



Two Striper® Dental, Podiatry Burs and Dermabraders Diamond Instruments

Cleaning/Sterilization

Two Striper® diamond burs (Dental, Podiatry and Dermabraders) can be sterilized in any acceptable manner, including autoclaving, dry heat, chemiclaves and bead sterilizers. Diamond crystals on Two Striper® instruments are permanently bonded to a one-piece, hardened, stainless steel shank. The procedure for sterilizing them is identical to that of stainless steel hand instruments:

- Pre-soaking & Cleaning
- Packaging
- Sterilization
- Monitoring
- Drying/Cooling
- Storage

1. *Pre-soaking & Cleaning (or ultrasonic)*

Separate all dissimilar metals, rinse all instruments in a stream of warm (110°F) tap water. Place instruments in a container of EPA-approved disinfectant for 10 minutes. Discard solution daily.

Cleaning is done via manual (hand cleaning/scrubbing) or mechanical (ultrasonic) When hand cleaning the instruments, scrub them lightly with an instrument cleaner or detergent using a soft, nylon brush. The brush and the instruments should be held under the surface of the liquid to prevent aerosoling and splashing with contaminated droplets. Special attention should be given to the bur surface that is impregnated with the diamond particles. The solution should be changed daily.

In the case of ultrasonic cleaning, the cleaner should be covered and operated for 5-10 minutes or until no visible debris remains on the bur surface. Remove from unit. Rinse in a stream of warm (110°F) tap water and towel dry.

2. *Packaging*

Package clean instruments in a bur holder or an appropriate wrapping material before sterilization. The advantage is protection of the processed instruments from environmental contamination. The instruments may be packaged in functional sets, then opened at chair-side, packaged individually, or in small groups and distributed on sterile/disposable or clean disinfected bur blocks for use at chair-side.

Only a wrapping material that is designated as sterile wrapping for a particular type of sterilization should be used. Some paper wrappings and polyfilm bags or pouches facilitate instrument identification. One type of polyfilm bag is provided as a clear tubing or a roll that may be cut and heat-sealed. These bags are available for steam, unsaturated chemical vapors or dry heat sterilization.

3. *Sterilization*

Various methods of sterilization are possible, including steam, dry heat, cold liquids and unsaturated chemical vapors. Each method has its own advantages and disadvantages. The oldest acceptable method uses moist heat under pressure at higher temperatures. In its usual application, an autoclave is used for this purpose.

Autoclaving

During autoclaving, sterilization is accomplished by the instrument being introduced to steam within a closed chamber. Both of the currently available autoclaving methods, gravity displacement and pre-vacuum are deemed acceptable for sterilization of these instruments. Descriptions of the two methods follows:

- Gravity Displacement – during this method, sterilization is accomplished with the use of steam (using de-ionized water) under pressure at 250°F (121°C) after 20 to 30 minutes at 15psi.
- Pre-vacuum sterilization – this autoclaving method removes all of the air from the autoclave chamber prior to introducing steam (using de-ionized water) to the sterilization cycle, thus allowing for reduced sterilization processing times. Typical specifications for a pre-vacuum sterilization cycle are 270°F (131°C) for 4 minutes of chamber exposure.

Advantages:

- Short cycle time
- Good penetration
- Wide range of materials can be processed

Disadvantages:

- Possible corrosion of unprotected carbon steel instruments
- Dulling of unprotected cutting edges
- Packages may remain wet at the end of the cycle
- May destroy heat sensitive materials

Liquid Sterilants

Prolonged immersion times of between 6-24 hours often are required to achieve sterilization; however, the interval can be even longer under conditions of heavy contamination. The ability to kill bacterial spores is an essential criterion for inclusion of a chemical into the high level disinfection class.

Even though high level disinfectants are capable of sterilizing immersed items, these chemicals are often misused. Instead of immersing items in the solution for the required interval, personnel may only use an interval of 20-30 minutes, then rinse the “sterilized” instruments in warm, non-sterile water. These items are, at best, disinfected, making the use of cold sterilization one of the most abused aspects of infection control.

Advantages:

- Works well on items that are sensitive to heat.

