

CHAPTER 7510
DEPARTMENT OF PUBLIC SAFETY
FIRE MARSHAL DIVISION
FIRE SAFETY

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FIRE SAFETY 7510.3130

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7510.3100 PURPOSE.

The purpose of parts 7510.3100 to 7510.3280 is to adopt uniform fire safety standards governing the maintenance of buildings and premises; regulate the storage, use, and handling of dangerous and hazardous materials, substances, and processes; and regulate the maintenance of adequate egress facilities.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3110 SCOPE.

The scope of parts 7510.3100 to 7510.3280 is intended to be consistent with Minnesota Statutes, section 299F.011.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3120 RULES AND STANDARDS ADOPTED BY REFERENCE.

The Uniform Fire Code, as promulgated by the International Conference of Building Officials, and the Western Fire Chiefs Association (Whittier, California, 1988) is incorporated by reference and made a part of Minnesota Rules pursuant to statutory authority, subject to the alterations and amendments in parts 7510.3100 to 7510.3280. The Uniform Fire Code is not subject to frequent change and is available at the State Law Library, 117 University Avenue, Saint Paul, Minnesota 55155.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

UNIFORM FIRE CODE AMENDMENTS

7510.3130 ARTICLE 1 OF UNIFORM FIRE CODE.

Sec. 1.101 of the Uniform Fire Code is amended to read:

Sec. 1.101. This code shall be known as the Minnesota Uniform Fire Code, may be cited as such, and will be referred to herein as "this code."

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3140 ARTICLE 2 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 2.102.** Sec. 2.102 of the Uniform Fire Code is amended to read:

Sec. 2.102. (a) Local Government Amendments to Article 2. Any jurisdiction which adopts this code is authorized to make amendments, by ordinance or regulation, to Article 2 hereof to provide for a system of enforcement and administration within the jurisdiction. These amendments shall be equal to, in addition to, or more stringent than this code. None of the existing provisions of Article 2 shall be changed nor shall any amendment be made which interferes with the intent of the existing provisions nor the state fire marshal's duties and powers thereunder.

(b) Local Government Rules. Any jurisdiction which adopts this code is authorized to adopt, by ordinance or regulation, rules for the prevention and control of fires and fire hazards as may be necessary from time to time, to carry out the intent of this code, and which may be more restrictive than this code when the rules are necessary to protect life or property in the community. The governing body may adopt this code by ordinance. One certified copy of the ordinance containing the rules shall be filed with the clerk of the jurisdiction and shall be in effect immediately thereafter, and additional copies shall be kept in the office of the fire department for distribution to the public.

(c) Chief Defined. Wherever the term "chief" appears in Articles 2 to 87 or in the Appendix of this code, it shall mean state fire marshal, except that it shall also include the chief of any jurisdiction adopting this code.

Subp. 2. **Sec. 2.103.** Sec. 2.103 of the Uniform Fire Code is amended to read:

Sec. 2.103. A fire prevention bureau may be established within the fire department under the direction of the fire chief, which shall consist of such fire department personnel as may be assigned thereto by the fire chief. The function of this bureau shall be to assist the fire chief in the administration and enforcement of the fire prevention provisions of this code.

Subp. 3. **Sec. 2.202.** Sec. 2.202 of the Uniform Fire Code is amended to read:

Sec. 2.202. (a) Investigation. The fire department of any jurisdiction adopting this code shall investigate promptly the cause, origin, and circumstances of each and every fire occurring in the municipality involving loss of life or injury to person or destruction or damage to property, and if it appears to the members of the fire department making the investigation that such fire is of suspicious origin, they shall then take immediate charge of all physical evidence relating to the cause of fire, shall notify the proper authorities designated by law to pursue the investigation of such matters, and shall cooperate with the authorities in the collection of evidence and in the prosecution of the case. The chief shall make a report in writing to the state fire marshal of all facts and findings relative to each investigation.

(b) Police Department Assistance. The police department may assist the fire department in its investigation whenever requested to do so.

Subp. 4. **Sec. 2.205.** Sec. 2.205 of the Uniform Fire Code is amended to read:

Sec. 2.205. Any order or notice authorized or required by this code shall be given or served upon the owner, operator, occupant, or other person responsible for the condition or violation either by oral notification, personal service, or by delivering the same to and leaving it with some person of suitable age and discretion upon the premises; or, if no such person is found on the premises, by affixing a copy thereof in a conspicuous place on the door to the entrance of said premises and by mailing a copy thereof to such person by mail to the person's last known address. Orders or notices given orally shall be confirmed by service in writing as herein provided.

Subp. 5. **Sec. 2.303.** Sec. 2.303 of the Uniform Fire Code is deleted.

Subp. 6. **Sec. 2.304(b).** The first paragraph of Sec. 2.304(b) of the Uniform Fire Code is deleted and replaced with the following:

Sec. 2.304. (b) Recognized Standards. The following standards are intended for use as a guide in the design, fabrication, testing, and use of equipment regulated by this code:

Subp. 7. **Sec. 2.304(c).** Sec. 2.304 of the Uniform Fire Code is amended by adding a subsection to read:

Sec. 2.304. (c) Standard 101 Incorporated. Whenever the Uniform Fire Code, as amended by parts 7510.3100 to 7510.3280, is silent on any subject, for any reason, in any situation, the provision of protection shall be in accordance with National Fire Codes, 1988, Standard Number 101, issued by the National Fire Protection Association (Quincy, Massachusetts, 1988) which is adopted by reference as part of this code as though set forth herein in its entirety. Standard Number 101 is not subject to frequent change and is available at the State Law Library, 117 University Avenue, Saint Paul, Minnesota 55155.

Statutory Authority: *MS s 299F.011*

History: 14 SR 847

7510.3150 ARTICLE 4 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 4.103.** Sec. 4.103 of the Uniform Fire Code is amended to read:

Sec. 4.103. All applications for a permit required by this code shall be made to the chief in such form and detail as required by the chief. Applications for permits shall be accompanied by such plans as required by the chief.

Subp. 2. **Sec. 4.108.** The first sentence of Sec. 4.108 of the Uniform Fire Code is amended to read:

Sec. 4.108. When required by the chief, a permit shall be obtained prior to engaging in the following activities, operations, practices, or functions:

Statutory Authority: *MS s 299F.011*

History: 14 SR 847

7510.3160 ARTICLE 9 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 9.103; adult day care center defined.** Sec. 9.103 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.103. ADULT DAY CARE CENTER shall mean a facility, licensed by the Department of Human Services under Minnesota Rules, parts 9555.9600 to 9555.9730, which provides a program of services to adults for periods of less than 24 hours per day.

Subp. 2. **Sec. 9.103; authority having jurisdiction defined.** Sec. 9.103 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.103. AUTHORITY HAVING JURISDICTION shall mean any municipal fire code official or the state fire marshal or any of their authorized representatives.

Subp. 3. **Sec. 9.104; Building Code definition amended.** The definition of Building Code in Sec. 9.104 of the Uniform Fire Code is amended to read:

Sec. 9.104. BUILDING CODE shall mean the Minnesota State Building Code.

Subp. 4. **Sec. 9.108; family day care home defined.** Sec. 9.108 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.108. FAMILY DAY CARE HOME shall mean a residence, licensed by the Department of Human Services under Minnesota Rules, parts 9502.0315 to 9502.0445, in which no more than ten children receive care, maintenance, and supervision by other than their relatives or legal guardians for less than 24 hours per day.

Subp. 5. **Sec. 9.109; group day care home defined.** Sec. 9.109 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.109. GROUP DAY CARE HOME shall mean a residence, licensed by the Department of Human Services under Minnesota Rules, parts 9502.0315 to 9502.0445, in which at least 11 but not more than 14 children receive care, maintenance, and supervision by other than their relatives or legal guardians for less than 24 hours per day.

Subp. 6. Sec. 9.109; guest room defined. Sec. 9.109 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.109. GUEST ROOM shall mean a room used exclusively for living or sleeping purposes excluding storage rooms, laundry rooms, furnace rooms, and similar common areas. Every 100 square feet of superficial floor area in a dormitory shall be considered to be a guest room.

Subp. 7. Sec. 9.115; mechanical code definition amended. The definition of mechanical code in Sec. 9.115 of the Uniform Fire Code is amended to read:

Sec. 9.115. MECHANICAL CODE shall mean the Minnesota Heating, Ventilation, Air Conditioning and Refrigeration Code, in Minnesota Rules, chapter 1345.

Subp. 8. Sec. 9.115; municipality defined. Sec. 9.115 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.115. MUNICIPALITY shall mean any statutory or home rule charter city, county, or town meeting the requirements of Minnesota Statutes, section 368.01, subdivision 1, the University of Minnesota, or the state for public buildings.

Subp. 9. Sec. 9.117; Group E Occupancies definition amended. The definition of Group E Occupancies in Sec. 9.117 of the Uniform Fire Code is amended to read:

Sec. 9.117. Group E Occupancies:

Division 1. Any building used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or four hours in any one day.

Division 2. Any building used for educational purposes through the 12th grade by less than 50 persons for more than 12 hours per week or four hours in any one day.

Division 3. Any building used for child day care purposes for more than ten children, or for adult day care centers serving four or more ambulatory and mobile persons who are capable of taking appropriate action for self-preservation under emergency conditions as determined by program licensure provisions.

Subp. 10. Sec. 9.117; Group I Occupancies definition amended. The definition of Group I Occupancies in Sec. 9.117 of the Uniform Fire Code is amended to read:

Sec. 9.117. Group I Occupancies:

Division 1. Nurseries for the full-time care of children under the age of six, each accommodating more than four persons; and, hospitals, sanitariums, nursing homes, and similar buildings, each accommodating more than four persons.

Division 2. Detoxification centers; homes for children six years of age or over; Class B supervised living facilities for the mentally retarded, mentally ill, or the physically handicapped, defined in Sec. 9.121; and, adult day care centers serving ambulatory, nonambulatory, mobile, or nonmobile persons who are not mentally or physically capable of taking appropriate action for self-preservation under emergency conditions as determined by program licensure provisions, each accommodating more than four persons.

EXCEPTION: Adult day care centers meeting the following criteria may be classified as Group E, Division 3 Occupancies:

1. not more than 50 percent of the center's licensed capacity shall be made up of participants who are not capable of taking appropriate action for self-preservation under emergency conditions;

2. the center shall be located on a floor level with all exits directly to grade without intervening stairs;
3. the center shall be protected with a complete automatic fire detection system consisting of:
 - (i) automatic smoke detectors in all corridors and at the top of all stairways;
 - (ii) automatic detectors in boiler and furnace rooms, kitchens, storage rooms, janitor closets, laundries, and other hazardous areas; and
 - (iii) in buildings equipped with manual fire alarm systems, the manual fire alarm and automatic detection systems shall be electrically interconnected; and
4. the center shall demonstrate the ability to evacuate the entire center population within three minutes.

Division 3. Mental hospitals, mental sanitariums, jails, prisons, reformatories, and buildings where personal liberties of inmates are similarly restrained.

EXCEPTION: Group I Occupancies shall not include buildings used only for private residential purposes or for a family group.

Subp. 11. **Sec. 9.117; Group R Occupancies definition amended.** The definition of Group R Occupancies in Sec. 9.117 of the Uniform Fire Code is amended to read:

Sec. 9.117. Group R Occupancies:

Division 1. Hotels and apartment houses. Convents and monasteries, each accommodating more than ten persons; and Class A-2 supervised living facilities, defined in Sec. 9.121, for the mentally retarded, mentally ill, chemically dependent, and physically handicapped, each accommodating more than four persons. Physically handicapped persons shall be housed at street level in supervised living facilities.

EXCEPTION: Class A-2 supervised living facilities, defined in Sec. 9.121, having more than six but not more than 15 ambulatory or mobile disabled persons, duly licensed before April 11, 1983, and complying with the requirements for lodging and rooming houses as set forth in Standard 101 in the National Fire Codes, 1973, issued by the National Fire Protection Association (Boston, Massachusetts, 1973), are classified as Group R, Division 3 Occupancies.

Division 2. Not used.

Division 3. Dwellings, lodging houses, and Class A-1 supervised living facilities defined in Sec. 9.121.

Subp. 12. **Sec. 9.120; required by chief defined.** Sec. 9.120 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.120. REQUIRED BY THE CHIEF shall mean determined by the chief to be directly related to the safeguarding of life and property from the hazards of fire and uniform for each class or kind of building, structure, or property covered.

Subp. 13. **Sec. 9.121; state fire marshal defined.** Sec. 9.121 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.121. STATE FIRE MARSHAL shall mean the Minnesota state fire marshal or the state fire marshal's authorized representatives.

Subp. 14. **Sec. 9.121; supervised living facility defined.** Sec. 9.121 of the Uniform Fire Code is amended by adding a definition to read:

Sec. 9.121. SUPERVISED LIVING FACILITY means a facility in which supervision, lodging, meals, and in accordance with the rules of the Department of Human Services and the Department of Health, counseling and developmental habilitative or rehabilitative services are provided to five or more persons who

are mentally retarded, chemically dependent, adult mentally ill, or physically handicapped.

Class A supervised living facility shall mean a supervised living facility for ambulatory and mobile persons who are capable of taking appropriate action for self-preservation under emergency conditions as determined by program licensure provisions.

Class A-1 supervised living facilities shall include homes providing boarding and lodging for six or fewer ambulatory or mobile disabled persons.

Class A-2 supervised living facilities shall include homes providing boarding and lodging for more than six ambulatory or mobile disabled persons.

