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Standard Practice for Pretreatment of Backing Fabrics Used in Textile Conservation Research¹

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1. Scope

1.1 This practice covers the washing, rinsing, drying, ironing, and related testing of backing fabrics prior to their use in textile conservation research. Both sturdy and delicate pretreatment procedures for backing fabrics are described.

1.2 This practice applies only to the pretreatment of the backing fabrics with which a textile artifact might be in contact. This practice is not to be applied to any textile artifact, whether it be fragile, sturdy, historic, or contemporary, as other considerations and treatments would be required. Decisions regarding the conservation treatment of textile artifacts should be made only by textile conservators.

1.3 This practice on pretreatment of backing fabrics used in textile conservation research is limited to use on greige goods. Considerations for dyed or bleached backing fabric will not be addressed in this practice.

1.4 The procedures in this practice concern:

1.4.1 Removal of sizings and any impurities left in the backing fabric from the manufacturing process,

1.4.2 Preshrinking of the backing fabric, and

1.4.3 Testing for impurities.

1.5 All backing fabrics used in textile conservation research should be pretreated before use. Even greige fabrics obtained as "preshrunk" and "desized" should be pretreated to further reduce shrinkage and residual amounts of sizing and impurities. Residual shrinkage and impurities might be a source of unwanted variability in research.

1.6 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 123 Terminology Relating to Textiles²

D 2960 Method of Controlled Laundering Test Using Naturally Soiled Fabrics and Household Appliances³

D 5038 Terminology of Textile Conservation⁴

2.2 AATCC Test Method:

AATCC Test Method 81 Determination of pH of the Water-Extract from Bleached Textiles⁵

2.3 Other Document:

Spot Tests for Identification of Warp Sizes on Fabrics⁶

3. Terminology

3.1 Definitions:

3.1.1 *backing fabric, n*—in textile conservation, a support textile fabric located behind the textile artifact.

3.1.1.1 *Discussion*—Backing fabric is a general term for fabric used in a variety of treatments such as: a foundation fabric for an entire area or a patch in a localized area; a mounting fabric to be stretched on a strainer; a loose lining; or an interleaf fabric that separates textiles in a storage drawer. Occasionally an additional backing fabric piece; usually thin and sheer, may be used on the surface of a textile artifact to protect the face side.

3.1.2 *block, v*—to align warp and weft yarns at right angles, by some form of manipulation.

3.1.3 *delicate pretreatment procedure, n*—in textile conservation, the washing, rinsing, drying, and pressing actions followed when fabrics are of certain yarn and fabric constructions or fiber contents, such as lightweight or sheer fabrics, fine yarns, silks, or wools. (Compare sturdy pretreatment procedure.)

3.1.3.1 *Discussion*—Shorter wash and rinse times, gentle agitation, and reduced temperatures are used in the delicate pretreatment procedure.

3.1.4 *greige goods, n*—textile fabrics that have received no bleaching, dyeing, or finishing treatment after being produced by any textile process.

3.1.5 *hardness, n*—in water, dissolved salts of calcium, magnesium, and other cations that destroy the action of soap; expressed as parts per million (ppm) or grains per gallon (gr/gal) of calcium carbonate. (Compare softness.)

3.1.5.1 *Discussion*—When calcium and magnesium salts are present in water, they react with (a) carbonates from soil, (b) carbonate-built detergents, or (c) the fatty acid portion of soap to form an undesirable, insoluble precipitate.

3.1.6 *hard water, n*—in textile conservation, water having a concentration of more than 60 ppm (3.5 gr/gal) hardness calculated as calcium carbonate.

3.1.6.1 *Discussion*—The range of water hardness as established by the U.S. Geological Survey (reported in Method

¹ This practice is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.53 on Consumer Textiles and Textile Conservation.

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² *Annual Book of ASTM Standards*, Vol 07.01.

³ *Annual Book of ASTM Standards*, Vol 15.04.

⁴ *Annual Book of ASTM Standards*, Vol 07.02.

⁵ AATCC Technical Manual, available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

⁶ Livengood, C. D. Spot tests for identification of warp sizes on fabrics, *Textile Industries*, September 1983, pp. 114–115.

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D 2960, Section 7.1.1) is: soft water, 0 to 60 ppm; moderately hard water, 61 to 120 ppm; hard water, 121 to 180 ppm; and very hard water, more than 180 ppm. Water might be softened by substituting sodium salts for calcium and magnesium salts. Alternatively, essentially all of the dissolved calcium and magnesium salts can be removed by deionization or distillation.

3.1.7 *ironing, n*—a method of pressing using a heated hand iron, sometimes together with moisture or steam, and a sliding motion. (Compare *pressing*.)

3.1.7.1 *Discussion*—Ironing might be used in the sturdy pretreatment procedure, but is not used in the delicate pretreatment because the sliding motion might disorient yarns.

