INSTRUMENT CARE

STAINLESS STEEL INSTRUMENTS

- Stainless Steel has superior corrosion resistance, it will discolor and corrode when exposed to higher than recommended chemical concentrations or certain chemicals.
- Stainless steel should not be exposed to the following chemicals:
- **Sodium Hypochlorite (household bleach), Tartaric Acid (stain and tartar remover), Aluminum Chloride, Barium Chloride, Bichloride of Mercury, Calcium Chloride, Carbolic Acid, Chlorinated Lime, Citric Acid, Dakin's Solution, Ferrous Chloride, Lysol, Mercuric Chloride, Mercury Salts, Phenol, Potassium Permanganate, Potassium Thiocyanate or Stannous Chloride**.
- The following chemicals should NEVER be used with stainless steel:
- **Aqua Regia, Ferric Chloride, Sulfuric Acid, Hydrochloric Acid or Iodine.**

CARBON STEEL INSTRUMENTS

- Carbon steel instruments are NOT compatible with most automated washers, are more sensitive to chemicals than stainless steel and require special handling.
- Carbon steel should NOT be exposed to any of the previously listed chemicals for stainless steel.
- Separate carbon steel instruments from stainless steel instruments throughout the cleaning and sterilization process. If processed together, the carbon steel instrument will likely create cross-corrosion on the stainless instruments.
- Carbon steel instruments should be thoroughly dried prior to sterilization to prevent rusting and/or corrosion.
- Use a protective rust-inhibitor before sterilization.

COMPOSITE INSTRUMENTS

- For all types of composite instruments ,always wipe off any composite material from the working end with 2x2 alcohol gauze even if the material is not visible. This will promote easy cleaning in the ultrasonic cleaner and will avoid manual removal of any dried debris which can permanently harm the surface finish.

  Cleaning
  - Composite instruments can be cleaned by the acceptable dental office methods; ultrasonic cleaning, automatic dishwashers, manual cleaning.
  - Enzymatic or mild detergents are recommended for the ultrasonic cleaner. Keep the instruments together with the procedural set-up for efficient processing.

  Sterilization
  - All composite instruments can be heat sterilized by the acceptable methods, not exceeding 350°F/177°C.

ULTRASONIC INSTRUMENTS

- Inspect, clean and sterilize (autoclave only). Steam sterilize for at least 5 min. at 273˚F/134˚C or 20 min. at 250˚F/121˚C. Do not heat above 275˚F/135˚C.
- Do not expose to phenols or iodophors or dry heat sterilization.
- Inserts with bent, altered or worn tips or other compromising conditions should be removed from service.

HINGED INSTRUMENTS

- All hinged instruments—forceps, rongeurs, scissors, pliers, hemostats, orthodontic pliers, etc.—should be kept lubricated. Regular use of proper lubricants will prevent rust, corrosion and stiff joints and will ensure smooth operation.
- (Household lubricants and handpiece lubricants are NOT recommended.)
- All hinged instruments should be sterilized in the open position.

ANODIZED ALUMINUM

- Special care needs to be exercised in cleaning and sterilizing these coated aluminum instruments.
- Do not clean in an ultrasonic unit. Clean by hand or in some automated washers.
- Check processing product labels for caution about use with aluminum.
- Sterilize in autoclave, chemiclave or dry heat under 350°F (177°C) according to manufacturer's instructions.
- Note: Anodized aluminum instruments, when sterilized with stainless steel instruments, may cause an adverse chemical reaction.

INSTRUMENT CLEANING AND STERILIZATION

INSTRUMENT CLEANING

- All instruments need to be cleaned and thoroughly dried before they are sterilized.
- They should be washed with a non-corrosive, low sudsing neutral detergent.
- Instrument cleaning can be accomplished by ultrasonic or automated cleaning, which is preferred to minimize the opportunity of sharps injuries due to hand scrubbing.
- Use of any abrasive brush or materials to clean instrument is not suggested

INSTRUMENT STERILIZATION

- Sterilization is a process that kills microorganisms. There are three common methods of heat sterilization used in the dental office that can be verified by spore testing (steam autoclave, dry heat, and chemical vapor).

