LABORATORY TECHNIQUE

Enamel Plus
aesthetic system
The demand for aesthetic results in Dentistry was constantly increasing in recent years and led the dental manufacturers to a growing commitment in scientific investigation and composite evolution, allowing the clinician to obtain ideal long lasting, aesthetic results.

The spreading of Dr. Lorenzo Vanini’s composite techniques brought a development in the use of these materials involving more and more the dental laboratory more and more with the indirect technique. Sharing clinical and technical experiences, composite has been further optimized, becoming an ideal material for dental restorations not only for its aesthetic properties but also for its mechanical and physical characteristics.

Nowadays, the technological progress (CAD/CAM) and the deeper knowledge of the materials allowed us to determine still more reliable solutions that can be achieved also with composite. In this manual the protocols for working with composite are updated according to the application fields, suggesting also the ideal steps to optimize time and cost and how to apply the new generation composite materials with high refraction index, the result of research and development of optical behaviour of aesthetic material.

The experiences described in this manual are the results of my work in the laboratory with my team and of the daily relationship with the clinicians.

Daniele G. Rondoni
**Product**

**Composition**

**“TENDER” BODIES**

**RESIN MATRIX:**
Urethane dimethacrylate, Butanediol dimethacrylate

**CONTENT OF FILLER:**
Inorganic Filler: 53% by weight (37% by volume);
Glass filler: mean particle size 0.7 µm
Pyrogenic silicic acid: mean particle size 0.04 µm
Organic filler: 12.5% by weight copolymers

**DENTINE, INTENSIVE & OPALESCENT MICROHYBRID**

**RESIN MATRIX:**
Diurethan dimethacrylate; Iso-propyliden-bis[2(3)-hydroxy-3(2)-(4-phenoxy) propyl]-bis(methacrylate) (Bis GMA); 1,4 Butanediolmethacrylate.

**CONTENT OF FILLER:**
75% weight (52% volume)
Glass filler: mean particle size 0.7 µm
Highly dispersed silicone dioxide: mean particle size 0.04 µm

**“HRi” UNIVERSAL ENAMEL NANO FILLED**

**RESIN MATRIX:**
Diurethan dimethacrylate; Iso-propyliden-bis[2(3)-hydroxy-3(2)-(4-phenoxy) propyl]-bis(methacrylat) (Bis GMA); 1,4 Butanediolmethacrylate.

**CONTENT OF FILLER:**
80% weight. New high refraction index glass filler (68% by weight): mean particle size 1.0 µm. Nano zirconium oxide particles, specially silanized in order to increase refraction index of resin (12% by weight): medium particle size 20nm.

**Adhesion & physical characteristics**

**TENDER:** high elasticity dentine body

**HRi:** high resistance enamel body

- Flexural strength: 170 MPa 85 MPa
- Vickers hardness: 700 MPa 250 MPa
- Modulus of elasticity: 14.500 MPa 4900 MPa
- Compressive strength: 500 MPa 350 MPa
- Transparency: 30% 4%

* at 63°C for 13 min. (at 75°C + 20% hardness)

The combination of Tender masses with the HRi dentine masses gives the stratification on metal better properties of resistance to compression and bending. Enamel Plus HRi also provides proper resistance to abrasion, giving the material excellent polishability and reducing the aggressive power of bacterial plaque.

**TEMP**

**PHYSICAL CHARACTERISTICS**

- Flexural strength: 75 N/mm²
- Collision resistance: 2.8 kJ/m²
- Vickers hardness: 1.40 MPa
- Modulus of elasticity: 2300 N/mm²
- Retraction: 5-6%
- Absorption water: 21.2 µg./mm²
- Residual of monomer: 0.8%

"Quintessence International" N. 6 Nov/Dec 2003

The research shows that the wear of Enamel plus is lower than that of comparative brands.
Preparation of metal framework
The crown or bridge framework should be waxed-out using standard techniques and provided with retainers. Ensure that the frame-work/facing junctures are shaped in the form of a deep chamfer and preferably add retentions: apply "Temp Chips" adhesive and apply immediately "Temp Chips" retentions. Micro, in occlusal areas, and Standard in vestibular areas, leave to dry for 1-2 minutes. Once the framework has been trimmed and finished, sandblast the surfaces to receive the facings using 50 micron aluminium oxide, and clean them with steam or pure acetone.

Tender Bond metal primer
A thin layer of Tender Bond is applied with a brush immediately after cleaning and allowed to dry for approx. 1 min. A second layer can be applied if required. Useful tips: the surfaces of the framework should be cleaned of any grease and polish residue.

