Flocked Fabrics

Flocking is a process of adhering short fibers to fabric to create a pile-like design or overall pile effect. The texture of the fabric is similar to nap or velvet, but is called a flocked fabric. However, a flocked fabric is distinctly different in its structure from a napped or pile fabric. Napped fabrics are brushed on the surface to raise fiber ends. Pile fabrics have an additional set of yarns introduced into the base fabric. Flocking can be either a printing or a finishing process. The adhesive may be roller printed onto the fabric in a patterned design with the flock fibers adhering only to the printed areas. As a finishing process, the adhesive coats the entire surface of the fabric for overall surface flock.

The flock (short lengths of fibers) can be made from any fiber type. Rayon is most commonly used because it is inexpensive and easy to cut during the manufacturing process. Nylon is often used when good abrasion resistance and durability are required. Other fibers often used as flock are cotton, wool, acrylic, polyester, and olefin. Fibers for flocking are made from bundles of tow fiber (continuous monofilament fibers without twist). The tow is fed through a finish removal bath, then into a bank of cutters that cut the flock to the desired length. The flock generally ranges in length from 2/25 to 1/4 inch. The fibers may be dyed before they are attached to the fabric or the completed fabric may be dyed. Flock can be applied to many base materials. The two types of bases for fabrics are a woven fabric and a urethane foam which is bonded to a knit or woven fabric.

Methods of Construction

The two basic methods of applying flock to fabric are mechanical and electrostatic. In both methods, the flock is placed perpendicular to the base fabric to achieve either a pattern flock or overall flock. During the mechanical flocking process, short fibers are sifted onto an adhesive-coated fabric. The vibration of beater bars causes the flock flowing over the surface of the fabric to stand erect and to penetrate into the adhesive. This method is less expensive and most widely used in the United States. The advantage is the flock becomes more deeply embedded and, therefore, permanently attached. However, many flock fibers adhere at various angles so the flocking may not be as dense as desired.

Ground or Giroud is another method of mechanical flocking. Fibers or tow are fed into a channel which holds the fibers vertically and cuts them into predetermined, uniform lengths. The flock is continually moved horizontally in a feeding guide toward a conveyor belt which contains an adhesive-coated fabric. The adhesive-coated fabric meets the flock fiber and is adhered. The flock forms a compact dense pile superior to other methods.
adhesive in an erect position. The advantage to this method is both sides of the fabric can be flocked and denser flocking is achieved because the fibers uniformly adhere in an upright position. However, this method is more expensive since it requires more complicated machinery and better quality flock fibers.

After the fabric has been flocked by one of these methods, it is sent to an oven to dry the adhesive. There is no way for a consumer or cleaner to tell which flocking method was used.

End Uses

Flocked fabrics are used in many areas of textiles. The largest use is for household items such as upholstery, draperies, bedspreads, blankets, and rugs. The Vellux blanket is an example of a foam-flocked construction. The blanket is made of nylon fibers electronically bonded to two layers of polyurethane foam that are sealed to a nylon scrim (open-mesh weave) for reinforcement.

The second largest use of flocked fabrics is in women’s and children’s clothing. Flocked designs such as dotted Swiss and imitation velvets are often used in wearing apparel.

Problems

The durability of flocked fabrics is dependent upon the adhesives that hold the flock to the fabric. Some flocked fabrics have limited abrasion resistance. Edges of pockets, sleeves, and collars are areas that receive the most wear abrasion and are likely to show loss of pile after cleaning. In addition, areas which are in a creased or folded condition during the tumbling action of cleaning can show a loss of pile. The type of fiber used to make the flock affects its durability. For example, rayon wears more readily than nylon.

In some cases, the adhesives may be soluble in drycleaning solvent. This damage may be noted as peeling or blistering of flock from the base fabric or a complete loss of flock design. Damage to flocking will usually increase as the fabric is subjected to additional drycleanings.

Cleaning Procedures

With proper precautions, drycleaners can minimize chances of damage to flocked fabrics. The drycleaner should always follow the care instructions listed on the care label. When the garment is received, it should be inspected for any loss of flock due to wear abrasion or previous cleanings. The customer should be warned of any possible, additional loss of flocking during drycleaning.

Spotting

During prespotting or spotting, the use of dryside spotting agents should be avoided. Dryside agents, especially oily-type paint removers, can cause the adhesive to solubilize. Also, mechanical action with the spotting brush or spatula can cause distortion of the flocking. Wetside spotting agents can be used, but it is wise to test on an unexposed seam first. The spotting gun should be held six inches from the surface of the fabric.

It is difficult for the cleaner to determine prior to cleaning if the adhesive is solvent soluble. The wash cycle for drycleaning should be less than five minutes when cleaning in perchloroethylene.

Finishing

During finishing, steam on an air form or steam only on the buck of the press. The fabric should not be touched with a brush or the head of the press.

_all diagrams used courtesy of Fairchild Books, Division of Fairchild Publications, New York._

This bulletin was written by IFI’s Garment Analysts.