

Recommended Steps in Cleaning, Sterilization and Maintenance of Surgical Instruments



1. HOLDING/PRESOAK

Never hold instruments in a dry container. Doing so allows blood and debris to dry onto instrument surfaces and makes cleaning more difficult. If rinsing and decontamination processes are not immediately available, pre-treat instruments or hold them in a neutral pH holding/presoak enzymatic solution after patient use but before actual cleaning. Miltex[®] Instrument Prep Enzyme Foam (3-760) is a ready to use foaming spray for pre-cleaning soiled instruments and scopes. Simply spray the foam on instruments until they are ready for processing. Also, Miltex[®] EZ-Zyme[®] (3-750 and 3-755) neutral pH all purpose multi-enzyme concentrate is ideal for instrument presoaking and pre-cleaning. As soon as possible, rinse and clean as follows:

2. RINSING

Always wear safety protection gear.

Immediately after surgery, remove organic materials by rinsing instruments under warm (not hot) running water. Rinse should remove most blood, fluids and tissue. Do not process dissimilar metals (stainless, copper, chrome plated, etc.) together.

Note: *Disinfection can be included to protect medical personnel from contamination during cleaning; however, protection also can be accomplished by following standard precautions by wearing appropriate PPE as promulgated by OSHA & AORN.*

3. CLEANING

All blood, dried body fluids and tissue should be completely removed from instruments prior to sterilization. Several methods for removing these materials are available.

- A. **Soak:** An enzymatic cleaner bath (soak) such as Miltex[®] EZ-Zyme[®] (3-750 and 3-755) or a solution of water and neutral pH (7) detergent such as Miltex[®] Surgical Instrument Cleaner (3-720, 3-725 and 3-726) is effective in removing organic material from instruments. Use distilled (demineralized) water, if possible. Instruments should be fully submerged for at least 10 minutes. Do not let "sharps" (scissors, knives, osteotomes, etc.) touch each other. Ensure that dissimilar metal instruments are separated. Rinse instruments under running water to remove solutions and change solutions frequently.
- B. **Ultrasonic Cleaning:** Most instrument manufacturers recommend ultrasonic cleaning as the most effective way to clean surgical instruments, particularly instruments with hinges, box locks and other moving parts.
- All instruments must be fully submerged in an open position using distilled (demineralized) water, if possible. To prevent possible surface scratching make sure that "sharps" do not touch other instruments. Also, separate instruments of dissimilar metals.
 - Process instruments for the full recommended ultrasonic cleaning cycle. Change solution frequently or as often as the manufacturer recommends.

- Rinse instruments with water to remove the cleaning solution. Miltex[®] EZ-Zyme[®] (3-750 and 3-755) or Miltex[®] Surgical Instrument Cleaner (3-720, 3-725 and 3-726) can be safely used with all ultrasonic units.

C. **Automatic Washer Sterilizers:** Following manufacturers' recommendations, ensure that instruments are lubricated before the sterilization cycle and after the last rinse cycle.

CAUTION: Needle holders and forceps may crack if sterilized with ratchet in closed position.

D. **Manual Cleaning:** If ultrasonic cleaning is not available, observe the following steps:

- Use stiff nylon cleaning brushes (3-1000). Do not use steel wool or wire brushes except stainless steel wire brushes (3-1001) specially recommended for instrument serrated areas, bone files, burs or on stained areas of knurled handles.
- Use only neutral pH (7) detergents such as Miltex[®] Surgical Instrument Cleaner (3-720, 3-725 and 3-726). If not rinsed off properly, low pH (acidic - less than 6 pH) detergents break down the stainless protective surface resulting in pitting and/or black staining on instruments. High pH detergents (alkaline - more than 8 pH) can cause brown stains (phosphate surface deposit) which can also interfere with the smooth operation of instruments. Most brown stains are not rust and are easily removed with Miltex[®] Surgical Instrument Stain Remover (3-740).
- Brush delicate instruments carefully, and if possible, separate them from general instruments.
- Make sure instrument surfaces are visibly clean and are free from stains and tissue. Miltex[®] Surgical Instrument Stain Remover (3-740) can help remove residue stains. This is also a good time to inspect each instrument for proper function and condition.
- Check scissors' blades to ensure proper function. Blades should open and close smoothly. Test cutting performance at 3/4 length of the blade with the materials recommended below. Scissors should cut all the way to the tips. Recommended cutting test materials:
 - Fine/Delicate scissors: Surgical glove
 - Medium scissors: Single layer of stocking/cast netting
 - Large/Utility scissors: Double layer of stocking/cast netting
- Check forceps (pickups) for proper jaw alignment. Teeth must meet properly without catching.
- Check hemostats and needle holders to ensure jaw tips close in first ratchet position and that the entire jaw closes in third ratchet position. Check instruments for loose hinges and verify that they lock and unlock easily. Also check instruments for wear on jaw surfaces.



