Greenhouses and other Membrane Structures not used for Human Occupancy, 2015 IBC

3102.1 General.

The provisions of Sections 3102.1 through 3102.8 shall apply to air-supported, air-inflated, membrane-covered cable, membrane-covered frame and *tensile membrane structures*, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the *International Fire Code*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy are required to meet only the requirements of Sections 3102.3.1 and 3102.7. Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

3102.3.1 Membrane and interior liner material.

Membranes and interior liners shall be either noncombustible as set forth in Section 703.5 or meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 and the manufacturer's test protocol.

Exception: Plastic less than 20 mil (0.5 mm) in thickness used in greenhouses, **where occupancy by the general public is not authorized**, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.

❖ The membrane is a thin, flexible, impervious material capable of being supported by an air pressure of $1^1/_2$ inches (38 mm) of water column. Membranes may be noncombustible. Except for limited applications of plastic greenhouses and pond covers, combustible membranes are required to be flame resistant.

Noncombustible membranes and liner materials must meet the criteria of Section 703.5, which references ASTM E136. This test is used in the determination of noncombustibility. See the commentary for Section 703.5.1 for more information on this test.

Materials that are not noncombustible are required to be flame resistant. Flame resistance is determined by testing the membrane in accordance with NFPA 701. The materials when tested in accordance with NFPA 701 must comply with the performance criteria of one of the two identified test methods. The historic "small-scale test" is no longer accepted.

Although typically not applicable to membrane structures, it should be noted that recent tests have indicated a problem with combining two fabrics that individually passed the test procedure, but in combination would not be acceptable. Therefore, if multiple layers are used, testing should demonstrate acceptable performance for the combination of materials.

Both greenhouses that are not open to the public and aquaculture pond covers may be of plastic that is less than 20 mil (500 mm) thick and need not be flame resistant or tested to demonstrate compliance with NFPA 701. This provision for greenhouses is based on the limited number of occupants.

3102.7 Engineering design.

The structure shall be designed and constructed to sustain dead loads; loads due to tension or inflation; live loads including wind, snow or flood and seismic loads and in accordance with Chapter 16.

❖ The structure must be designed and constructed to sustain all dead loads, loads caused by tensioning or inflation and live loads, including wind, snow, flood and seismic. Chapter 16 provides criteria for design loads, except those associated with tensioning or inflation.