

Carpet Fibres



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Nylon

Nylon is a giant among molecules containing 1,700 atoms of carbon, nitrogen, hydrogen, and oxygen. Nylon is strong and abrasion resistant, shows good sunlight resistance and excellent resistance to mildew. Nylon has the greatest moisture absorption rate of all the polymer fibers and melts between 419°F and 480°F. Because of its smooth micro-surface, nylon resists most soils and is relatively easy to clean. Nylon has an affinity for most dye stuffs and thus stains easily.

Polypropylene

The generic name for polypropylene is "Olefin". Polypropylene is extremely hydrophobic (low moisture absorption) and can only be solution dyed. However, polypropylene soils very easily. This fiber has low tolerance to heat and can distort with heat as low as 180°F. At 212°F, polypropylene fibers can shrink. Polypropylene is not affected by water, mild to moderate alkalis or acids, reducers or bleaches, although continued exposure to bleach will degrade the fiber. This fiber is resistant to most solvents and all beverage dyes. Polypropylene is susceptible to sunlight degradation.

Polyester

Polyester is derived from ethylene gas. Polyester is produced in the same way as nylon and ranks just below nylon for strength and abrasion resistance. Polyester is not very elastic and is stable with excellent resiliency. Polyester has excellent sunlight resistance and does not lose its strength when wet. Polyester is hydrophobic and does not absorb moisture very well. Polyester, like polypropylene, is extremely difficult to stain, and like polypropylene attracts oils more than nylon. However, Polyester has a greater tendency to develop static electricity and pill in staple fiber. Polyester has good heat resistance and at temperatures below 212°C it shows excellent resistance to mild acids and alkalis.

Acrylic

Acrylic fibers are derived from methane. Acrylic was designed to be the synthetic substitute for wool and thus exhibits only moderate strength. Abrasion and sunlight resistance are good, but acrylic has little elasticity or resiliency. Acrylic is more water-loving than polyester or polypropylene, yet less than nylon. Acrylic is resistant to heat and resists mineral acids well and resists cool mild alkaline solutions. Hot alkali solutions will degrade this fiber. Mild solutions of bleach, reducers and strippers have little effect on the fiber.

Wool

Wool is a natural protein fiber obtained from sheep. Wool is the fiber to which all other fibers are compared. It is sensitive to color change, yellowing, and degradation when exposed to direct sunlight and it has a narrow pH range for cleaning. Wool cleans best between a pH of 5 and 8 and the cleaning chemistry must not contain bleaching agents or optical brighteners. Wool fibers should be cleaned with solutions on the neutral or acid side of the pH scale. Alkaline cleaning solutions (pH of above 7) may contribute to browning of fibers

Conclusion

Each of the fibers above have particular characteristics that make them unique. A fabric manufacturer can use several different fibers to enhance the strength, luster, texture, color, etc. of a fabric: a fabric made with more than one type of fiber is called a blend.

The combination of different fibers in a fabric often determine how a fabric can be cleaned. For example: a 50/ 50 cotton/ rayon blend tends to often be a solvent clean fabric. Why? Cotton, a wet clean fiber gains strength when wet. Rayon loses strength when wet and tends to brown. Thus, the weaker fiber controls the cleaning process. Solvent cleaning is used to maintain the fabric integrity and keep the fabric from browning.

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