

Illustrated Technique Guide



AET at a Glance



Precautions:

Do not force files. Gently work shaping files toward apex with handpiece. Discard files if tips become overly bent.

Discard files after patient treatment is complete.

Study individual instructions and precautions for each chemical used, including EndoREZ $^{\circledast}\!\!.$

Endo-Eze System:

AET - Anatomic Endodontic Technology: "Listen to the Needs of the Tooth"

Perception



The buccal view (clinical radiograph view) of the canal leads one to believe it is round in cross-section throughout its length.

Reality



The same root rotated 90° and viewed from the mesial aspect shows most of the canal is not round in crosssection. This anatomical reality demonstrates the need for a system that treats the complete canal, thus listening to the needs of the tooth.

Rotary Type Preparation



Rotary instruments can remove dentin where not needed while leaving excess soft tissues.

Rotary instruments do not clean and shape the entire canal. Tooth structure can be unnecessarily removed even to the point of compromising the integrity of the tooth.

AET Reciprocating Preparation



AET cleans and shapes canals using the canal anatomy as a guide, hence preserving tooth structure.

Anatomical realities/foundations which guide AET cleaning and shaping:

- Most teeth have canals with elliptical or even flat, ribbon shaped cross-sections in the "Middle Third." The greatest width runs buccolingually for lower teeth and bicuspids. It runs mesiodistally for palatal roots of upper first molar and upper centrals.
- 2 The "Apical Third" is almost always close to round in cross section and approximately 3mm in length.
- 3 The apical constriction is seldom larger than a #20 file.

Beginning Perception



Finished Reality



One gutta percha and EndoREZ Treatment, Xrays and photo courtesy of Dr. Fred Barnett, Assoc. Prof., Albert Einstein Medical Center, Philadelphia

EndoREZ®:

Hydrophilic Sealant/Filler. Actually has an AFFINITY for moist dentin!

Listens to the Requirements Necessary for Quality Obturation:

- Hydrophilic
- · Highly radiopaque
- Biocompatible



Handpiece

Endo-Eze® Handpiece

30° reciprocation preserves tooth structure and prevents file breakage!

Significantly less aggressive than a rotary "screw type" motion, plus it facilitates uniform instrumentation of all the walls of the canal.



Endo-Eze Files - Quality stainless by design.

Shaping Files

Apical Files

I. Shaping Files

Designed for side cutting

The design facilitates cleaning and shaping of the "Middle Third" of the canal with "milling" (side-toside type action). The tiny, flexible, non-cutting tips prevent ledging. The standard shaping files come in 3 tapers (for varying levels of stiffness) and 4 lengths.



II. Apical Files

These are designed to cut only in the "Apical Third" of the canal. Because the cutting edges are only on the end of the file, the clinician knows that resistance is felt only in the "Apical Third." Additionally, the taper is slightly greater than the standard ISO 2%, assuring that when "tug back" is felt with an ISO 2% cone, it is only occurring at the tip. Four sizes of Endo-Eze apical files are included in the standard patient kits. These are available in four different lengths. Apical files are available in separate packages for diameters larger than a #30 file and also smaller than a #15.





The standard kit contains all the file sizes needed for most root canals. Note that the largest apical file in the kit is a #30 because most apical constrictions are less than a size #20.



Auxiliary "C" Shaping File

The Auxiliary "C" shaping file is an additional size to use between yellow and blue files for the highly calcified canal.

Tip diameter = .13

Taper = .035

Note: Unless a general dentist is very experienced in endodontics, we recommend referring treatment of highly curved and/or calcified canals to an Endodontic Specialist.

File Refills





AET Procedure:

Refer to Endo-Eze Instructions for use for complete details and recommendations. *Note:

I. "Coronal Third"



I. "Coronal Third"

II. "Middle Third"



Use round or tapered diamond for initial access (some prefer the #4-6 round carbide).

III. "Apical Third"





Enlarge access to pulp chamber laterally using safe end tapered diamond bur.



The acorn burs. cut as they are withdrawn only.



available in two sizes,

Improve the access (rectification) to the canals with a straight-line access diamond bur. Care should be taken to remove the minimum amount of dentin required to achieve access and/or negotiation of curved canal(s).





