



Air Structures & Building Codes

Listed under chapter 31 of the International Building Code, air supported structures have many unique features and benefits as compared to buildings constructed with conventional building materials.

International Building Code Air supported structures are covered in the International Building Code (IBC) in chapter 31, “Special Construction.”

Fire Safety Features The building code requirements are constantly changing, but depending on the application, a sprinkler system is still not required for some projects. For example, an air structure with A-4 occupancy classification can be accepted without a sprinkler system if certain conditions are met and approved by the local building authority. Quite often, equivalent offsetting design features are incorporated into the dome design that not only enhances but highlights the generally safe nature of the clear-span air supported structure. [Fire alarm pull boxes](#), [fire extinguishers](#), [easy access to plenty of emergency egress doors](#), [on-site generated power for operation of systems during power outages](#), [smoke and fire detection systems](#) and even [state-of-the-art water cannon systems](#) have been incorporated into a fire protection package acceptable to building commissioners and fire marshalls alike.

There are thousands of air supported structures in use today without any type of water-based fire protection systems. Even so, [the industry track record is unblemished without a single fatality due to fire in the history of the industry](#). [No other building type can even come close to this stellar performance history](#).

Fire Performance Testing Air supported structures use non-traditional building materials, primarily fabric, for its buildings. These building materials are not considered truly “non-combustable,” but they do meet all requirements of NFPA 701 and so are allowed (see IBC paragraph 3102.3.1). The only reason that the materials used are not considered “non combustable” as defined in section 703.4 is the requirement of ASTM E136. The flame spread requirement in paragraph 703.4.2 of not greater than 50 is easily met (in fact, our materials have a flame spread of 15!). The base material does not pass the requirements of ASTM E136 simply because the % mass remaining after the test. The

test requirements have two parts: first, the material shall not catch fire (which Arizon’s material does not), and second, the material should have at least 50% of its original mass left (which is does not, it vaporizes). Given the choice from a purely safety sake, it is better to have the fabric vaporize rather than burn. The exception in paragraph 3102.3.1 allowing materials that pass NFPA 701 indicates the true requirements of the materials used in air structures: they should not burn when exposed to flame.

On extremely rare cases, a fire has occurred within an air structure (on landfill sites, specifically). The result was that when the fire did reach the building, it melted a hole in the fabric and the immediate opening blew out the fire at the building envelope, relieved the heat build up at the roof, allowed the smoke to escape, and allowed safe extinguishing of the fire by crews while the building stayed fully inflated. The make-up air system increased its output automatically to overcome the air loss through the opening in the building. The materials self extinguished, and the building needed only minor repairs.

Arizon Building Code Support Each project is unique, as well as local building codes and requirements. Arizon can work with your professional consultant to design an air supported structure and fire protection system suitable for almost any application. Additionally, Arizon will provide structural drawings and calculations sealed by a Professional Engineer for the owner’s use in obtaining a building permit.