



## Standard Test Method for Crimp and Shrinkage Properties for Textured Yarns Using a Dynamic Textured Yarn Tester<sup>1</sup>

This standard is issued under the fixed designation D 6774; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers the determination of crimp contraction, residual fiber shrinkage and their variability of all types of filament yarns (partially oriented yarn (POY), fully oriented yarn (FOY), flat yarns, textured and bulked continuous filament (BCF) carpet yarns) using an automated tester.

NOTE 1—For another method of testing crimp in textured yarns, refer to Test Method D 4031.

1.1.1 This method may also be used for non-textured yarns.

1.2 This test method is limited to crimped, multi-filament yarns ranging from 22.0 to 890 dtex (15 to 800 denier) and for BCF yarns from 890 to 4200 dtex (800 to 3800 denier).

1.3 The values stated in either SI or US customary units are to be regarded separately as standard. Within the text, the U.S. customary units are in parentheses. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the method.

1.4 *This standard does not purport to address all of the safety concerns, 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 Textiles<sup>2</sup>

D 2258 Practice for Sampling Yarn for Testing<sup>3</sup>

D 4031 Test Method for Bulk Properties of Textured Yarns<sup>2</sup>

D 4849 Terminology Relating to Fibers and Yarns

### 3. Terminology

3.1 For definitions of textile terms in this test method, refer to Terminology D 4949. For other textile terms used in this test method, refer to Terminology D 123.

### 4. Summary of Test Method

4.1 The specimen passes through a pretension device to remove crimp. The specimen then passes, at a constant speed, around an input roller, to a calibrated sensor which maintains a specific tension.

4.1.1 Subsequently, the specimen passes through a heating element, at a low tension, where the specimen shrinks and again is crimped.

4.1.2 The crimped specimen then goes to an intermediate roll, at a low tension.

4.1.3 The specimen then travels to a second sensor, which maintains a tension equal to the pretension applied, to remove developed crimp.

4.2 Residual fiber shrinkage, crimp developed, and maximum total contraction are calculated by the computer software using speeds of the input, intermediate and output rolls.

### 5. Significance and Use

5.1 Test Method D 6774, for determining maximum total contraction, crimp, and residual fiber shrinkage in textured filament yarns is suitable for acceptance testing of commercial shipments.

5.1.1 If there are differences of practical significance between reported test results for two laboratories (or more), comparative tests should be performed to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, use the samples for such a comparative tests that are as homogeneous as possible, drawn from the same lot of material as the samples that resulted in disparate results during initial testing and randomly assigned in equal numbers to each laboratory. The test results from the laboratories involved should be compared using a statistical test for unpaired data, a probability level chosen prior to the testing series. If a bias is found, either its cause must be found and corrected, or future test results for that material must be adjusted in consideration of the known bias.

5.2 The properties and their variability as measured by this method relate to bulk appearance, stretch and recovery of fabrics and dyeability of yarns.

5.3 For some yarns, elapsed time between processing and testing has a marked effect on the results, of this test, especially during the first 72 h. The effect is caused by stress decay which

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.58 on Yarn Test Methods, General.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 07.02.

<sup>3</sup> Annual Book of ASTM Standards, Vol 07.01.