

Synopsis of Dental Handpiece Maintenance Systems (Project #11-08) (10/11)

In clinical evaluations of high-speed handpieces, cleaning and lubrication were the most critical factors in determining performance and durability.^{1,2,3} Manufacturer instructions for cleaning, lubrication, and sterilization should be followed closely to maximize the life expectancy of the handpieces as well as to effectively heat sterilize the device. Without proper cleaning and maintenance, tooth debris, foreign materials and lubricant can be baked onto the bearings and other handpiece surfaces resulting in reduced mechanical efficiency and premature handpiece failure.



It has been well documented in published studies that high-speed handpieces have the potential for retracting oral fluids into the internal components and that the retained patient materials can be expelled intraorally during subsequent uses on patients.⁴⁻⁸ Recent studies have shown that the internal portions of some low-speed handpiece motors have the potential to become contaminated when used with both disposable and reusable prophylaxis angles and there is the potential for internal contamination to be released through the prophylaxis angle into the mouth of a patient during subsequent uses.⁹⁻¹¹ As a result, infection-control protocols/asepsis for dental handpieces and other devices that can be removed from the air and waterlines must address both the outside and the inside of the device.

Recommended pre-sterilization maintenance processes are similar for all handpieces with only slight variations. Handpiece asepsis begins chair side by carefully wiping any visible debris from the handpiece and flushing the handpiece water and/or air lines for 20–30 seconds with the bur in place. This procedure is intended to help physically flush out patient material that might have entered the turbine and air and waterlines.¹² Following this, all handpieces and attachments should be transported to the clinic instrument processing area. The handpiece is then scrubbed, rinsed, and dried. Most manufacturers do not recommend ultrasonic cleaning, however some do. A sequential process of cleaning, purging, lubricating and more purging follows. Some manufacturers have combined the lubricant with the cleaner, eliminating some steps. Purging after lubrication is critical because it distributes lubricant to the air turbine assembly and expels any excess. Finally, if applicable, the fiber optics at both ends of the handpiece should be cleaned with a damp cotton swab according to manufacturer instructions. Because handpiece maintenance is performed outside of the dental operator, usually in the “contaminated” area of the instrument processing area the instrument processing area should be equipped with compressed air for purging.

A variety of systems to help with handpiece maintenance before heat sterilization are commercially available with the most basic product being a manually-operated purging station. After administering the cleaning and lubricating solutions, the handpiece is held to the device to purge it. Recently, units have been introduced which use an automated process to clean, lubricate, and purge handpieces. Some of these units can handle more than one handpiece at a time. The handpieces are simply snapped onto the appropriate coupler, the door closed, and after pushing the start button, all processes occur automatically. At the completion of the cycle, the handpieces are ready for packaging and heat sterilization.

Most of the automatic-maintenance units can handle the majority of currently available high- and low-speed handpieces, air motors, and e-type attachments. One “purge-only” device can handle only high-speed handpieces. All of the units accept most major handpiece brands, however manufacturer-specific couplers (typically sold by the supplier of the unit) may need to be purchased separately.

Handpiece manufacturers typically recommend using their own products to maintain their handpieces and offer proprietary cleaners, lubricants and other maintenance items when handpieces are purchased. When asked, most handpiece manufacturers had no information to indicate that maintaining their handpieces on another manufacturer's system was detrimental. Some manufacturers even indicated they would honor the handpiece warranty if maintained on another manufacturer's system. However, it is advisable to consult with the handpiece manufacturer before purchasing another manufacturer's maintenance system.

In summary, the inventory, maintenance, repair and replacement costs of handpieces can be extremely high. Automated maintenance systems have the potential to save time, provide consistency to the overall handpiece maintenance process and reduce repair costs. These factors should be considered when deciding whether to purchase a handpiece maintenance system. The following [synopsis](#) consists of tables listing selected handpiece

maintenance systems, their manufacturers, and basic information. This [synopsis](#) should assist the reader in selecting a handpiece maintenance system.

