Dyeing and Colorfastness in Fabrics

L. D. Simpson and A. W. Koester

This publication is one of a set written to help consumers select and care for today's clothing.

Those of the publications—fibers and fabrics; information found on garment labels; and dyeing and colorfastness—aid consumers in evaluating clothing and household textiles. Those on laundry aids and laundry detergent and soaps help consumers choose effective cleaning products. The publication on professional clothing care services discusses working with a dry cleaner.

Seeing color

The visual sensation of color requires three things: the eye containing the retina where nerve cells are stimulated, an object that contains the dye or pigment and provides the color sensation, and a source of light so that the visual sensations can be communicated. The eye is a light-sensitive detector of radiant energy in the near-infrared to near-ultraviolet range. The visual sensations produced by radiant energy with wavelengths below 700 nanometers are perceived as color sensations.

* Today's Clothing Care

Date 9/2/95

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Colorfastness problems can result from the improper dye selection for the fiber; the use of inferior, less expensive dyes; use of a fiber for other than its intended purpose; not using a recommended dyeing method; improper labeling of imported apparel; the use of dyes that may cause skin irritation; or incorrect care methods. The product to be used in any application, the consumer can follow the recommendations for care and the care instructions on the label. Consumers should compare the care instructions on the label with the care instructions on the fabric label.
Dyeing and Colorfastness in Fabrics

This publication is one of a set which help consumers select and use fabric care products. The publications in this set are:

- Colorfastness in Fabrics
- Dyeing Color
- Professional Clothing Care Services
- Selecting and Using Laundry Aids
- Laundry Detergents and Soaps
- Fibers and Fabrics Update
- Preparing and Pressing Garments
- Cleaning with Steam
- Staining and Stain Removal
- Sensitivity and Skin Reactions
- Small Appliance Use
- Humidity Control
- Cleaning Materials
- Washing Machines
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LoEma Simpson, assistant professor, textiles, Department of Apparel, Interiors, Housing, and Administrative Services.


Colorfastness in Fabrics

Colorfastness in fabrics is an important characteris-
tic for consumer expectations. Colorfastness refers to the chemical stability of the dyeing process and ensures that the fabric will resist altering its color when exposed to a variety of conditions. Dyes are chemical compounds that can be attached to the fibers of fabrics to produce color. These dye reactions can be both chemical and physical.

See Table 1 for a list of some common dyes and their characteristics. The reactions of dye with the fiber can be both chemical and physical. It is the reaction with the fiber that causes the color retention.

Dyes react differently with different fibers. For example, synthetic fibers like nylon, polyester, and acrylic have different reactions with dyes compared to natural fibers like cotton, linen, and silk. The type of fiber and the dyeing process can affect the colorfastness of the fabric.

Pigments also evoke color, but must be applied to the surface of the fabric in order to create a visible color. Pigments are finely ground colored particles, similar to dust. They are not soluble and may not penetrate the fiber surface. In addition to surface printing using binders, pigment particles can also be mixed with liquid fiber-spinning solutions to add color to manufactured fibers.

These processes for coloring agents for cloth have gone through different stages over time. In the prehistoric period, colors were obtained from natural sources like plants, animals, insects, and minerals. These were used during the process of dyeing, predating written history.

During the Middle Ages, plant dyes were used to color textiles. Three of the publications—fibers and fabrics; information found in these; and care for today's clothing—are available from OSU Agricultural Communications. To order, send the amount shown to:

For more information, contact:

International Color Changes Symbols, SPD, 30 E. 45th St., New York, NY 10017

TODAY'S CLOTHING CARE
Dyeing and Colorfastness in Fabrics

L. P. Simpson and A. W. Reutter

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