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- Suction tubes should be clean inside.
- Test Biopsy Punches by punching a clean hole in 3-6 mil thick poly-bag material. If poly-bag material is not available, use tissue paper.
- Retractors should function properly.
- Cutting edge instruments and knives should be sharp and free of damage.
- After scrubbing, rinse instruments thoroughly under running water. While rinsing, open and close scissors, hemostats, needle holders and other hinged instruments to ensure that hinged areas are rinsed out and that no debris remains.

4. AFTER CLEANING

Separate dissimilar metals prior to sterilizing/autoclaving. If instruments will be stored, allow them to air-dry and store them in a clean and dry environment.

5. AUTOCLAVING

A. **Lubricate all hinged instruments** which have any "metal to metal" action at the screw or box lock. A non-silicone, water-soluble surgical lubricant such as Miltex[®] Lube (3-700 or 3-705) is recommended. Do not use industrial oils or lubricants.

B. **Sterilize instruments** either individually or in sets.

- **Individual Instruments:** Disposable paper or plastic pouches are ideal. Make sure to use a wide enough pouch for instruments with ratchet locks so instruments can be sterilized in an open (unlocked) position. Instruments locked during autoclaving can develop cracked hinges (box locks) or other problems because of heat expansion. If wrapping instruments, make sure the towel does not contain detergent residue which can stain instruments.
- **Instrument Sets:** Unlock all instruments and sterilize in an open position. Place heavy instruments on the bottom of set (when two layers are required). Do not overload the chamber because an air pocket that hinders steam penetration may form.

CAUTION: With most portable tabletop autoclaves, unlock the door and open it no more than a crack, about 1/4" (6.4 mm). (at the end of the autoclave cycle and before the drying cycle) Then run the dry cycle for the period recommended by the autoclave manufacturer. If the autoclave door is fully opened before the drying cycle, cold air will rush into the chamber and will cause condensation on the instruments, potentially resulting in water stains or causing wet packs. Make sure autoclave filters and chambers are cleaned as recommended by the manufacturer. Miltex[®] Surgical Instrument Stain Remover (3-740) is effective in removing stains and in cleaning the autoclave chamber. If you have any unusual staining on your instruments after sterilization, obtain our Instrument Care DVD (3-810) or contact your local Miltex[®] representative.

6. CHEMICAL/COLD STERILIZATION

Most chemical/cold sterilization solutions render instruments sterile only after 10-hour immersion. This prolonged chemical action can be more detrimental to instruments than the usual 20-minute autoclave cycle. If the instruments need to be "disinfected" only, a chemical/cold sterilization soak is acceptable, as disinfection will take approximately 10 minutes or more. Check manufacturers' specifications. Also see our warning in using bleach (paragraph 3).

Keep in mind the difference between:

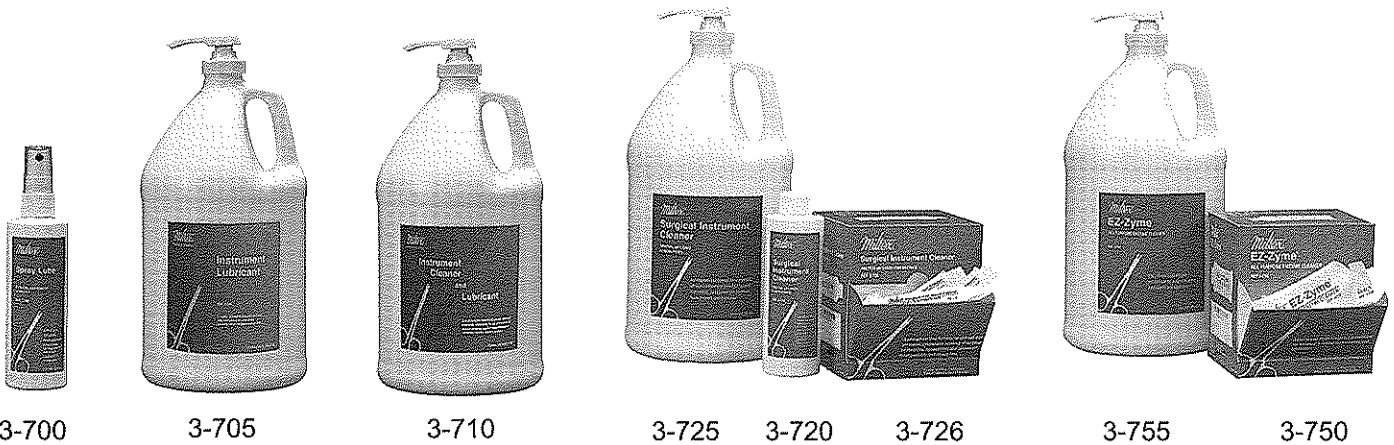
- Sterile - an absolute term (no living organism survives); and
- Disinfected - basically clean. Some organisms may survive. Always use the proper sterilization/cleaning technique to render the instrument in the required condition for use.