References

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11. Herd S, Chin J, Palenik CJ, Ofner S. The in vivo contamination of air-driven low-speed handpieces with prophylaxis angles. *J Am Dent Assoc* 2007;138:1360–1365.
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Dental Handpiece Maintenance Systems*

| Product | Assistina 301 Plus  | Care3Plus (CO Model)  |
|--|--|---|
| Manufacturer | A-dec, Inc. 2601 Crestview Drive Newberg, OR 97132 (800) 547-1883 (503) 538-9471 (503) 537-2702 (FAX) www.a-dec.com | NSK America 700 B Cooper Court Schaumburg, IL 60173 (888) 675-1675 (800) 838-9328 www.nskamerica.com |
| Number of Handpieces Accepted | 1 | 3 |
| Types of Handpieces | High speed, low speed, air motor, air scaler, electric | High speed, low speed, air motor, air scaler, electric |
| Compatible Handpieces | KaVo, Lares, Midwest, NSK, Siemens, Star, W&H | KaVo, Lares, Midwest, NSK, Siemens, Star, Sirona, W&H |
| Automatic or Manual | Automatic | Automatic |
| Cycle Time | 35 sec | 35-40 sec (3) programmable settings: short, long, and extra long |
| Air Pressure Requirements and Features | 65-140 psi Quick swivel air hose coupling | 50-80 psi Air supply button |
| Vapor Removal | Automatic: Air filter system | Air filter system |
| Cleaner/Lubricant Indicator | Yes | Yes |
| Electrical Requirements | None | 120V/230V 50/60 Hz |
| Weight | 5.95 lbs | 15 lbs |
| Dimensions (W x H x D) | 7.5" x 8.8" x 16.3" | 11" x 14" x 9" |
| Reservoir Capacity | 250 mL (both reservoirs) | 350 mL |
| Cycles per Full Reservoir | 2,500 (handpieces) | 3,000 (handpieces in slow mode) |
| Recommended Cleaner/Lubricant | W&H service oil W&H maintenance solution | Care 3 Maintenance oil |
| Warranty | 1 year | 1 year |
| Additional Items Included with Purchase | Solution for 7,000 cycles and Universal adapter | Maintenance oil (1L), oil replenish funnel w/filter, mist filter set, oil absorber sheet, air tube, air filter, (3) standard ports for air driven handpieces only |
| Suggested Retail Price Government Price | \$2,435.00 \$1,105.05 | \$2,450.00 \$1,450.00 |

*Manufacturers provided the data for these tables. The listing or omission of a product in this table does not imply endorsement, approval, or disapproval by DECS.

Dental Handpiece Maintenance Systems*

| Product | DCI Flush  | STATMATIC  |
|--|--|--|
| Manufacturer | DCI International 305 N Springbrook Road Newberg, OR 97132 (800) 624-2793 (503) 538-9302 FAX www.dcionline.com | SciCan, Inc. 701 Technology Drive Canonsburg, PA 15317 (800) 572-1211 (724) 820-1600 (724) 820-1479 FAX www.sciscanusa.com |
| Number of Handpieces Accepted | 1 | 3 (w/an integrated chuck cleaner) |
| Types of Handpieces | High speed only | High speed, low speed, air motor, and electric handpiece |
| Compatible Handpieces | KaVo, Lares, Midwest, NSK, Star, W&H, Borden, Henry Schein | KaVo, Lares, Midwest, NSK, Star, W&H, Siemens: SciCan, Bien-Air, Henry Schein, Kinetic Instruments, Morita, Patterson, Sirona, Vector |
| Automatic or Manual | Manual | Automatic |
| Cycle Time | Operator determines | 15-60 sec (4 programmable settings in 15 sec increments) |
| Air Pressure Requirements and Features | 80 psi Adjustable air pressure, 35 micron filter | 58-87 psi |
| Vapor Removal | None | Absorption pads |
| Cleaner/Lubricant Indicator | N/A | Yes |
| Electrical Requirements | None | 100-230V 50/60 Hz |
| Weight | 1 lb | 18.9 lbs |
| Dimensions (W x H x D) | 4.25" x 5.5" x 9.5" | 11.4" x 16" x 7.6" |
| Reservoir Capacity | N/A | N/A |
| Cycles per Full Reservoir | N/A | 500 |
| Recommended Cleaner/Lubricant | Follow handpiece manufacturer's recommendation | Statmatic and KaVo QUATTROcare spray can |
| Warranty | 1 year | 10 years |
| Additional Items Included with Purchase | All adapters sold separately | Absorption pad |
| Suggested Retail Price | \$195.00 | \$2,700.00 |
| Government Price | \$195.00 | \$1,620.00 |