3.1.8 *pressing, n*—in the care of textiles, a process of smoothing and shaping by heat and pressure, with or without the presence of steam. (Compare *ironing*.)

3.1.8.1 *Discussion*—Pressing uses a raising and lowering of the iron without the gliding action, and is recommended in the delicate pretreatment procedure.

3.1.9 *pH, n*—in common usage, a measure of the acidity or alkalinity of a solution, with neutrality represented by a value of 7, with increasing acidity represented by increasingly smaller values, and with increasing alkalinity represented by increasingly larger values.

3.1.10 *softness, n*—in water, the relative absence of dissolved calcium, magnesium, and other salts that react with soluble soaps to form insoluble precipitates. (Compare *hardness*.)

3.1.11 *sturdy pretreatment procedure, n*—in textile conservation, the washing, rinsing, drying, and ironing actions followed when backing fabrics are medium to heavy weight. (Compare *delicate pretreatment procedure*.)

3.2 For definitions of other textile terms that appear in this practice, refer to Terminology D 123. For definitions of conservation terms used in this practice refer to Terminology D 5038.

4. Significance and Use

4.1 This practice applies only to the pretreatment of the backing fabric by washing, rinsing, drying, and ironing before the backing fabric will be used in textile conservation research. Textile artifacts of historic and artistic value must not be treated using this practice. Decisions regarding the conservation treatment of textile artifacts should be made only by textile conservators.

4.2 This practice describes two procedures: sturdy and delicate pretreatments. Considerations of fiber content, yarn construction, and fabric construction will affect which procedure is chosen.

4.3 This practice provides for both the preshrinkage of backing fabrics used in textile conservation research and the removal of impurities such as water soluble sizings and other soils. Even backing fabrics obtained as “preshrunk” and “desized” should be pretreated to further reduce any residual amounts of sizing and shrinkage. Residual shrinkage and impurities might provide a source of unwanted variability in research. Not all sizings currently in use are water soluble, and some still might remain on the fabric even after pretreatment.

4.4 This practice is designed so that potentially harmful

impurities, such as detergent residues, will not be added to backing fabric. Added impurities might eventually be a source of unwanted variability.

4.5 This practice is designed to essentially neutralize (pH 7 ± 1) backing fabrics used in textile conservation research.

5. Apparatus and Materials

5.1 *Washing Machine*, either top or front loading, having water temperature and time controls, and used for the sturdy pretreatment procedure.

5.2 *Sink*, a wash basin having a clean, smooth, and chemically inactive surface, used during the delicate pretreatment procedure. Other suitable containers allowing gentle, hand agitation may be used.

5.3 *Tumble Dryer*, with time and temperature controls, used during sturdy pretreatment procedure.

5.4 *Flat Surface*, such as glass or plastic countertop, having a clean, smooth, and chemically inactive flat area; necessary for air drying during delicate pretreatment procedure and may be used during sturdy pretreatment procedure; aids in blocking grainlines and obtaining a smoother fabric.

5.4.1 A clothesline or rack of clean, smooth, and chemically inactive materials may be substituted for the flat surface for air drying.

5.5 *Ironing Board or Surface*, covered with a clean, desized, white, cotton fabric.

5.6 *Iron*, with a temperature control and clean sole plate.

5.6.1 Irons may contaminate textiles if they spit, drip or have soiled sole plates, so a pressing cloth should be used. Avoid using steam with the iron; instead dampen the pressing cloth or the backing fabric itself, using distilled or deionized water. Avoid using steamers to which sodium chloride or chemicals are added.

5.7 *Pressing Cloth*, medium-weight, clean, white, unsized cotton fabric that is left dry or dampened with deionized or distilled water to supply moisture; used to protect backing fabric from the iron.

5.7.1 The pressing cloth must be laundered with the specified detergent described in 5.8.

5.8 *Liquid Detergent*, formulated washing compound that contains anionic and nonionic surfactants and a soil suspending agent.⁷

5.8.1 A surfactant alone, although sometimes used by conservators to remove soil from a textile artifact being conserved, cannot effectively remove sizing from contemporary backing fabrics.

5.8.2 Undesirable ingredients in laundry detergents that must be avoided include carbonate builder, more than 2.5 % soap, fabric softener (cationic surfactant), enzyme, perfume or other additives which might not rinse out completely. Currently, most powdered detergents contain carbonate builders and should be avoided. Carbonate builders and soaps form precipitates with the dissolved minerals in hard

⁷ Formulations of commercially available liquid detergents frequently change. Contents of liquid detergents are listed on labels and must be read with care to avoid purchasing detergents with carbonate builders, soaps, perfumes, colorants, enzymes, or fabric softeners. The following two detergents or their equivalent have been found satisfactory for this test: (1) *Cheer Free* containing anionic and nonionic surfactants, water softeners, soil suspending agents, fabric whitener, water and processing aids; and (2) *All Free of Perfume and Clear of Dyes* containing anionic and nonionic surfactants, stabilizer buffering agent, and brightening agent.