II. "Middle Third"



Instrumentation of the "Middle Third" cleans and shapes most of the canal. This portion is completed before going to the "Apical Third" to prevent expulsion of tissue past the apex. The shaping files are designed to avoid creating ledging, even when used only in the "Middle Third."



Step: 1 Measure parallel radiographic length with clear Endo-Eze scale. (Optional: Apex locators)



#3

I STATE

#1 #2

Shaping Files

Step: 2 Insert #1 shaping file by hand. Briefly manipulate file to find path. File-Eze is recommended to facilitate initial file insertion into canal.

Important Note: If resistance is encountered going to length, never apply force. File-Eze® Chelator and cutting lubricant.

17mm 21mm 25mm 27mm 17mm 25mm 27mm NaviTip® FX Tips 17mm 25mm

File-Eze and sodium hypochlorite are delivered through unique NaviTip or NaviTip FX. File-Eze is used with the first two or three instruments only. Copious sodium hypochlorite is used during entire instrumentation and cleansing procedure alternating with liquid EDTA between each file.

II. "Middle Third" (cont'd)

Step: 3

Insert shaping file #1 into Endo-Eze Handpiece and position file to previously determined radiographic length minus 3mm (average "Middle Third" length).



Move the shaping file in a side-to-side motion, lifting slightly to facilitate removal of tissue coronally, while stroking along canal walls. Lean the file firmly, side to side, flexing the file. Repeat with shaping files #2 and #3. Irrigate with copious sodium hypochlorite (ChlorCid is recommended) after using each file. **Do not use peroxide-containing lubricants or irrigants with this system.**

Helpful Hint:

If initial file insertion into calcified canals is difficult, work #2 shaping file into initial 1-2 mm of canal. Express File-Eze around tip end of file while it is engaged. Attach handpiece to the file. Run handpiece gently moving the file into the canal. Insert only onethird to one-half the length of the canal. This flares the upper canal.

Once initial flare is accomplished, go back to a #1 shaping file and treat in usual progression. Using this technique usually enables one to reach into problematic canals, avoiding the time-consuming "noodling" of small diameter, small taper files.



AET side-to-side "Milling"



- 1. Equally addresses all walls for anatomical cleaning and shaping.
- 2. Minimally invasive.
- 3. Substantially reduces file breakage/separation.



"Middle Third" instrumentation completed

III. "Apical Third"



Canals are usually round in cross-section in the apical 3mm. AET addresses this anatomical feature by "listening to the tooth's anatomy."







Measure file and set working length with rubber stop. X-ray verification is accomplished with shaping #1 and/ or apical 15 or 20 files in canal. Electronic apex locator may be used as an alternative.





Note: If resistance to vertical positioning is encountered in a curved canal, bend the file 1-2mm from the tip and rotate toward canal curvature while inserting.

III. "Apical Third" (cont'd)

The apical instrumentation occurs quickly with a conventional twist-pull motion starting with the #15 file and ending with the #30 file. If resistance is felt with the #25 file inserted to full working length, stop and move to obturation phase. If resistance to rotation at full working length is not realized with the #30 file, continue with larger apical (note: auxiliary apical files pg. 5) or ISO files until resistance is felt, then move to obturation phase. Always lubricating the file helps initial insertion of each size of file and helps prevent file separation. Continue copious irrigation with sodium hypochlorite solution (ChlorCid is recommended).



ChlorCid®: sodium hypochlorite



Ultradent[®] EDTA 18% Solution

Prior to obturation, canals have been instrumented then cleaned and disinfected using significant quantities of sodium hypochlorite solution (ChlorCid). Be sure all sodium hypochlorite solution or other antimicrobial irrigants are flushed from canal with clean water. Removal of all excess fluids is simplified with a capillary tip attached to the high velocity vacuum system followed by paper points. Note: If clean (bacteria-free) water is not available to thoroughly rinse antimicrobial agent (sodium hypocholorite) before placing EndoREZ, an alternative may be used: EDTA solution. Do not leave EDTA in the canal for more than one minute. Important Note: Use peroxide-free lubricants or irrigants, as oxygen generated from peroxide can inhibit the set of resins, including EndoREZ. EDTA is a root canal chelating agent that conditions / cleans through a chelation process. Ultradent EDTA 18% Solutions is the irrigant of choice for chelation and smear layer removal. Carefully read all manufacturers instructions. Do not use any lubricant or irrigants not specifically designed for endodontic use.