Tender paste Opaque
Tender paste Opaque is applied in a very thin layer with a stiff, short-haired brush. Incomplete opaque coverage negatively affects the shade. The flow of the opaque is improved by mixing it on a mixing pad. The paste should be applied especially thinly to retention areas. Each layer is polymerised separately: LABORLUX: 3 min, LAMPADAPLUST: 4 min. We suggest to apply as first layer the paste Clear and as second layer the paste Light to guarantee an optimal curing. N.B. Useful tips: the opaque should only be applied in very thin layers. If the opaque layer is applied too thick, it prevents optimum polymerization and weakens the bond. See pages 8-9.

Composite application
Take composite out from syringes and apply it, using Tender Bodies for total covering of Opaque, and then Dentines and Enamels (see pages 9-11). Note: apply very small quantities of material pulling down with a brush in order to avoid any bubbles (Enamel plus "M" brush for anterior and "P" for posteriors). Use a "waves" application technique in order to allow a better light diffusion effect. The thickness of each layer should be between 1.0 - 1.5 mm. Oxygen leaves a thin layer of uncured composite: this layer should not be contaminated or wet because it creates a chemical connection between the different layers of composite. We advise to apply an Air Block (Shiny Q), when restoration is finished and before the final light curing. This glicerine based product eliminates the oxygen and allows a complete curing of the surface. For inlay build up first the external walls and then the occlusal areas. It is possible to use composite stains between dentin and generic enamel.

Curing
Working time under standard light is approximately 3 minutes. During long build up cover the composite with an opaque foil or use black cover of the colours palette COSTAIN01. Note: Each layer should not be thicker than 2 mm and should be cured for 90 seconds (LABORLUX). Go on with final curing of 7 minutes in power light curing like LABORLUX.

COMPLETE SHADE CURING
If the composite shows an increased yellow value due to the uncured catalyst, we advise to cure again for 7 minutes in LABORLUX.

Finishing and polishing
Use diamond and diamond pastes. Do not use any disc buccally in order to avoid destroying the texture surface. We suggest using the complete finishing and polishing system Enamel plus SHINY. Finish with burs and polish with Enamel plus SHINY brushes and diamond pastes. Wash with soap and water and dry with oil-free air spray.

Note: use an aspirator during finishing procedure. See page 11.

Adjustment
Roughen the facings up to 2 mm around the margin of the area to be corrected or repaired, brush Temp Bonding Fluid on the surface and light cure it for about 90 sec. in LABORLUX. If the cured layer looks whitish, it has been polymerised excessively and must be removed. Repeat the above mentioned procedure, but reduce the curing time. Then Enamel Plus material should be applied and cured as indicated before. See page 20.

Pressing system for light curing composites
The Tender Flask System allows the reproduction in light curing resin of crown & bridge and aesthetic sections of partials, implant prosthesis through a very simple technique, reducing considerably the working time (up to 70%) This system requires two silicones:
- TEMP-SILIC PUTTY, 90 shore putty hardness silicone, for the base
- TEMP-SILIC CLEAR, 50 shore transparent silicone in self-mixing cartridge, for the mould
The wax-up is perfectly reproduced with all details, respecting shape and function, thanks to the transparent silicone mould. See also pages 12-19.

Inlay, Onlay and Veneers
Follow some indications suggested for dentine and enamel bodies (see pages 8-12). Sometimes it is useful to introduce more opaque Tender bodies internally.

Enamel plus Temp - Fluorescent Temporary Resin
The special opacity of the dentine and the translucency of the enamel accentuate the natural contrast between the two. Also, the enamel body facilitates a natural glaze in the final temporary crown, cosmetically close to the permanent ceramic restoration.
Indirect method in laboratory: diagnostic wax up or vacuum formed matrix.
Direct method in mouth: silicone impression or preformed crown.
Cold curing. Application: approx 6 min. on the model (in mouth 3.5 min. Over time could damage pulp).
Elastic phase: approx. 1,5 min. Setting: approx. 2 min. Note: Enamel Plus Temp can be left to set in the mouth or on the bench (rest of monomer below 0,8%). We suggest 3 min. at 2-3 bars in warm water.
Hot curing: Working time: 4 min.
Application: approx 9 min. on the model.
Curing time: 20 min. at 95°C with 2-3 bars.
Flash: Working time: 20 min.
Curing time: 30 min. at 100°C under pressure in flask.
Light curing: Working time: 3-5 min.
Curing time: in very thin layer 3 min. in halogen light curing unit (or 4 times 40 sec.)

TECHNICAL FEATURES
- biocompatible, non toxic, non allergic, resistant
- high precision of fit, easy to repair - creamy consistency, no bubbles, with a rubbery-elastic consistency - cadmium-free, no tertiary amines and no discoloration

“Temp” discs for CAD/CAM
Laboratory indications

Inlays, onlays, jacket crowns. Crown and bridges where an easy adjustment is required. Adhesive bridges, implants appliances, veneers, long term temporaries, telescopic crowns, perio-overdenture, characterization of acrylic teeth.

