

“Composite Challenge”

Restoring the Erosion/Bulimia Patient with Composite Resins

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Douglas L. Lambert, DDS, FACD, FASD, FASDA, FICD, ABAD
ddssmile@aol.com





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Learning Objectives for today's workshop...

- Maximizing the use of composites to restore a variety of anterior cases
- Techniques, instruments, and matrices
- Goals:
 - Learn to use a unique anterior matrix to restore a Class V on a maxillary canine
 - Restore teeth #7 through #10 damaged by erosion (bulimia, GERD, etc...) using a simplified layering technique and matrix

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A mantra to live by...

PRACTICALITY + SCIENCE = TECHNIQUE



MATERIALS + TECHNIQUE = **SUCCESS**

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Why Composite?

- Conservative in nature
- Flexibility to restore only what is missing
- Use as a transitional restoration
- Less costly to the patient

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Today's Requirements for a Composite


- Universal use throughout the mouth - if possible
- Excellent abrasion/wear resistance
- High radiopacity
- Easy to finish and polish and maintains finish
- Superior esthetics: multiple shades + translucent
- User-friendly handling properties
- Low shrinkage
- Cures with multiple energy sources
- Compatible with multiple bonding systems

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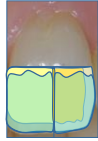
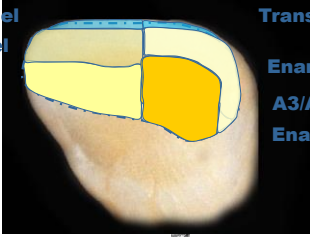
Layering of Anterior Composites

- **MONOCHROMATIC**
 - One shade, medium opacity, small restorations, esthetics not a high priority
- **GRADIENT**
 - Two shades: Dentin/body shade covered with 0.5mm of enamel shade
- **STRATIFIED**
 - Three shades and/or may include:
 - Halo, mammelon definition, translucency, maverick lines, flecks, fluorosis, etc...



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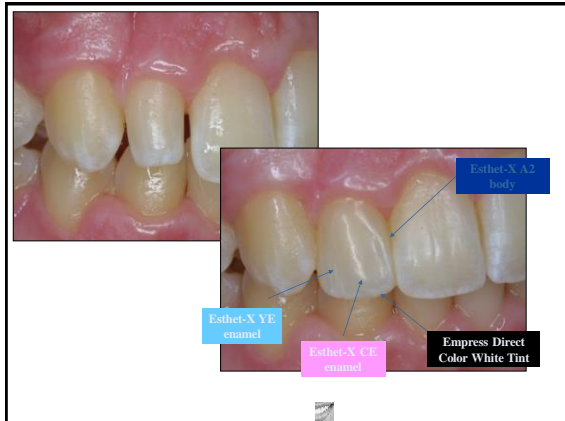
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Placement		Techniques
Shaded Dentists		Anatomical Ceramists
"Match Shade"		"Create Shade"
Trans Enamel		Trans Enamel
A1 Enamel		Enamel
A1 Dentin		A3/A4 Dentin Enamel

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Matrix or Free Hand?

- Which option will give me the best results?
- Some things to consider:
 - Isolation of the bonding site
 - Shape created by the matrix
 - Flexibility to adapt to multiple preparations
 - Cost per use
- Numerous matrices on the market today

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"Recipe for Success"

Anterior Composite Technique

- Cut marginal enamel with a diamond and a metal abrasive strip or air abrasion
- Secure appropriate matrix
- Clean and scrub surfaces with an antibacterial solution
- Flush and dry – do not desiccate
- Use etch technique of choice:
 - Total, Selective, or Self.



