

Synthetic Grass and Artificial Turf

In this Tek Newsletter, synthetic grass carpets refers to tufted carpets made specifically for residential end-uses that include patios, walkways, decks, porches, and areas around swimming pools. Artificial turf refers to tufted carpets made specifically for end-use that include athletic playing surfaces, driving ranges, putting greens, "goofy golf", putt putt golf, etc. A second reference to synthetic grass carpets used for landscaping, playgrounds, and other commercial end-use's will also be mentioned briefly.

The first successful effort to produce what was referred to as artificial turf occurred in 1960 at the North Carolina State University College of Textiles. By 1965, the first artificial turf was installed in the newly-built Astrodome in Houston, Texas. By 1970, similar artificial turfs were being installed in both the United States and Canada in indoor and outdoor stadiums for venues such as soccer, baseball, and football. By this time, the most advantageous use of artificial turf was seen in its use in football stadiums with colder climates. By the 1980s, artificial turf was being installed in European soccer stadiums, and later as a playing surface for cricket and rugby. At this time, artificial turfs had begun to gain a bad reputation for being very hard and unforgiving surfaces, as more and more serious joint injuries were being associated with their use. By the 1990s, many stadiums that had used artificial turfs began to replace them with softer, more forgiving natural grass that had been engineered to withstand colder climates where necessary.

Today's generation of artificial turfs are considered to be much safer, and are now compared to playing on natural grass. These products are made from UV-enhanced olefin (polypropylene) fiber that is tufted into a woven synthetic primary backing that receives a coating of synthetic latex on the opposite side of the face fibers to give the turf dimensional stability. When installed, the turf's face (i.e., the grass "blades") is generally given a layer of sand to augment water drainage, and a layer of cryogenic rubber granules to help keep the tufts more vertically oriented; and to provide shock-absorbency. Other synthetic turfs are often made from shorter, denser polyethylene fibers that have even shorter crimped fibers to keep the tufts (grass blades) upright. Variations of artificial turf are now used on field hockey playing surfaces and on tennis "grass courts".

For physical testing purposes, artificial turf must pass ASTM F1551-09 Standard Test Method for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials. Other required test for artificial turf include ASTM D 624 Test Method for tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers, ASTM F 1015-Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces, ASTM F 355-Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials, and about 26 other ASTM test methods and requirements for synthetic turf products. .

The actual construction and physical performance properties between artificial turf carpets and synthetic grass differ significantly. Here are just a few examples: Artificial turf is often made from polyethylene fiber that must be colored by adding pigments and dyes prior to spinning, and will require a tuft bind minimum average of 21 lbs/square inch. Synthetic grass carpets are made from solution dyed polypropylene (olefin), and are required to have a minimum tuft bind strength average of 3 lbs/square inch. Typical synthetic grass carpets have a pile height ranging from 3/8" - 1/2", and a pile yarn weight of 10-34 oz./square yard. Artificial turf will often have a pile yarn weight as much as 55 oz./square yard, and have a pile height ranging from 0.5- 4". Synthetic grass carpets are typically coated /laminated using styrene butadiene rubber. Artificial turfs are coated using a polyurethane rubber. Most artificial turfs consist of two face yarns, one that is textured, and one that is not. Synthetic grass carpets can be made using tufts consisting of one or more face yarns.

This information demonstrates the vast differences between the required performance criteria between synthetic grass carpets used on patios, around swimming pools, etc., to artificial turf used for various sundry athletic playing surfaces. In no case should residential synthetic grass carpet be used as an athletic playing surface, or be confused with synthetic grass products specifically designed for landscaping, parks, and playgrounds. Like synthetic turfs, these carpets are typically made with thicker "blades", will have a urethane secondary backing, and require drainage capabilities and the use of in-fill during installation.

Beaulieu does not make artificial turf for playing surfaces or synthetic carpet for any type commercial end-use installation.

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