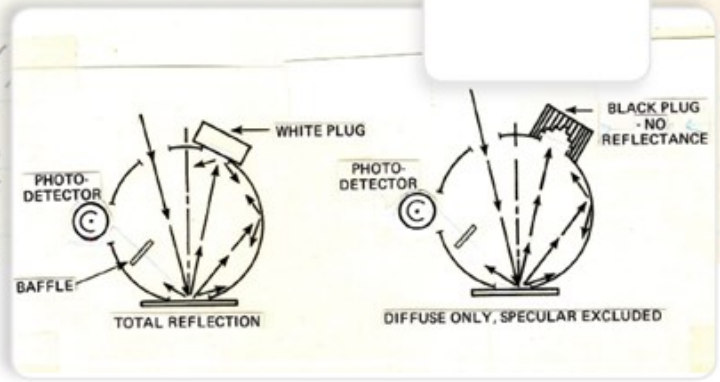
Applications Note

AN 1070



Gray Change and Gray Stain Scales

(These scales) indicate the amount of fading, color alteration or staining of adjacent materials with environmental exposure or washing.

Abstract

The Gray Change and Gray Stain scales are available in HunterLab's EasyMatch QC andin the ColorFlex L2 and MiniScan EZ firmware. Both scales measure color-fastness of textile dyes. Gray Change indicates the amount of fading or color alteration with environmental exposure or washing, and Gray Stain indicates the amount of staining of adjacent materials that occurs with washing of a specimen.

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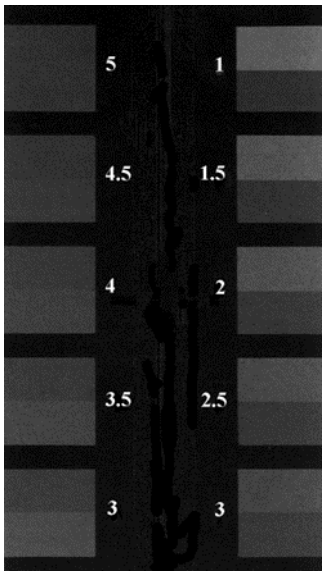
Gray Change

The loss of color using the gray change scale is evaluated by comparison to five pairs of gray standards similar to those shown below. One half of each standard is always of identical chroma to the starting specimen. The second half ranges from the starting chroma (no loss of color) to white (loss of all color). The amount of contrast between the treated and untreated fabric is related to one of the standard pairs to yield the gray scale rating. On this scale, 5 indicates that next to no color was lost, and 1 indicates that most color was lost.

Gray Change Standard Pairs

The bottom half of each pair shows the starting color. The top half shows the color of the treated fabric. (Illustration from AATCC Evaluation Procedure 1.)



Note: The picture has been lightened slightly to facilitate copying.

Gray Change, as implemented in HunterLab's products, is based on ISO 105-A05:1996, Textiles-Tests for Colour Fastness-Part A05: Instrumental Assessment of Change in Colour for Determination of Grey Scale Rating. This method is equivalent to AATCC Evaluation Procedure 7, "Instrumental Assessment of the Change in Color of a Test Specimen." It is intended as an alternative to the visual assessment described in ISO 105-A02: 1993, Textiles-Tests for Colour Fastness-Part A02: Grey Scale for Assessing Change in Colour, or AATCC Evaluation Procedure 1, "Gray Scale for Color Change." It may be used in assessing any samples except those which have been treated with fluorescent whitening agents (FWAs).

To obtain the gray scale rating of a specimen:

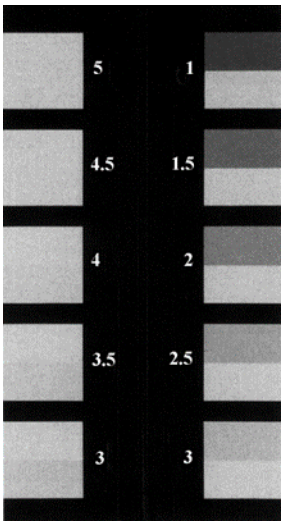
1. Standardize the instrument in a reflectance mode.
2. Configure your display(s) to report Gray Change as a color difference scale.
3. Fold a piece of the original, untreated material into enough layers to make it opaque. Alternatively, a single layer of material may be backed with white cardboard containing no FWAs or an uncalibrated white tile, provided the sample and standard are backed in the same manner.
4. Read the fabric as a standard at the reflectance port. The preferred illuminant/observer conditions are D65/10°. C/2° and C/10° are also permitted by the test method.
5. Fold the treated sample into the same number of layers as the standard (or back with white cardboard containing no FWAs or a white uncalibrated tile) and read it at the reflectance port as a sample under the same conditions. The Gray Change result appears on your display. If a red piece of cloth were washed repeatedly and then read, the treated cloth might be pink and the gray change about 3.

Gray Stain

The transference of color from the test specimen to an adjacent specimen is evaluated in a manner very similar to that of gray change. Again, five standard pairs are used. One half of each standard is white, and the second half ranges from white (no staining) to a gray with the chroma value of the test specimen (great deal of staining). A value of 5 corresponds to virtually no staining, whereas 1 indicates poor color-fastness.

Gray Stain Standard Pairs

The bottom half of each pair shows the starting color of the adjacent fabric. The top half shows the color of the treated adjacent fabric. (Illustration from AATCC Evaluation Procedure 2.)



Note: The* picture *has been lightened slightly to facilitate copying.

Gray Stain, as implemented in HunterLab's products, is based on ISO 105-A04: 1989, Textiles-Tests for Colour Fastness-Part A04: Method for the Instrumental Assessment of the Degree of Staining of Adjacent Fabrics. It is intended as an alternative to the visual assessment described in ISO 105-A03: 1993, Textiles-Tests for Colour Fastness-Part A03: 1993, Textiles-Tests for

Colour Fastness-Part A03: Grey Scale for Assessing Staining, or AATCC Evaluation Procedure 2, "Gray Scale for Staining."

To obtain the Stain Scale Rating of a specimen:

1. Standardize the instrument in a reflectance mode.
2. Configure your display(s) to report Gray Stain as a color difference scale.
3. Mount the fabric which has been subjected to the fastness test without the test fabric (control) on white card stock containing no FWAs or your uncalibrated white tile.
4. Measure this fabric as a standard. The preferred illuminant/observer conditions are D65/10°. C/2° is also permitted by the test method.
5. Mount the adjacent fabric which has been subjected to color fastness testing with the test fabric on white card stock containing no FWAs or the white uncalibrated tile.
6. Measure this fabric as a sample using the same conditions. If the staining is uneven, make several measurements and average the results. The gray stain result appears on your display. If a white "adjacent" fabric were washed with a piece of red test fabric, it might be dyed pink and have a stain rating of 3.

Reference

Trotman, E.R., *Dyeing and Chemical Technology of Textile Fibres*, Charles Griffin and Co. Ltd.: 1984.

About HunterLab

HunterLab is the technology leader in color measurement solutions, providing instruments, software, knowledge and service to a wide variety of industries.
With over 5 decades of experience in more than 65 countries, HunterLab applies our leading edge technology to your products helping you measure and communicate color simply and effectively.

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