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# Test Method for Color Change of Disperse Dyes Caused by Metals, with and without Chelating Agent

Developed in 1983 by AATCC Committee RR90; editorially revised 1985, 1988 (with title change), 2004, 2008, 2010, 2019; editorially revised and reaffirmed 1986, 1987, 1992, 2002, 2012; reaffirmed 2007; revised 2018.

## 1. Purpose and Scope

1.1 This test method provides a laboratory procedure for:

1.1.1 Determining the effectiveness of chelating agents in disperse dyebaths for inactivating heavy metals that can cause color change.

1.1.2 Evaluating the sensitivity of disperse dyes to metal-induced color change during dyeing.

## 2. Principle

2.1 The effectiveness of chelating agents in sequestering metals in a dye-bath, thereby preventing metal-induced color change, is determined by the protocol in Fig. 1.

2.2 Metal sensitivity of disperse dyes is determined by comparing control dyes and test dyes by the protocol shown in Fig. 2.

## 3. Terminology

3.1 **chelating agent**, *n.*—in *textile chemistry*, a chemical capable of deactivating metal ions by formation of a water-soluble complex. SYN: *sequestering agent*.

3.2 **color change**, *n.*—as used in *colorfastness testing*, a change in color of any kind whether in lightness, hue or chroma, or any combination of these, discernible by comparing the test specimen with a corresponding untested specimen.

3.3 **grade**, *n.*—the number assigned to a test specimen resulting from comparison to a scale.

3.4 **Gray Scale**, *n.*—a scale consisting of pairs of standard gray chips, the pairs representing progressive differences in color or contrast corresponding to numerical colorfastness grades.

NOTE: Gray Scale grades are expressed as half-steps in decimal form (e.g., 1 or 1.5). Dashed form is also acceptable (e.g., 1 or 1-2).

3.5 **metal sensitivity**, *n.*—the propensity of a dye to produce an abnormal color on a textile material when in the presence of certain metal ions.

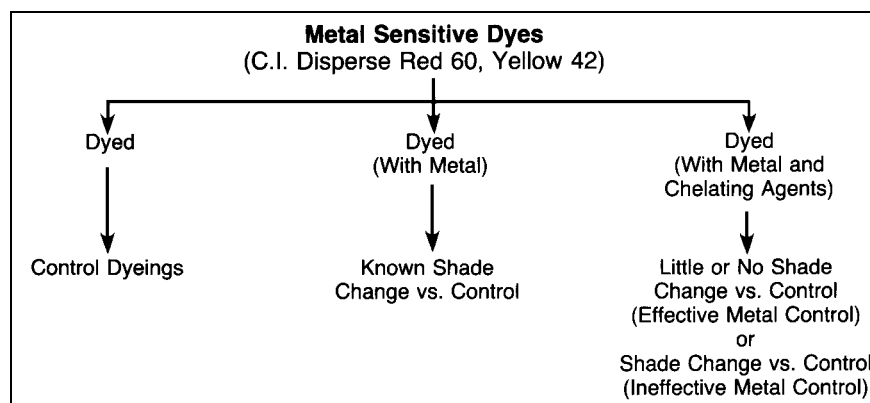


Fig. 1

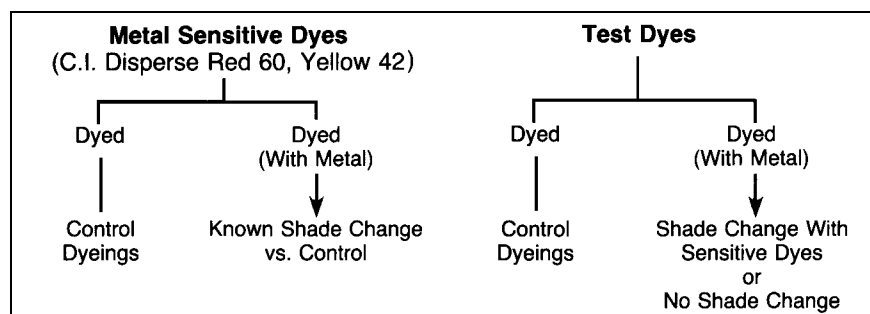


Fig. 2

## 4. Safety Precautions

NOTE: These safety precautions are for information purposes only. The precautions are ancillary to the testing procedures and are not intended to be all inclusive. It is the user's responsibility to use safe and proper techniques in handling materials in this test method. Manufacturers MUST be consulted for specific details such as material safety data sheets and other manufacturer's recommendations. All OSHA standards and rules must also be consulted and followed.

4.1 Good laboratory practices should be followed. Wear safety glasses in laboratory areas.

4.2 Pressurized dyeing equipment is required for some dyeing. Trained personnel should exercise care and follow the equipment manufacturer's instructions for use and safety precautions.

4.3 All chemicals should be handled with care.

4.4 In preparing, dispensing and han-

dling acetic acid and phosphoric acid, use chemical goggles or face shield, impervious gloves and an impervious apron. Concentrated acids should be handled only in an adequately ventilated laboratory hood. CAUTION: Always add acid to water.

4.5 Carriers vary in toxicity depending on type. Read vendors technical data, SDS and/or product label for contents and/or OSHA hazard classification.

4.6 An eyewash/safety shower should be located nearby and a high efficiency particulate respirator with a full facepiece should be readily available for emergency use.

4.7 Exposure to chemicals used in this procedure must be controlled at or below levels set by governmental authorities [e.g., Occupational Safety and Health Administration's (OSHA) permissible exposure limits (PEL) as found in 29 CFR 1910.1000; see [www.osha.gov](http://www.osha.gov) for latest version]. In addition, the American Conference of Governmental Industrial Hy-