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- **Total-Etch:** Etch all surfaces with 30+% orthophosphoric acid – first 5 seconds on enamel, then 10 seconds on dentin – for a total etch time of 15 seconds. Rinse and dry. Utilize 5th generation dentin bonding agent, such as Prime & Bond NT (Dentsply/Sirona), or Universal DBA (Prime & Bond Elect (Dentsply), Adhese (Ivoclar), etc).
 - **Self-Etch:** Use a Self-Etch DBA (Clearfil SE Bond) or Universal DBA (Prime & Bond Elect) according to manufacturer's directions. Enamel must be cut/beveled for best results.
 - **Selective-Etch:** 15 seconds etch of enamel only. Rinse and dry. Use a Self-Etch or Universal DBA.
- Cure DBA for 10 seconds.
 - Apply thin layer of flowable composite over entire prep, then air disperse. **DO NOT LIGHT CURE!**
 - Syringe first layer of body composite material.
 - Polymerize with sufficient light energy.

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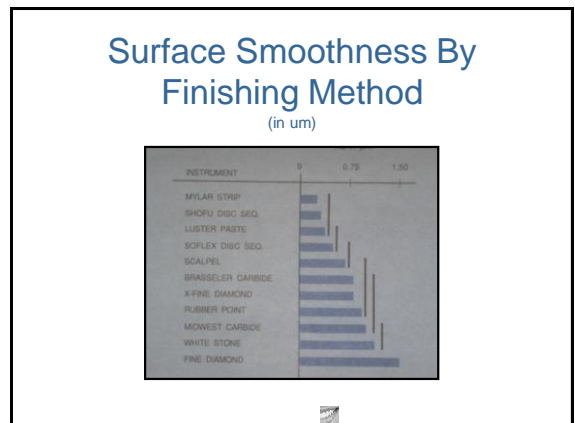
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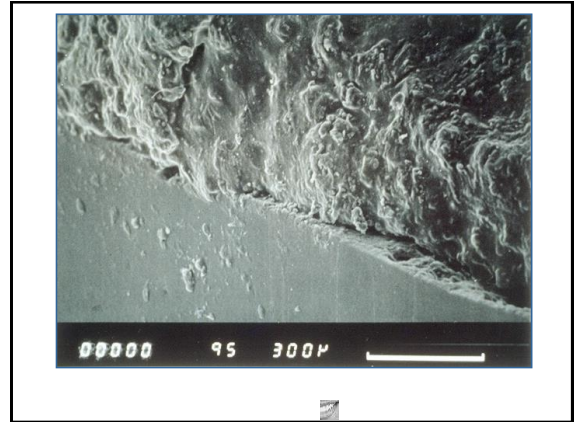
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Mylar Matrices and Composites

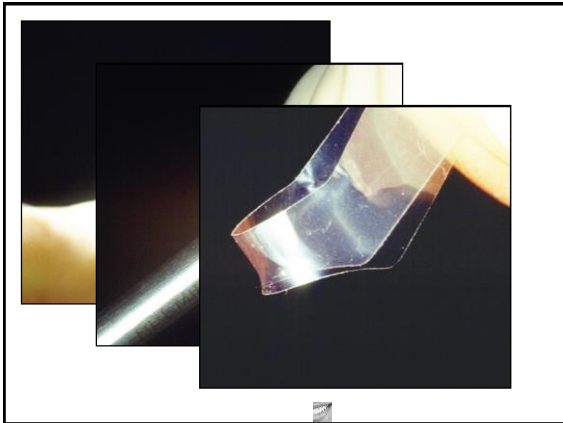
Spanning five decades!

