



Designation: F 1825 – 03

## Standard Specification for Clampstick Type Live Line Tools<sup>1</sup>

This standard is issued under the fixed designation F 1825; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

### 1. Scope

1.1 This specification applies to the Clampstick type live line tools to ensure manufacturing processes and materials are compatible and no deterioration of components occur during the assembly process.

1.2 This specification establishes the technical characteristics for clampsticks.

1.3 This specification applies to clampsticks both hollow and foam-filled.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 The following safety hazards caveat pertains only to the test portions of this specification: *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 applicable of regulatory limitations prior to use.*

1.6 The use, maintenance, and in-service testing of this equipment is beyond the scope of this specification.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

F 711 Specification for Fiberglass-Reinforced Plastic (FRP) Rod and Tube Used in Live Line Tools<sup>2</sup>

F 819 Terminology Relating to Electrical Protective Equipment for Workers<sup>2</sup>

### 3. Terminology

3.1 *Definitions*—Terminology used in this specification is in accordance with Terminology F 819.

#### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *clampstick, n*—a live line tool having a hand control with latching stops at the butt end mechanically connected by an insulating rod to a hook that retracts into a slotted ferrule at the head end.

3.2.1.1 *Discussion*—Clampsticks are used by qualified workers for high-voltage application of hot line clamps, ground clamps, operation of energized apparatus and the like. Clampsticks are sometimes referred to as “shotgun sticks” or “grip all sticks”. Clampsticks are designed to provide insulation to the user while performing the above operations.

3.2.2 *design test, n*—a test made on a sample treated as representative of an industrial product. This test will not generally be repeated in quantity production.

3.2.3 *electrical test, n*—a test to ensure that a product meets minimum electrical requirements of a standard.

3.2.4 *FRP insulating tubes and rods, n*—fiberglass reinforced plastic (FRP) products manufactured so that the tubes and rods produced will meet the electrical and mechanical requirements of this specification.

3.2.5 *hand control, n*—lower control of the clampstick and connected to hook by an FRP rod.

3.2.6 *head ferrule, n*—a nonmetallic structural part with slots to accept clamp bases of standard size and allow the closing motion of the hook.

3.2.7 *mechanical test, n*—a test to ensure that a product meets minimum mechanical requirements of a standard.

3.2.8 *rear stop, n*—a device or devices that stop the rearward motion of the hand control when the tool has reached its fully retracted position.

3.2.9 *retract lock, n*—a locking means that allows the hand control to be positioned and releaseably latched between the safety stop and rear stop and prevents movement toward the safety stop.

3.2.10 *safety stop, n*—a releasable latch that automatically and positively engages at partial retract to fully capture a device.

3.2.11 *visual inspection, n*—a visual check made to detect defects that impede the performance of product(s).

### 4. Materials and Manufacture

4.1 Neither the FRP tube and rod, foam filling, or the bonding adhesive shall deteriorate during the prescribed mechanical and electrical test of this specification.

4.2 The external surface of the FRP shall be uniform, symmetrical, and free of abrasions, scratches, blemishes, and surface defects.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F18 on Electrical Protective Equipment for Workers and is the direct responsibility of Subcommittee F18.35 on Tools and Equipment.

Current edition approved March 10, 2003. Published May 2003.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 10.03.

4.3 Any defect that may capture an impurity or impair the dielectric integrity of the product shall be cause for rejection.

4.4 FRP rod or tube material to which a finish coating, such as paint, is applied must meet all physical, electrical, and mechanical requirements after the coating is applied.

4.5 The external surfaces of all composite material parts and fittings shall be uniform and free of projections or flaws that present a hazard to the operator.

4.6 Moving parts must operate properly without binding at temperatures from  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) to  $48.9^{\circ}\text{C}$  ( $120^{\circ}\text{F}$ ).

4.7 Retract lock and safety stop must be separate and so arranged that release of retract lock or forward motion of control shall not release safety stop. Release of safety stop must require a distinct and separate action.

4.8 The hook shall be designed to enter a 1.42-cm (0.560-in.) inside diameter, minimum eye. The ferrule shall be designed to swallow an eye with a 3.96-cm (1.560-in.) outside diameter and a 1.19-cm (0.470-in.) maximum diameter cross-section and with a 2.29 cm (0.900-in.) outside diameter maximum shank or flange.