Class B supervised living facility shall mean a supervised living facility for ambulatory or nonambulatory, mobile or nonmobile persons who are not mentally or physically capable of taking appropriate action for self-preservation under emergency conditions as determined by program licensure provisions.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3170 ARTICLE 10 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 10.207(m).** Sec. 10.207 of the Uniform Fire Code is amended by adding a subsection to read:

Sec. 10.207. (m) Marking Fire Lanes. The marking of fire lanes on private and public property shall be designated and approved by the chief.

Subp. 2. **Sec. 10.207(n).** Sec. 10.207 of the Uniform Fire Code is amended by adding a subsection to read:

Sec. 10.207. (n) Obstruction of Fire Lanes. Parking of motor vehicles in, or otherwise obstructing, fire lanes shall be prohibited at all times.

Subp. 3. **Sec. 10.301(f).** Sec. 10.301(f) of the Uniform Fire Code is amended to read:

Sec. 10.301. (f) Approval and Testing. All fire alarm systems, fire hydrant systems, fire-extinguishing systems (including automatic sprinklers), wet and dry standpipes, basement inlet pipes, and other fire-protection systems and appurtenances thereto shall meet the approval of the chief as to installation and location and shall be subject to periodic tests required by the chief. Plans and specifications shall be submitted to the chief for review and approval before installation.

Subp. 4. **Sec. 10.309(b).** Sec. 10.309(b) of the Uniform Fire Code is amended to read:

Sec. 10.309. (b) Where Required. Standpipe systems shall be provided as set forth in Table No. 10.309 and shall have a constant water supply and pressure.

EXCEPTION: Dry standpipes may be installed with prior approval of the chief.

Subp. 5. **Table No. 10.309.** Table No. 10.309, Item No. 2, "Occupancy" column, of the Uniform Fire Code is amended to read:

TABLE NO. 10.309. Item No. 2, "Occupancy" column: Occupancies 3 stories or more but less than 150 feet in height, except Group R, Division 3. Class II standpipes are not required in Group E or Group R-1 Occupancies.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3180 ARTICLE 11 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 11.117.** Article 11 of the Uniform Fire Code is amended by adding a section to read:

Fires or Barbecues on Balconies or Patios

Sec. 11.117. (a) Open Flame Prohibited. When required by the chief, in any

structure containing three or more dwelling units, no person shall kindle, maintain, or cause any fire or open flame on any balcony above ground level, or on any ground floor patio within 15 feet of the structure.

(b) **Fuel Storage Prohibited.** No person shall store or use any fuel, barbecue, torch, or other similar heating or lighting chemical or device in the locations designated in subsection (a).

EXCEPTION: Listed electric or gas-fired barbecue grills that are permanently mounted, wired, or plumbed to the building's gas supply or electrical system and that maintain a minimum clearance of 18 inches on all sides, unless listed for lesser clearances, may be installed on balconies and patios when approved by the chief.

Subp. 2. **Sec. 11.204.** Sec. 11.204 of the Uniform Fire Code is amended by adding an Exception to read:

Sec. 11.204. Exception. For requirements relating to Christmas trees, see Sec. 11.210.

Subp. 3. **Sec. 11.210.** Article 11 of the Uniform Fire Code is amended by adding a section to read:

Christmas Trees

Sec. 11.210. (a) Group I Occupancies. The use or display of natural or resin-bearing trees or decorations in Group I Occupancies is prohibited.

(b) **Public Buildings.** The use, display, or storage of natural or resin-bearing trees without open flames or electric light decorations is permitted in schools, churches, hotels, and business and mercantile occupancies. See Sec. 11.203(c).

(c) **Flame-retardant Artificial Trees.** The use or display of flame-retardant artificial trees decorated with U.L. listed electric lighting systems is acceptable in all occupancies.

(d) **R-1 Occupancies.** Natural or resin-bearing trees shall not be stored on balconies or grounds of R-1 Occupancies. See Sec. 11.203(c).

Subp. 4. **Sec. 11.302(e).** Sec. 11.302 of the Uniform Fire Code is amended by adding a subsection to read:

Sec. 11.302. (e) Misdemeanor. Whoever intentionally gives a false alarm of fire, or unlawfully tampers or interferes with any station or signal box of any fire alarm system or any auxiliary fire appliance, or unlawfully breaks, injures, defaces, or removes any such box or station, or unlawfully breaks, injures, destroys, or disturbs any of the wires, poles, or other supports and appliances connected with or forming a part of any fire alarm system or any auxiliary fire appliance is guilty of a misdemeanor.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3190 ARTICLE 12 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 12.101.** Sec. 12.101 of the Uniform Fire Code is amended by adding a paragraph to read:

Sec. 12.101. Egress requirements in family and group day care homes located in a single family dwelling located on a residential lot in which the day care provider provides the services referred to in Minnesota Statutes, section 245A.02, subdivision 10, to one or more persons, shall not exceed the egress requirements that apply to the home as a single family dwelling.

Subp. 2. **Sec. 12.106(a).** Sec. 12.106(a) of the Uniform Fire Code is amended to read:

Sec. 12.106. (a) General. Stairways shall conform to the provisions of the Building Code.

EXCEPTION: Stairs or ladders used only to attend equipment are

exempt from the requirements of this section when properly maintained.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3200 ARTICLE 14 OF UNIFORM FIRE CODE.

Sec. 14.104(b). Sec. 14.104(b) of the Uniform Fire Code is amended to read:

Sec. 14.104. (b) Type of System. A manual or automatic fire alarm system or both shall be installed in occupancies in accordance with the following:

1. A manual fire alarm system shall be installed in:

A. Group A, Divisions 1, 2, and 2.1 Occupancies

B. Group H Occupancies used for the manufacture of organic coatings

ings

C. Group H, Division 6 Occupancies as set forth in Article 51

2. An automatic fire alarm system shall be installed in:

A. Group B, Division 2 Occupancies as set forth in Chapter 33 of the Building Code

B. As set forth in Article 81 of this code

3. A manual and automatic fire alarm system shall be installed in:

A. Group E Occupancies having more than 50 occupants and as set forth in Chapter 33 of the Building Code, and in Group E, Division 3 Occupancies having more than 29 occupants. In every Group E Occupancy with an automatic sprinkler or detection system, the operation of the system must automatically activate the building fire alarm system.

In Group E Occupancies, an approved fire alarm system shall mean a complete, noncoded, continuously sounding until manually reset, electronically supervised fire alarm system consisting of the following:

(i) Sounding stations on 100-foot to 150-foot spacing: (1) in corridors, (2) in areas of high noise levels, such as band rooms, shops, and boiler rooms, and (3) on a weatherproof station on the exterior of the building facing residential areas.

(ii) Automatic sending stations (detectors) in boiler rooms, kitchens, shops, painting areas, lounges, laundries, janitor's closets, storerooms, unsupervised and unoccupied spaces, and critical or hazardous areas.

(iii) Unobstructed, readily accessible manual sending stations at visible locations in the natural path of escape from fire, near each exit from an area on each floor.

B. Group I Occupancies

C. Group R, Division 1 Occupancies specified in subsection (c).

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3210 ARTICLE 26 OF UNIFORM FIRE CODE.

Subpart 1. Title. The title of Article 26 of the Uniform Fire Code is deleted and replaced with the following:

RESURFACING AND REFINISHING

Subp. 2. Sec. 26.101. Sec. 26.101 of the Uniform Fire Code is amended to read:

Sec. 26.101. Bowling alleys, roller skating rinks, and other public assembly occupancies shall conform to all other applicable requirements of this code, as well as the following provisions.

Subp. 3. **Sec. 26.102.** Sec. 26.102 of the Uniform Fire Code is amended to read:

Sec. 26.102. No person shall conduct bowling pin refinishing and bowling alley or floor resurfacing and refinishing operations involving the use and application of flammable liquids or materials without a local permit.

Subp. 4. **Sec. 26.103.** The subtitle of Sec. 26.103 of the Uniform Fire Code is amended to read:

Resurfacing and Refinishing

Subp. 5. **Sec. 26.104.** The subtitle of Sec. 26.104 of the Uniform Fire Code is amended to read:

Refinishing

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3220 ARTICLE 61 OF UNIFORM FIRE CODE.

Sec. 61.105 of the Uniform Fire Code is amended to read:

Sec. 61.105. The grade of fuel oil used in a burner shall be that for which the burner is approved and as stipulated by the manufacturer. The installation and use of waste oil burners shall conform to the provisions of Minnesota Statutes, section 299F.015.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3230 ARTICLE 77 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 77.104.** Sec. 77.104 of the Uniform Fire Code is deleted.

Subp. 2. **Sec. 77.105.** Sec. 77.105 of the Uniform Fire Code is deleted.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3240 ARTICLE 79 OF UNIFORM FIRE CODE.

Subpart 1. **Sec. 79.101(a).** Sec. 79.101(a), Exception 1 of the Uniform Fire Code is amended to read:

Sec. 79.101. (a) General.

EXCEPTIONS:

1. The transportation of flammable and combustible liquids when in conformity with the United States Department of Transportation regulations on file with and approved by the United States Department of Transportation.

Subp. 2. **Sec. 79.101(d).** Sec. 79.101 of the Uniform Fire Code is amended by adding a subsection to read:

Sec. 79.101. (d) Review of Plans. Requirements for the review of plans, as covered in the following items 1 to 7, are herein incorporated as part of this code, to read:

1. Before any construction or new or additional installation for the storage, handling, or use of flammable liquids is undertaken in bulk plants, service stations, chemical plants, refineries, and processing plants, drawings or blueprints of them made to scale shall be submitted to the state fire marshal with an application, all in duplicate, for review. Within a reasonable time, usually ten days after receipt of the application with drawings or blueprints, the state fire marshal shall examine them. On finding that they conform to the applicable requirements of this code, the state fire marshal shall so signify either by endorsement on them or by attachment to them, retain one file copy, and return to the applicant the other copy plus any additional copies submitted by the applicant.

If the drawings or blueprints do not conform to the applicable requirements of this code, the state fire marshal shall notify the applicant in writing within the time allowed for the examination of the application.

2. Drawings shall show the name of the person, firm, or corporation proposing the installation, its location, and the adjacent streets or highways and surface waters of the state.

3. In the case of bulk plants, the drawings shall show, in addition to any applicable features required under items 5 and 6, the plot of ground to be utilized and its immediate surroundings on all sides; complete layout of buildings, tanks, and loading and unloading docks; type of construction of each building and the type and location of heating devices for each building, if any.

4. In the case of service stations, the drawings, in addition to any applicable features required under items 5 and 6, shall show the plot of ground to be utilized; the complete layout of buildings, drives, dispensing equipment, and greasing or washing stalls; and the type and location of any heating devices.

5. In the case of aboveground storage, the drawings shall show the location and capacity of each tank; dimensions of each tank that has a capacity exceeding 50,000 gallons; the class of liquids to be stored in each tank; the type of tank supports; the clearance as covered in sections 79.503 and 79.504; the type of venting and pressure relief relied upon and the combined capacity of all venting and pressure relief valves on each tank, as covered in Sec. 79.509; the tank control valves as covered in Sec. 79.509(c); the location of the pumps and other facilities by which liquid is filled into and withdrawn from the tanks; and diking provided, if any.

6. In the case of underground storage, the drawings shall show the locations of fill gauge and vent pipes and openings, the location and capacity of each tank, and the class of liquid to be stored in each tank, along with the clearance and requirements as covered in sections 79.601 to 79.605.

7. In the case of an installation for storage, handling, or use of flammable liquids within buildings or enclosures at any establishment or occupancy covered in this section, the drawings shall be in such detail as will show whether applicable requirements are to be met.

Subp. 3. **Sec. 79.902(e)**. Sec. 79.902(e) of the Uniform Fire Code is amended by adding an exception to read:

Sec. 79.902. (e) Dispensing.

EXCEPTION: When approved by the chief, the dispensing of Class I and Class II liquids from a fuel dispensing system supplied by exterior aboveground tanks may be permitted under the following conditions:

1. Not more than three aboveground storage tanks shall be used for dispensing. Tanks shall not exceed 6,000 gallons individual capacity.
2. The tank system shall be listed or approved for such aboveground use.
3. Fuel delivery from aboveground tanks shall be from the top of the tank with the dispensing line equipped with an approved antisiphon system, or by a remote submersible pump system located in a tank of not over 60 gallons capacity attached to the main storage tank, provided the line between the main tank and the remote pump is equipped with a normally closed solenoid valve and fire valve at the tank opening.
4. Dispensing lines between the diked area and the dispenser shall be located underground. These lines shall be equipped with approved leak detection devices connected to an audible and visual alarm as required by the chief. These lines shall also be equipped with approved excess flow valves and a normally closed solenoid valve at each dispenser located below the impact valve.
5. The tank shall be equipped with overfill protection and the fill pipe

between the opening and the diked area shall be underground. In addition to the normal valving requirements of the code, there shall be a manually operated, mechanical shut-off valve on the fill line inside the diked area which is operated from a location outside the dike.

6. Dispensing lines and fill piping shall not penetrate the dike.

7. The tanks and piping shall be safeguarded against collision, spillage, and overflow as required by the chief.

8. The tanks shall comply with requirements for emergency relief venting, and the tanks and dispensing system shall meet the electrical classification requirements of the code.

9. Tanks, piping, valves and fittings, and diking shall be constructed and maintained in accordance with Article 79.

10. Tanks shall be provided with lightning protection as specified in National Fire Protection Association Standard 78, Lightning Protection Code, by the National Fire Protection Association (Quincy, Massachusetts, 1986). Standard 78 is incorporated by reference, is not subject to frequent change, and is available at the State Law Library, 117 University Avenue, Saint Paul, Minnesota 55155.

