



Designation: D 617 – 84 (Reapproved 1998)

An American National Standard

Standard Test Method for Punching Quality of Phenolic Laminated Sheets¹

This standard is issued under the fixed designation D 617; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the determination of the punching quality of phenolic laminated sheets $\frac{1}{8}$ in. (3.2 mm) and under in thickness. It involves the use of a standard punching die and standard punching practice to form punched specimens both at room temperature, designated as cold punching, and at an elevated temperature of 135°C, designated as hot punching, and a standard system for rating the punched specimens produced.

1.2 The values stated in inch-pound units are to be regarded as the standard.

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:

D 229 Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation²

D 785 Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials³

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials⁴

3. Significance and Use

3.1 This test method further provides for a control test on uniformity of punching quality after this property has been determined with the punching die for a particular grade and thickness. The control test consists in the determination of

Rockwell hardness at room temperature, and Rockwell hardness at 135°C under a definitely prescribed procedure.⁵

4. Apparatus

4.1 *Punching Die*—A compound die.⁶

4.2 *Oven*—An oven that will provide a temperature of 135 $\pm$ 2°C.

4.3 *Hardness Tester*—A Rockwell hardness tester conforming to the requirements prescribed in Test Methods **E 18**.

5. Test Specimens

5.1 *Punching Test Specimens*—Use two strips of the material, each $1\frac{5}{8}$ in. (41 mm) in width by 12 in. (305 mm) in length, one cut lengthwise and one cut crosswise from the sheet for punching out specimens in the compound die. The dimensions of the punched specimen are shown in **Fig. 1**.

5.2 *Hardness Test Specimens*—The specimen for the cold Rockwell hardness test and hot Rockwell hardness test shall conform to that prescribed in Test Method **D 785**, except that the specimen for the hot Rockwell hardness test shall be 1 in. (25 mm) square.

6. Preparation of Apparatus

6.1 The results obtained with this test method will depend upon the care taken in properly assembling the die as well as in the condition of the punch and die. It is recommended that a standard die set be used in order to ensure proper alignment of the punch and die at all times. Examine the cutting edges of the punches, as well as those of the die, for sharpness. If the surfaces are not flat and if the edges are not sharp, it is advisable to grind the surfaces of both the punch and die to ensure good punching.

¹ This test method is under the jurisdiction of ASTM Committee D-9 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.07 on Flexible and Rigid Insulating Materials.

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² *Annual Book of ASTM Standards*, Vol 10.01.

³ *Annual Book of ASTM Standards*, Vol 08.01.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

⁵ Another punching method in use is the German punchability rating system DIN 53-488. Copies are obtainable at a nominal cost from ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Request Adjunct No. ADJD0617.

⁶ Detailed drawings of the dimensions of the compound die are available at a nominal cost from ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Request adjunct No. ADJD0617.