

RESISTANCE OF MATERIALS TO FADE**Application**

This test method is used to determine the colour fastness of textiles, vinyl welts, artificial leather, genuine leather and other materials as specified by Product Development Group.

Apparatus Required**1. Fade-Ometer**

Model 18 FR meets requirement of this test.

The fadeometer is an electrically controlled apparatus in which materials are exposed to a carbon arc lamp under specifically controlled conditions of temperature and humidity.

Source:

Atlas Electrical Devices Co.
Chicago 10, IL USA

Brabender Technologie KG
41 Duisburg, Kulturstr. 51-55

Operating Conditions

In order to obtain more consistent fading rates and closer correlation between different fadeometers, the following operating conditions have been found necessary.

Carbons

The carbons should be of the type and length as specified on the fadeometer carbon instruction plate.

Globe

The globe enclosing the carbon arc should be pyrex 9200-PX. The globe should be cleaned daily with each carbon change. Use water and a good detergent, then dry and polish thoroughly. The flat edges of the globe must be free of cracks, nicks or chips, so that a good seal is formed around the carbon arc when assembled. After 2000 hours of use or when a pronounced cloudiness occurs, the globes should be replaced to obtain maximum light transmission.

Date	Action	Revisions
2001 08 22	Revised	Editorial – no technical change A. Cockman
1994 02 28		

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Current

After burning 15 minutes, the arc current should be 15 - 17 amperes as indicated by the ammeter on the control panel of the fadeometer. The voltage across the arc should read 130 - 145 volts and the power line voltage should be 220 volts in order to maintain the intensity of illumination. A voltage regulator is recommended, as the radiant output in the spectral region (300 - 400 nm), probably the most effective region, changes 11% for a 4% line voltage change.

Temperature

The temperature in the exposure chamber should be maintained at 63 +/- 3 °C as recorded on the black panel thermometer mounted on the specimen rack. The fadeometer should be located in a room having a reasonably controlled temperature as large fluctuations in room temperature cause difficulties in maintaining the specified temperature and humidity in the test chamber.

Humidity

The relative humidity shall be 50 +/- 5 % when checked with a wet and dry bulb thermometer.

Specimen Rack

The fadeometer specimen rack should always be completely filled with holders as this is necessary to obtain thermal equilibrium. If sufficient samples are not available, insert blank specimen holders to completely fill the rack. The front and back covers of the specimen holders should make good contact with the test specimens without compressing them unnecessarily.

The holders containing the test specimen should be in perfect vertical alignment and should be supported both top and bottom. A slight displacement of the test specimen toward or away from the lamp may lead to too much or too little fading.

- 2a. **Grey Scale - for Evaluation Change in Colour**
(10 step modification) according to ISO - Recommendation R 105/1, Part 2.

Source: Beuth Vertrieb GmbH
5 Köln
Friesenplatz 16, Germany

or alternatively:

AATCC - Grey Scale - For Evaluation Change in Colour
(Modification including intermediate steps)

Source: American Association of Textile Chemists and Colourists
P.O. Box 12215
Research Triangle Park, N.C. 27709 USA

2b. **Light Sensitive Paper**

and

Standard Faded Strip

U.S. Department of Commerce
National Bureau of Standards
Office of Standard Reference Materials
Washington, D.C. 20234

3. **Colour Matching Device (North Sky Daylight)**

(e.g. Equipment as described in FLT M BI 109-01.

Source:

Kollmorgen (U.K.) Ltd.

46 London Road

Reading, Berks, England

Darbringhauser Str. 48, Germany

Dr. A. Th. Bruck

5 Koln-Holweide

Calibration of the Fadeometer

Fadeometers vary widely in their rates of fading in a given number of clock hours and it is necessary, in order to correlate results, to calibrate the machines in terms of a standard unit of measurement known as the Standard Fading Hour (SFH) which was developed by the National Bureau of Standards.

Calibration is accomplished by means of the light sensitive papers and standard faded strips. The paper may be used to check the performance of the lamp in order to predict the number of clock hours of exposure which will be required to produce a specified number of Standard Fading Hours.

A letter circular, LC 1036 which describes the paper and explains its use may be obtained from the Bureau.

If the fading rate of the lamp is incorrect, adjustments will be necessary to correct it as follows. The steps must be carried out in the order given:

1. To increase the intensity reduce the amount of resistance in the arc circuit by progressively turning the rotary switch to positions A, B, and C. To decrease the intensity increase the resistance in the circuit by progressively turning the rotary switch to positions C, B, and A.
2. To increase the light intensity reduce the amount of reactance in the arc lamp circuit by progressively moving the rotary tap switch to higher numbered positions over the previously used position. To decrease the light intensity increase the amount of reactance in the circuit by moving the rotary voltage adjustment switch to lower numbered positions.