CONTRA-INDICATIONS

Uncured resin could cause skin allergy. User should use gloves. In case of known allergy to some of the components do not use it.

TROUBLE SHOOTING GUIDE

- **OPAQUE CURING** All remains of grease and polish must be cleaned off the surface of the framework. The opaques must be mixed thoroughly. It is better to apply two thin coats of opaque. Each coat must be cured separately.

- **COMPOSITE, WAX-UP THE FRAMEWORK PROPERLY.** Avoid pre-contacts. Apply the individual materials in the correct thickness and cure for the correct periods. Add retention beads. Do not apply too much primer. Once the primer has dried in air for 2 minutes, apply the opaque without further delay.

- **BUBBLES.** Rotate the plunger to extrude the paste out of the syringe and scrape it off - do not use an instrument to remove the paste from the syringe. Apply sufficient material for the facing and spread it. Do not mix composite material, rather apply coats on top of each other.

- **DISCOLURATION AND PLAQUE.** Check the luminous power of the light curing units. Polish the surface thoroughly to seal it. Ensure that the restorations are positioned correctly in the light curing units. Apply the composite material in the correct thickness and adhere to the polymerization times.

- **INFORMATION ON HRi UNIVERSAL ENAMEL.** Do not wet Universal Enamel with any resin or bonding because it will cause the composite to become too opaque.

Curing informations

Each layer should not be thicker than 2 mm. It is necessary to use a light curing unit with spectrum of 310-500 nm. The required physical results can be reached only if using a multi-wall reflecting unit. For this reason we suggest a periodic check of the light intensity following the manufacturer’s instructions.

Use and storage

Do not store above 25°C. Do not use the product after the expiration date (see label on syringe). Use the material at room temperature. Medical device, for dental use only: keep away from children. Turn back the spindle after taking out the material, to avoid sticking of the material. After use, close container with cap and keep it closed. Avoid direct exposure to sunlight if the material is not completely cured, it may discolour, mechanical properties deteriorate and pulpal inflammation can occur. This product was developed specifically for the range of indications described. It must be used as described in the instructions. The manufacturer is not liable for damage due to incorrect handling or application.

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<table>
<thead>
<tr>
<th>COLOUR CHART &amp; CURING TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COLOUR</strong></td>
</tr>
<tr>
<td>Bleaching</td>
</tr>
<tr>
<td>UD1 (A1)</td>
</tr>
<tr>
<td>UD2 (A2)</td>
</tr>
<tr>
<td>UD3 (A3)</td>
</tr>
<tr>
<td>UD3,5 (A3,5)</td>
</tr>
<tr>
<td>UD4 (A4)</td>
</tr>
</tbody>
</table>

**ALSO AVAILABLE ON REQUEST**

| B1 | clear+light | T2 | B1 | UE3 |
| B2 | clear+light | T2 | B2 | UE3 |
| B3 | clear+light | T3 | B3 | UE2 |
| B4 | clear-dark* | T3 | B4 | UE1 |
| C2 | clear+light | T2 | C2 | UE1 |
| C3 | clear+light | T3 | C3 | UE1 |
| D3 | clear+light | T3 | D3 | UE1 |

**Light can be used as universal opaque**

**Generic Enamel can be used as alternative enamel**

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**COLOUR CHART**

<table>
<thead>
<tr>
<th>Light curing unit</th>
<th>Paste Opaque</th>
<th>Tender intermediate curing</th>
<th>HRi in Tender Flask</th>
<th>HRi, Stain Glass Connector</th>
<th>Colour fixation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labordur (Micerium)</td>
<td>3 min.</td>
<td>90 sec.</td>
<td>5 min.</td>
<td>30 sec.</td>
<td>90 sec.</td>
</tr>
<tr>
<td>DC-XS (Kulzer)</td>
<td>90 sec.</td>
<td>30 sec.</td>
<td>4 min.</td>
<td>30 sec.</td>
<td>30 sec.</td>
</tr>
<tr>
<td>UNI-XS (Kulzer)</td>
<td>90 sec.</td>
<td>190 sec.</td>
<td>5 min.</td>
<td>30 sec.</td>
<td>90 sec.</td>
</tr>
<tr>
<td>Spectranet (Kulzer)</td>
<td>2 min.</td>
<td>1 min.</td>
<td>6 min.</td>
<td>1 min.</td>
<td>10 min. + 10 min.</td>
</tr>
<tr>
<td>Spectra Led (Schutz Dental)</td>
<td>30 sec.</td>
<td>30 sec.</td>
<td>8 min.</td>
<td>30 sec.</td>
<td>3 min.</td>
</tr>
<tr>
<td>Triad II** (Dentply)</td>
<td>5 min.</td>
<td>1 min.</td>
<td>6 min.</td>
<td>1 min.</td>
<td>7 min. + 7 min.</td>
</tr>
<tr>
<td>Labfold II (Ivoclar)</td>
<td>1 min.</td>
<td>1 min.</td>
<td>5 min.</td>
<td>1 min.</td>
<td>9 min. + 9 min.</td>
</tr>
<tr>
<td>Soladina EX (Shofu)</td>
<td>1 min.</td>
<td>90 sec.</td>
<td>5 min.</td>
<td>30 sec.</td>
<td>90 sec.</td>
</tr>
<tr>
<td>Luxi Lye (Dentply)</td>
<td>3 min.</td>
<td>1 min.</td>
<td>6 min.</td>
<td>1 min.</td>
<td>4 min. + 4 min.</td>
</tr>
<tr>
<td>MPA 2000 (Dentply)</td>
<td>1 x HD</td>
<td>90 sec.</td>
<td>5 min.</td>
<td>30 sec.</td>
<td>90 sec.</td>
</tr>
<tr>
<td>LampadaPlus (Micerium)</td>
<td>2 min.</td>
<td>60 sec.</td>
<td>6 min.</td>
<td>60 sec.</td>
<td>6 min. + 5 min.</td>
</tr>
<tr>
<td>4 min.</td>
<td>A2-A3</td>
<td>10 min.</td>
<td>11 min.</td>
<td>10 min.</td>
<td>30 min.</td>
</tr>
</tbody>
</table>

