Antistatic Treatments

TAI PING

Static electricity remains a major concern that ranges from regulatory requirements for safety environments, such as aviation and maritime, commercial environments with sensitive electronic equipment, general office areas with a network of personal computers, to the average residential end-use. Further advancements in heating and insulation cause warmer, dryer indoor climates ideal for static generation.

The amount of static electricity generated by a material is based on the Triboelectric Scale and is expressed in kilovolts (kV). One kilovolt = 1,000 volts. It is generally accepted that the level of human sensitivity to static electricity is 3,500 volts, or 3.5 kV. Fortunately, shocks generated by carpet from higher kV's are generally only a nuisance, and are not damaging to individuals. One important factor that will determine static generation is room temperature and ambient relative humidity. **Studies show that static electricity is generally not discernable until relative humidity drops below 40%.**

Antistatic options can be added to increase or guarantee a carpet's antistatic performance, for example **'no shock' fibre** can be mixed into the body yarn, or antistatic chemistry is added to face fibre and carpet backing. An alternative method for static reduction is the use of topically applied antistatic sprays. However, topical treatments are incapable of providing permanent static protection and break down over time causing loss of antistatic performance and also risk of accelerated soiling.

Specifiers for special environments with sensitive equipment, such as aircraft, control rooms etc., may not accept a static level greater than 1.5 to 2 kV. The addition and permanency of built-in static inhibitors such as static dissipative filaments and conductive primary and secondary backings are often required in carpet to protect sensitive components. Typically, static dissipative carpets will generate 1.0 to 1.5 kV depending on construction and static component materials.

The typical test for static electricity in carpet is the **AATCC 134 Electrostatic Propensity of Carpets test method.** Using this test, carpets are tested for static generation by step and scuff action using various shoe sole materials at ambient conditions of 70°F and 20% relative humidity. Ratings are then recorded and averaged. According to this test carpets that do not yield voltages more than 3 kV for commercial environments, and 5 kV for residential end-use, yield acceptable static performance.

Tai Ping applies both 'no-shock' fibre and an antistatic agent to latex to provide a reliable level of antistatic performance such that surface generated static will fall consistently below 3.5kV. The 'no-shock' fibre can be applied to wool, wool/silk blends and some (but not all) pure silk yarns.

If antistatic requirements have been specified it is important to include these options at the sampling stage as there can be very subtle changes to material appearance.

Anti-static Performance Levels

The specifier should be advised to confirm the required level of anti-static performance in writing, typically there are two levels for anti-static performance:

2.0kV = For special environments with sensitive equipment, such as aircraft, control rooms etc., will not accept a static level greater than 1.5 to 2.0 Kv

3.5kV = This is the industry standard level of performance, static charges below this level are not normally noticeable to humans

Once the level of anti-static performance has been agreed a sample should be tested in a laboratory prior to production providing recorded and certified evidence that it reaches the required level of performance.