- McLundie A, Murray F. Comparison of methods used in finishing composite resin-a scanning electron microscope study. *J Prosthet Dent* 1974; 31:163-17.
- Dennison J, Fan P, Powers J. Surface roughness of microfilled composites. *JADA* Jun 1981; 102(6):859-62.
- Belvedere P, Lambert D. A polyester matrix system for a periodontally sound, acid-etched bonded veneer. *NW Dent* May-Jun 1984; 14-17.
- Bauer J. Contour of class V composite restorations. *J Prosthet Dent* Jul 1987; 58(1):8-12.
- Stoddard J, Johnson G. An evaluation of polishing agents for composite resins. *J Prosthet Dent* Apr 1991;65(4):491-5.
- Chung K. Effects of finishing and polishing procedures on the surface texture of resin composites. *Dent Mater* Sept 1994;10(5):325-30.
- Yap A, Lye K, Sau C. surface characteristics of tooth-colored restoratives polished utilizing different polishing systems. *Oper Dent* Nov-Dec 1997;22(6):260-5.
- Hoelscher D, Neme A, Pink F, Hughes P. The effect of three finishing systems on four esthetic restorative materials. *Oper Dent* Jan-Feb 1998;23(1):36-42.
- Gedik R, Hurmuzlu F, Coskin A et al. Surface roughness of new microhybrid resin-based composites. *JADA* Aug 2005;136(8):1106-12.
- Cadenaro M, Dorigo E, Contardo L et al. Surface roughness of three resin restorative materials after finishing and polishing. *Minerva Stomatol* Apr 2006;55(4): 179-97.
- Ruschel V, Basso G, et al. Effects of different polishing systems on the surface roughness and microhardness of a silorane-based composite. *Applied Adhesion Science* July 2014; 2-7.

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The Margin Perfect Matrix

www.marginperfectmatrix.com



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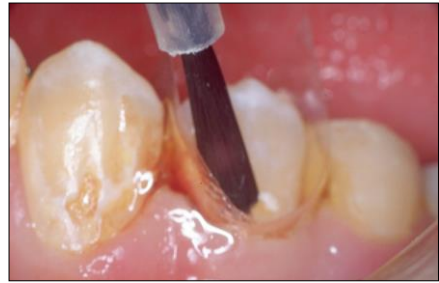
Excavate Class V caries. Bevel placed with a 40 µm diamond.
(H 689-009-3.5 ML Diatech)

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Secure the Margin Perfect Matrix with Heliobond resin (Ivoclar) to create a resin collar.

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Scrub with a disposable brush and 5% sodium hypochlorite. Rinse and lightly dry.

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Total etch for 15 seconds.

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Apply dentin bonding agent.
(Prime & Bond Elect - Dentsply/Sirona)

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Wipe flowable resin over prep, air thin, and cure for 10 seconds. Then syringe traditional composite into the prep.

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Manipulate composite with brushes and instruments lubricated with an unfilled bond resin, such as Heliobond.

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After curing, remove Heliobond resin collar with a scaler.

(Bates 7/8 scaler - American Eagle)

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All remaining flash is supragingival and removed with a 12 fluted, spiral bladed carbide bur.

(H48L-010 - Axis or Brasseler)

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Polish with abrasive cups.

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"Jeffrey"

862-010-08ML - Diattech

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H 48-L 010 (AXIS)

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Key ingredients:

- Margin Perfect Matrix (Margin Perfect Matrix, LTD)
- Heliobond (Ivoclar/Vivadent)
- Pink tint (Pulpdent)
- Dentin shade/enamel shade

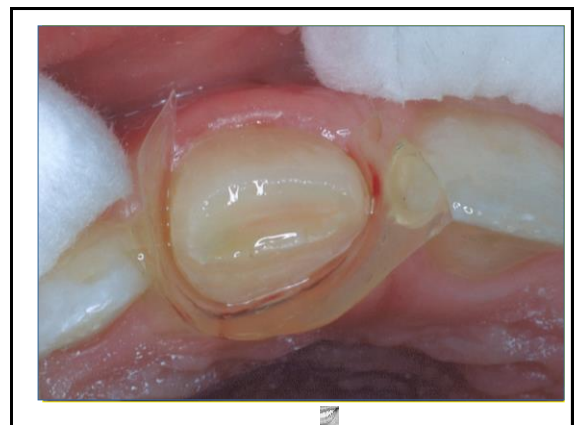
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Anterior "Grocery List"

- Matrix System
 - Margin Perfect Matrix (MPM) and Heliobond (Ivoclar)
- Dentin Replacement (if needed)
- Adhesive
 - Prime & Bond NT or P & B Elect (Dentsply/Sirona)
 - Adhese Universal Pen (Ivoclar/Vivadent)
- Flowable
 - TPH Spectra Flow (Dentsply), Heliomolar Flow (Ivoclar)
- Body Composite
 - Numerous choices.
- Light Source
 - LED such as Bluephase Style (Ivoclar/Vivadent), Valo Grand (Ultradent), SmartLight Focus (Dentsply/Sirona). Minimum 1000 mW/cm².
- Finish and Polish
 - 12-fluted spiral-bladed carbides (Axis and Brasseler)
 - Astropol (Ivoclar), ProGloss (Axis) or Optrapol (Ivoclar), PoGo and Enhance (Dentsply)

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Let's get started!

