

1. HOLDING/PRESOAK

It is important never to hold instruments in a dry container, which 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 of soiled instruments and scopes. Simply spray on instruments until ready for rinsing and disinfection. 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, disinfect and clean as follows:

2. RINSING

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. Always wear safety protection gear.

3. DISINFECTING

To protect medical personnel from contamination during cleaning, immerse instruments completely in an EPA approved disinfectant for approximately 10-20 minutes. Always closely follow manufacturers' recommended disinfecting time and solution preparation instructions. Then rinse again.

CAUTION: Disinfected instruments are NOT STERILE. Never expose stainless steel instruments to bleach or other corrosive chemicals to disinfect. Exposure to bleach may result in instrument pitting and will void all manufacturer guarantees.

4. CLEANING

All blood, dried body fluids and tissue should be completely removed from the instruments prior to sterilization. Several methods 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) are 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 and also be sure dissimilar metal instruments are separated. Rinse instruments under running water to remove solutions. Change solutions frequently.

B. **Ultrasonic Cleaning:** Most instrument manufacturers recommend ultrasonic cleaning as the most effective way to clean surgical instruments, particularly those with hinges, box locks, and other moving parts.

- All instruments must be fully submerged in open position. Use distilled (demineralized) water if possible. Make sure that "sharps" blades do not touch other instruments to prevent possible surface scratching and also be sure dissimilar metal instruments are separated.

- Process instruments for 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:** Follow manufacturers' recommendations but ensure instruments are lubricated after the last rinse cycle and before the sterilization 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 specially recommended stainless steel wire brushes (3-1001) 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. 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 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 glide open and closed smoothly. Test cutting performance at 3/4 length of the blade with the following recommended materials. 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 entire jaw should close 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.

- 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 make sure the hinge areas are rinsed out and no debris remain.

5. AFTER CLEANING

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

6. 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 experience 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 may form that hinders steam penetration.

CAUTION: With most portable tabletop autoclaves, at the end of the autoclave cycle and before the drying cycle, unlock the door and open it no more than a crack, about 1/4" (6.4 mm). 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 room air will rush into the chamber causing condensation on the instruments that may result in water stains or cause 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 cleaning the autoclave chamber. If you have any unusual staining on your instruments after sterilization, obtain our Instrument Care System Video tape (3-810) or contact your local Miltex representative.

7. CHEMICAL/COLD STERILIZATION

Most chemical/cold sterilization solutions render instruments sterile only after 10-hour immersion. This prolonged chemical action can be more detrimental 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)
- 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, we do not recommend use of chemical/cold sterilization solutions, which may deteriorate the instrument's jaw.

For proper instrument care we recommend these Miltex products to 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 • Ultrasonic cleaning
3-755	EZ-Zyme®, All Purpose Enzyme Cleaner 1-gallon pump bottle	• 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

