



Standard Guide for Care and Handling of Stainless Steel Surgical Instruments¹

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1. Scope

1.1 This guide is intended to provide a better understanding of the care of stainless steel surgical instruments intended for reuse. This guide is not intended for use with electrical, pneumatic or other powered surgical instruments.

2. Referenced Documents

2.1 ASTM Standards:

- F 899 Specification for Stainless Steel Billet, Bar, and Wire for Surgical Instruments²
- F 921 Definitions of Terms Relating to Hemostatic Forceps²
- F 1026 Specification for General Workmanship and Performance Measurements of Hemostatic Forceps²
- F 1078 Terminology for Surgical Scissors—Inserted and Non-Inserted Blades²
- F 1079 Specification for Inserted and Non-Inserted Surgical Scissors²
- F 1089 Test Method for Corrosion of Surgical Instruments²
- F 1325 Specification for Suture Needle Holders—General Workmanship Requirements and Corresponding Test Methods²

3. General

3.1 *Stainless Steel Types*—The stainless steels most used are martensitic and austenitic types such as those in Specification F 899. Martensitic stainless steel contains iron, chromium, and sufficient carbon so that when it is hardened by heat treatment, a substantial martensitic structure is the result. Austenitic stainless steel has better corrosion resistance and contains iron, chromium, and nickel. It has a substantial austenitic structure and a lower carbon content. Although it cannot be hardened by heat treatment, it can be work-hardened.

3.2 *Passivation*—Stainless steel can spot, stain, and corrode. This is minimized by passivation which is a process used to create a protective chromium oxide surface layer while removing surface carbon and iron. This is accomplished in the atmosphere slowly or through immersion in oxidizing solution or through an electro-polish process. Through repeated processing the passivation layer will thicken until a good protective film is formed.

3.2.1 Never expose instruments to strong acids such as hydrochloric, aqua regia, dilute sulphuric, carbonic, and tartaric.

3.2.2 Avoid contact with salt solutions such as aluminum chloride, mercury salts, stannous chloride. Also avoid contact with potassium thiocyanate and potassium permanganate and limit contact with iodine solutions to periods less than 1 h.

3.2.3 Chloride-bearing solutions such as blood and saline can cause localized corrosion. Avoid prolonged exposure to or rinsing in saline solutions or corrosion and pitting will occur. Use demineralized or distilled water instead. Place instruments into water, enzymatic solution, or disinfectant bath immediately after use so the blood or other material will not dry on them prior to transport to designated cleaning/reprocessing area.

4. General Care of Instruments

4.1 *General*—Use instruments only for their intended purpose, such as cutting, holding, clamping, retracting, etc. Avoid undue stress or strain when handling and cleaning. Standard terminology relating to Hemostatic Forceps and Surgical Scissors are found in Definitions F 921 and Specification F 1078.

4.1.1 *Hemostatic Forceps*—These forceps are designed to clamp blood vessels. They should not be used to clamp towels, suction tubing, or as needle holders or pliers. Misuse generally results in misalignment and even cracked box locks.

4.1.2 *Needle Holders*—Although designed to withstand some force, they are not to be used as pliers, jaw misalignments being the result. Select a needle holder matching the size needle being used.

4.1.3 *Scissors*—Do not use scissors for the wrong job, otherwise, the tips will become misaligned and the blades will dull or chip. Delicate scissors should be particularly guarded against misuses. Use tissue scissors for tissue dissections only, not for cutting suture material or wires.

4.1.4 *Microsurgical Instruments*—Microsurgical instruments are most susceptible to damage through misuse or rough handling. Consequently, extra care must be taken to avoid compromising their exacting performance. To minimize damage, the following should be done:

4.1.4.1 Inspect the instrument when purchased and after each use and cleaning, preferably under magnification.

4.1.4.2 Only use for its intended purpose.

4.1.4.3 After each use remove blood and debris from instrument. A non-fibrous sponge may be used to eliminate

¹ This practice is under the jurisdiction of ASTM Committee F-4 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.65 on Medical/Surgical Instruments.

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² *Annual Book of ASTM Standards*, Vol 13.01.