11. Tank location and distance shall be two times that specified in sections 79.503 and 79.504, but not less than 30 feet from the nearest side of any public way or from the nearest building and dispensing units on the same property.

12. Where more than one tank is used, all aboveground tanks shall be protected by an approved fire protection system when required by the chief.

13. Variances shall not be granted from any of the provisions contained in items 2 to 12.

Subp. 4. **Sec. 79.903(a).** The first paragraph of Sec. 79.903(a) of the Uniform Fire Code is amended to read:

Sec. 79.903. (a) Design and Construction. Except as otherwise provided in Sec. 79.902(e), Class I and Class II liquids shall be transferred from underground tanks by means of fixed pumps so designed and equipped as to allow control of the flow and to prevent leakage or accidental discharge. Supplemental means shall be provided outside of the dispensing device so that the source of power may be readily disconnected in the event of fire or other accident. Dispensing devices for Class I, II, or III-A liquids shall be of approved type. See Sec. 2.303(b). Class I, II, or III-A liquids shall be dispensed by approved pumps taking suction through the top of the container. Class I, II, or III-A liquids shall not be dispensed by a device that operates through pressure within a storage tank or container unless the tank or container has been approved as a pressure vessel for the use to which it is subjected. In no case shall air or oxygen pressure be used for dispensing flammable Class I, II, or III-A liquids. This section does not prohibit use permitted by Sec. 79.904.

Subp. 5. **Sec. 79.903(g).** Sec. 79.903 of the Uniform Fire Code is amended by adding a subsection to read:

Sec. 79.903. (g) Age Requirement. Flammable and combustible liquids shall be dispensed only by persons 16 years of age or older. Prominent signs shall be posted at self-service stations prohibiting flammable liquids from being dispensed by anyone under age 16.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3250 ARTICLE 80 OF UNIFORM FIRE CODE.

Sec. 80.104(e) of the Uniform Fire Code is amended to read:

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Sec. 80.104. (e) IDENTIFICATION. Visible hazard identification signs as specified in Uniform Fire Code Standards, Standard No. 79-3, Identification of the Health, Flammability, and Reactivity of Hazardous Materials, published by the International Conference of Building Officials and the Western Fire Chiefs Association, 1988, (Whittier, California), shall be placed at entrances to locations where hazardous materials are stored, dispensed, used, or handled in quantities requiring a permit. The chief shall designate the specific entrances where signs are required.

The chief may waive this requirement in special cases when consistent with safety, if the facility owner or operator, in conjunction with the chief, develops an approved preemergency plan consistent with the Hazardous Materials Management Plan (HMMP) in Appendix II-E. The owner or operator shall make copies of this plan available to other emergency response agencies on request.

In addition, when required by the chief, hazard identification signs mounted on a building shall include a sign indicating the hazard type and range value for the average daily amount of hazardous materials present, as required on the Tier 1 hazardous chemical inventory form under the Superfund Amendments and Reauthorization Act of 1986, Public Law Number 99-499, section 312, subsection (d)(1) "Tier I Information," which is incorporated by reference. The placard symbols for hazard type and range value are as follows:

1. HAZARD TYPE:

Physical Hazards

Fire - The 3-letter placard abbreviation is:	FIR
Sudden Release of Pressure - The 3-letter placard abbreviation is:	SRP
Reactivity - The 3-letter placard abbreviation is:	REA

Health Hazards

Immediate (acute) - The 3-letter placard abbreviation is:	HHI
Delayed (chronic) - The 3-letter placard abbreviation is:	HHD

2. RANGE VALUE:

Placard Abbreviation	Weight Range in Pounds	
	From	To
—	None Present	
00	0	99
01	100	999
02	1,000	9,999
03	10,000	99,999
04	100,000	999,999
05	1,000,000	9,999,999
06	10,000,000	49,999,999
07	50,000,000	99,999,999
08	100,000,000	499,999,999
09	500,000,000	999,999,999
10	1 billion or greater	

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3260 ARTICLE 82 OF UNIFORM FIRE CODE.

Subpart 1. **Article 82.** Article 82 of the Uniform Fire Code is deleted in its entirety and replaced with the following:

Sec. 82.101. LP Gas Storage and Handling. The storage, handling, transpor-

tation, and use of liquefied petroleum gas and the installation of all equipment pertinent to systems for such uses shall be designed, constructed, installed, operated, and maintained in accordance with the provisions of U.F.C. Standard No. 82-1.

Sec. 82.102. LP Gas Systems at Utility Gas Plants. The design, construction, location, installation, and operation of refrigerated and nonrefrigerated liquefied petroleum gas systems at utility gas plants shall be in accordance with the provisions of U.F.C. Standard No. 82-2.

Sec. 82.103. Submittal of Plans. Where an underground container is permitted, plans of its installation, regardless of capacity, shall be submitted for review to the state fire marshal before construction.

For any installation utilizing aboveground storage containers of over 2,000 gallons water capacity, or when aggregate water capacity of all aboveground containers exceeds 4,000 gallons, plans shall be submitted to the state fire marshal before construction.

Subp. 2. Uniform Fire Code Standard No. 82-1. Part I of Uniform Fire Code Standard No. 82-1 is deleted in its entirety.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3270 ARTICLE 85 OF UNIFORM FIRE CODE.

Sec. 85.109 of the Uniform Fire Code is amended to read:

Sec. 85.109. Electrical appliances or fixtures shall not be used unless they are of an approved type.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.3280 AMENDMENTS TO APPENDIXES OF UNIFORM FIRE CODE.

Subpart 1. Adoption. Appendixes I-A, I-C, II-A, II-B, II-C, IV-A, and VI-D of the Uniform Fire Code, as amended by this part, shall be deemed a part of this code and shall be enforced as such.

Subp. 2. Appendix I-A, Sec. 1(b). Appendix I-A, Sec. 1(b), is deleted in its entirety.

Subp. 3. Appendix I-A, Sec. 2(a). The first paragraph and the accompanying exception in Appendix I-A, Sec. 2(a), are amended to read:

Sec. 2. EXITS

(a) **Number of Exits.** Every basement and every floor above the first story used for human occupancy shall have access to at least two separate exits, one of which may be an exterior fire escape complying with subsection (d) of this section. Subject to the approval of the chief, an approved ladder device may be used in lieu of a fire escape when the construction feature or location of the building on the property makes the installation of a fire escape impractical.

EXCEPTIONS:

1. In all occupancies, basements and second stories with an occupant load of ten or less may have one exit.
2. When the third floor within an individual dwelling unit does not exceed 500 square feet, only one exit need be provided from that floor.
3. Floors and basements used exclusively for service of the building may have one exit. For the purposes of this exception, storage rooms, laundry rooms, maintenance offices, and similar uses shall not be considered as providing service to the building.
4. Storage rooms, laundry rooms, and maintenance offices not exceeding 300 square feet in floor area may be provided with only one exit.

Subp. 4. Appendix I-A, Sec. 2(c). Appendix I-A, Sec. 2(c), is amended to read:
Sec. 2. EXITS

(c) **Corridors.** Corridors serving a Group R, Division 1 or Group I Occupancy having an occupant load of ten or more and corridors serving other occupancies having an occupant load of 30 or more shall have walls and ceilings of not less than one-hour fire-resistive construction as required by the Building Code. Existing walls surfaced with wood lath and plaster in good condition or 1/2-inch gypsum wallboard or openings with fixed wired glass set in steel frames are permitted for corridor walls and ceilings and occupancy separations when approved. Doors opening into such corridors shall be protected by 20-minute fire assemblies or solid wood doors not less than 1-3/4 inches thick. Where the existing frame will not accommodate the 1-3/4 inches thick door, a 1-3/8 inches thick solid bonded wood core door or equivalent insulated steel door shall be permitted. Doors shall be self-closing or automatic-closing by smoke detection. Transoms and openings other than doors from corridors to rooms shall comply with Section 3305(h) of the Building Code or shall be covered with a minimum of 3/4-inch plywood or 1/2-inch gypsum wallboard or equivalent material on the room side.

EXCEPTION: Existing corridor walls, ceilings, and opening protection not in compliance with the above may be continued when such buildings are protected with an approved automatic sprinkler system throughout. Such sprinkler system may be supplied from the domestic water system if it is of adequate volume and pressure.

Subp. 5. Appendix I-A, Sec. 5. Appendix I-A, Sec. 5, is amended to read:
Sec. 5. STANDPIPES

When required by the chief, any building three stories or more in height shall be provided with an approved Class I or Class III standpipe system.

Statutory Authority: *MS s 299F.011*

History: *14 SR 847*

7510.4100 [Repealed, 14 SR 847]

7510.4200 [Repealed, 14 SR 847]

7510.4300 [Repealed, 14 SR 847]

7510.4400 [Repealed, 14 SR 847]

SYMBOLS MARKING CARRIERS OF PRESSURIZED FLAMMABLE GAS

7510.4500 PURPOSE AND SCOPE.

Subpart 1. **Purpose.** The purpose of parts 7510.4500 to 7510.4900 is to prescribe the standard abbreviation and symbol required to be displayed on the exterior of any vehicle carrying liquefied petroleum gas fuel or natural gas in a concealed tank.

Subp. 2. **Scope.** The scope of parts 7510.4500 to 7510.4900 is intended to be consistent with Minnesota Statutes, section 169.762.

Statutory Authority: *MS s 169.762*

7510.4600 PRESSURIZED FLAMMABLE GAS.

"Pressurized flammable gas" includes liquefied petroleum gas, compressed natural gas, and liquefied natural gas.

Statutory Authority: *MS s 169.762*

7510.4700 WARNING SYMBOL REQUIRED.

The marking required by Minnesota Statutes, section 169.762, must be dis-

played on the exterior of a vehicle carrying pressurized flammable gas in a concealed area, whether the gas is the primary fuel or secondary fuel.

Statutory Authority: *MS s 169.762*

7510.4800 SYMBOL DESIGN.

Subpart 1. **Design.** The required warning symbol must be of a design illustrated as follows:



Compressed natural
gas



Liquefied petroleum
gas



Liquefied natural
gas

Subp. 2. **Specifications.** The following specifications apply to each of the warning symbols:

A. The symbol must be diamond-shaped, 2-1/2 inches in height, and four inches in width at its highest and widest points respectively.

B. The letters and border must be silver in color.

C. The background must be black in color.

D. The letters within the symbol must be a minimum of one inch in height.

E. The entire symbol, including letters, background, and border, must be made of reflectorized material and not fade or wash away when exposed to weather or other adverse elements.

Statutory Authority: *MS s 169.762*

7510.4900 SYMBOL PLACEMENT.

A minimum of two warning symbols is required to be displayed. The warning symbols must be displayed in the places specified in item A. If the symbols cannot be clearly displayed or effectively applied to those locations they may be displayed in the places specified in item B. Display at least two symbols as follows:

A. one warning symbol on the extreme left (driver's) side of the rear-facing portion of the rear bumper, and one warning symbol on the extreme right (passenger) side of the front-facing portion of the front bumper; or

B. one warning symbol at least 12 inches but not more than 30 inches above the ground on the rear of the vehicle near the left (driver's) side and one warning symbol at least 12 inches but not more than 30 inches above the ground on the front of the vehicle near the right (passenger) side.

Statutory Authority: *MS s 169.762*

STORAGE, HANDLING, AND USE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

7510.5100 [Repealed, 14 SR 847]

7510.5200 [Repealed, 14 SR 847]

7510.5300 [Repealed, 14 SR 847]

7510.5400 [Repealed, 14 SR 847]

NATURAL GAS PIPELINE FACILITIES AND TRANSPORTATION**7510.6100 DEFINITIONS.**

Subpart 1. **Scope.** As used in parts 7510.6100 to 7510.6900 the following terms and phrases have the meanings given them.

Subp. 2. **Secretary.** "Secretary" means the commissioner of public safety.

Subp. 3. **State.** "State" means the state of Minnesota.

Subp. 4. **State agency.** "State agency" means the Department of Public Safety, State Fire Marshal Division.

Statutory Authority: *MS s 299F.57*

7510.6200 PURPOSE.

The purpose of parts 7510.6100 to 7510.6910 is to prescribe reporting requirements for gas leaks, safety standards for pipeline facilities and the transportation of gas, and fees to recover the state costs related to inspections, investigations, and other duties prescribed by statute. These requirements and standards are required for state certification by the Natural Gas Pipeline Safety Act of 1968 as provided in United States Code 1976 and Supplement III, title 49, section 1674 (a).

Statutory Authority: *MS s 299F.57*

History: 9 SR 2383

7510.6300 SCOPE.

The requirements and standards in parts 7510.6100 to 7510.6910 apply to the design, installation, inspection, testing, construction, operation, extension, replacement, and maintenance of pipeline facilities. The scope of parts 7510.6350 to 7510.6910 is intended to be consistent with Minnesota Statutes, sections 299F.56 to 299F.64.

Statutory Authority: *MS s 299F.57*

History: 9 SR 2383

7510.6350 FEDERAL REGULATIONS ADOPTED BY REFERENCE.

Reporting requirements for gas leaks and standards for gas and pipeline safety as provided in Code of Federal Regulations 1980, title 49, parts 191 and 192 are incorporated by reference and made part of Minnesota rules subject to the amendments in parts 7510.6400 to 7510.6910.

Statutory Authority: *MS s 299F.57*

History: 9 SR 2383

7510.6400 TELEPHONED NOTICE OF LEAKS.

Code of Federal Regulations, title 49, section 191.5 is amended by adding a clause to read:

S 191.5 Telephonic notice of certain leaks.