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Inventory Checklist




- Full arch Viade model with Class V canine and #7-10 eroded teeth
- Box of "goodies" from Dentsply/Sirona
 - TPH Spectra ST LV Composite compules
 - TPH Spectra Flow
 - Prime & Bond Elect Universal dentin bonding agent
 - PoGo and Enhance polishers
- Composite bur kit from Axis
- Margin Perfect Matrix (MPM)
- Heliobond resin (Ivoclar/Vivadent)
- Various hand instruments
- Black Sharpie marker, brushes, finishing strips, etc...

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CASE ONE:

11 Class V using the Anterior Matrix



- Today's first goal is to properly place the Margin Perfect Matrix (MPM) and restore # 11 Class V which has a subgingival margin.
- This will allow you to create a sealed mold in which to work and subgingival margins that do not require finishing or polishing.

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- In a Class V, all enamel margins should be irregularly beveled with a diamond, while margins on cementum and dentin would remain a butt joint.
- Remove your tooth and mark a bevel using the Sharpie.

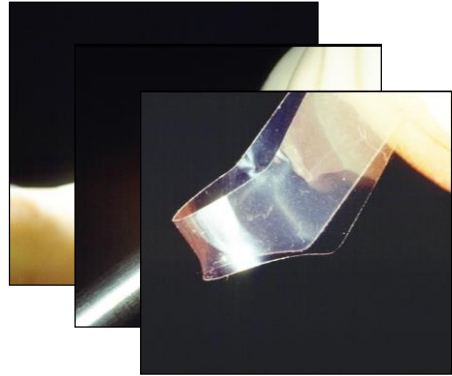
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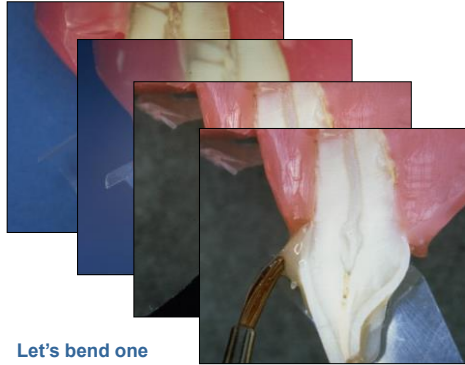
- After replacing your tooth, create an enamel bevel with the F 889-009 diamond removing your black marker area.

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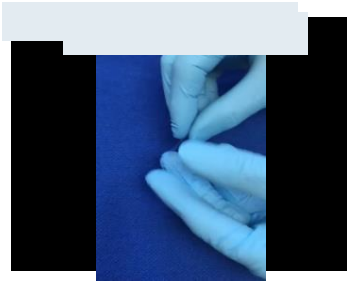
Let's bend one together!

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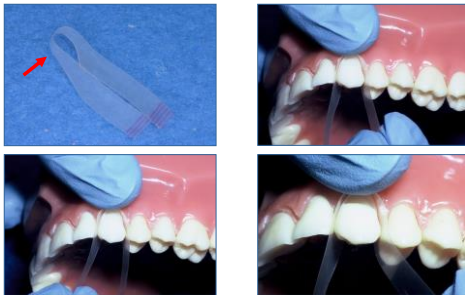
The Margin Perfect Matrix (MPM)

www.marginperfectmatrix.com



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- Take one of the pre-shaped Margin Perfect Matrices and slide the curved neck portion of it up around the gingival of # 11.
- Pull the two long ends through the proximal contact areas while placing apical pressure on the gingival margin.
- Be sure to seat the gingival portion of the strip up under the free gingival margin.