CAUTION: For instruments with tungsten carbide insert jaws, the use of chemical/cold sterilization solutions is not recommended as it may deteriorate the instrument's jaw.

We recommend these Miltex products to properly safeguard and care for your quality instruments.

REF	Description	Use During
3-760	Instrument Prep Enzyme Foam 24 oz. spray	• Holding & presoak
3-750	EZ-Zyme [®] , All Purpose Enzyme Cleaner Box 32 - 3/4 oz. packets	• Holding & presoak • Soak cleaning
3-755	EZ-Zyme [®] , All Purpose Enzyme Cleaner 1-gallon pump bottle	• Ultrasonic cleaning • Manual cleaning • Laundry presoak
3-700	Spray Lube 8 oz. spray bottle	• Before autoclaving
3-705	Surgical Instrument Lubricant 1-gallon pump bottle	
3-710	Surgical Instrument Cleaner & Lubricant 1-gallon pump bottle	• Manual cleaning • Washer/decontaminator • Ultrasonic cleaning
3-720	Surgical instrument Cleaner 8 oz. spray bottle	• Soak cleaning • Ultrasonic cleaning • Manual cleaning
3-725	Surgical Instrument Cleaner 1-gallon pump bottle	
3-726	Surgical Instrument Cleaner Box 80 - 1/4 oz. packets	
3-740	Surgical Instrument Stain Remover 3 oz. jar	• Stain removal
3-1000	Nylon Instrument Cleaning Brushes 3-pack	• Manual cleaning of instruments
3-1001	Stainless Steel Instrument Cleaning Brushes 3-pack	
3-800	Instrument Care System	• Complete instrument care
3-810	Instrument Care DVD	• Training personnel in the care of instruments

Instrument Care Products



The Miltex care and cleaning product portfolio is designed to provide optimum cleaning performance and will help to prolong the service life of valuable surgical and dental instrumentation. Many products are available in multiple sizes, including single-dose packets for ease of use, space-saving 8 oz. bottles, and 1-gallon bulk containers with pump dispensers.

REF	Description
3-700	MILTEX Spray Lubricant, 8 fl. oz. spray bottle (0.24 liters) (case of 12)
3-705	MILTEX Lubricant, 1-gallon bottle (3.78 liters).
3-710	MILTEX Surgical Instrument Cleaner/Lubricant, 1-gallon bottle (3.78 liters).
3-720	MILTEX Surgical Instrument Cleaner, 8 fl. oz. bottle (0.24 liters). Contents of 8 oz. bottle makes 32 gallons of solution.
3-725	MILTEX Surgical Instrument Cleaner, 1-gallon bottle (3.78 liters). Contents of 1-gallon bottle makes 512 gallons of solution.
3-726	MILTEX Surgical Instrument Cleaner, Box 80 – 1/4 oz. (7.4 ml) packets. Contents of 1 box makes 80 gallons of solution.
3-740	MILTEX Surgical Instrument Stain Remover, 3 oz. (85g) jar (case of 12)
3-750	MILTEX EZ-Zyme®, All Purpose Enzyme Cleaner, Box 32 – 3/4 oz. (22 ml) packets. Contents of 1 box makes 32 gallons of solution.
3-755	MILTEX EZ-Zyme®, All Purpose Enzyme Cleaner, 1-gallon bottle (3.78 liters). Contents of 1-gallon bottle makes 170 gallons of solution.
3-760	MILTEX Instrument Prep Enzyme Foam, 24 oz. (0.71 liters) spray bottles (case of 12)
3-800	MILTEX Instrument Care System Kit includes one each of Spray Lube, Surgical Instrument Cleaner (8 oz.), Surgical Instrument Stain Remover, Instrument Care Video/DVD, Nylon Brush, Stainless Steel Brush.
3-810	MILTEX Instrument Care DVD, 25-minute instructional DVD designed to help practitioners and staff properly care for instruments
3-1000	MILTEX Nylon Instrument Cleaning Brushes, 7-1/4" (18.4 cm) (set of 3)
3-1001	MILTEX Stainless Steel Instrument Cleaning Brushes, 7-1/4" (18.4 cm) (set of 3)
5-5000	MILTEX Edge Scissors Sharpener, not intended for serrated or SuperCut scissors