



OFFICE OF THE ILLINOIS STATE FIRE MARSHAL

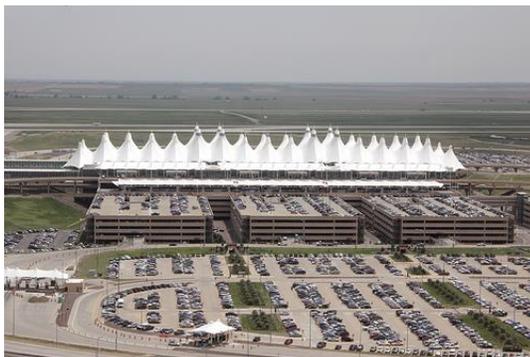
Membrane Structures and Tents Used for Outdoor Dining¹

The Office of the State Fire Marshal (OSFM) reminds local authorities, owners, and operators of membrane outdoor dining structures that these structures present special hazards that make them vulnerable to fire and fire injuries if applicable codes are not followed. By their nature, tents and membrane structures are constructed of materials that do not resist ignition or the spread of flame unless properly treated to do so. Additionally, because of their temporary nature, owners often believe that tents and membrane structures are exempt from fire sprinkler protection or fire detection system requirements. This document reviews the fire safety regulations found in the rules adopted by Illinois, specific to the common membrane structures and tents used for outdoor dining.

The rules of OSFM serve as the minimum requirements in non-home rule municipalities. If the local fire and/or building departments has more stringent requirements these more stringent requirements must be followed. Tents and membrane structures found in home-rule municipalities that have not adopted OSFM's Life Safety Code must comply with that municipality's requirements and OSFM's Life Safety Code does not apply.

NFPA 101, *Life Safety Code* (LSC) provides requirements for membrane structures and tents. A membrane structure is defined as a building or portion of a building incorporating an air-inflated, air-supported, tensioned-membrane structure; a membrane roof; or a membrane-covered rigid frame to protect habitable or usable space. Even though it may appear that a tent would also be considered a membrane structure, the LSC treats tents independently. The major difference between tents and membrane structures is that tents are only permitted to be used on a temporary basis. The LSC defines a temporary structures as a building or structure that is permitted to remain in place for a period of 180 days or less in any consecutive 12-month period.

Figure 1 is a photograph of the Denver International Airport. Denver International Airport is a good example of a tensioned-membrane structure. Figure 2 provides an example of an air-supported or air-inflated structure



(Figure 1)



(Figure 2)

¹ This document is provided as a result of outdoor dining requirements triggered by Restore Illinois COVID-19 phasing plan. This phasing plan was implemented after January 1, 2020, therefore OSFM is using requirements for new occupancies.

Examples of common structures used for outdoor dining are tents and membrane-covered rigid framed (MCRF) structures. Figures 3 and 4 provide examples of tents that are used for outdoor dining.



Figure 3



Figure 4

Figures 5 and 6 provide examples of MCRF structures that are used for outdoor dining. These structures are sometimes called “dining igloos.”



Figure 5



Figure 6

Illinois Code Requirements

Tents

A tent is a temporary structure, the covering of which is made of pliable material that achieves its support by mechanical means such as beams, columns, poles, or arches, or by rope or cables, or both. **It is important to remember that tents are to be used only as a temporary structure. This means tents can be in operation for 180 days or less.**

In addition to the requirements found in Chapter 11 for tents, the chapter related to the occupancy use within the tent must also be followed. Therefore, if a tent is used for dining and can hold more than 50 patrons, this tent must follow the requirements found in Chapter 12 for new assembly occupancies.

Other requirements related to tents are as follows:

- All tent fabric shall be flame resistant in accordance with LSC Section 10.3.1 with some additional requirements related to alternative methods for proving flame resistance.
- Fire extinguishers need to be provided pursuant to NFPA 10, *Standard for Portable Fire Extinguishers* (2007).
- Smoking is prohibited and posting is required, except when permitted by the AHJ.

- The ground enclosed by any temporary membrane structure, and the ground for at least 10 ft outside of a tent, must be cleared of all flammable or combustible material or vegetation.
- This work must be accomplished prior to the erection of such a structure(s).
- The premises shall be kept free from such flammable or combustible materials during the period for which the premises are used by the public.
- The placement of tents relative to other structures shall be at the discretion of the AHJ, with consideration given to occupancy, use, opening, exposure, and other similar factors.
- There shall be a minimum of 10 ft between stake lines.
- Adjacent tents shall be spaced to provide an area to be used as a means of emergency egress. Where 10 ft between stake lines does not meet the requirements for means of egress, the distance necessary for means of egress shall govern.