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- When properly seated, the Margin Perfect Matrix will seal off the gingival sulcus – keeping it free of hemorrhage and sulcular fluids.
- In the mouth, you will know when it is seated because the gingival tissue will blanch.

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- Trim off the excess of the two interproximal legs of the MPM approximately 2 mm beyond the incisal edge of # 11 with the scissors.

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- Use the Heliobond with the black canule to flow a liquid collar of Heliobond around the neck of the MPM, the adjacent teeth, and dried gingival tissues. Use plenty...don't be shy!
- Light cure for 20 seconds. The Heliobond collar secures the matrix and you are now ready to restore the Class V.

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- We will assume the tooth is already been cleaned with an antimicrobial, and etched. Place the Prime & Bond Elect Universal bonding agent, thin it with air, and cure for 20 seconds.
- Syringe a little TPH Spectra Flow resin into the prep and coat the surfaces using the same brush applicator. Air thin and do not cure.

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- Syringe the body composite, TPH Spectra ST LV Shade A1, into the gingival portion of the prep.
- Condense and contour the composite with instruments and brushes lubricated with a thin coat of Heliobond.

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- Cure the Class V for 20 seconds, then pick off the Heliobond collar with an explorer and slide the Margin Perfect Matrix off.
- "Extract" your canine and examine the smooth contour and subgingival margin of the Class V.

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- Finish and contour supragingivally using the H48L-010 (Axis kit)
- Polish to a high luster using Enhance and PoGo polishing cups and disks.

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Acidic Erosion

- Knowledge that acid was responsible for erosion was first recognized in patients who had eating disorders such as anorexia nervosa or bulimia nervosa
- “Periomyolysis” is the historical term used to describe the pattern of erosive wear seen on the palatal surfaces of the maxillary incisors
- Enamel changes also seen as a result of GERD, hiatal hernias, “sour stomach”, acidic fruits, sports drinks, low pH beverages, sour candies, etc...

Bartlett D. Intrinsic causes of erosion. Monogr Oral Sci 2006; 20:119-139.

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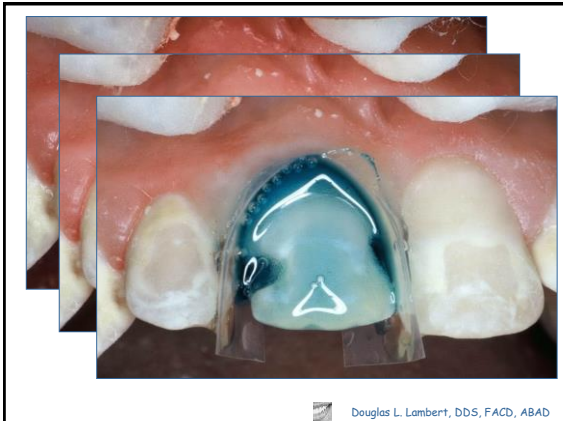
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“Dan”



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“Elizabeth”



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Need space to restore?

- Orthodontic treatment
 - Full brackets and bands
 - Invisalign
 - Minor Tooth Movement (MTM)
- Adjust opposing dentition
- Remove additional tooth structure on lingual of eroded teeth
- Open VDO



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“Bonnie”



- 33 year old female
- Medical hx: Bulimia
- Dental hx: Lingual and incisal erosion of Mx anteriors
- TMJ/TMD: Normal
- Periodontal: Recession Mn arch premolars and molars
- Soft tissue and oral mucosa: WNL
- Current status: Eating disorder under control. Anterior teeth exhibit severe erosive wear.
- Patient's goal: "I want fix my row teeth and have the smile I've always wanted!"

