

The friction created by rubbing two materials together generates static electricity. The act of walking across a carpet results in friction between two materials - carpet face fibers and shoe sole materials.

There are numerous variables that affect the amount of static that is generated. These variables include differences in environments, humans, shoe soles, generic fiber types, carpet constructions, carpet backing materials, carpet cushions, and even the type of base floor on which the carpet is installed. The static performance of a carpet may be altered in service as a result of wear, soiling, cleaning, temperature, relative humidity, etc. Changes in any of these variables can alter the amount of static electricity that is generated in carpet and, therefore, the degree of shock. However, studies have revealed that static electricity does not become a problem with most people until the relative humidity drops below 40 percent.

### **Specifying Considerations**

Carpet is available today with built-in static inhibitors. These control elements include specific fiber blends and specially engineered coated fibers, each of which, when used properly, limits the amount of static accumulation.

When static shock is predicted to be a problem, it is advisable to specify a permanent built-in static control system. Carpet that has been properly tested by American Association of Textile Chemists and Colorists Test Method 134 and does not yield voltages in excess of 5.0 kV (kilovolts), provides acceptable static performance in residential end uses.

AATCC Test Method 134: *Electrostatic Propensity of Carpets* is a laboratory simulation that assesses the static-generating tendency developed when a person walks across a carpet area. As previously mentioned, static generation is dependent upon humidity conditions; therefore, testing is performed at 20%  $\pm$ 2% relative humidity.

For general commercial environments, 3.5 kV is the acceptable maximum value not to exceed. For more critical environments involving data processing operations, etc., more stringent requirements may be desirable. Generally, 2.0 kV is an accepted upper limit for static generation of carpets to be used in these areas. In highly critical environments, such as the handling of semiconductors, the typical "antistatic" carpet may not provide sufficient static protection and must be augmented by other means. One should keep in mind that most, if not all, personal office computers have built-in protection systems to shield components from damage or disruption from electrostatic discharges.

## **Controlling Static in Existing Installations**

For existing carpet installations, static electricity problems can best be reduced by maintaining a proper balance of relative humidity. If for some reason the relative humidity cannot be controlled at the proper balance, there are several non-permanent antistatic products that can be supplied and/or applied by professional cleaners. These products significantly reduce the occurrence of static electricity to levels that are below the level of human sensitivity. Caution should be considered before using a topically applied product, however, because some products can cause carpet to soil at a much faster rate than normal.