



Designation: D 3998 – 81

Standard Test Method for PENDULUM-IMPACT RESISTANCE OF EXTRUSION PLASTOMETER EXTRUDATES¹

This standard is issued under the fixed designation D 3998; 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.

1. Scope

1.1 This method covers the determination of the resistance to breakage by flexural shock of extruded plastics by a miniature machine, as indicated by the energy extracted from a standardized (Note 1) pendulum-type hammer mounted in a standardized machine, in breaking standard specimens with one pendulum swing.

1.2 The values stated in SI units are to be regarded as the standard.

NOTE 1—The term “standardized” refers to certain fixed dimensions and specifications of the apparatus used in the test, as described in Section 6. Different initial energies (produced by varying the effective weights) are recommended for use with materials of different impact strengths.

1.3 The excess energy-pendulum impact test measures the energy to break a standard test specimen under stipulated conditions of specimen mounting and pendulum velocity at impact.

2. Applicable Documents

2.1 ASTM Standards:

- D 256 Tests for Impact Resistance of Plastics and Electrical Insulating Materials²
- D 618 Conditioning Plastics and Electrical Insulating Materials for Testing³
- D 1238 Test for Flow Rates of Thermoplastics by Extrusion Plastometer⁴

3. Summary of Method

3.1 A specimen obtained from the extrudate of an extrusion plastometer (Note 2) is held as a vertical cantilever beam and is impacted by a single swing of the pendulum, with the line of the initial contact at a fixed distance from

the leading edge of the specimen clamp. The method requires that the type of failure for each specimen be recorded as one of the three coded categories (see 5.1, 5.2, or 5.3).

NOTE 2—Method D 1238 describes the extrusion plastometer and gives the procedure for its use.

4. Significance

4.1 This method may be used to evaluate the impact strength of extruded plastics for quality control and for research and development purposes.

5. Terminology

5.1 *complete break (C)*—a break in which the specimen separates into two or more pieces.

5.2 *partial break*—an incomplete break (*P*). One part of the specimen cannot support itself above the horizontal when the other part is held vertically, or has fractured at least 90 %.

5.3 *non-break (NB)*.

6. Apparatus

6.1 *Extrusion Plastometer*, as specified in Method D 1238.

6.2 *Impact Tester*,⁵ which shall consist of a base, on which is mounted a vise for holding the specimen, to which is connected, through a rigid frame and antifriction bearings, a pendu-

¹ This method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties.

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² *Annual Book of ASTM Standards*, Parts 35, 38, and 39.

³ *Annual Book of ASTM Standards*, Parts 22, 35, and 39.

⁴ *Annual Book of ASTM Standards*, Part 35.

⁵ A Kravitz Impact Tester manufactured by Custom Scientific Instruments, Inc., P.O. Box A, Whippany, N.J. 07981, is a suitable instrument.