

DETERMINATION OF TENSILE STRENGTH OF TRIM MATERIALS AFTER AGEING

Application

This test method is used to determine the effects of ultraviolet radiation on tensile strength of trim materials after Fade-Ometer and field exposure.

Apparatus Required

Fade-Ometer

According to FLTM EU-BN 001-01.

Tensile Test Machine

Constant rate of transverse type e.g., Model 'E' Tensometer.

Source: Monsanto Ltd.
Edison Road
Dorcan, Swindon, Wilts, SN3 5HN, England

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

Method A - Fade-Ometer Exposure Test (ASTM D 1682, Methods 2C and 2R)

1. Measure and cut two samples 120 x 280 mm, one Wales/Warp direction and the other Courses/Weft direction. These are for exposure in the Fade-Ometer. Additional specimens, at least two from each direction, shall be prepared according to ASTM D 1682, Method 2R or 2C, whichever is applicable, for determining original tensile strength values.
2. Clamp each end of the 120 x 280 mm samples to the revolving frame of the Fade-Ometer ensuring that they are in a vertical position and that the surface after fitting is even, i.e. not wrinkled.

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2001 08 22	Revised	Editorial – no technical change A. Cockman
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3. Expose the samples in the Fade-Ometer for 200 standard fade hours under the operating conditions described in FLTM EU-BN 001-01.
4. After exposure, prepare two specimens from each of the aged samples in the same way as for the original tensile strength. Specimens shall be taken from the middle of the exposed area only.
5. Prior to performing the tensile tests (original and after exposure) ensure that the specimens have been conditioned as required in the material specification for 24 hours.
6. Measure the tensile strength of the original and the aged specimen as described by ASTM D 1682, Method 2R or 2C, whichever is applicable.
7. Record the average tensile strength for each direction separately in N/50 mm.

Evaluation

Calculate the percentage loss in tensile strength for each direction as follows:

$$\text{Loss in tensile strength \%} = \frac{\text{Original Tensile} - \text{Aged Tensile}}{\text{Original Tensile}} \times 100$$

Method B - Florida Field Exposure Test

1. Prepare 120 x 280 mm samples as outlined in para 1 and expose at South Florida Test Service, Miami, Florida, or equivalent exposure station for 21,000 Langleys under glass in accordance with AATCC 16 B-1964.
2. After exposure, prepare and test as outlined in para 4, 5, 6 and 7 of Method A.

Evaluation

According to Method A.

Method C - Fade-Ometer Exposure Test (ASTM D 1682, G)

1. Measure and cut two samples 150 x 280 mm with the shorter dimension parallel to the Warp/Wales and Weft/Courses direction. These are for exposure in the Fade-Ometer. Prepare another two specimens (100 x 150 mm) from each direction according to ASTM D 1682, Method G. Delaminate the face fabric and determine the "Original Tensile Strength" values.
2. Clamp each end of the 150 x 280 mm samples to the revolving frame of the Fade-Ometer ensuring that they are in a vertical position and the surface is even after fitting. Expose the samples according to para 3, Method A.
3. After exposure cut two specimens 100 x 150 mm with the longer dimension parallel to the Warp/Wales and Weft-Courses direction from the exposed area of each aged sample. Delaminate the face fabric and determine the "Tensile Strength after Ageing" values.