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Dental Handpiece Maintenance Systems*

| Product | Midwest Air Station  | QUATTROcare  |
|--|---|--|
| Manufacturer | Dentsply/Midwest 901 West Oakton Street Des Plaines, IL 50018 (800) 800-2888 (847) 640-6165 (FAX) www.dentsply.com | KaVo Dental 340 East Main Street Lake Zurich, IL 60047 (800) 323-8029 (847) 550-6825 (FAX) www.kavousa.com |
| Number of Handpieces Accepted | 1 | 4 |
| Types of Handpieces | High speed, low speed, air motor, electric | High speed, low speed, air motor, air scaler, electric |
| Compatible Handpieces | KaVo, Lares, Midwest, NSK, Star, W&H | KaVo, Lares, Midwest, NSK, Siemens, Star, W&H |
| Automatic or Manual | Manual | Automatic (fan filter) |
| Cycle Time | Operator determines | 20-45 sec |
| Air Pressure Requirements and Features | 34-100 psi | 58-145 psi Built in automatic regulator |
| Vapor Removal | Spray guards | Automatic: fan/filter |
| Cleaner/Lubricant Indicator | N/A | Yes |
| Electrical Requirements | None | 120 V 50/60 Hz |
| Weight | 1lb | 22lbs |
| Dimensions (W x H x D) | 8" x 2.75" x 4.5" | 13-9/16" x 15" x 11" |
| Reservoir Capacity | N/A | 500 mL (spray can) |
| Cycles per Full Reservoir | N/A | 100 (400 handpieces) |
| Recommended Cleaner/Lubricant | Follow handpiece manufacturer's recommendation | QUATTROcare spray can |
| Warranty | 6 months | 1 year |
| Additional Items Included with Purchase | 12 Spray guards | QUATTROcare spray can, (2) multiflex coupler, (1) E-type couplers, (1) INTRA head adapter |
| Suggested Retail Price | \$315.00 | \$3,402.00 |
| Government Price | \$174.00 | \$1,939.59 |

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Dental Handpiece Maintenance Systems*

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|--|--|
| Product | <p>Lubrina[†]</p>  |
| Manufacturer | <p>J. Morita 9 Mason Irvine, CA 92618 (800) 831-3222 (949) 581-9600 (949) 581-8811 (FAX) www.jmoritausa.com</p> |
| Number of Handpieces Accepted | 4 |
| Types of Handpieces | High speed, low speed, contra-angles, straight handpieces, air scalers, electric handpieces |
| Compatible Handpieces | KaVo, Sirona, Bien-Air, NSK, W&H |
| Automatic or Manual | Automatic |
| Cycle Time | 25 sec (short mode, long mode, and long blow-out mode) |
| Air Pressure Requirements and Features | 43.5-72.5 psi (recommended 50.8 psi) |
| Vapor Removal | Air suction system |
| Cleaner/Lubricant Indicator | Yes |
| Electrical Requirements and Features | 100-240 V 50/60 Hz |
| Weight | 22 lbs |
| Dimensions (W x H x D) | 12" x 15" x 12" |
| Reservoir Capacity | Any of the two various spray cans listed below |
| Cycles per Full Reservoir | 1,380 (handpieces) |
| Recommended Cleaner/Lubricant | <p>Morita AR spray (420 mL), KaVo spray (500mL), Bien-Air Lubrifluid spray (500 mL), W&H Serivce Oil F1 spray (400 mL), Sirona T1 spray (250 mL), and NSK Pana spray (480 mL) NOTE: Two different sprays can be used in the same cycle.</p> |
| Warranty | 1 year |
| Additional Items Included with Purchase | AR spray (420 mL), AR Spray Can Stand, (5) Oil Absorption Pads, Oil absorption Case, Tray, Tray Filter, Air tube, and power cord |
| Suggested Retail Price | \$ 2,420.00 |
| Government Price | Contact manufacturer for government price. |

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[†]Lubrina has built-in chuck maintenance system for Morita instruments only.