(c) Each notice required by paragraph (a) of this section must also be telephoned to the state fire marshal, (612) 296-7641, and must include the information required by paragraph (b) of this section.

Statutory Authority: *MS s 299F.57*

7510.6500 ADDRESSEE FOR WRITTEN REPORTS.

Code of Federal Regulations, title 49, section 191.7 is amended to read:

S 191.7 Addressee for written reports.

Each written report required by this part must be made to the Director, Office of Pipeline Safety, Department of Transportation, Washington, D.C. 20590. One copy of each written report required by this part must be submitted

to the Department of Public Safety, State Fire Marshal Division, Saint Paul, Minnesota 55104.

Statutory Authority: *Ms s 299F.57*

7510.6600 DISTRIBUTION SYSTEM LEAK REPORTS.

Code of Federal Regulations, title 49, section 191.9 is amended by adding a clause to read:

S 191.9 Distribution system: leak report.

(c) Each operator of a distribution system serving 100,000 customers or fewer will comply with the leak reporting requirements of this paragraph by submitting one copy of each report to the Department of Public Safety, State Fire Marshal Division, Saint Paul, Minnesota 55104.

Statutory Authority: *MS s 299F.57*

7510.6700 DISTRIBUTION SYSTEM ANNUAL REPORTS.

Code of Federal Regulations, title 49, section 191.11 (a) is amended to read:

S 191.11 Distribution system: annual report.

(a) Except as provided in paragraph (b) of this section, each operator of a distribution system shall submit an annual report on Department of Transportation Form DOT-F-7100.1-1. This report must be submitted not later than February 15 for the preceding calendar year. One copy of the report must be submitted to the Department of Public Safety, State Fire Marshal Division, Saint Paul, Minnesota 55104, not later than February 15 for the preceding calendar year.

Statutory Authority: *MS s 299F.57*

7510.6800 ANNUAL REPORTING BY TRANSMISSION AND GATHERING SYSTEMS.

Code of Federal Regulations, title 49, section 191.17 is amended to read:

S 191.17 Transmission and gathering systems: annual report.

Each operator of a transmission system or a gathering system shall submit to the Department of Transportation an annual report on Department of Transportation Form DOT-F-7100.2-1 not later than February 15, for the preceding calendar year. One copy of the report must be submitted to the Department of Public Safety, State Fire Marshal Division, Saint Paul, Minnesota 55104, not later than February 15 for the preceding calendar year.

Statutory Authority: *MS s 299F.57*

7510.6900 FILING INSPECTION AND MAINTENANCE PLANS.

Code of Federal Regulations, title 49, section 192.17 is deleted and replaced with the following:

S 192.17 Filing of inspection and maintenance plans.

Each operator shall file with the State Fire Marshal a plan for inspection and maintenance of each pipeline facility he owns or operates. A change in an inspection and maintenance plan must be filed within 20 days after the change is made. Plans must be sent to the Department of Public Safety, State Fire Marshal Division, Saint Paul, Minnesota 55104.

Statutory Authority: *MS s 299F.57*

7510.6910 INSPECTION FEE.

A person who engages in the transportation of gas or who owns or operates pipeline facilities subject to Minnesota Statutes, sections 299F.56 to 299F.64 is subject to payment of a fee to recover the state's share of the cost of administering the natural gas pipeline safety activity.

A. The department shall maintain records on the amount of time each pipeline safety inspector spends performing duties related to each public or private natural gas pipeline company in Minnesota.

B. The department shall charge each natural gas pipeline owner or operator for the actual hours spent by pipeline safety inspectors in the conduct of duties under Minnesota Statutes, sections 299F.56 to 299F.64, plus a share of other related expenditures including supplies, materials, and overhead, prorated on the basis of the inspector hours. These charges must reflect the portion of expenses not reimbursable by the United States or a federal department or agency, under Minnesota Statutes, section 299F.64. The natural gas owner or operator must be provided an itemized statement of its charges upon request.

C. The department shall submit invoices to operators within 30 days after the end of the calendar quarter. Owners or operators shall remit payment to the department within 30 days after the date of the department invoice.

Statutory Authority: *MS s 299F.57*

History: *9 SR 2383*

SMOKE DETECTORS AND ALARMS

7510.7100 DEFINITIONS.

Subpart 1. **Administrative authority.** "Administrative authority" means the fire chief, or his authorized representative, of the fire department having jurisdiction, or the state fire marshal or his authorized representative.

Subp. 2. **Alarm signal.** "Alarm signal" means an audible signal indicating a fire condition.

Subp. 3. **Smoke detector.** "Smoke detector" means a device that detects visible or invisible products of combustion.

Statutory Authority: *MS s 299F.362 subd 2*

7510.7200 PURPOSE AND AUTHORITY.

Subpart 1. **Purpose.** The purpose of parts 7510.7100 to 7510.7400 is to specify the placement of smoke detectors in dwelling units, apartment houses, hotels, and lodging houses.

Subp. 2. **Authority.** Parts 7510.7100 to 7510.7400 are enacted pursuant to Minnesota Statutes, section 299F.362, subdivision 2.

Statutory Authority: *MS s 299F.362 subd 2*

7510.7300 SMOKE DETECTOR PLACEMENT.

Subpart 1. **Installation.** Care shall be exercised to insure that the installation will not interfere with the operating characteristics of the detector.

Subp. 2. **Alarm signal.** When actuated, the detector shall provide an alarm signal in the dwelling unit or guest sleeping room.

Subp. 3. **Dwelling units.** In dwelling units, smoke detectors shall be mounted on the ceiling or wall of a corridor or area giving access to rooms used for sleeping purposes.

Ceiling mounted smoke detectors shall be located as close to the center of the ceiling as possible, but not within six inches of a wall.

As an alternate, smoke detectors may be mounted on a wall within 12 inches of the ceiling, but not closer than six inches from the intersection of the wall and ceiling.

Subp. 4. **Hotels and lodging houses.** In hotel guest sleeping rooms, hotel suites, and lodging houses the detector shall be centrally located on the ceiling of the main room or hotel guest sleeping room. In hotel suites, where sleeping rooms are on more than one floor, the detector for the area of the sleeping rooms on the upper level shall be placed at the center of the ceiling directly above the stairway.

Statutory Authority: *MS s 299F.362 subd 2*

7510.7400 ALTERNATE LOCATIONS.

The administrative authority may approve alternate locations provided the proposed locations are substantially equivalent to the requirements of parts 7510.7100 to 7510.7400 and 7510.9920 so as not to alter the operating characteristics of the detector. (See part 7510.9920 for example of proper mounting for spot-type detectors.)

Statutory Authority: *MS s 299F.362 subd 2*

FLAME RESISTANCE OF TENTS AND SLEEPING BAGS**7510.8200 PURPOSE, SCOPE, AND AUTHORITY.**

Subpart 1. **Purpose.** The purpose of parts 7510.8200 to 7510.8500 is to adopt minimum flame resistance standards and to establish certification and labeling requirements for camping tents, sleeping bags, and public assembly tents.

Subp. 2. **Scope and intent.** It is the intent of parts 7510.8200 to 7510.8500 to provide tests to determine whether all component fabrics are comparatively difficult to ignite and whether it is comparatively difficult to propagate flame beyond the area exposed to the source of ignition.

Subp. 3. **Authority.** Parts 7510.8200 to 7510.8500 are enacted pursuant to Minnesota Statutes, sections 325F.03 to 325F.07.

Statutory Authority: *MS s 325F.05*

7510.8300 CAMPING TENTS.

The standard for flame resistance of camping tents shall be the Camping Products Association International Standard C.P.A.I. - 84, 1975 edition, and is hereby incorporated by reference and made part of Minnesota Rules.

Statutory Authority: *MS s 325F.05*

7510.8400 SLEEPING BAGS.

The standard for flame resistance of sleeping bags shall be the Camping Products Association International Standard C.P.A.I. - 75, 1976 edition, and is hereby incorporated by reference and made part of Minnesota Rules.

Statutory Authority: *MS s 325F.05*

7510.8500 PUBLIC ASSEMBLY TENTS.

The standard for flame resistance of public assembly tents shall be the small scale test requirements of National Fire Protection Association Standard NFPA No. 701, Flame Resistant Textiles, Films, 1975, adopted by NFPA at its annual meeting on May 15, 1975. The following sections of NFPA No. 701 apply to small scale test requirements and are hereby incorporated by reference and made part of Minnesota Rules:

Test apparatus and materials

2-1 Preconditioning oven

2-2 Small scale test apparatus

2-4 Test specimens

Flame test procedures

3-1 Small scale test

Cleaning and weathering procedures

4-1 General considerations

4-2 Application

4-3 Accelerated dry cleaning

4-4 Accelerated laundering

4-5 Scrubbing

4-6 Accelerated water leaching

4-7 Accelerated weathering

Flame resistance requirements
5-1 Small scale test

APPENDIX A

CPAI-75

A RATE-OF-BURN STANDARD FOR SLEEPING BAGS

1975

1. Scope.

1.1 Scope. This standard provides a test method and performance requirements for measuring the flammability, i.e. burn rate, of multicomponent sleeping bags, and provides labeling requirements to facilitate the identification of products conforming to this specification.

1.2 Application. This standard is applicable to all sleeping bags.

2. Performance requirements.

2.1 Performance requirements. When subjected to the test described in section 8 the average burn rate for a sample unit shall not exceed six inches per minute. No individual specimen shall have a burn rate of more than eight inches per minute.

3. Labeling.

3.1 Labeling. Bags shall be labeled as conforming to CPAI-75 Rate-of-Burn Standard of Sleeping Bags.

4. Specimens and sampling.

4.1 Specimen. The specimen shall be taken from the bag as shown in figure I (part 7510.9930) and shall have a finished size of 12" x 14". In the event that it is impossible to cut an actual sample from a bag due to its construction, a 12" x 28" facsimile may be constructed and folded. All components shall be used in their correct positions and amounts.

4.2 Sample unit. A sample unit shall consist of ten specimens, five to be subjected to three cycles of washing following the procedures recommended by the manufacturer. (Samples should be dried between washings and thoroughly dry before testing).

5. Conditions for testing.

5.1 Ambient conditions. Test shall be conducted under ambient conditions. In the case of a dispute, tests shall be conducted under conditions of 55 percent maximum relative humidity and a temperature of 70 degrees Fahrenheit \pm 2 degrees Fahrenheit, and specimens shall be in moisture equilibrium under the above conditions.

5.2 Draft. Tests shall be conducted in a draft-free environment.

6. Apparatus.

6.1 Test cabinet. A test cabinet similar to that shown in figure IV (part 7510.9945) shall be used.

6.2 Support frame. A support frame conforming to figure II (part 7510.9935) shall be used. It shall be constructed of 1/8" steel.

6.3 Hold-down plate. A hold-down plate conforming to figure III (part 7510.9940) shall be used. It shall be constructed of one-eighth inch steel.

6.4 Spacers and clamps. A spacer and clamping arrangement shall be used which is capable of positioning the hold-down plate with its bottom surface one inch above the top surface of the support frame, so that it holds the test specimen at a one-inch thickness on the two sides and the back.

6.5 Thread. #50 white mercerized cotton thread.

6.6 Tape. Tape for fastening the thread to the frame. (Alternate methods of accomplishing this, such as small clips, may also be used.)

6.7 Weights. Weights for attachment to the timing threads. (See Note 9.1.)

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6.8 Burner. A Bunsen burner with a tube of three-eighths inch inside diameter shall be used. The gas adjusting valve is set to provide a flame, with the tube vertical, 1-1/2 inch in height. The air inlet to the burner is closed.

6.9 Gas. The gas used shall be Matheson Manufactured Gas Type B or the equivalent.

6.10 Stop watch. A stop watch or other timing device shall be used capable of measuring the burning time to two-tenths second.

7. Sample preparation.

7.1 Compression. Samples shall be compressed to one-half their original loft for 24 hours prior to testing. (See Note 9.2.)

7.2 Relofting. Following the 24 hour compression period, specimens shall be allowed a minimum of one hour to regain their loft before tests are conducted.

8. Procedure.

8.1 Mount the specimen horizontally on the support frame with the sewn sides and end held at a one-inch thickness by the U-shaped hold-down frame, spacers, and clamps.

8.2 Attach two #50 white mercerized cotton threads to one edge of the frame at points one and one-half inches and 11 and one-half inches back from the open end, i.e. with ten inches in between, and stretch across the sample, attaching small weights to the overhanging ends of the threads. Timing will begin and end as the respective threads burn through and their weights drop.

8.3 With the flame adjusted as in section 6.8 and the frame with mounted specimen in the test cabinet, position the burner so that the center of the burner tip is three-fourths inches below the center of the edge of the exposed end of the specimen.

8.4 Lower the door of the test cabinet.

8.5 Expose the sample to the flame for 30 seconds to force ignition. (See Note 9.3.)

8.6 Begin timing when the first weight drops and continue until the second weight drops or until the flaming stops.

8.7 Calculate the burn rate using the following formula:

$$B = 60 \times \frac{D}{T}$$

Where:

B = Burn rate in inches per minute

D = Distance the flame travels in inches, and

T = Time in seconds for the flame to travel D inches.

9. Notes.

9.1 Small clamp-type paper clips work well as weights.

9.2 An easy method of accomplishing this is to stack a number of specimens in a box and compress them all to half their original height under a board or plate held down by pins through the side of the box, etc.

