

THE DENTAL ADVISOR™

"Improving Patient Care Through Research & Education"



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THE DENTAL ADVISOR evaluates and rates dental products and equipment by objective clinical and laboratory protocols. The publication consists of clinical evaluations, comprehensive long-term evaluations, product comparisons and specialty reports. To subscribe, please call 734-665-2020.

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Electric Handpieces

Benefits of Electric Handpiece Systems

Constant Speed and Torque

An air-driven handpiece rotates at 300,000 to 350,000 rpm; however, when placed under load, the handpiece actually cuts at 180,000 to 200,000 rpm. An electric handpiece maintains a constant speed of 200,000 rpm. The constant torque of an electric handpiece eliminates the stalling or reduced speeds experienced when using an air-driven handpiece to cut through crowns or other dense materials.

Concentric Cutting

The constant torque produces a concentric cutting motion as speed is maintained. The feather motion needed when using an air-driven handpiece results in varying degrees of irregularities at the margin of a preparation. The gears of the electric handpiece hold the bur in a locked position to prevent the wobble or vibration of the bur that is often experienced when using an air-driven handpiece. Constant torque and stabilization of the bur allow a concentric motion that ultimately produces a smooth, even margin.

Reduced Noise

While no handpiece is truly quiet, the electric handpiece produces a much quieter noise than the high-pitch sound of the air-driven systems.

Product	Company	Motor Speed Range, rpm	Motor Speed w/ Attachment, rpm
Apex	Lares Research	60-40,000	770-200,000
EA-40LT	A-dec/W&H	2,000-40,000	150-200,000
EA-50LT	A-dec/W&H	300-40,000	3-200,000
ELECTROtorque	KaVo	2,000-40,000	27-200,000
ELECTROtorque plus 701KL	KaVo	2,000-40,000	27-200,000
Midwest eStylus	DENTSPLY Professional/Midwest	1,500-40,000	150-200,000
Optima MX	Bien Air	100-40,000	100-200,000
Optima Plus T&R	Bien Air	20-40,000	20-200,000
SIROTORQUE I EL-1	Sirona Dental Systems	2,000-40,000	87-200,000
SIROTORQUE I SL	Sirona Dental Systems	2,000-40,000	87-200,000
TiMax NL 400	Brasseler USA/NSK	2,000-40,000	2,000-200,000
Titan E-lectric Motor System	DentalEZ Group/StarDental	1,000-40,000	62.5-200,000

*E = external, I = internal, TT = tabletop

**Internally available only in the C Series Treatment Center

***Motor replacement cost

na = not available

ce = currently evaluating

Turbine-free Attachments

Failure of the turbine is the leading cause of malfunction in an air-driven handpiece. Electric handpiece attachments utilize gears rather than turbines. The use of gears allows the handpiece to maintain constant torque and more concentric cutting. While most attachments have two gears, some provide three gears to better distribute the load. This feature reduces the wear on the bearings, resulting in less failure over time.

One Motor/Several Attachments

One motor is used for high-speed and slow-speed attachments with an operating range of 70-200,000 rpm. A large variety of attachments are available for high-speed, slow-speed, endodontic and implant placement procedures.

Manual Control of Operating Speed

The motor speed is easily adjusted to provide precise control of the rotation of the bur for a specific procedure. Most current systems offer a digital display of the current operating speed.

Recent Improvements

Brushless Motors

Early electric motors utilized small brushes in the gear systems. Over time, the carbon brushes wore against the rotors and required replacement. Many of the new motors are brushless, reducing the need for routine maintenance.

Shorter, Lighter-weight Motors

The greatest complaint of clinicians converting to the first electric handpiece systems was the increased weight as compared to air-driven handpieces. Manufacturers have significantly reduced the length and weight of the motor and improved the balance between the motor and attachments.

Fewer Attachments

A wide speed range allows all procedures to be performed using the same electric motor. The first systems required several different costly attachments requiring the clinician to change between steps.

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THE DENTAL ADVISOR Recommends:

ELECTROtorque plus 701KL (97%), ELECTROtorque (96%), Optima Plus T+R (94%), Midwest eStylus (92%), Titan E-lectric Motor System (92%)



Midwest eStylus
(DENTSPLY Professional/Midwest)



Titan E-lectric Motor System
(DentalEZ Group/StarDental)

Other Featured Products



Optima MX
(Bien Air)

Installation Options*	Motor Weight/Length	Auto Reverse	Brushless	Motor Cost	Handpiece Cost	Rating
E	100 g/94.3 mm	Yes	Yes	\$859	200LS-\$899, 40LS-\$749, 10LS-\$779	na
TT, A-dec Cascade-I	79 g/47 mm	No	Yes	\$2,700	\$1,175	na
A-dec 500-I	79 g/47 mm	No	Yes	\$2,800	\$1,250	na
E	94 g/46 mm	No	No	\$1,795	25LPA-\$1,540, 25LHA-\$1,220	96%
E, I – KaVo operatory only	99 g/46 mm	No	Yes	\$2,905	25LPA-\$1,540, 25LHA-\$1,220	97%
E, TT	98 g/51 mm	Yes, w/torque limiting	No	\$2,458	HS-\$1,295, LS-\$1,062	92%
E, I	116 g/66 mm	Yes, w/torque	Yes	\$2,950	\$1,154	ce
E, I	102 g/64 mm	Yes, w/torque	No	E-\$2,100, I-\$2,600	\$1,154	94%
E, I, Retrofit**	100 g/98 mm	Yes	No	\$1,333***	\$551.50 – \$1,499	ce
E, I, Retrofit**	60 g/87 mm	Yes	No	\$1,007***	\$664.25 – \$1,499	ce
E	76 g/147.3 mm	No	Yes	\$1,795	\$400 – \$1,050	na
E, I, TT	106 g/69 mm	No	No	\$1,395	\$825	92%

EDITORS' NOTES: Only products evaluated by THE DENTAL ADVISOR are eligible for listing as a recommended product. Table information provided by manufacturer. Costs are listed for comparison only and are not used to calculate the ratings; all costs shown in U.S. dollars.

Electric Handpieces *continued*

Manufacturers have designed attachments that can be used for several different applications with control of the speed at the conversion box or on the delivery system.

Reduction in Height and/or Angle of the Attachment

Intraoral attachments for the first electric systems had large heads and steep angles, which became a challenge in areas of limited access. New attachments have been designed to provide easier access. Some manufacturers have reduced the size of the head, while others have reduced the distance from the tip of the bur to the top of the handpiece head. The angle of the attachment has also been reduced to improve access.

Integration into Delivery Systems

The first systems in the United States offered only external air/electric conversion kits. While tabletop models are still available, the new electric handpiece systems can be fully integrated into the tubing of the delivery system.

Auto-reverse

As with all rotary endodontic systems, there is a risk of separating files. Some of the new electric handpiece systems have specific endodontic attachments that automatically reverse when the file engages.

Handpiece Maintenance Systems

Daily maintenance remains essential, prolonging the life of any handpiece and optimal function. Using the proper type of cleaner/lubricant and purging the attachment before sterilization are very important. Automatic handpiece maintenance systems (*QuattroCare/KaVo*; *Assistina 301 Plus/A-dec/W&H*) provide a quick and efficient way to extend the life of a handpiece by ensuring the proper type and amount of lubricant along with thorough purging. ■

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