Always stay at least 2mm away from the apex. Withdraw to more than 2mm away from the apex if canula is not loose in the canal. Pump in and out while gently expressing irrigants.

Auxiliary Materials and Procedures

NaviTip[®]/ NaviTip[®] FX

The NaviTip has been specially designed to "navigate" through curved canals. The hub and shank are rigid to support insertion. The flexible rounded end negotiates curves. The NaviTip[®] FX Tip simultaneously scrubs walls and cleans irrigants.



correspond with patient kit lengths.

Lengths:	X-Short	Short	Medium	Long
	19mm	23mm	27mm	30mm
		See page 5 for file kits.		

Luer Vacuum Adapter

Connect Luer Vacuum Adapter to high velocity evacuation valve. Using Capillary or Micro Capillary tip, vacuum canals dry! Capillary tips are to be used for evacuation only, not for irrigation.

Quickly vacuum canals dry!



Absorbent Points

Most of the moisture is evacuated with the Capillary tips and Luer Vacuum Adapter; usually one or two paper points are all that are needed to verify canal is dry. *Tedious insertion of multiple paper points is a thing of the past!*

Capillary Tip



Ultradent Paper Points



Now...canals are ready for obturation!

EndoREZ: Obturation

EndoREZ is a unique biocompatible, radiopaque, resin-based root canal sealer/filler.



This hydrophilic, two-part, chemically set resin penetrates into dentinal tubules and accessory canals!

Mix and dispense directly into Skini Syringe EndoREZ RESIN RASED ROOT CAN

Mixing Tip

Mixes base and catalyst as it is being delivered from the dual barrel into Skini Syringe.

Mixing:

Step 1. Remove dual barrel cap; express a small amount of EndoREZ on a pad (or 2x2 gauze) to assure both sides are flowing. Attach mixing tip to dual barrel.



Step 2. Attach NaviTip to Skini Syringe.

Step 3. Insert mixing tip into back of Skini Syringe and express an appropriate amount of EndoREZ (usually 1/3 of a syringe is more than adequate to fill a multi-rooted tooth). Fill syringe to back flange so no air remains between the plunger and the EndoREZ.

Step 4. Insert plunger into Skini Syringe and express a small amount of material to verify flow.



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Before obturating with EndoREZ, see irrigation protocol on page 10.

Skini Syringe

Small diameter Skini Syringe facilitates flow of viscous. thixotropic EndoREZ through tiny NaviTip with minimal plunger pressure.

Two materials cannot occupy the same space at the same time. Many times, one of the materials is air. To predictably seal and fill the canal preparation, the canal not only requires hydrophilic materials but also air displacement. EndoREZ "listens to the needs of the tooth and canal preparation."

Note: Refer to EndoRez Instructions for use for complete details and reccommendations.

Sequence for Obturation



Step 1. Fit gutta percha to length. Verify radiographically. Ultradent's EndoREZ Points are recommended.





Deliver from apical portion outward.

In large canals, additional gutta percha may be inserted. No "condensation"

is necessarv.





Step 2. Canal is dried with Capillary tip and Luer Vacuum Adapter followed by paper point(s). Dry canel with paper points for 1-2 seconds each (point should be damp 1-3mm at tip). Do not overdry canals. Capillary tips are used for evacuation only, not for irrigation.

EndoREZ delivery:

NaviTip on filled Skini Syringe is inserted to 2mm short of the apex. Test to see if it is loose in canal. If not, withdraw slightly until it is. Express while slowly withdrawing until EndoREZ is seen at top of canal. Verify that EndoREZ is coming up the canal as you express material. Do not use force to push Skini Syringe plunger to express material as this may cause material to be pushed out the apex.

To avoid bubbles, keep end of tip buried in EndoREZ as you withdraw.

Step 3. Insert master cone to length. EndoREZ will set in about 15 minutes* in canal. Note hydrophilic, radiopaque EndoREZ filling accessory canals. Melt off extraneous gutta percha and restore coronal aspect as usual. Note: A quality seal/fill can occur with EndoREZ using master cone and EndoREZ only. However, EndoREZ is conducive to lateral condensation and warm gutta percha techniques.

only. However, EndoREZ is conducive to lateral condensation and warm gutta percha technique

Recommendation for Post Preparation & Core Buildup*

Radiopaque pre-activated fiber posts, encased in a bondable resin matrix

Sequence for **Bonded Post**







Determine post size by comparing a UniCore Drill to the completed endodontic radiograph.

