



## Standard Test Method for Thermal Endurance of Varnished Fibrous- or Film-Wrapped Magnet Wire<sup>1</sup>

This standard is issued under the fixed designation D 4881; 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 test method covers the determination of thermal endurance of rectangular and square fibrous- or film-wrapped magnet wire coated with an insulating varnish.

1.2 The values given in SI units are the 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.* A specific precautionary statement is given in Section 5.

NOTE 1—There is no similar or equivalent IEC Standard.

### 2. Referenced Document

2.1 *ASTM Standards:*

D 1711 Terminology Relating to Electrical Insulation<sup>2</sup>

D 2307 Test Method for Relative Thermal Endurance of Film-Insulated Round Magnet Wire<sup>2</sup>

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *varnish, electrical insulating, n*— a liquid resin system that is applied to and cured on electrical components providing electrical, mechanical, and environmental protection.

3.1.1.1 *Discussion*—There are two types of electrical insulating varnishes—solvent-containing and solventless. Solvent-containing types are solutions, dispersions, or emulsions of a polymer or a mixture of polymers in a volatile, nonreactable liquid. Solventless types are liquid resin systems free of volatile, nonreactable solvents.

3.1.2 Refer to Terminology D 1711 for definitions of other terms.

### 4. Significance and Use

4.1 Individual varnishes may behave differently when ap-

plied to the same fibrous- or film-wrapped magnet wire and aged at elevated temperatures. Likewise, a varnish may not behave the same when applied to different types of fibrous or film-wrapped magnet wires and aged at elevated temperatures.

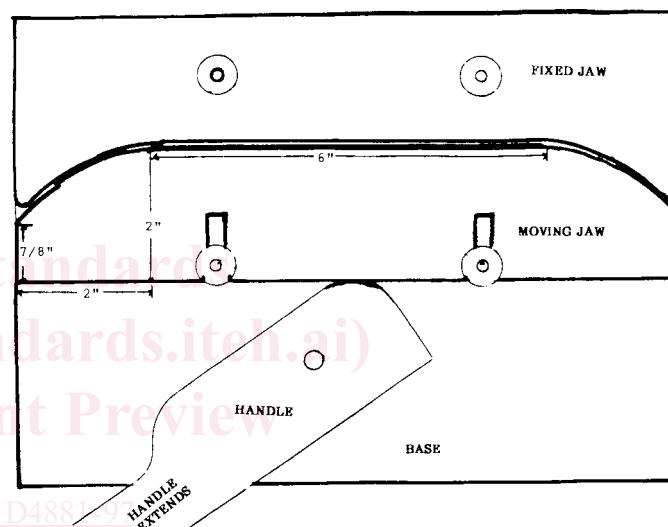


FIG. 1 Jig for Forming Wire

### 5. Safety Precautions

5.1 Do not use varnish at temperatures above the flash point when inadequate ventilation, possibility of flames or sparks exist. Store varnish in sealed containers. These precautions shall also apply to the handling of the reagents and solvents called for in this test method.

### 6. Test Specimens

6.1 *Construction of Test Specimens:*

6.1.1 Cut two 250-mm (10-in.) lengths of wire for each specimen to be made.

6.1.2 Form each length in a fixture as shown in Fig. 1.

6.1.3 Prepare a test specimen by placing the two formed wires together back to back and wrap tightly with glass yarn over the middle 6-in. (150-mm) section. The glass yarn shall have a gap between turns and there must be intimate contact of the two wires.

6.1.4 Prepare ten specimens for each test temperature.

<sup>1</sup> 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 D09.01 on Electrical Insulating Varnishes, Powders, and Encapsulating Compounds.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 10.01.