Designation: D6287 – 09

Standard Practice for Cutting Film and Sheeting Test Specimens[1]

This standard is issued under the fixed designation D6287; 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 practice covers equipment and techniques for cutting film and sheeting specimens for testing.[2] The specimens are nick-free, non-stretched and can be rapidly prepared.

1.2 The values given in SI units are to be considered standard. The values given in parentheses are for information only.

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.*

NOTE 1—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D882 Test Method for Tensile Properties of Thin Plastic Sheeting

D2838 Test Method for Shrink Tension and Orientation Release Stress of Plastic Film and Thin Sheeting

F88 Test Method for Seal Strength of Flexible Barrier Materials

3. Significance and Use

3.1 Many test methods including Test Methods D882, D2838, and F88 require the use of narrow strips of varying length. The quality of the sample preparation directly affects test results. This practice describes two techniques for preparing samples with straight, clean, parallel edges with no visible imperfections.

NOTE 2—After cutting, each specimen should be examined visually to insure the edges are undamaged (free of nicks). On a periodic basis specimen edge quality should be evaluated by microscopic examination. To determine when cutting blades need to be replaced or sharpened, a control chart of tensile strength and percent elongation at break (see Test Method D882) of a uniform material may be maintained. Tensile strength and percent elongation at break will decrease as the quality of specimen cutting decreases.

4. Apparatus and Materials

4.1 *Procedure A*—A hand rotatable drum cutter (Fig. 1) containing a 12.7 cm (5 in.) diameter drum with grooves at 12.7 mm (0.5 in.) intervals and a blade holder allowing a blade to ride in each groove or be raised above the groove.[4,5]

NOTE 3—Plas-Tech in Boston offered a rotary drum cutter in the 1950's and 1960's which was shown to be an excellent instrument with respect to yielding nick free non-stretched film specimen(s) at high rates.[6] However, Plas-Tech disappeared in the late 1960's and the cutter with them. This type of cutter has been redesigned to meet current government regulations and retain its original desirable characteristics plus additional improvements.

4.2 *Procedure B*—A dual blade shear cutter (Fig. 2) with parallelism tolerances within 0.0254 mm (0.001 in.). The cutter cuts individual strips of a particular sample width.

4.3 *Procedure C*—Dies with replacable razor-blade cutters are available in many different specimen configurations. The dies are equipped with a spring-loaded mechanism that allows easy specimen removal. These dies are mounted on either a manual or pneumatic press and provide easy replacement of worn cutting elements.[7,5]

4.4 *Scissors.*

4.5 *Marker.*

4.6 *Tape.*

[1] This practice is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.19 on Film and Sheeting.

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[2] This practice does not cover all types of techniques which may be used for cutting film and sheeting specimens.

[3] 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.

[4] The sole source of supply of the rotary drum film and sheeting cutter known to the committee at this time is Zebedee Corporation, P.O. Box 395, Landrum, SC 29356.

[5] If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee [1], which you may attend.

[6] Patterson, Gordon D., "An Interlaboratory Study of Cutting Plastic Film Tension Specimens," *Materials Research and Standards*, April 1964, p. 159.

[7] The sole source of supply of the razor-blade cutters and associated equipment known to the committee at this time is the Dumbbell Co., Ltd, 2243-1 Kasahata Kawagoe-Shi, Saitama, 350-1175 Japan, represented by Ontario Die International, 235 Gage Avenue, Kitchener, ON, N2M 2C9.