Use a round bur to remove coronal obturation material down to canal orifice and to provide a guide (or pilot).

Place a rubber stop on UniCore Drill at desired length based on radiographs.

NOTE: If you are using UniCore Analog Try-In Posts* to aid in the diagnostic steps of a post procedure, place a rubber stop or locking plier at the same place on the UniCore Analog Try-In that is matched to the specific drill size.

At full 20,000 RPM, (use drill size 4 at 5,000 RPM) place the UniCore tip into the pilot hole (Image 1). Using light pressure, follow the obturation material to desired length at the rubber stop. Keeping the drill at full speed, withdraw from the canal. To avoid disruption of the apical plug, DO NOT stop the drill at anytime while entering or withdrawing it from the tooth.

Verify post space is appropriately prepared by placing the same size UniCore Post as UniCore Drill used and seat to length.



Apply PermaFlo DC Primer A for 10 seconds (image 2); DO NOT air dry. Apply PermaFlo DC Primer B for 10 seconds, then blow dry with TriAway and appropriate size Endo-Eze bendable metal tip. Prepare core preparation with Primers A & B as well. Repeat A & B until surface is shiny.



Use Permaflo[®] DC Opaque White (or appropriate shade) Dual Cure composite luting and core resin. As with EndoREZ (pg 12), insert mixing tip into back of the Skini Svringe. Attach appropriate size Endo-Eze metal tip on svringe (as large as possible for minimizing resistance to flow, but still loose in channel). Deliver mixed PermaFlo DC luting resin into syringe. Resin is delivered from depth of post preparation coronally to push air out ahead of resin (Image 3). DC A3.5



Insert and cut to length the appropriate UniCore post. PermaFlo DC resin can be light accelerated with curing light (1-3 seconds) (Image 5) to prevent unwanted flow during build-up of core. This eliminates the need for a matrix. Lute post and build core in one mix/procedure (Image 4)!





5900	EndoREZ Refill Kit				
	1 - Dual Barrel Syringe, 20 - Mixing Tips				
5920	Mixing Tips - 20pk				
5005	Endo Ezo Tochnique Kit with Handnisco				
5905 5906	Endo-Eze Technique Kit with Handpiece Endo-Eze Z-Axis Technique Kit				
5907	Endo-Eze Technique Kit with Contra				
	Angle Only				
5908	Endo-Eze Mini Technique Kit				
	(International Only)				
1136	Endo-Eze AET Handpiece				
1155	Reciprocating Contra-Angle for AET				
1178	Air motor with internal spray				
5901	EndoREZ Obturation Kit - 0.02 Taper				
5902	EndoREZ Obturation Kit - 0.04 Taper				
5903	EndoREZ Obturation Kit - 0.06 Taper				
5904	EndoREZ Mini Obturation Kit				
	(International Only)				
Shaping	File Patient Kits				
3246	Patient Kits, Extra Short 16/19mm				
3247	Patient Kits, Short 20/23mm				
3248 3249	Patient Kits, Medium 24/27mm Patient Kits, Long 27/30mm				
Patient 1 1564	Kits (shaping, apical files) Patient Kits Extra Short 16/19mm				
1504	(7 files)				
1565	Patient Kits, Short 20/23mm (7 files)				
1566	Patient Kits, Medium 24/27mm (7 files)				
1567	Patient Kits, Long 27/30mm (7 files)				
	ı File Refills				
1586	Shaping File Refills (6) #1, 16mm				
1501 1502	Shaping File Refills (6) #1, 20mm Shaping File Refills (6) #1, 24mm				
1502	Shaping File Refills (6) #1, 24mm				
1589	Shaping File Refills (6) C, 16mm				
1504	Shaping File Refills (6) C, 20mm				
1505	Shaping File Refills (6) C, 24mm				
1506 1587	Shaping File Refills (6) C, 27mm Shaping File Refills (6) #2, 16mm				
1507	Shaping File Refills (6) #2, 20mm				
1508	Shaping File Refills (6) #2, 24mm				
1509	Shaping File Refills (6) #2, 27mm				
1588 1510	Shaping File Refills (6) #3, 16mm				
1510 1511	Shaping File Refills (6) #3, 20mm Shaping File Refills (6) #3, 24mm				
1512	Shaping File Refills (6) #3, 27mm				
	ile Refills				
1601 1602	Apical File Refills (6) #8, 19mm Apical File Refills (6) #8, 23mm				
1603	Apical File Refills (6) #8, 27mm				
1604	Apical File Refills (6) #8, 30mm				
1610	Apical File Refills (6) #10,19mm				
1519	Apical File Refills (6) #10,23mm				
1520 1521	Apical File Refills (6) #10, 27mm Apical File Refills (6) #10, 30mm				
1611	Apical File Refills (6) #15, 19mm				
1522	Apical File Refills (6) #15, 23mm				
1523	Apical File Refills (6) #15, 27mm				
1524	Apical File Refills (6) #15, 30mm				
1612 1525	Apical File Refills (6) #20, 19mm Apical File Refills (6) #20, 23mm				
1526	Apical File Refills (6) #20, 27mm				
1527	Apical File Refills (6) #20, 30mm				
1613	Apical File Refills (6) #25, 19mm				
1528 1520	Apical File Refills (6) #25, 23mm Apical File Refills (6) #25, 27mm				
1529 1530	Apical File Refills (6) #25, 27mm Apical File Refills (6) #25, 30mm				
1619	Apical File Refills (6) #30, 19mm				

