



Designation: D 5171 – 09

Standard Test Method for Impact Resistance of Plastic Sew-Through Buttons¹

This standard is issued under the fixed designation D 5171; 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 (ϵ) 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D 123 Terminology Relating to Textiles

D 618 Practice for Conditioning Plastics for Testing

D 5497 Terminology Relating to Buttons

3. Terminology

3.1 *Definitions:*

3.1.1 *button, n*—a knob, disc, or similar object which when forced through a narrow opening or buttonhole, fastens one part of a garment or other flexible substrate to another (See also sew-through button)

3.1.1.1 *Discussion*—Although the primary purpose of buttons is to serve as fasteners, buttons can also be used as decoration.

3.1.2 *face, n*—in buttons, that portion which will be exposed after attaching to the substrate.

3.1.3 *impact resistance, n*—resistance to fracture under the sudden application of an external force.

3.1.4 *ligne size, n*—an English unit, used to measure buttons, one ligne equals 0.635 mm (0.025in).

¹ 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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² 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.

3.1.5 *sew-through buttons, n*—a button that has two or more holes on its face for passage of a needle and thread or possibly other material in order to attach it to a flexible substrate.

3.1.6 For other textile terminology used in this method, refer to Terminology D 123.

3.1.7 For definitions of button terms used in this method, refer to Terminology D 5497.

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 D 5171 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.