

Random Pill Test
ASTM D-3512
Resistance to Pilling

What This Test is Used For:

This test is used to cover the resistance to the formation of pills and other related surface changes on the textile fabrics using the random tumble pilling tester. The procedure is generally applicable to all types of woven and knitted fabrics.

How This Test Works:

Textile samples are placed into the random tumble pill tester for a specified amount of time and tumbled. The samples are then evaluated for the degree of pilling.

Scientific Testing Requirements:

Bring specimens to moisture equilibrium for testing in standard atmosphere for testing textiles according to ASTM D-1776, conditioning Textiles for Testing.

Equipment Needed:

- Random Tumble Pilling Tester
- Cork Cylinder Liners: about 5 3/4" wide by 17.81" long cut from 0.063" thick flat sheets of Type P2117A material conforming to Classification System F104, Appendix X2.
- Air Injection Device to give 14-21 kPa (2-3 psi) air pressure in each test chamber
- Adhesive: white all-purpose, for sealing the edges of the specimen
- Twelve 4.13" squares cut on the bias approximately at a 45° angle to the warp and filling

Procedure:

Sample Preparation:

1. Cut a 4.13" square on the bias at approximately a 45° angle to the warp and filling directions. One sample needed per person. (Avoid cutting samples in areas with wrinkles & other distortions. Avoid getting oil, water, grease, etc. on the sample while handling.)
2. Condition sample and cork liners by bone drying and then bring them to moisture equilibrium in the controlled chamber.

Loading the Random Tumble Pill Tester

1. Place Specimen and a 25 mg of a 5 mm (0.2") gray colored cotton fiber into the test chamber.
2. Place the cover on the chamber and set the timer for a running time of 30 minutes. (10 minute intervals for up to 30 minutes may be more indicative for certain knits or soft-woven fabrics.)
3. Turn the motor switch to "on," and push the "start" button, and start the airflow.
4. During the run check each chamber at frequent intervals. (If the specimen becomes wedged around the impeller without tumbling or lies on the bottom or side of the chamber, shut off the air, stop the machine, remove the face plate, and free the specimen. Record on a data sheet any abnormal behavior or hang ups of the specimen.
5. After each run, rake out each specimen and clean off excess cotton fiber using the vacuum cleaner.

Preparation for Evaluation

1. Place each specimen on the double faced tape in the viewing cabinet.

Evaluation

1. Using suitable rating standards, and the apparatus for fabric evaluation, subjectively rate the face of each specimen, looking down on the specimen at a 45° angle and using the rating standard and the following scale. When the appearance of a test specimen falls between that of 2 rating standards, assign the half value (i.e. 3.5).
 - 5- no pilling
 - 4- slight pilling
 - 3- moderate pilling
 - 2- severe pilling
 - 1- very severe pilling
2. Average the ratings for the 3 specimens from each laboratory sampling unit and the average for the lot.
3. **Take note if one strip in either fabric direction**, or in any one portion of a specimen, report this condition. This indicates that different yarns may have been used in the construction of the fabric being tested.
4. Check the pilled specimens for evidence of irregular tumbling. If specimens show a high concentration of pills in a general line not parallel to either fabric direction, assume a specimen is wedged around the impeller for one or more periods during the test. Discard these and repeat test with new specimens.
5. Evaluate the fabric for other surface effects such as fuzzing. It is advisable to have a separate set of in-house fabric rating standards for each surface effect to be rated.

Results

The level of satisfaction the sample fabric displays will be determined by the specification written for the fabric. For the Quality Assurance class, this is the specification the group wrote for the textile material.

For reference in the industry the level of satisfaction determined by the amount of color change is as follows:

Satisfactory – If the test specimen exhibits a color change of less than or equal to Step 4.

Unsatisfactory – If the test specimen exhibits a color change or more than Step 4.

Evaluation Report

1. State that the specimens were tested as directed in Test Method D-3512. Describe the material or product sampled and the method of sampling used.
2. Report the following information for the laboratory sampling unit and for the lot as applicable to a material specification or contract order.
 - Ratings of each individual specimen, the average rating of the 3 specimens from each laboratory sampling unit, and the average for the lot.
 - If the fabric was washed before testing and laundering conditions used.
 - Running time
 - Type of viewing apparatus and rating standard used.