9.3 The most reproducible results are produced when the fan in the hood is turned off, or down if a variable speed fan is used, during the 30-second ignition period. During this time it is desirable that the burner flame not flicker. Following the ignition period the fan should be turned back up to exhaust fumes, yet not cause a draft in the test cabinet.

CPAI - 75 Test Cabinet
Materials List

 All Items 1/8" Stainless
Except as Noted

Item	Number Required	Description
1.	4	Corner Angle, 1 x 28"
2.	4	Window Frame, 3 x 28"
3.	4	Frame Spacer, 1- 3/4 x 4"
4.	4	Window Seat, 1- 1/4 x 4"
5.	1	Window, Heat Resistant Glass, 3/16 x 20 x 20"
6.	3	Panel, 24 x 24"
7.	1	Top Plate, 24-1/2 x 26"
8.	2	Chain, 24"
9.	2	Window Stop Rods, 1/4 diameter x 4"
10.	4	S-Hooks
11.	22	Bolt w/nut, 1/4-20 x 3/4"
12.	6	Bolt w/nut, 10-24 x 1/2"
13.	2	Hole, 1/4 diameter

Notes: The window glass slides up and down; its edges are taped to avoid cuts; and rubber tubing on top of seat acts as cushion.

CPAI - 84

A SPECIFICATION FOR FLAME RESISTANT MATERIALS USED
IN CAMPING TENTAGE

1975

1. Scope.

1.1 Scope. This standard provides performance requirements and test methods for evaluating the flame resistance of fabric and other pliable materials used in camping tentage. It also provides for certification of materials by suppliers and for labeling programs to caution the user against actions detrimental to flame retardant finishes, as well as to facilitate the identification of tentage as being constructed of flame resistant materials and to identify the manufacturer.

2. Definitions.

2.1 Camping tentage: Any portable temporary shelter or structure designed to protect persons from the elements, all or a portion of the covering of which is made of fabric or other pliable materials. This includes, though not exclusively, the following: camping tents; play tents; recreational vehicle awnings; dining flies and canopies; fabric screen houses; add-a-room; and ice fishing tents.

2.2 Material classifications. All materials covered in this standard fall under one of the following definitions:

2.2.1 Flooring material: Any pliable material used for flooring in camping tentage but excluding such things as rugs or carpets placed in the tent which are not an integral part of the item.

2.2.2 Wall and top material: Any pliable material used in camping tentage for other than flooring including walls, roofs, tops, doors, windows, screens, awnings, flies, and canopies.

2.3 Sample unit. A sample unit shall consist of the following:

2.3.1 Flooring material: Four individual specimens, no two specimens containing the same warp or fill yarns or filaments.

2.3.2 Wall and top material: Eight individual specimens, four taken from the warp and four from the fill direction of the test material. No two warp specimens shall contain the same warp years or filaments and no two fill specimens shall contain the same fill yarns or filaments.

3. Performance requirements.

3.1 Flooring material. When subjected to the test described in section 6, no specimen from a sample unit of flooring material shall be damaged within one inch of the edge of the hole in the flattening frame.

3.2 Wall and top material. When subjected to the test described in section 7, no specimen from a sample unit of wall and top material shall have an after-flame time (length of time a specimen continues to flame after removal of the test flame source) of more than four seconds; the average afterflame time for all specimens in a sample unit shall not exceed two seconds. The damaged length (distance from the bottom of the specimen to a point above which all material is sound) for the sample unit and individual specimens shall not exceed the values shown in section 3.2.1. Portions or residues which break or drip from the test specimens shall not continue to flame after they reach the floor of the test cabinet.

3.2.1 Damaged length. The maximum permissible damaged lengths for wall and top material shall be as follows:

Untreated Weight of Materials Being Tested	Maximum Average Damaged Length for Sample Unit	Maximum Damaged Length for an Individual Specimen
Ounces Per Square Yard	Inches	Inches
Over 10	4.5	10.0
Over 8 but not over 10	5.5	10.0
Over 6 but not over 8	6.5	10.0
Over 4 but not over 6	7.5	10.0
Over 1.5 but not over 4	8.5	10.0
Not over 1.5	9.0	10.0

4. Certification and labeling.

4.1 Material certification. Each lot of flame resistant material supplied to a manufacturer of camping tentage shall be accompanied by a written certification from the supplier stating that it meets the flame retardance requirements of CPAI-84 and giving the lot number and yardage therein.

4.2 Labeling of camping tentage. A label or labels shall be permanently affixed to each item of camping tentage containing the following information:

4.2.1 Certification: A statement that the materials used in the manufacture of the item meet the flame resistance requirements of CPAI-84.

4.2.2 Manufacturer identification: An identification of the manufacturer of the item, unless the item bears a private label, in which case, it shall identify the private labeler and shall also contain a code mark which will permit the seller of the item to identify the manufacturer thereof to the purchaser upon his request.

4.2.3 Code number: A number enabling the manufacturer to identify from his records the suppliers and suppliers' lot numbers of the certified materials used in the item. The manufacturer shall also maintain records identifying the parties to whom he sold camping tentage. Further, he shall maintain records identifying items manufactured from lots of certified material. Records shall be maintained for four years.

4.2.4 Warning label: (See part 7510.9950.)

This warning label or its equivalent must be permanently affixed to the tent at one conspicuous location, and must contain block letters on a white back-

ground. The first paragraph of the body of the label must be placed in a conspicuous location on each carton containing the tent.

5. Conditioning.

5.1 Standard conditions for testing. Flame tests shall be performed under or upon immediate removal from Standard Atmospheric Conditions and on specimens in moisture equilibrium under Standard Atmospheric Conditions.

5.1.1 Standard atmospheric conditions. Standard Atmospheric Conditions for testing are 65 percent + 2 percent relative humidity at a temperature of 70 degrees Fahrenheit \pm 2 degrees Fahrenheit. (21.1 degrees Celsius \pm 1.1 degrees Celsius.)

5.1.2 Moisture equilibrium. Moisture equilibrium is considered to have been reached when, after free exposure of the material to air in motion controlled at Standard Atmospheric Conditions as defined above, the change in weight of successive weighings made at intervals of one hour is no greater than 0.25 percent.

5.1.3 Preconditioning. In the event of dispute concerning the results of tests that may be affected by the moisture content, the material shall be preconditioned by being brought to moisture equilibrium with an atmosphere having a relative humidity of not over ten percent and a temperature not over 125 degrees Fahrenheit (52 degrees Celsius). The material shall then be brought to moisture equilibrium under Standard Atmospheric Conditions as defined above and then tested.

5.2 Leaching. Tests in sections 6 and 7 shall be performed both before and after leaching.

5.2.1 Test specimen. Test specimens to be leached shall be of the following dimensions:

5.2.1.1 Flooring material. Each test specimen shall be a nine inch by nine inch (\pm 1/16 inch) section of the flooring material to be tested.

5.2.1.2 Wall and top material. Test specimens shall be rectangles of cloth two and three-fourths inches by 12 inches (\pm 1/16 inch) with the long dimensions parallel to either the warp or filling directions of the material.

5.2.2 Apparatus.

5.2.2.1 Water container or tank of such shape and size that the specimen can be submerged therein with all surfaces of the specimen having full access to the water. For cloth specimens the container shall allow not less than one-half gallon of water for each square foot of specimen. The water shall be changed by a continuous flow or by emptying and refilling so that there shall be at least six complete changes of water in a 72-hour period.

5.2.2.2 Means of maintaining water at a temperature of 60 degrees Fahrenheit to 70 degrees Fahrenheit (15.5 degrees Celsius to 21.1 degrees Celsius) and a pH of 6.0 to 8.0 during the test.

5.2.2.3 Means for holding the specimen submerged throughout the leaching period.

5.2.3 Procedure. The specimens shall be immersed in water at a temperature of 60 degrees Fahrenheit to 70 degrees Fahrenheit (15.5 degrees Celsius to 21.1 degrees Celsius) and a pH of 6.0 to 8.0 for 72 hours. The specimen shall then be removed, air-dried, and brought to Standard Atmospheric Conditions prior to further testing.

5.3 Accelerated weathering. Tests in sections 6 and 7 shall be performed both before and after accelerated weathering.

5.3.1 Test specimen. Test specimens to be weathered shall be of the following dimensions:

5.3.1.1 Flooring material. Each test specimen shall be a nine inch by nine inch (\pm 1/16 inch) section of the flooring material to be tested.

5.3.1.2 Wall and top material. Test specimens shall be rectangles of cloth two

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and three-fourths inches by 12 inches ($\pm 1/16$ inch) with the long dimensions parallel to either the warp or filling directions of the material.

5.3.2 Apparatus.

5.3.2.1 Vertical carbon arc mounted at the center of a vertical cylinder. The arc shall be designed to accommodate either two or three pairs of carbons but shall burn only one pair at a time, automatically transferring from one pair to another as the carbons are consumed. The carbons shall be Sunshine cored and copper coated, No. 22 for the upper pair and No. 13 for the lower pair. The arc shall be operated on 60 amperes and 50 volts across the arc for alternating current and on 50 amperes and 60 volts across the arc for direct current.

5.3.2.2 A rotating rack with holder in which the specimens are suspended vertically and normally to radiation from the arc with the center of the face of the specimen at a radial distance of approximately 18 inches from the arc.

5.3.2.3 Water-spray nozzles shall be mounted horizontally (the water-spray assembly vertically) in the test chamber inside the specimen rack and so placed that the water shall strike the specimens evenly over their entire length in the form of a fine spray in sufficient volume to cover specimens immediately on impact. The apparatus shall be so operated that the specimens are exposed to successive cycles of 102 minutes of light without spray and 18 minutes of light with spray.

5.3.2.4 Means for maintaining the required temperature of water in the spray.

5.3.2.5 Means for maintaining the required pressure of water entering the spray.

5.3.2.6 Means for delivering the required quantity of water per spray nozzle to the specimen.

5.3.2.7 Exhaust fan to ventilate the arc effectively.

5.3.2.8 Black panel thermometer unit for measuring the temperature within the machine. This unit shall consist of a metal panel to the base of which is attached the sensitive portion of a bimetallic dial-type thermometer. The entire base is then coated twice with long lasting baked enamel paint.

5.3.3 Procedure.

5.3.3.1 The rack shall rotate about the arc at a uniform speed of one revolution per minute.

5.3.3.2 The temperature of water in the spray shall be 80 degrees Fahrenheit ± 10 degrees Fahrenheit (26.7 degrees Celsius ± 5.6 degrees Celsius).

5.3.3.3 The pressure of the water entering the spray shall be one to 18 psi inclusive.

5.3.3.4 The quantity of water delivered to the specimen shall be .12 to .25 gallons, inclusive, per hour per spray nozzle.

5.3.3.5 The black panel temperature at the exposure plane of the specimen rack shall be 155 degrees Fahrenheit ± 10 degrees Fahrenheit (68 degrees Celsius ± 5.7 degrees Celsius) when measured in the following manner:

Before reading the temperature the machine shall be full of specimens and shall be in operation long enough for thermal equilibrium to be established. The black panel shall be mounted in the test-panel rack and readings taken at the point where water spray is not striking the panel.

5.3.3.6 The specimen shall be suspended on the rotating rack without tension and in such a way that the ends or corners cannot curl. The long dimension of the specimen shall be in the vertical position and shall be indicated on the reverse side of the cloth. No test portion of the specimen shall be over seven inches about or below the horizontal plane of the arc.

5.3.3.7 The specimen shall be exposed to normal radiation from the arc for 100 hours.

5.3.3.8 At the end of the exposure period, the specimen shall be removed from the machine, allowed to dry, and brought to Standard Atmospheric Conditions prior to further testing.

6. Test method, flooring material.

6.1 Test specimen. Each test specimen shall be a nine inch by nine inch (\pm 1/16 inch) section of the flooring material to be tested.

6.2 Apparatus.

6.2.1 Test chamber. The test chamber shall consist of an open top hollow cube made of noncombustible material with inside dimensions 12 x 12 x 12 inches and a minimum of one-fourth inch wall thickness. The flat bottom of the box shall be made of the same material as the sides and shall be easily removable. The sides shall be fastened together with screws or brackets and taped to prevent air leakage into the box during use.

6.2.2 Supporting frame. A steel plate, nine inches by nine inches, one-fourth inch thick with an eight inch diameter hole in its center and a one inch by one inch by one-sixteenth inch thick shim affixed to the underside of each corner is required to support the material above the floor of the chamber during the course of the test.

6.2.3 Flattening frame. A steel plate nine inches by nine inches, one-fourth inch thick with an eight inch diameter hole in its center is required to hold the flooring material flat during the course of the test.

6.2.4 Punch: A punch capable of making a one-fourth inch diameter hole in the center of the specimen of flooring material to be tested.

6.2.5 Standard igniting source: No. 1588 methenamine timed burning tablet or an equal tablet. These tablets shall be stored in a desiccator over a desiccant for 24 hours prior to use. (Small quantities of sorbed water may cause the tablets to fracture when first ignited. If a major fracture occurs, any results from that test shall be ignored, and it shall be repeated.)

6.2.6 Hood: A hood capable of being closed and having its draft turned off during each test and capable of rapidly removing the products of combustion following each test. The front or sides of the hood should be transparent to permit observation of the tests in progress.

6.2.7 Mirror: A small mirror mounted above the test chamber at an angle to permit observation of the specimen from outside of the hood.

6.3 Procedure.

6.3.1 Place the test chamber in the draft-protected environment (hood with draft off) with its bottom in place and the supporting frame centered in the bottom of the chamber, shimmed side down.