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"Mock up" or Diagnostic Preview

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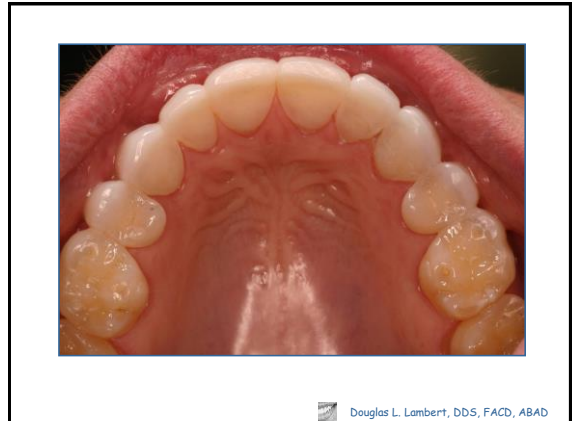
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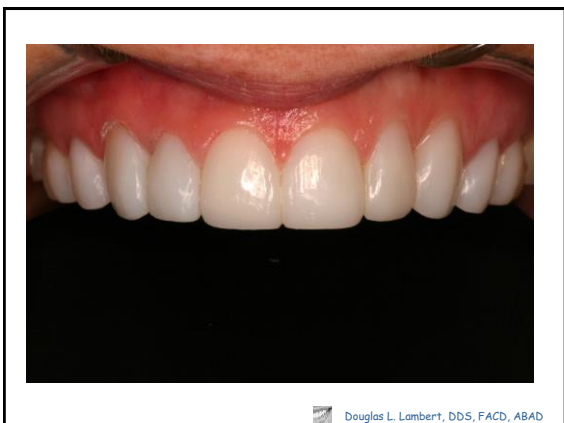
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**CASE TWO:
Restoring #7- #10 damaged by acids**



- In this case, we will restore the eroded # 7-10 with composite using a $\frac{3}{4}$ preparation and the Margin Perfect Matrix (MPM) to create a conservative solution to an esthetic and functional dilemma.

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- Evaluate the lingual aspect of the anteriors and note the enamel ridge remaining around the eroded and burnished dentin.
- Start with # 8. Mark the enamel ridge, place back in the model and bevel with the F 889-009.

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- Now mark the lingual aspect with the Sharpie and "roughen" the eroded surface with the M856L-014, removing all the black marker. This creates a better micromechanical surface to bond to.

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- Mark and reduce the incisal edge about 1mm to remove thin enamel.

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- Mark and create an irregular facial bevel of 2-3 mm using the Sharpie, prep the bevel with the F862-009, and round the incisal point angles.
- Clean the loose enamel rods mesially and distally using the QwikStrip or a metal abrasive strip..

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- Place the Margin Perfect Matrix (MPM) on the lingual aspect of #8, sliding it under the free gingival margin, and pulling the proximal legs through the contacts.

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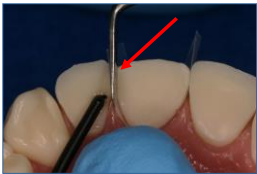
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- Trim the excess length from the Margin Perfect Matrix "legs" 2-3 mm longer than the incisal edge of the adjacent tooth, #9.

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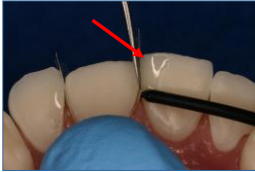
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- Place a flat bladed composite instrument inside the Margin Perfect Matrix on the distal of # 8 and press it against the mesial of # 7.
- Flow Heliobond on the outside of the MPM and adjacent tooth to secure.
- Cure for 10 seconds.


Repeat on mesial of # 8.

You may wish to work with your neighbor on this step.



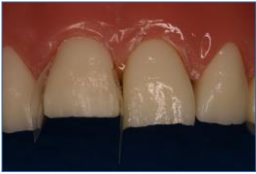
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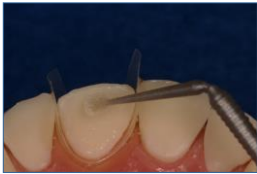
- Complete the "Superglue" seal by flowing the Heliobond across the lingual of the MPM to connect the two sides.
- Cure for 10 seconds.

Facial view of the MPM when properly secured.



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Skip cleansing with sodium hypochlorite and acid etching (done clinically).


Place Prime & Bond Elect over and beyond all etched surfaces-facial and lingual.

Air thin and cure for 20 seconds with the LED light.



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Follow with the TPH Spectra Flow flowable resin, coating beyond the bevels.

