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Standard Specification for Wrought Stainless Steels for Surgical Instruments¹

This standard is issued under the fixed designation F899; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers the chemistry requirements for wrought stainless steels used for the manufacture of surgical instruments. The data contained in Tables 1–4 of this specification, including typical hardness values, common heat treating cycles, and examples of selected stainless steels that have been used for surgical instruments, is provided for reference only. Mechanical property requirements, heat treating requirements, hardness requirements and all other requirements except chemistry are governed by the appropriate material standards as referenced below or as agreed upon between the purchaser and supplier.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

2. Referenced Documents

2.1 ASTM Standards:²

A276 Specification for Stainless Steel Bars and Shapes

A313/A313M Specification for Stainless Steel Spring Wire

A314 Specification for Stainless Steel Billets and Bars for Forging

A480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

A484/A484M Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings

A555/A555M Specification for General Requirements for Stainless Steel Wire and Wire Rods

A564/A564M Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes

A582/A582M Specification for Free-Machining Stainless Steel Bars

A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

2.2 ISO Standards:³

ISO 7153/1 Instruments For Surgery—Metallic Materials—Part 1: Stainless Steel

ISO 9001 Quality Management Systems—Requirements

2.3 American Society for Quality (ASQ) Standard:⁴

ASQ C1 Specification of General Requirements for a Quality Program

3. Classification and Type

3.1 **Classes**—Stainless steel material requirements for surgical instruments shall conform to one of the following classes, as specified:

3.1.1 **Class 3**—Austenitic Stainless Steel.

3.1.2 **Class 4**—Martensitic Stainless Steel.

3.1.3 **Class 5**—Precipitation Hardening Stainless Steel.

3.1.4 **Class 6**—Ferritic Stainless Steel.

3.2 **Type**—Where applicable, the commercially recognized type of stainless steel is included in Tables 5 and 6.

¹ This specification is under the jurisdiction of ASTM Committee F04 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.02 on Metallurgical Materials.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from American Society for Quality (ASQ), 600 N. Plankinton Ave., Milwaukee, WI 53203, <http://www.asq.org>.

*A Summary of Changes section appears at the end of this standard.

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**American Society for Testing and
Materials**

A red circular graphic with a gradient, appearing as a partial circle or a thick arc, located to the right of the American Society for Testing and Materials text.

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Stainless Steels for Medical and Surgical Applications Gary L. Winters, Michael J. Nutt, 2003 Covered a wide range of topics on stainless steels with most of the presentations dealing with narrow segments of a specific topic Therefore a single theme of the presentations may be that work on stainless steels for medical uses continues and that stainless steels may be part of the answers for some of the issues facing the surgical community today such as biological response corrosion resistance mechanical performance quality and cost **Corrosion** Stephen D. Cramer, 2006 Report on the

Elevated-temperature Properties of Stainless Steels Ward F. Simmons, Howard Clinton Cross, 1952 *Advances in the Technology of Stainless Steels and Related Alloys* American Society for Testing and Materials, 1965 *Advances in the Technology of Stainless Steels and Related Alloys* Committee A-10 Staff, 1965-01-01 **ASTM F 899-02** American Society for Testing and Materials, 2002 Standard Specification for Wrought Stainless Steels for Surgical Instruments , 2012

Report on the Elevated-Temperature Properties of Stainless Steels Simmons Ward, Ward F. Simmons, 1952

ASTM Special Technical Publication , 1961 Report on the Elevated-Temperature Properties of Stainless Steels, Prepared by Ward F. Simmons and Howard C. Cross American Society for Testing and Materials Staff, *Toughness of ferritic stainless steels* R. A. Lula, 1980 **Report on the Elevated-Temperature Properties of Stainless Steels** Simmons Ward, 1981-05 *Advances in Teh Technolgy of Stainless Steels and Related Alloggy* American Society for Testing and Materials, 1965

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