6.3.2 Punch a one-fourth inch diameter hole in the center of the specimen of flooring material to be tested.

6.3.3 Place the specimen on the supporting frame in the position in which it will be used, exercising care that the specimen is horizontal and flat. Place the flattening frame on the specimen and position a methenamine tablet on one of its flat sides with its edge within one-eighth inch of the edge of the hole in the center of the specimen.

6.3.4 Ignite the tablet by touching a lighted match or an equivalent igniting source carefully to its top.

6.3.5 Continue each test until the last vestige of flame or glow disappears (this is frequently accompanied by a final puff of smoke) or the flaming or smoldering has approached within one inch of the edge of the hole in the flattening frame at any point. (Any test in which the tablet is extinguished by physical action of the specimen of flooring material shall be disregarded and the test repeated.)

6.3.6 When all combustion has ceased, ventilate the hood and measure the shortest distance between the edge of the hole in the flattening frame and the damaged area. Record the distance measured for each specimen.

6.3.7 Remove the specimen from the chamber and remove any burn residue from the floor of the chamber. Before proceeding to the next text, the floor must be cooled to normal room temperature or replaced with one that is at normal room temperature.

6.4 Report. The number of specimens of the four tested in which the damaged area does not extend to within one inch of the edge of the hole in the flattening frame shall be reported.

6.5 Notes.

6.5.1 The No. 1588 methenamine tablet may be procured from a local pharmacy or from Eli Lilly & Co., 740 S. Alabama, Indianapolis, Indiana 46206.

7. Test method, wall, and top material.

7.1 Test specimen. The test specimens shall be rectangles of cloth two and three-fourths inches by 12 inches ($\pm 1/16$ inch) with the long dimensions parallel to either the warp or filling directions of the material.

7.2 Apparatus

7.2.1 Cabinet: A cabinet and accessories, fabricated in accordance with the requirements specified in Figures A, B, and C, parts 7510.9955, 7510.9960, and 7510.9965, respectively. Galvanized sheet metal or other suitable metal shall be used. The entire inside back wall of the cabinet shall be painted black to facilitate the viewing of the test specimen and pilot flame.

7.2.2 Burner. The burner shall be equipped with a variable orifice to adjust the flame height, a barrel having a three-eighths inch inside diameter, and a pilot light.

7.2.2.1 The burner may be constructed by combining a three-eighths inch inside diameter barrel $3 \pm 1/4$ inches long from a fixed orifice burner with a base from a variable orifice burner.

7.2.2.2 The pilot light tube shall have a diameter of approximately one-sixteenth inch and shall be spaced one-eighth inch away from the burner edge with a pilot flame one-eighth inch long.

7.2.2.3 The necessary gas connections and the applicable plumbing shall be as specified in figure D (part 7510.9970) except that a solenoid valve may be used in lieu of the stopcock valve to which the burner is attached. The stopcock valve or solenoid valve, whichever is used, shall be capable of being fully opened or fully closed in one-tenth second.

7.2.2.4 On the side of the barrel of the burner, opposite the pilot light there shall be a metal rod of approximately one-eighth inch diameter spaced one-half inch from the barrel and extending above the burner. The rod shall have two five-sixteenths inch prongs marking the distances of three-fourths inch and one and one-half inches above the top of the burner.

7.2.2.5 The burner shall be fixed in a position so that the center of the barrel of the burner is directly below the center of the specimen.

7.2.3 A control valve system with a delivery rate designed to furnish gas to the burner under a pressure of $2-1/2 \pm 1/4$ pounds per square inch at the burner inlet (see 7.5.1). The manufacturer's recommended delivery rate for the valve system shall include the required pressure.

7.2.4 The gas used shall be Matheson Manufactured Gas Type B or the equivalent.

7.2.5 Metal hooks and weights to produce a series of total loads to determine damaged length. The metal hooks shall consist of No. 19 gauge steel wire or equivalent and shall be made from three inch lengths of the wire and bent one-half inch from one end to a 45 degree hook. One end of the hook shall be fastened around the neck of the weight to be used.

7.2.6 Stop watch or other device to measure the burning time to two-tenths second.

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7.2.7 Scale, graduated in one-tenth inch to measure the damaged length.

7.3 Procedure.

7.3.1 The specimen in its holder shall be suspended vertically in the cabinet in such a manner that the entire length of the specimen is exposed and the lower end is three-fourths inch above the top of the gas burner. The apparatus shall be set up in a draft free area.

7.3.2 Prior to inserting the specimen, the pilot flame shall be adjusted to approximately one-eighth inch in height measured from its lowest point to the tip. The burner flame shall be adjusted by means of the needle valve in the base of the burner to give a flame height of one and one-half inches ($\pm 1/16$ inch) with the stopcock fully open and the air supply to the burner shut off and taped. The one and one-half inch flame height is obtained by adjusting the valve so that the uppermost portion (tip) of the flame is level with the tip of the metal prong (see figure B, part 7510.9960) specified for adjustment of flame height. It is an important aspect of the evaluation that the flame height be adjusted with the tip of the flame level with the tip of the metal prong. After inserting the specimen, the stopcock shall be fully opened, and the burner flame applied vertically at the middle of the lower edge of the specimen for 12 seconds ($\pm .2$ second) and the burner turned off. The cabinet door shall remain shut during testing.

7.3.3 The after flame time for each specimen shall be recorded to the nearest two-tenths seconds. After flaming and glowing have ceased, the specimen shall be removed from the cabinet.

7.3.4 After each specimen is removed, the test cabinet shall be cleared of fumes and smoke prior to testing the next specimen.

7.3.5 After both flaming and glowing have ceased, the damaged length shall be measured. The damaged length shall be the distance from the end of the specimen, which was exposed to the flame, to the end of a tear (made lengthwise) of the specimen through the center of the damaged area as follows: The specimen shall be folded lengthwise and creased by hand along a line through the highest peak of the damaged area. The hook shall be inserted in the specimen (or a hole, one-fourth inch diameter or less, punched out for the hook) at one side of the damaged area one-fourth inch from the adjacent outside edge and one-fourth inch in from the lower end. A weight of sufficient size such that the weight and hook together shall equal the total tearing load required in 7.3.6.1 shall be attached to the specimen.

7.3.6 A tearing force shall be applied gently to the specimen by grasping the corner of the cloth at the opposite edge of the char from the load and raising the specimen and weight clear of the supporting surface. The end of the tear shall be marked off on the edge and the damaged length measurement made along the undamaged edge.

7.3.6.1 Loads for determining damaged length. The specific load applicable to the weight of the test material shall be as follows:

Untreated Weight of Material Being Tested Ounces per Square Yard	Total Tear Weight for Determining the Damaged Length - Pounds
Not exceeding 6.0	0.25
Over 6.0 and not exceeding 15.0	0.50
Over 15.0 and not exceeding 23.0	0.75
Over 23.0	1.00

7.3.7 The damaged length for each specimen shall be recorded to the nearest one-tenth inch.

7.4 Report.

7.4.1 The after flame time and damaged length of the sample unit shall be

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the average of the results obtained from the individual specimens tested. All values obtained from the individual specimens shall be recorded.

7.4.2 The after flame time shall be reported to the nearest two-tenths second and the damaged length to the nearest one-tenth inch.

7.5 Notes.

7.5.1 The gas and the regulator valve system, Models IL-350 and 70 with hose and fittings connected in series may be obtained from Matheson Gas Products, P.O. Box 85, East Rutherford, New Jersey 07073.

7.5.2 The test cabinet of the type described in this test method may be obtained from the Govmark Organization, Inc., P.O. Box 807, Bellmore, New York 11710.

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2-1 Preconditioning oven.

2-1.1 A forced draft oven shall be used to properly condition test specimens prior to testing in either the small scale test or the large scale test.

2-1.1.1 The interior of the oven shall be large enough to provide free air flow around each specimen contained.

2-1.1.2 The oven shall have variable temperature control.

2-2 Small scale test apparatus.

2-2.1 Specimen holder.

2-2.1.1 A metal holder, having clamps arranged to grip the specimen along its edges only, shall be used to support the specimen. The ends of the specimen shall remain free.

2-2.2 Test shield.

2-2.2.1 The specimen and its holder shall be supported in the vertical position within a metal shield having a depth of 12 inches, a width of 12 inches and a height of 30 inches.

(a) The shield shall be open at the top and shall be provided with baffled vent openings along the bottom of at least two sides, totaling six square inches of free vent area.

(b) The shield shall also have a sliding glass door or panel.

2-2.3 Gas burner.

2-2.3.1 A Bunsen or Tirrell gas burner, approximately six inches high and three-eighths inch tube diameter, shall be used as an ignition source.

(a) The burner shall be supported so that its barrel will be at a 25 degree angle with vertical.

(b) The burner shall have means for being moved into test position after the shield has been closed. (A rod attached to the base of the burner and extending through a slot at the bottom of the shield will serve the purpose.)

(c) The gas supply to the burner shall be natural gas or a mixture of natural and manufactured gases having a heat value of approximately 800-1000 BTU per cubic foot.

2-2.4 Hook and weight.

2-2.4.1 A hook and weight assembly shall be used to determine the length of char or destruction of the specimen.

(a) The weight shall be detachable from the hook.

(b) The combined weight of the assembly shall follow Table 2-2.4, part 7510.9975.

2-4. Test specimens.

2-4.1 Small scale test.

2-4.1.1 Five specimens of the material, two and three-fourths inches by ten inches, shall be cut with their long dimension in the direction of the warp and five in the direction of the filling.

2-4.1.2 Each lot of five shall be cut from at least four places in the sample separated sufficiently to give indication as to the uniformity of the flame-resistant treatment.

3-1 Small scale test.

3-1.1 Preconditioning of test specimens.

3-1.1.1 The test specimens shall be conditioned in an oven at temperatures of 140 to 145 degrees Fahrenheit, for duration of one to one and one-half hours prior to testing.

3-1.1.2 Materials which distort or melt at the above indicated oven exposure are to be conditioned at 60 to 80 degrees Fahrenheit and 25 to 50 percent relative humidity for not less than 24 hours.

3-1.1.3 Specimens shall be removed from the oven one at a time and immediately subjected to the procedures described in sections 3-1.2 and 3-1.3.

3-1.2 Mounting of Test Specimens.

3-1.2.1 The specimen shall be placed on the specimen holder and clamped so that a strip two inches wide and ten inches long is left exposed.

3-1.2.2 The specimen and its holder shall be supported within the test shield so that its lower end will be three-fourths inch above the top of the gas burner.

3-1.3 Conducting the flame test.

3-1.3.1 The gas burner shall be ignited and, with the air supply completely shut off, shall be adjusted to give a luminous flame about one and one-half inches long.

3-1.3.2 The burner shall be moved under the specimen so that the flame is applied vertically to the lower end of the specimen, near the middle of its width. The flame shall be applied for 12 seconds, then withdrawn.

3-1.3.3 The duration of flaming of the specimen shall be noted after withdrawal of the burner.

3-1.4 Measurement of length of char or material destruction.

3-1.4.1 After all flaming and afterglow on the specimen has ceased, the length of char or material destruction shall be determined immediately. The length of char in this test is defined as the distance from the end of the specimen which was exposed to the flame to the end of a tear made lengthwise of the specimen through the center of the charred area in the following manner:

(a) The hook (of the hook/weight assembly) is inserted in the specimen, on one side of the charred area, one-fourth inch in from the adjacent outside edge and one-fourth inch up from the bottom.

(b) The weight is then attached to the hook.

(c) The specimen is then grasped on the opposite side of the charred area with the fingers, and raised gently until it supports the weight. The specimen will tear through the charred area until fabric strong enough to carry the load is reached.

3-1.4.2 When it is not feasible to measure char, the material destruction can normally be judged as the measurement from the bottom of the sample to a horizontal line above which all material is sound and in original condition.

4-1. General considerations.

4-1.1 The probable durability of a treatment relative to the life of the fabric is difficult to assess but, in general, flame-retardant treatments tend to be either very tenacious or quite easily removed.

4-2 Application.

4-2.1 These procedures shall be applied to fabrics which are expected to retain their flame-resistant qualities through dry cleaning, laundering, weathering, or other exposures to water.

4-2.2 Each fabric shall be subjected to only those exposure procedures which are applicable to its intended use. It shall meet the flame resistance requirements of chapter 5 after passing through the appropriate exposure cycles.

4-2.2.1 It is believed that such accelerated exposure tests as those described in this section provide sufficient testing to permit a reasonable appraisal of the durability of the treatment (under the conditions for which it was designed) for the useful life of the fabric.

4-3 Accelerated dry cleaning.

4-3.1 The specimens of the treated fabric shall be agitated for approximately 15 minutes in a suitable commercial type dry cleaning apparatus.

4-3.1.1 A dry cleaning solution of ten to 15 parts dry cleaning soap or detergent and 1000 parts perchlorethylene shall be used. The volume of solution employed shall be in excess of that required to saturate the sample.

4-3.2 The specimens shall be rinsed for at least five minutes in pure perchlorethylene shall be used. The volume of solution employed shall be in excess of that required to saturate the sample.

4-3.3 The above procedure shall be repeated until ten complete cycles of cleaning and drying have been realized.

4-4 Accelerated laundering.

4-4.1 A sample of the treated fabric shall be washed in an automatic commercial washing machine using a solution containing 0.15 percent solution of tallow soap and 0.20 to 0.25 percent alkali.

4-4.2 The sample shall then be dried in a drying tumbler at 250 degrees Fahrenheit.

4-4.4 The above procedure shall be repeated until ten complete cycles of washing and drying have been accomplished.

4-4.4.1 If the material is to be subjected to a special use, more laundering may be required.

