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Relative Hand Value of Textiles: Instrumental Method

Developed in 2012 by AATCC Committee RA89; reaffirmed 2013, 2014.

1. Purpose and Scope

1.1 This method is for the determination of an instrumental relative hand value (RHV) using the mechanical properties measured on a selected reference fabric and a comparable candidate fabric.

1.2 This method does not purport to replace AATCC Evaluation Procedure (EP) 5, Fabric Hand: Guidelines for the Subjective Evaluation of, nor are the values obtained by this method known to be comparable to actual tactile sensations felt by human evaluators.

2. Principle

2.1 A specimen is placed over a plate with a specified diameter opening through which a plunger forces the fabric specimen resulting in mechanical deformation data. Force displacement curve data from a reference fabric and a test fabric are used in calculations to produce a Relative Hand Value (RHV).

3. Terminology

3.1 **hand**, n.—the tactile sensations or impressions that occur when fabrics are touched, squeezed, rubbed or otherwise manipulated.

3.2 **reference fabric**, n.—a fabric selected to represent a baseline for comparison of tactile properties of hand.

3.3 **relative hand value**, (RHV) n.—an index of properties, relative to a reference fabric, as determined by either an instrumental system or a subjective hand evaluation that can be used to predict tactile sensations a human perceives when handling a fabric.

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 all laboratory areas.

5. Uses and Limitations

5.1 The results from this method yield a quantitative description of RHV for use in research and production quality control. A publication describing the historical, theoretical and technical background for the instrumentation on which this test method is based is available (see 13.1).

5.2 The test instrument system produces other hand measurement attributes but this method is specific only to the RHV attribute. Refer to the instrument's instruction manual.

5.3 Caution should be used when comparing the RHVs from fabrics with different yields, constructions, fiber contents and finishes to avoid erroneous conclusions. Correlation to hand panel studies has not been broadly determined. It is the responsibility of the user to determine applicability to their product/needs.

6. Apparatus and Materials

6.1 A relative hand value instrument system (RHV-IS), PhabrOmeter™ System and accessories and PhEST™ software (see 13.2 and Figs. 1 and 2).

6.2 Laboratory gloves and forceps.

6.3 Reference fabric(s). A reference fabric must be of the same density type and class and may be of the same fiber content, construction, processing stage or a fabric that is chosen for comparison against all fabrics to be tested.



Fig. 1—PhabrOmeter™ System

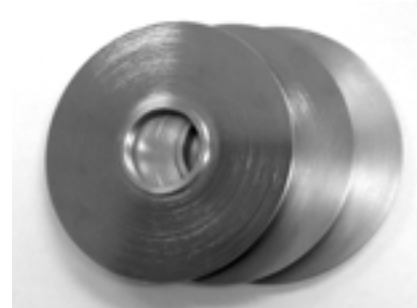


Fig. 2—Test Load Plates

7. Conditioning

7.1 Condition reference and test specimens flat, according to ASTM D1776, Standard Practice for Conditioning and Testing Textiles (see 13.3).

8. Preparation of Reference Fabric

8.1 Multiple reference fabrics should be established and identified using the New Fabric form in the RHV-IS. Each reference fabric should have a separate New Fabric file.

8.2 Perform tests on multiple sets of specimens (see 9.1-9.3) of a selected reference fabric specimen to provide statistical confidence in the force displacement curves for each reference fabric (see 10.1-10.7) and save test data.

8.2.1 For example, if checking the RHV values of an application and variations of the application on woven, 400 g/m² (11.8 oz/yd²), polyester/cotton specimens, the reference fabric data base would be the same fabric that does not have an application or that has been prepared for finishing; therefore, the experimental applications can be compared to the unfinished reference specimen data set.

8.3 Selected reference fabric should be identified according to its class (or type of material). For instance, if one is testing woven fabric specimens one would not select a knitted reference fabric against which to compare.

9. Test Specimens

9.1 Identify the face and back of the specimen to ensure the same side will be tested.

9.1.1 The technical face of a specimen may not always be the one that will be 'touched' when selecting an item to purchase or the one that will be in contact with the skin when used or worn. Before