***A Summary of Changes section appears at the end of this standard**

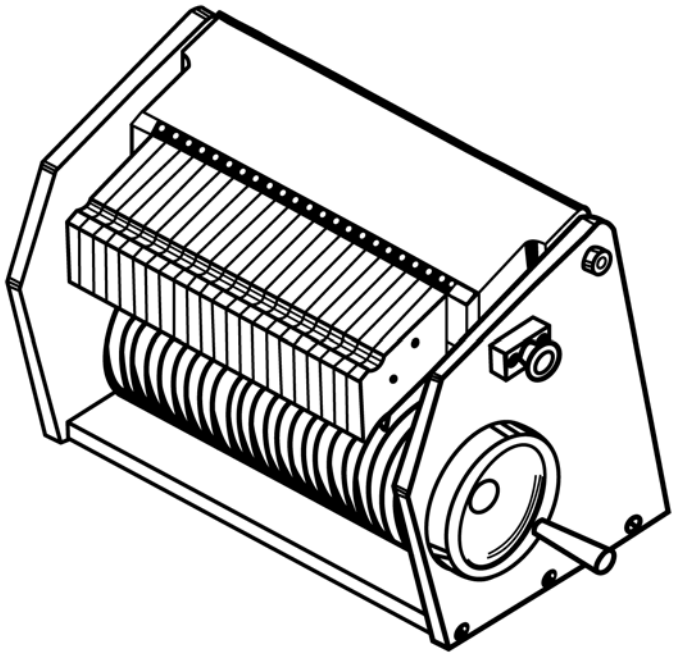

FIG. 1 Hand Rotatable Drum Cutter

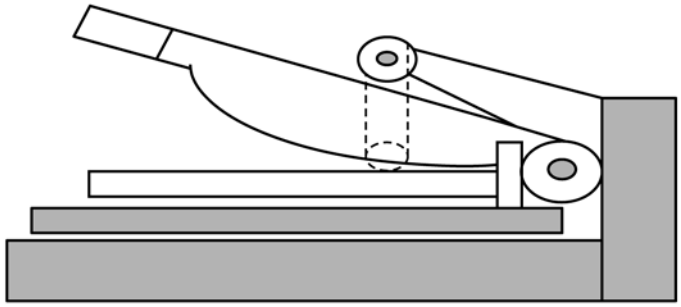

FIG. 2 Dual Blade Shear Cutter

5. Procedure

5.1 *Procedure A:*

5.1.1 Cut film or sheeting (with scissors) approximately 30 by 30 cm (12 by 12 in.) or desired size within these dimensions. It is recommended to cut only an individual (single) sheet of film.

5.1.2 Mark or number all samples as to identity, direction with respect to material flow, etc.

5.1.3 Place sample on work surface in desired direction and place a strip of tape on the sample edge with half the width of the tape overlapping the edge to enable the tape to adhere to the drum of the cutter.

5.1.4 Remove the taped sample from the work surface and place taped edge on the drum of the cutter below the blade holder allowing the sample to lie across the top of the cutter.

NOTE 4—Line the sample up precisely to ensure specimens are cut in the desired direction of material flow.

5.1.5 Turn the handle until the sample falls onto cutter drum. Continue to turn the drum and smooth the sample on the drum.

5.1.6 Tape the free corners of sample if necessary.

5.1.7 Align tape with cutter blades.

5.1.8 Pull blade knob to drop blades just in front of tape.

5.1.9 Rotate the drum with the drum handle.

5.1.10 Raise blades by lifting the front edge of the blade holder until a click is heard.

5.1.11 Turn drum handle until strips fall away from drum.

5.1.12 Remove strips and place on sheets of paper with proper identification.

5.2 *Procedure B:*

5.2.1 Mark or number all samples as to identity, direction with respect to material flow, etc. It is recommended to cut only an individual (single) sheet of film.

5.2.2 Slide sample underneath dual blades by moving sample on support platforms until aligned perpendicular to guide bar.

5.2.3 Using a firm downward motion press the cutter handle down.

5.2.4 Slowly release the cutter handle.

5.2.5 Remove strip and place on sheet of paper with proper identification.

5.3 *Procedure C:*

5.3.1 Mark or number all samples as to identity, direction with respect to material flow, etc. It is recommended to cut only an individual (single) sheet of film.

5.3.2 Examine the cutter blades using a hand magnifier to ensure there are no nicks or other defects in the blades.

5.3.3 Install the appropriate cutter in the unit in accordance with the manufacturer's instructions.

5.3.4 Place a flat back-up sheet on the cutting platform.

NOTE 5—Polyethylene or polypropylene sheets or cardboard (two to three mm in thickness) have been found to be satisfactory.

5.3.5 Place the sample on the covered cutting platform ensuring that there are no creases. If necessary, the edges can be taped to the platform to keep the sample flat.

5.3.6 Activate the cutter (manually or pneumatically) in accordance with the manufacturer's directions.

5.3.7 Remove the cut specimen from the die and place it on sheet of paper with proper identification.

NOTE 6—Although blade life is reported to be very long, the blades should be inspected prior to mounting as noted in 5.3.2 or, as a general practice, removed for inspection after every 500 specimens. This interval may vary depending on the types of materials being cut and users are urged to perform inspections more frequently at first to monitor wear (Reference Note 2).

6. Keywords

6.1 film; sample preparation; sheeting

SUMMARY OF CHANGES

Committee D20 has identified the location of selected changes to this standard since the last issue, D6287 - 05, that may impact the use of this standard. (September 1, 2009)

(1) Corrected ISO equivalency statement.

(2) Added Procedure "C" for razor dies.