4-4.5 Where instructions for laundering a fabric are supplied by the manufacturer or finisher, those instructions should be followed in preference to the above procedure which simulates a typical commercial laundering practice.

4-5 Scrubbing.

4-5.1 Certain articles of flame-resistant fabric not ordinarily washed by home or commercial laundering methods are sometimes scrubbed vigorously on one or both sides, applying laundry soap (or other detergent) and water with a stiff bristle brush. The fabric is then thoroughly rinsed with water and dried.

4-5.2 Where treated fabrics are likely to be cleaned in this manner during their use, test specimens shall be subjected to flame tests after repeated cycles of scrubbing as outlined.

4-6 Accelerated water leaching.

4-6.1 A sample of the treated fabric shall be totally submerged in a vessel containing tap water at room temperature for a period of 72 hours. The vessel shall have a capacity of at least four gallons of water.

4-6.2 The water shall be drained from the tank and replenished at 24-hour intervals during the immersion period.

4-6.3 At the conclusion of the immersion period, the sample shall be removed from the test vessel and dried at room temperature.

4-7 Accelerated weathering.

4-7.1 Either of the following alternative accelerated weathering conditioning procedures shall be used.

4-7.2 Alternative procedure No. 1.

4-7.2.1 Apparatus.

(a) The apparatus shall consist of a vertical metal cylinder fitted with a vertical carbon arc at its center and having a specimen holder mounted within.

(b) The diameter of the cylinder shall be such that the distance to the face of the specimen holder from the center of the carbon arc is 14 and three-fourths inches.

(c) The cylinder shall be arranged to rotate about the arc at a rate of approximately three revolutions per minute.

(d) A water spray shall be provided within the cylinder and fitted with means to regulate the amount of water discharged.

(e) The vertical carbon arc shall be either five-tenths inches diameter solid electrode type, if operating on direct current, or a single-cored electrode, if operating on alternating current. The electrodes shall be of uniform composition.

(f) The arc shall be surrounded by a clear globe of No. 9200 PX Pyres glass, 0.0625 inches thick, or other enclosure having equivalent absorbing and transmitting properties.

4-7.2.2 Operation of the test equipment.

(a) The specimens for test shall be mounted on the inside of the cylinder facing the arc.

(b) The cylinder shall rotate at approximately three revolutions per minute for the duration of the test.

(c) The water spray shall discharge about seven-tenths gallons per minute onto the specimens for about one minute during each revolution.

(d) The arc shall operate on 13 amperes direct current or 17 amperes, 60 hertz alternating current, with voltage at the arc of 140 volts.

(e) The electrodes shall be renewed at intervals sufficiently frequent to insure full operative conditions of the lamp.

(f) The globe shall be cleaned when the electrodes are removed or at least once in each 36 hours of operation.

4-7.2.3 Test cycle.

(a) Specimens shall be subjected to this exposure for 360 hours.

(b) Specimens shall then be allowed to dry thoroughly at a temperature between 70 and 100 degrees Fahrenheit.

(c) After drying, the specimens shall proceed through the Flame Test.

4-7.3.2 Operation of test equipment.

(a) The specimens for test shall be mounted on the rotating rack, facing the arc.

(b) The rack shall rotate about the arc at a uniform speed of about one revolution in two hours.

(c) The arc shall operate on 60 amperes and 50 volts across the arc for alternating current or 50 amperes and 60 volts across the arc for direct current.

4-7.3.3 Test cycle.

(a) Specimens shall be subjected to this exposure for 300 hours.

(b) They shall then be allowed to dry thoroughly at a temperature between 70 and 100 degrees Fahrenheit.

(c) After drying, the specimens shall proceed through the flame test.

5-1 Small scale test.

5-1.1 When subjected to the small scale test described in section 3-1 no specimen shall continue flaming for more than two seconds after the test flame is removed from contact with the specimen.

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FIRE SAFETY 7510.8500

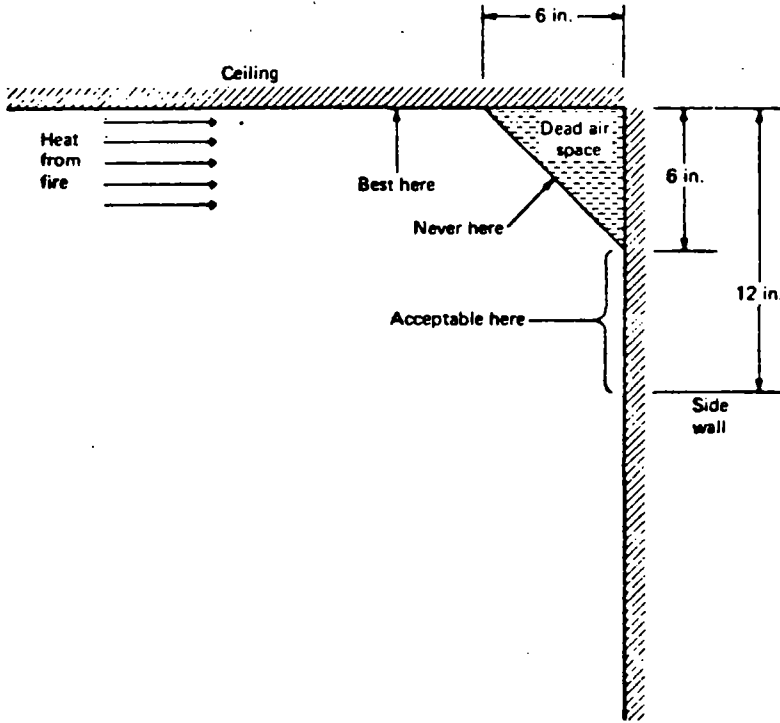
5-1.2 The vertical spread of flame and afterglow (smoldering combustion) on the material, as indicated by the length of char or the measurement from the bottom of the sample above which all material is sound and in original condition, shall not exceed the values shown in Table 5-1, part 7510.9985.

5-1.3 At no time during or after the application of the test flame shall portions or residues of textiles or films which break or drip from any test specimen continue to flame after they reach the floor of the tester.

Statutory Authority: *MS s 325F.05*

TABLES, FORMS, AND EXHIBITS

7510.9920 SMOKE DETECTORS: EXAMPLE OF PROPER MOUNTING.



Example of proper mounting for spot-type detectors.

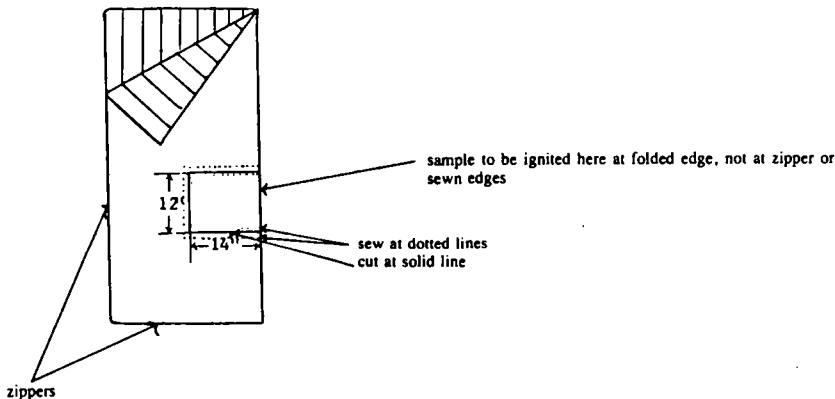
Statutory Authority: *MS s 299F.362 subd 2*

MINNESOTA RULES 1991

7449

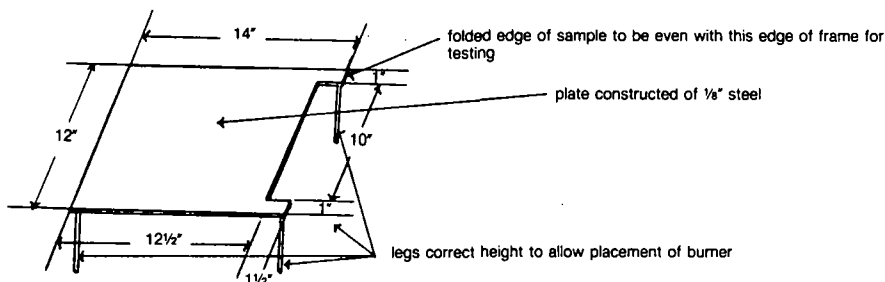
FIRE SAFETY 7510.9940

7510.9930 PUBLIC ASSEMBLY TENTS: FIGURE I, TEST SPECIMEN.



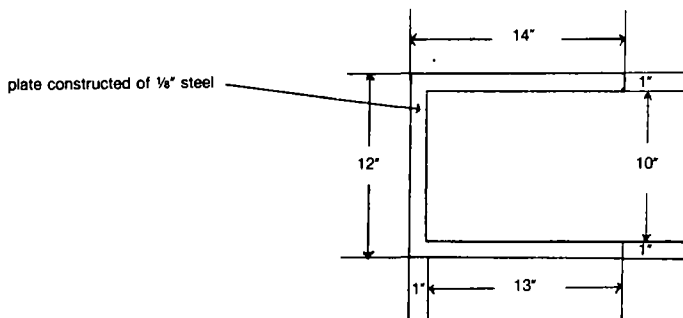
Statutory Authority: *MS s 325F.05*

7510.9935 PUBLIC ASSEMBLY TENTS: FIGURE II, SUPPORT FRAME.



Statutory Authority: *MS s 325F.05*

7510.9940 PUBLIC ASSEMBLY TENTS: FIGURE III, HOLD-DOWN PLATE.



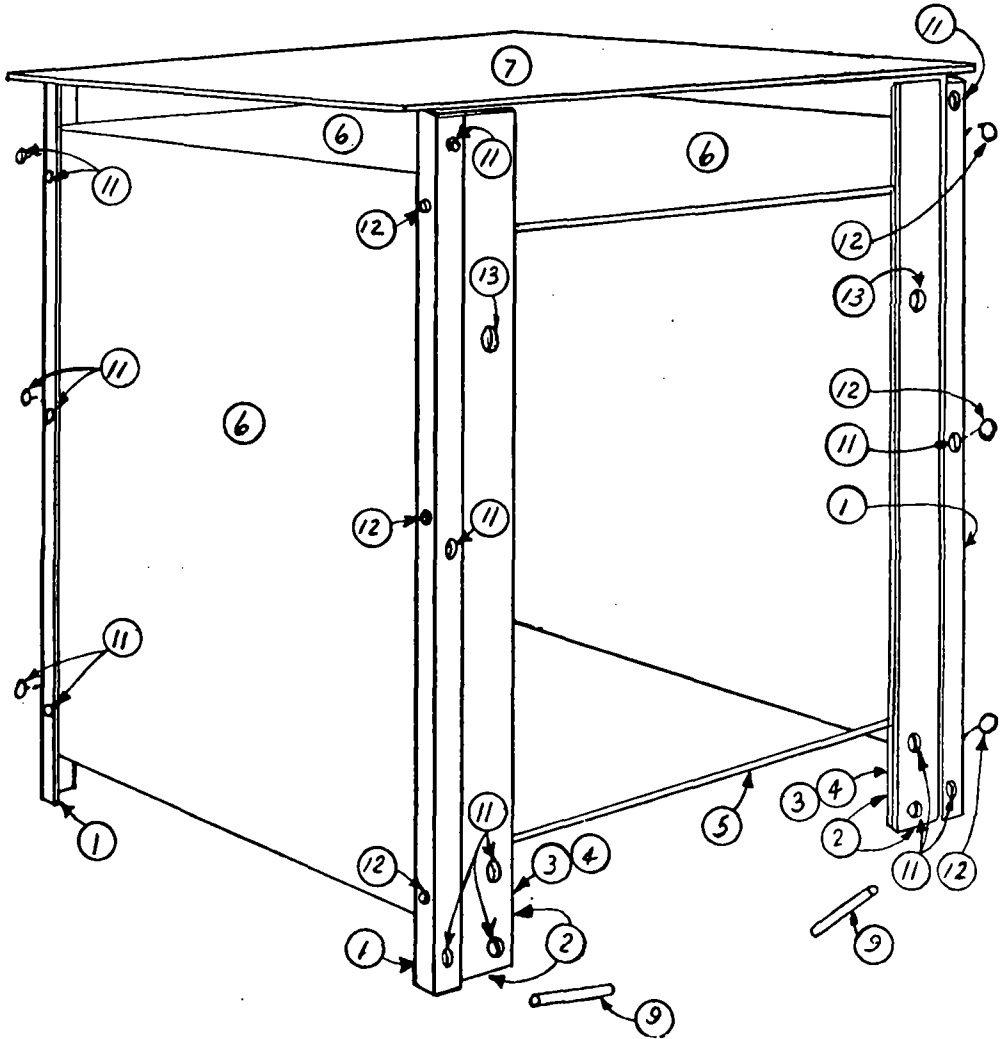
Statutory Authority: *MS s 325F.05*

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7510.9945 FIRE SAFETY

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7510.9945 PUBLIC ASSEMBLY TENTS: FIGURE IV, TEST CABINET.