Exception No. 1: Tents not occupied by the public and not used for the storage of combustible material shall be permitted to be less than 10 ft from other structures where the AHJ approves.

Exception No. 2: Tents not exceeding 1,200 ft² in area and located in fairgrounds or similar open spaces, shall not be required to be separated from each other, provided that safety precautions meet the AHJ.

- Fired heaters and electric heaters must comply with the following:
 - Only labeled heating devices shall be used.
 - Fuel-fired heaters and electric heaters and their installation shall be approved by the AHJ.
 - LPG containers shall be installed not less than 5 ft from any tent and shall be in accordance with the provisions of NFPA 58, *Liquefied Petroleum Gas Code*.
 - Tanks shall be secured in the upright position and protected from vehicular traffic.
 - Electrical heaters shall be connected to electricity by electric cable that is suitable for outside use and is of sufficient size to handle the electrical load.

Tents used as assembly occupancies are subject to other requirements of the LSC's assembly occupancy chapter. These include, but are not limited to:

- Fire protection requirements including but not limited to sprinklers and fire alarm systems.
- Provision of an adequate number of means of egress.
- Provision of panic hardware on exit doors.
- Restrictions on dead end pathways.
- Aisle and aisle accessways must comply with requirements of Chapter 12.
- The use of open flame devices or pyrotechnic special effects must comply with Illinois regulations found in Title 41 Ill. Adm. Code 235.
- Furnishings and decorations (including all draperies and curtains) are required to be flame resistant as proven in a test in accordance with NFPA 701 *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*.
- In accordance with both LSC requirements and Illinois' Furniture Fire Safety Act (Title 41 Ill. Adm. Code 300), any upholstered furniture in the occupancy must comply with testing and labeling requirements.

Membrane Structures

OSFM has defined a “dining igloo” as a membrane-covered rigid framed structure (MCRF). The requirements for MCRF are found under the requirements for permanent or temporary membrane structures in LSC Chapter 11. These are permitted to be permanent structures and therefore may be used for more than 180 days. In addition to the requirements found in Chapter 11 for membrane structures, the occupancy chapter related to the use within the tent must be followed. Therefore, if an MCRF is used for dining and can hold more than 50 patrons, the MCRF must follow the requirements found in Chapter 12 for new assembly occupancies.

Requirements related to MDRF are as follows:

- The flame spread index of all membrane materials exposed within the structure shall be Class A. This means the material needs to have a flame spread of 0–25 with a smoke development of 450.
- All fabric shall meet the flame propagation performance criteria contained in Test Method 2 of NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*. (See LSC Section 11.9.1.6 for alternative approaches to testing membrane materials.)
- Fired heaters and electric heaters must comply with the following:
 - Only labeled heating devices shall be used.
 - Fuel-fired heaters and electric heaters and their installation shall be approved by the AHJ.
 - LPG containers shall be installed not less than 5 ft from any MCRF structure and shall be in accordance with the provisions of NFPA 58, *Liquefied Petroleum Gas Code*.
 - Tanks shall be secured in the upright position and protected from vehicular traffic.
 - Only labeled electrical heaters shall be used and their placement, and installation shall be approved by the AHJ.
 - Electrical heaters shall be connected to electricity by electric cable that is suitable for outside use and is of sufficient size to handle the electrical load.

MCRF structures used as assembly occupancies are subject to other requirements of the LSC’s assembly occupancy chapter. These include, but are not limited to:

- Fire protection requirements including but not limited to sprinklers and fire alarm systems.
- Provision of an adequate number and width of means of egress to accommodate occupant loads within the building.
- Provision of panic hardware on exit doors.
- Restrictions on dead end pathways.
- The use of open flame devices or pyrotechnic special effects must comply with Illinois regulations found in Title 41 Ill. Adm. Code 235.
- Furnishings and decorations (including all draperies and curtains) are required to be flame resistant as proven in a test in accordance with NFPA 701 *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*.

- In accordance with both LSC requirements and Illinois' Furniture Fire Safety Act (Title 41 Ill. Adm. Code 300), any upholstered furniture in the occupancy must comply with testing and labeling requirements.

For further information regarding membrane structures and tents used for outdoor dining, contact the OSFM's Technical Services Division at SFM.Techservices@illinois.gov.