



# Standard Test Methods for INTERLAMINAR SHEAR STRENGTH OF STRUCTURAL REINFORCED PLASTICS AT ELEVATED TEMPERATURES<sup>1</sup>

This Standard is issued under the fixed designation D 2733; 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 These methods cover the determination of interlaminar shear strength of structural reinforced plastics at temperatures above the Standard Laboratory Temperature of 23 C (73.4 F).

NOTE 1—The values stated in SI units are to be regarded as the standard.

NOTE 2—Safeguards against the effects of extremely high temperatures should be utilized to protect the operator.

1.2 These methods are not intended specifically for use in determining the effect of long continued exposure at elevated temperatures or of a cyclic exposure range of temperature, although they may be used for such special tests if desired.

## 2. Summary of Methods

2.1 These methods consist of preparing specimens as described in 6.2 and inserting the specimens in the testing machine, with or without attachments as required. The specimens are then stressed until rupture occurs, in accordance with either of the methods outlined below:

2.1.1 *Method A* requires the use of side-supporting steel plates, tightened evenly and firmly (to the extent necessary to prevent peeling of the specimen during the test, but not to the point where the specimen is crushed) against the faces of the test specimen by means of two small clamps, located 6.5 cm (2½ in.) apart. With the steel plates in place, the specimen shall be inserted in the grips of the testing machine and stressed until rupture occurs. A shear-type failure should result.

2.1.2 *Method B* does not require the use of side-supporting steel plates; hence peel effects are promoted. A shear-type failure with some peeling at the interlaminar bond should result.

## 3. Significance

3.1 Interlaminar shear strength properties of reinforced plastic structures at elevated temperatures are of considerable importance in predicting the strength of materials for characterization of materials for control and specification purposes, and to provide useful data for research and development studies.

## 4. Definition

4.1 *interlaminar shear strength*—the shear strength at rupture in which the plane of fracture is located between the layers of reinforcement of a plastic reinforced structure. It is expressed in pounds per square inch based on the distance between saw cuts.

## 5. Apparatus

5.1 *Testing Machine*—The tension testing machine and its accessory equipment shall conform to the requirements specified in ASTM Method D 638, Test for Tensile Properties of Plastics.<sup>2</sup> All mechanical parts of the apparatus that are exposed to elevated temperatures during the test shall be adjusted to

<sup>1</sup> These methods are under the jurisdiction of ASTM Committee D-20 on Plastics and are the direct responsibility of Subcommittee D-20.18 on Reinforced Thermosetting Plastics.

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<sup>2</sup> *Annual Book of ASTM Standards*, Part 35.