Statutory Authority: *MS s 325F.05*

7510.9950 WARNING LABEL FOR CAMPING TENTS.

WARNING

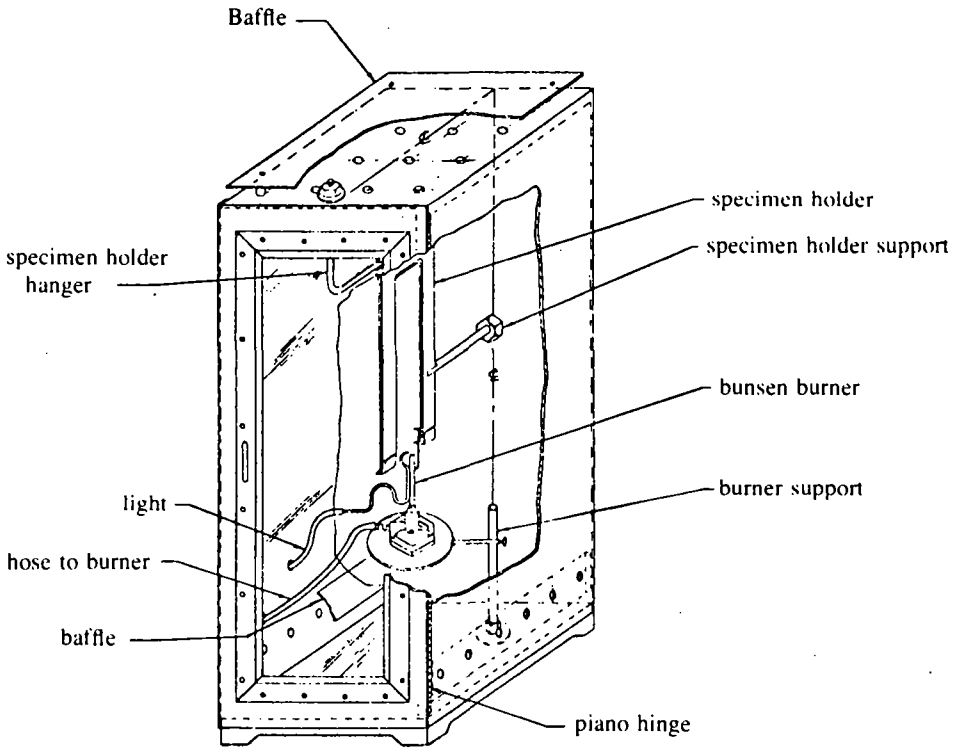
**KEEP ALL FLAME
AND HEAT SOURCES
AWAY FROM THIS
TENT FABRIC**

This tent is made with flame resistant fabric which meets CPAI-84 specification. **It is not fire proof.** The fabric will burn if left in continuous contact with any flame source.

The application of any foreign substance to the tent fabric may render the flame resistant properties ineffective.

Statutory Authority: *MS s 325F.05*

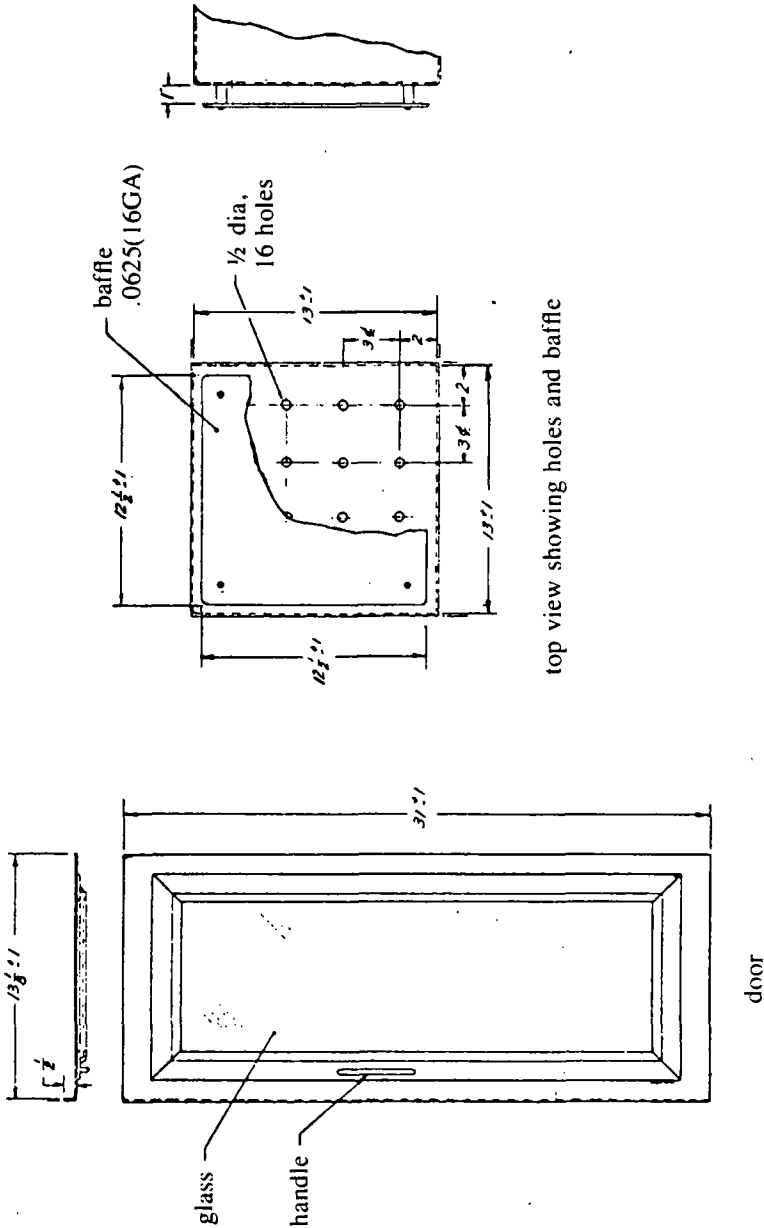
7510.9955 CAMPING TENTS: VERTICAL FLAME RESISTANCE TEXTILE APPARATUS.



CPAI 84 Figure A Vertical Flame Resistance Textile Apparatus

Statutory Authority: *MS s 325F.05*

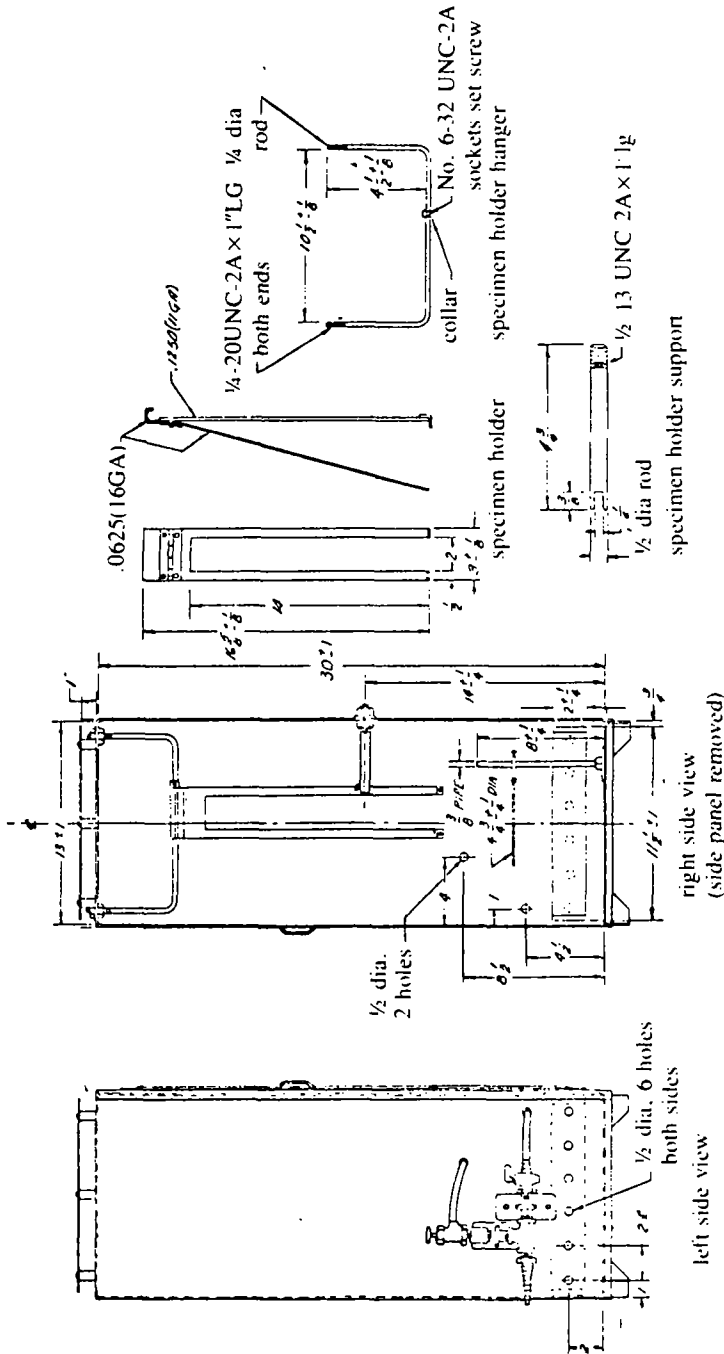
7510.9960 CAMPING TENTS: TOP VIEW OF TESTING APPARATUS WITH BAFFLE.



CPAI 84 Figure B Vertical Flame Resistance Textile Apparatus, Door and Top View w/Baffle

Statutory Authority: *MS s 325F.05*

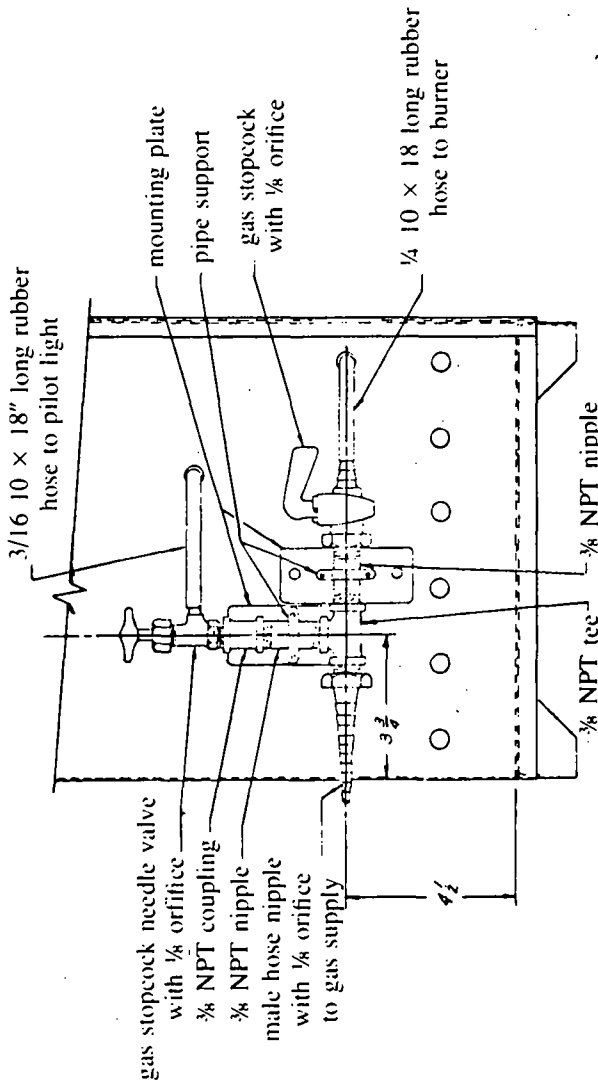
7510.9965 CAMPING TENTS: VIEWS AND DETAILS OF TESTING APPARATUS.



CPAI 84 Figure C Vertical Flame Resistance Textile Apparatus, Views and Details

Statutory Authority: MS s 325F.05

7510.9970 CAMPING TENTS: SIDE VIEW OF TESTING APPARATUS SHOWING GAS HOSE CONNECTION.



side view showing gas hose connection

Note:
all pipe fitting to be
black iron pipe

CPAI 84 Figure D Vertical Flame Resistance Textile Apparatus

Statutory Authority: *MS s 325F.05*

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7510.9975 FIRE SAFETY

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7510.9975 TEXTILES, TABLE 2-2.4: SMALL SCALE TEST, TEARING WEIGHTS.

Tearing Weights - Small Scale Test

Weight of Treated Fabric Being Tested	Total Tearing Weight for Determination of Length of Char
Ounces per Square Yard	Pounds
2 to 6 inclusive	0.25
Over 6 and not exceeding 15	0.5
Over 15 and not exceeding 23	0.75
Over 23	1.00

Statutory Authority: *MS s 325F.05*

7510.9980 TEXTILES, TABLE 4-4: OPERATING CYCLE FOR ACCELERATED LAUNDERING.

Operation	Time, Minutes	Temperature - Degrees Fahrenheit
1. Sudsing	6	130
2. Sudsing	6	160
3. Sudsing	6	160
4. Bleaching	8	150
5. Rinsing	2	160
6. Rinsing	2	160
7. Rinsing	2	160
8. Rinsing	2	130
9. Bluing	3	100
10. Scouring	3	100

This cycle is intended for white fabrics. For colored fabric, the bleaching and bluing operations are omitted and the temperature of the "Sudsing" and "Rinsing" operations is reduced 30 degrees Fahrenheit.

Statutory Authority: *MS s 325F.05*

7510.9985 TEXTILES, TABLE 5-1: SMALL SCALE TEST, LENGTH OF CHAR OR DESTROYED MATERIAL.

Permissible Length of Char or Destroyed Material - Small Scale Test

Weight of Treated Fabric Being Tested	Maximum Average Length of Char or Destroyed Material for Ten Specimens	Maximum Length of Char or Destroyed Material for Any Specimens
Ounces per Square Yard	Inches	Inches
Over 10	3-1/2	4-1/2
Over 6 and not exceeding 10	4-1/2	5-1/2
Not exceeding 6	5-1/2	6-1/2

Statutory Authority: *MS s 325F.05*