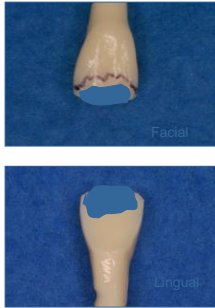
Try using the Bend-a-Brush to spread the flowable over the tooth.

Air thin. Cure for 10 seconds



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Facial

Lingual

"RECIPE"

- TPH Spectra ST LV Shade BW (dentin)
- TPH Spectra ST LV Shade A1 (enamel)
- TPH Spectra LV Shade XL (enamel)



• Following the "recipe" in a layering concept, first add the base layer of composite (TPH Spectra LV Shade BW), overlapping the incisal edge. Use the stone model as a guide for final contours and incisal edge length while building up # 8.

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•Place the first increment (Shade BW) onto the incisal edge, building it up approximately 2mm. This is a dentin extension. Shape with the flat bladed instrument and chisel shaped brush lubricated in Heliobond. Cure labial and lingual for 20 seconds.

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RECIPE

1. TPH Spectra LV Shade BW (dentin)
2. TPH Spectra LV Shade A1 (enamel)
3. TPH Spectra LV Shade XL (enamel)

•Overlay the first layer with TPH Spectra LV A1, building up the entire lingual and overlapping the incisal edge slightly.

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•For this second increment, you will want to add enough composite to extend up to and slightly over the incisal- wrapping it over the facial. Try using the cuticle pusher to manipulate the composite. Cure for 40 seconds.

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RECIPE

1. TPH Spectra LV Shade BW (dentin)
2. TPH Spectra LV Shade A1 (enamel)
3. TPH Spectra LV Shade XL (enamel)

•Add the third layer (Shade XL) for an enamel effect, blending in the facial and overlapping the lingual-incisal.

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•When adding the third layer – TPH Spectra LV Shade XL – be sure to extend over the facial bevel and slightly overbuilding the incisal edge length by 10%. Cure for 40 seconds from facial and lingual.

•Remove Margin Perfect Matrix as previously shown by using the explorer to free the cured Heliobond, then peel off the MPM using a cotton pliers or hemostat.

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• Before you begin shaping and contouring, “extract” your tooth and examine the smooth surface and gingival margin created by the Margin Perfect Matrix. Replace the tooth and go on to the next step.

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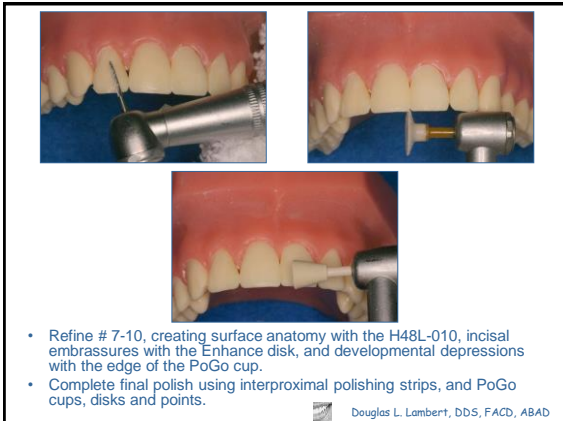
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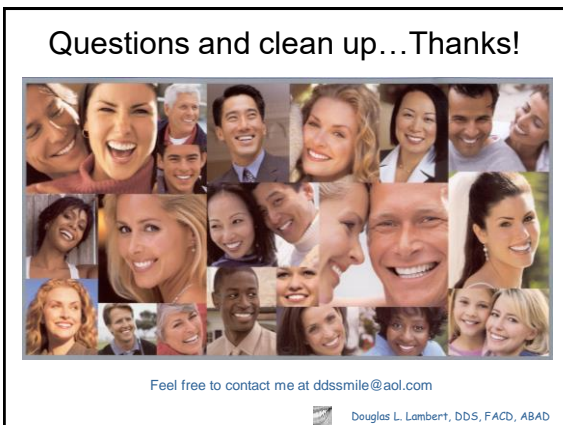
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