 times the weight of carbide per charge in pounds. The minimum ceiling height of rooms containing generators shall be 10 feet (3048 mm). An acetylene generator shall not be moved by derrick, crane or hoist while charged.

2608.3 Protection against freezing. Generators shall be located where water will not freeze. Common salt such as sodium chloride or other corrosive chemicals shall not be utilized for protection against freezing.

SECTION 2609 PIPING MANIFOLDS AND HOSE SYSTEMS FOR FUEL GASES AND OXYGEN

2609.1 General. The use of piping manifolds and hose systems shall be in accordance with Section 2609.2 through 2609.7, Chapter 30 and Chapter 5 of NFPA 51.

2609.2 Protection. Piping shall be protected against physical damage.

2609.3 Signage. Signage shall be provided for piping and hose systems as follows:

1. Above-ground piping systems shall be marked in accordance with ASME A13.1.
2. Station outlets shall be marked to indicate their intended usage.
3. Signs shall be posted, indicating clearly the location and identity of section shutoff valves.

2609.4 Manifolding of cylinders. Oxygen manifolds shall not be located in an acetylene generator room. Oxygen manifolds shall be located at least 20 feet (6096 mm) away from combustible material such as oil or grease, and gas cylinders containing flammable gases, unless the gas cylinders are separated by a fire partition.

2609.5 Identification of manifolds. Signs shall be posted for oxygen manifolds with service pressures not exceeding 200 psig (1379 kPa). Such signs shall include the words:

LOW-PRESSURE MANIFOLD
DO NOT CONNECT HIGH-PRESSURE CYLINDERS
MAXIMUM PRESSURE 250 PSIG

2609.6 Clamps. Hose connections shall be clamped or otherwise securely fastened.

2609.7 Inspection. Hoses shall be inspected frequently for leaks, burns, wear, loose connections or other defects rendering the hose unfit for service.