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AMERICAN SOCIETY FOR TESTING AND MATERIALS  
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## Standard Test Method for FINISH CONTENT OF WOVEN GLASS FABRIC, CLEANED AND AFTER-FINISHED WITH AMINO-SILANE-TYPE FINISHES, FOR PLASTIC LAMINATES<sup>1</sup>

This standard is issued under the fixed designation D 2408; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This method covers the measurement of the amount of amino-silane finish applied to various styles of woven glass fabrics that have been suitably cleaned to remove the oils and binders present on the yarn to make them suitable for use in plastic laminates.

1.2 Glass fabrics with this finish can be used with epoxy and phenolic resin systems to produce laminates with a wide variety of properties for general use and for use under conditions of high physical stress and high temperature.

NOTE 1—Typical amino-silane finishes are known as A-1100 and soft A-1100.

NOTE 2—The modified Kjeldahl method is used in this method.

### 2. Applicable Document

#### 2.1 ASTM Standard:

D 4029 Specification for Finished Woven Glass Fabrics<sup>2</sup>

### 3. Summary of Method

3.1 Specimens are subjected to a cyclical heating-purging-distilling procedure. The nitrogen content of the material is measured, which is a reliable indication of the amount of amino-silane finish on the glass fabric.

### 4. Significance and Use

4.1 The purpose of this method is to provide a means for determining the amount of amino-silane finish on glass fabrics that have met the requirements of Specification D 4029 and whether it has been correctly applied. It is intended for use in specifications, product eval-

uations, and quality control.

4.2 The amino-silane finish enhances the handleability of the fabric and improves the mechanical properties of the glass fabric when used as a reinforcement in epoxy or phenolic laminates.

### 5. Apparatus

5.1 *Analytical Balance*, sensitive to  $\pm 0.1$  mg.

5.2 *Nickel Crucible*, J. Lawrence Smith, 17-mL capacity.

5.3 *Test Tube*, high-silica glass, 75-mL capacity, 25 by 200-mm.

5.4 *Rubber Stopper*, No. 4, with two holes.

5.5 *Kjeldahl Connecting Bulb*, 52-mm diameter.

5.6 *Tubing, Glass*, inside diameter less than 5 mm.

5.7 *Tubing, Vinyl*.

5.8 *Crucible Furnace, Fieldner*.

5.9 *Variable Transformer*.

5.10 *Asbestos or Transite Collar*.

### 6. Reagents and Materials

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such spec-

<sup>1</sup> This method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.18 on Reinforced Thermosetting Plastics.

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<sup>2</sup> *Annual Book of ASTM Standards*, Part 33.