



# Standard Specification for General Workmanship and Performance Measurements of Hemostatic Forceps<sup>1</sup>

This standard is issued under the fixed designation F1026; 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 specification covers general workmanship aspects of hemostatic forceps fabricated from stainless steel and intended for reuse in surgery.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

**E18 Test Methods for Rockwell Hardness of Metallic Materials**

**E92 Test Method for Vickers Hardness of Metallic Materials (Withdrawn 2010)**<sup>3</sup>

**E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness**

**F899 Specification for Wrought Stainless Steels for Surgical Instruments**

**F921 Terminology Relating to Hemostatic Forceps**

## 3. Terminology

3.1 Definitions applicable to hemostatic forceps shall be in accordance with Definitions **F921**.

## 4. Material

4.1 All of the component parts of the instruments shall be made of martensitic stainless steel of Type 410, 410X, 416, 416MOD, 420A, or 420B of Specification **F899**.

## 5. Physical Requirements

5.1 *Heat Treatment and Hardness for Component Parts:*

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee **F04** on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee **F04.33** on Medical/Surgical Instruments.

Current edition approved Oct. 1, 2014. Published November 2014. Originally approved in 1986. Last previous edition approved in 2008 as F1026 – 86 (2008) <sup>$\epsilon$ 1</sup>. DOI: 10.1520/F1026-86R14.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

5.1.1 The component parts of the instruments shall be heat treated under conditions recommended for the material used. Typical heat treating guidelines and hardness values are given in Specification **F899**.

5.1.2 The hardness of all opposing parts of the same instrument shall not vary in hardness by more than 4 units on the Rockwell Hardness C scale (HRC) or equivalent. (See Test Methods **E18**.)

5.2 *Passivation*—Instruments and instrument components shall be passivated after completion of all fabricating and finishing operations.

## 6. Performance Requirements

6.1 *Finger Rings*—Inside surfaces shall be well rounded and polished and shall comply with the requirements in **7.1**.

6.2 *Jaw Serrations and Teeth*—The serrations and teeth shall be of uniform depth and height and well defined to provide effective gripping. The serrations and teeth shall interdigitate. The edges of the serrations shall be chamfered.

6.3 *Box Lock*—The hemostatic forceps shall be of box lock construction, as defined in Definitions **F921**. The pin, or other fastening component, shall be permanently secured. The joint performance of the box lock shall be smooth, of equal resistance, and non-binding when opening or closing the forceps to an included angle of  $90 \pm 5^\circ$  (the lock may be lubricated).

6.4 *Clearance*—The maximum clearance between the male and female members of the forceps in the lock area shall be 0.4 mm (0.015 in.). The clearance is the visible gap that exists when the instrument is viewed from both the front and side profile or end view of the instrument (excluding bevel) (see **Fig. 1**).

6.5 *Ratchets*—Ratchets shall securely engage at each ratchet position in a smooth and progressive manner.

6.6 *Jaw and Ratchet Setting*—The jaw tips shall close and interdigitate when the first ratchet position is engaged, and there shall be no visible misalignment of the jaws. The jaws shall progressively tighten with each succeeding ratchet engagement. Each ratchet position shall hold firmly and release easily. The jaws shall be fully closed and the serrations

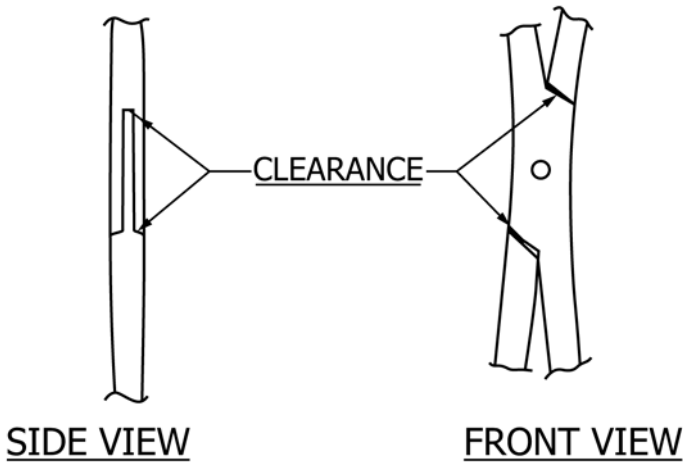


FIG. 1 Clearance of Forceps

interdigitated when the last ratchet is engaged. The jaws shall not open as the result of engaging any ratchet position.

6.7 *Elasticity*—The instrument by design shall be capable of passing the test for elasticity as specified in 8.2. After completion of the test, no visible distortion, cracks, or other visible damage to the instrument shall be evident.

## 7. Workmanship, Finish, and Appearance

7.1 *Surfaces*—The surfaces of the instrument shall be uniformly finished and free of burrs, sharp edges, cracks, coarse marks, and manufacturing materials.

7.2 *Type*—The finish shall be one of the types defined in Definitions F921, or as required by the purchaser.

## 8. Test Methods

8.1 *Hardness*—Hardness shall be determined in accordance with Test Methods E18 or Test Method E92. Conversion of Vickers hardness values to Rockwell values shall be in accordance with the Conversion Tables in E140.

8.2 *Elasticity*—The instrument shall have a segment of basswood, leather strap, or stainless steel wire test material placed between the jaws at the tip. The instrument shall be engaged in the last (tightest) ratchet position for 24 h at room temperature. The thickness of the test material shall be as listed in Table 1.

8.3 *Corrosion Resistance*—Instruments or instrument components shall be subject to the corrosion tests.

## 9. Marking and Labeling

9.1 All markings shall be legible.

9.2 The instrument shall bear: the manufacturer’s or contractor’s name or registered trademark; the country of origin, when the instrument is not manufactured in the United States; and other markings as required by the purchaser, manufacturer, or contractor.

9.3 The markings shall be located on a suitable surface of the instrument.

TABLE 1 Test Material Thickness and Instrument Length

Thickness or Diameter of Test Material, mm (in.)	Nominal Overall Length of Instrument, mm (in.)
1.98–2.00 (0.0781–0.0787)	Up to and including 127 (5)
3.00–3.18 (0.1181–0.1250)	Over 127 to 150 (5 to 5.906)
3.97–4.00 (0.1563–0.1575)	Over 150 to 177.8 (5.906 to 7.000)
4.76–5.00 (0.1875–0.1969)	Over 177.8 (7.000)

*ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; http://www.copyright.com/*