COMPARISON OF CLEANING METHODS

METHOD	ADVANTAGES	DISADVANTAGES
Hand scrubbing	• Effective if performed properly	• Increases chances for operator injury • Increases spread of contamination through splatter • Labor-intensive • Need proper care of scrub brush
Ultrasonic cleaning	• Safer than hand scrubbing • Effectively cleans all instruments • Reduces chances for spread of contaminants through splatter. • Allows for more efficient use of staff time.	• Microorganisms may accumulate in cleaning solution. Solutions should be changed every 8 hours. • Ultrasonic cleaning will not remove • hardened permanent cement. • (Solution: remove cement while it is still soft.)
Automated washer	• Safer than hand scrubbing • Reduces chances for spread of contaminants through splatter and aerosols • Allows for more efficient use of staff time • Effectively cleans instruments	• Not all instruments are compatible with automated washers. Please see manufacturer's instructions for detailed requirements.

COMPARISON OF HEAT STERILIZATION METHODS

METHOD	STANDARD STERILIZATION CONDITIONS*	ADVANTAGES	PRECAUTIONS
Steam autoclave	20+ minutes at 250°F/121˚C (15 psi)	• Time efficient • Good penetration • Sterilize water-based liquid	• Do not use closed containers • May damage plastic and rubber items • Non-stainless steel metal items corrode • Use of hard water may leave deposits • Dry instruments
Unsaturated chemical Vapor	20 minutes at 270°F/132˚C (20–40) psi	• Time efficient • No corrosion	• Do not use closed containers • May damage plastic and rubber
Dry Heat **Dry heat oven**	60–120 minutes at 320°F/160˚C	• No corrosion • Can use closed containers • Large capacity per cost • Items are dry after cycle	• Longer sterilization time • Cannot sterilize liquids • May damage plastic and rubber items • Do not open door before end of cycle • Dry instruments
Rapid dry heat transfer	12 minutes at 350°F/177˚C (for wrapped items) 6 minutes at 350°F/177˚C (For unwrapped items)	• No corrosion • Short cycle • Items are dry after cycle	• Cannot sterilize liquids • May damage plastic and rubber items • Do not open door before end of cycle • Small capacity per cost • Dry instruments • Unwrapped items become contaminated after cycle

* These conditions do not include warm-up time and they may vary depending on the nature and volume of the load

RECOMMENDED METHOD OF INSTRUMENTS STERILIZATION

Sterilization Method	Recommended Temperature	Expected Advantages
Steam Autoclave	121˚C for 20 minutes	• Time efficient • Good Penetration • Sterilize water-based liquid
Dry Heat	160˚C for 60 to 120 minutes	• No Corrosion • Large capacity per cost • Items are dry after cycle
Chemical Vapor	132˚C for 20 minutes	• No Corrosion • Time efficient • Items dry quickly after cycle

TROUBLE SHOOTING GUIDE

INSTRUMENTS

Problem	Cause	Prevention
Spotting	• Insufficient rinsing after ultrasonic cleaning	• Rinse thoroughly under steady stream of water for 30 seconds
	• Insufficient drying after ultrasonic cleaning	• Rinse with hot water • Optional: Dip cassettes in alcohol after rinsing
	• Not changing ultrasonic solution	• Solution should be changed at least once a day
	• Sterilizer has not been cleaned	• Sterilizers should be cleaned weekly or per manufacturer recommendations • Use only distilled water for reservoir
Rust	• Corrosion from carbon instruments spreads to stainless steel instruments	• Separate stainless and carbon instruments • For carbon steel instruments: Dip in pre-sterilized rust-inhibiting solution as suggested by sterilizer manufacturer
Pitting	• Chemical attack on instruments	• Rinse and dry instruments thoroughly • Use approved cleaning, sterilization solutions only. Never use household bleach or stain and tartar remover

CASSETTES

Problem	Cause	Prevention
Staining		
• **Black**	• Amalgam left in carrier	• Thoroughly empty amalgam carrier before returning to cassette • If carrier is plugged, sterilize separately and unplug while carrier is warm
• **Green**	• Chrome breakdown of instruments	• Inspect instruments and replace those with cracked handles or peeled plating
• **Yellow/Brown**	• Sterilizer has not been cleaned • Normal use discoloration	• Change reservoir water once a week • Regularly clean chamber and filters
Broken Hinges	• Overloading/ improperly placed instruments	• Instruments should not protrude from cassette • Only light force is needed to close the cassette
	• Improperly placed rails	• Properly reposition cassette rails
Wet Packs	• Insufficient drying before or during sterilization	• Thoroughly dry cassette after cleaning, before wrapping • Crack open autoclave sterilizer door during dry cycle • Optional: After sterilization cycle, leave cassettes in warm sterilizer for 10 minutes
	• Improper loading of cassettes in sterilizer	• Do not overpack sterilizer • Keep cassettes slightly separated within the chamber • Always use sterilizer's cassette rack