4.9 Hook opening shall accept a 20-mm ( $3/4$ -in.) diameter rod.

4.10 Hook retraction from safety stop (intermediate position) shall be 11.73 cm (4.62 in.) minimum.

4.11 The end slots of head ferrule must accept a clamp base 1.22 cm (0.480 in.) max width to a depth of 0.76 cm (0.300 in.) min.

4.12 Foam-filled clampsticks shall be sealed at both ends.

4.13 Foam-filled FRP tube and solid FRP rod used in the manufacturing of clampsticks shall meet all requirements of Specification F 711.

4.14 Hollow tube shall meet all requirements of Specification F 711 except mechanical aging and shall withstand 75 % crushing strength of the foam-filled tube of equal outside diameter listed in Specification F 711.

## 5. Mechanical Design Test

5.1 FRP tube and rod shall meet all mechanical specifications and requirements of Specification F 711.

5.2 The complete clampstick shall withstand a torque load of 50 ft lb along centerline of operating parts rotated about longitudinal axis without failure.

5.2.1 Sectional (jointed) clampsticks shall be tested assembled (spliced together) and folded clampsticks shall be tested fully unfolded. Telescoping clampsticks shall be tested fully extended.

5.3 Safety stop shall withstand a tensile load of 750 lb without failure.

5.4 At each position, the retract lock shall withstand a tensile load of 750 lb without failure.

5.5 Control rod assembly shall withstand a tensile load of 750 lb without failure.

5.6 The mechanical design test shall be performed on a minimum of three samples.

## 6. Electrical Design Test

### 6.1 Electrical Design Test Procedure:

6.1.1 The test apparatus shall be designed to provide the operator full protection in the performance of his duties and provide reliable means of de-energizing and grounding the high-voltage circuit. Isolate the test equipment and specimen to guard against accidental contact by persons in the vicinity.

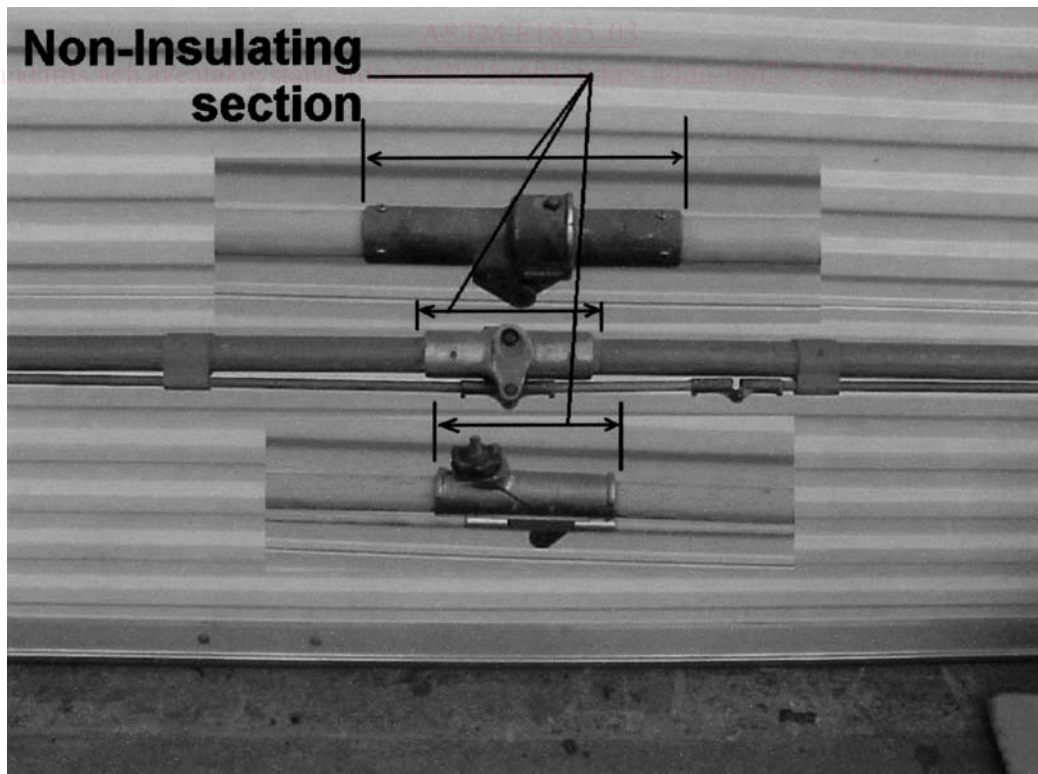


FIG. 1 View of Hinge Joint of Folding Internal and External Operating Rod Clampsticks