



Designation: D5171 – 15 (Reapproved 2020)

# Standard Test Method for Impact Resistance of Plastic Sew-Through Buttons<sup>1</sup>

This standard is issued under the fixed designation D5171; 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 impact resistance of plastic sew-through buttons.

1.2 The values stated in either acceptable metric units or other units shall be regarded separately as standard. The values expressed in each system may or may not be exact equivalents; therefore, each system must be used independently of the other, without combining values in any way.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

- D123 Terminology Relating to Textiles
- D618 Practice for Conditioning Plastics for Testing
- D2050 Terminology Relating to Subassemblies Used in the Manufacture of Textiles

## 3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of button terms used in this test method, refer to Terminology D2050.

3.1.1.1 The following terms are relevant to this standard: button, face, impact resistance, ligne size, sew-through flange buttons.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.54 on Subassemblies.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.2 For other textile terminology used in this test method, refer to Terminology D123.

## 4. Summary of Test Method

4.1 Individual buttons are placed on a surface centered under a tube through which a preselected mass falls from a preselected height. After the mass impacts the button the impacted button is removed and visually examined using a 5X magnifying glass for breakage, cracking, or chipping.

## 5. Significance and Use

5.1 This test method may be used to determine the ability of a button to resist breaking under impact, for example in pressing the end item, which could cause the button to fail.

NOTE 1—In the development of this test method it was found that the following factors influenced the ability of a button to resist failure under impact conditions: resin formulation, shape ligne size, thickness, number and spacing of holes. Buttons may also pass this test but fail during the pressing of a garment due to the presence of heat during pressing.

5.1.1 If there are differences of practical significance between the 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, test samples should be used that are as homogeneous as possible, that are drawn from the material from which the disparate test results were obtained, and that are randomly assigned in equal numbers to each laboratory for testing. Other materials with established test values may be used for this purpose. The test results from the two laboratories should be compared using a statistical test for unpaired data, at 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 must be adjusted in consideration of the known bias.

5.2 Test Method D5171 for the determination of the impact resistance of buttons may be used for acceptance testing of commercial shipments of buttons but caution is advisable since information is lacking on precision.

## 6. Apparatus

6.1 *Impact Resistance Testing Machine*—The impact resistance tester consists of a tube through which a plunger of standard mass drops onto the button from a predetermined