Apical File Refills (6) #30, 23mm

1531

1532 1533 1620 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1544 1545 1618 1516 1517 1518	Apical File Refill Apical File Refill	Is (6) #30, 30r Is (6) #35, 19m Is (6) #35, 27n Is (6) #35, 27n Is (6) #35, 27n Is (6) #35, 30n Is (6) #40, 23n Is (6) #40, 27n Is (6) #40, 27n Is (6) #45, 27n Is (6) #45, 27n Is (6) #45, 27n Is (6) #50, 23n Is (6) #50, 27n Is (7) #50, 27n Is (7) #50, 27n Is (7) #50, 27n Is (7)	nm m m nm nm nm nm nm nm nm nm nm nm nm		
7120	UniCore Kit 4 - Drills (one of each sizes 1-4) 20 - Posts (five of each size 1-4)				
7132	UniCore Starter Kit 2 - Drills (one of each sizes 1 & 2) 20 - Posts (five of each size 1 & 2)				
7133	UniCore Size 0 Supplement Kit (1 Drill and 5 Posts)				
UniCore 7134 7121 7122 7123 7124	Refills 1 - Size #0 Drill 1 - Size #1 Drill 1 - Size #2 Drill 1 - Size #3 Drill 1 - Size #4 Drill	7135 7125 7126 7127 7128	5 - Size #0 Posts 5 - Size #1 Posts 5 - Size #2 Posts 5 - Size #3 Posts 5 - Size #4 Posts		
5112 NaviTi 5113 NaviTi 5114 NaviTi 5115 NaviTi	ip, 21mm ip, 25mm	NaviTip (50pk - 29ga) 1378 NaviTip, 17mm 1374 NaviTip, 21mm 1376 NaviTip, 25mm 1377 NaviTip, 27mm 1379 Assorted NaviTip, 5 each length			
NaviTip (20pk/50pk - 30ga) 1249 NaviTip, 17mm 1349 NaviTip, 21mm 1250 NaviTip, 25mm 1354 NaviTip, 27mm 1351 Assorted NaviTip, 5 each length		NaviTip (50pk - 30ga) 1421 NaviTip, 17mm 1422 NaviTip, 21mm 1423 NaviTip, 25mm 1424 NaviTip, 27mm 3319 Assorted NaviTip, 5 each length			
NaviTip (20pk - 31ga) 5121 NaviTip, 21mm 5123 NaviTip, 27mm		NaviTip (50) 5122 NaviTip 5124 NaviTip	, 21mm		
 1562 Riitano Access Bur Kit 5 - Burs (Round carbide, Button, Acorn Small, Acorn Large, Straight line) 1 - Autoclaveable Bur Block 					

1397 Riitano Straight Line Access Bur 3pk 1398 Riitano Button Bur 3pk 1403 Riitano Acorn Bur Small 3pk 1404 Riitano Acorn Bur Large 3pk

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