



Association of Textile, Apparel & Materials Professionals

AATCC takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this test method. Users of this test method are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This test method is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reaffirmed or withdrawn. Your comments are invited either for revision of this test method or for additional procedures and should be addressed to the AATCC Technical Center. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing, you should make your views known to Diana A. Wyman, Technical Director, at the address shown below.

This test method is copyrighted by AATCC, PO Box 12215, Research Triangle Park, NC 27709 USA. Individual reprints (single or multiple copies) of this method may be obtained by contacting AATCC at the above address or tel: 919-549-3526; fax: 919-549-8933, or e-mail: orders@aatcc.org.

AATCC License Agreement: This test method is copyrighted by the American Association of Textile Chemists and Colorists (AATCC), PO Box 12215, 1 Davis Drive, Research Triangle Park, NC USA. All rights reserved.

AATCC grants you a license as follows: The right to download one electronic file of this AATCC test method for temporary storage on one computer for purposes of viewing, and/or printing one copy of the AATCC test method for individual use. Neither the electronic file nor the hard copy print may be reproduced in any way. In addition, the electronic file may not be distributed elsewhere over computer networks or otherwise. The hard copy print may only be distributed to other employees for their internal use within your organization.

This test method is not for resale.

Chelating Agents: Disperse Dye Shade Change Caused by Metals; Control of

Developed in 1983 by AATCC Committee RA90; editorially revised 1985, 1988 (with title change), 2004, 2008, 2010; editorially revised and reaffirmed 1986, 1987, 1992, 2002, 2012; reaffirmed 2007.

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 which can cause shade change.

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

2. Principle

2.1 The effectiveness of chelating agents in sequestering metals in a dye-bath, thereby preventing metal-induced shade 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 inactivating metal ions by formation of a water soluble complex. SYN: *sequestering agent*.

3.2 **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.

3.3 **shade change**, *n.*—a change from the normal or expected color of a textile material.

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 labo-

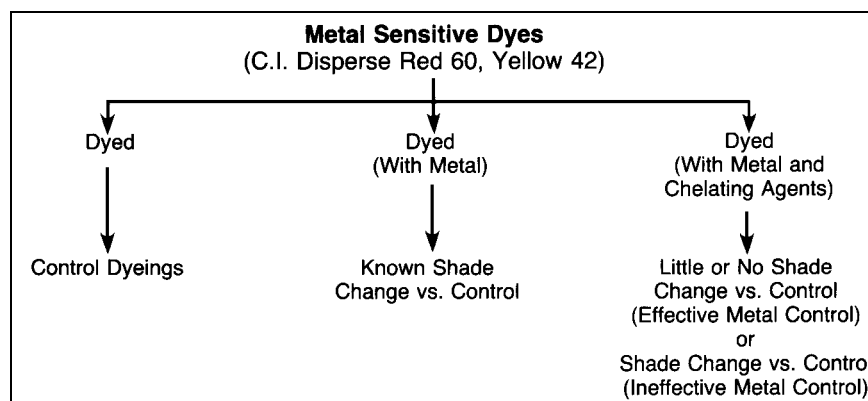


Fig. 1

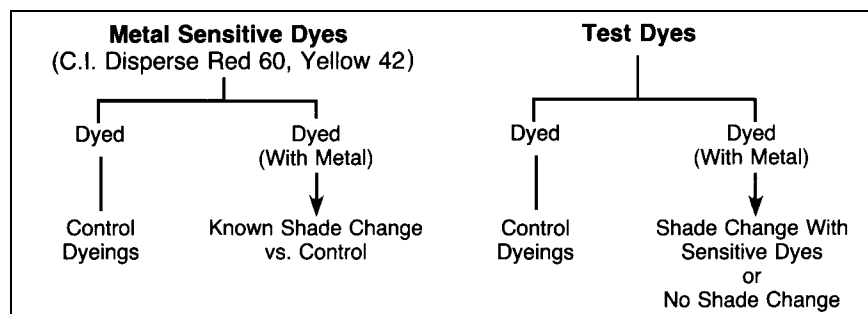


Fig. 2

ratory 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 handling 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, MSDS 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 web site: www.osha.gov for latest version]. In addition, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) comprised of time weighted averages (TLV-TWA), short term exposure limits (TLV-STEL) and ceiling limits (TLV-C) are recommended as a general guide for air contaminant exposure which should be met (see 12.1).

5. Uses and Limitations

5.1 Accurate results and expected shade changes depend on the particular metal dye and carrier used as well as close control of all dyeing parameters.

5.2 Extraneous metal contamination can give misleading results. Use clean fabrics, distilled water, and rinse the dye containers with a 10% phosphoric acid so-