Disadvantages:

- Frequently not done according to directions
- Long time required

Dry Heat

The destruction of all forms of microbial life in the absence of moisture requires different conditions than those mentioned earlier. As proteins dry, their resistance to denaturation increases. Thus, at a given temperature, dry heat sterilizes much less efficiently than moist heat, so higher temperatures are required. Sterilization of instruments with dry heat is the least expensive form of heat sterilization.

A complete cycle involves heating the oven to the appropriate temperature and maintaining the temperature for the proper interval.

Sterilization is accomplished when the internal temperature of the unit is maintained at 320°F for 2 hours. Temperatures greater than 345°F will permanently stain the instruments.

Advantages:

- Effective and safe for all types of metal instruments and mirrors
- Does not dull the cutting edges
- Does not promote rust or corrosion

Disadvantages:

- Long cycle required
- Poor penetration
- May discolor/char fabric
- Will destroy heat-sensitive items

Unsaturated Chemical Vapors

This system depends on heat, water and chemical synergy in order to work. A mixture of alcohols, formaldehyde, ketone, acetone and water is used. The temperature and pressure requirements are greater than those employed when using an autoclave. The principle of the operation has similarities with steam sterilizers, but also has some distinct differences.

The solution of pre-mixed chemicals added to the unit's reservoir must be purchased from the manufacturer because the ratio of each chemical in the preparation is critical. After the unit is pre-heated, the clean, dry and loosely wrapped instruments are placed into the chamber. The package wraps must be loose to allow the chemical vapors to condense on the instrument surfaces. Thick, tightly wrapped items will require longer exposure because of the inability of the unsaturated chemical vapors, including saturated steam, to penetrate under pressure. Metal instruments must be dry prior to sterilization or chemicals will accumulate on the surface and corrosion will occur.

Sterilization with the use of chemical vapors is accomplished when the internal temperatures of the unit is maintained at 270°F at 20-40 psi for at least 30 minutes.

Advantages:

- Short cycle time
- Does not rust or corrode metal instrument
- Does not dull cutting edges
- Suitable for orthodontic stainless wire

Disadvantages:

- Instruments must be completely dry before processing
- Will destroy heat-sensitive plastics
- Chemical odor is present in poorly ventilated areas

4. *Sterilization Monitoring*

The goal of sterilization is the complete killing of all forms of bacterial life. The only way to determine if all items are efficiently processed is to test each instrument for living organisms. This is impossible because the test items could be used for patient care. The object, therefore, is to keep the risk as low as possible by using properly designated sterilization equipment in a carefully controlled manner. Sterilization monitoring (spore testing), use of chemical indicators and physical monitoring is part of the overall controlled sterilization process needed to achieve a high level of quality assurance.

5. *Drying and Cooling*

Wet bur blocks or packages after steam sterilization may indicate problems with package composition, overloading of the chamber, improper arrangement of the packs in the chamber, removal of the packages too soon after the sterilizing cycle or a defective unit. It is important to follow the manufacturer's instructions relating to post-sterilization drying cycles or "crack" the chamber door for a few minutes after the pressure indicator reads zero. Sterilized bur blocks or packages that remain wet or become wet may draw organisms through the packaged materials or compromise the integrity of the material itself. Drying time recommendations follows:

- Gravity Displacement – Dry 20 to 50 minutes
- Pre-vacuum Sterilization – Dry 20 to 40 minutes.

Variables that could affect drying times are: loading density of tray, instrument configuration, total contents of sterilizer, quality of steam, unit maintenance, and other factors.

Items being cooled after they are removed from the unit at the completion of its cycle must remain untouched and protected from the environment. Blowing of unsterilized (open) air may contaminate them. Using a fan to cool down wrapped instruments is acceptable; however the warm packs should not be placed under air conditioning or cooling vents. Warm instruments should not be transferred to a cold surface, for this will also encourage condensation which can lead to rust/corrosion.

6. *Storage*

A rapid turn-around time in instrument processing is an important goal as this determines the number of bur blocks necessary to maintain a good patient flow. Thus, storage of instruments for more than a few days is uncommon.