**DENTINE**

<table>
<thead>
<tr>
<th>LIGHT CURING UNIT</th>
<th>HRi in Tender Flask</th>
<th>HRi, Stain Glass Connector</th>
<th>Colour fixation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TENDER</strong></td>
<td><strong>DENTINE</strong></td>
<td><strong>HRi</strong></td>
<td><strong>ENAMEL</strong>**</td>
</tr>
<tr>
<td>Bleaching</td>
<td>clear+light</td>
<td>T2 (+TW)</td>
<td>UD0 (+UD0,5+UD1)</td>
</tr>
<tr>
<td>UD1 (A1)</td>
<td>clear+light</td>
<td>T2 (+TW)</td>
<td>UD1 (+UD2+UD3)</td>
</tr>
<tr>
<td>UD2 (A2)</td>
<td>clear+light</td>
<td>T2 (+T3)</td>
<td>UD2 (+UD3+UD4)</td>
</tr>
<tr>
<td>UD3 (A3)</td>
<td>clear+light</td>
<td>T3 (+T5)</td>
<td>UD3 (+UD4+UD5)</td>
</tr>
<tr>
<td>UD3,5 (A3,5)</td>
<td>clear-dark*</td>
<td>T3,5 (+T5)</td>
<td>UD3,5 (+UD4+UD6)</td>
</tr>
<tr>
<td>UD4 (A4)</td>
<td>clear-dark*</td>
<td>T4 (+T5)</td>
<td>UD4 (+UD5+UD6)</td>
</tr>
</tbody>
</table>
1. ADHESIVE AESTHETIC RESTORATION

1A. LAMINATE VENEERS

**PREPARATION**

Supragingival preparation and anatomic reduction of the dental tooth by 0.7 – 1 mm is required. Trim the closing margins on the plaster model and highlight them using a 0.5 mm wax pencil, seal the die with Tender Rock DUR and apply (1 mm from the margin) the dentine colour spacer. Then apply Temp Seal and Temp Sep on the area beside the die.

**INCISAL STRATIFICATION**

Once the shape for reconstruction has been set in wax, prepare a silicone stent to construct the lingual incisal margin using HRi Universal Enamel. Apply UD3 dentine in the cervical area; go on with stratification using dentine UD2, and reproduce the mamelons with UD0.

Light cure in LaborluxL for 1 min. & 30 sec.

**VESTIBULAR STRATIFICATION**

Characterize the mamelons with IWS intensive. It’s possible to reinforce the opalescent effect applying OBN inserts in the incisal area. Check the peripheral volumes for HRi Universal Enamel (0.5 mm), chosen on the basis of the value of the tooth.

**FINAL CURING, FINISHING AND POLISHING**

Apply UE2 HRi Universal Enamel. Finish the veneer using mounted stones and polish using the Shiny system. Remove the laminated veneers from the model and check the restoration on a complete model. Before cementation, sandblast the inside of the veneer applying a low pressure.

Final curing in LaborluxL for 9 min.

See page 11
1. ADHESIVE AESTHETIC RESTORATION

1B. INLAYS/OVERLAY

**PREPARATION**

Supragingival preparation is required over a width of at least 2 mm in the occlusal area and the closing limits are not to correspond to the occlusal contacts. Prepare the model and remove both undercuts and interference in wax.

See page 6

**PERIPHERAL STRATIFICATION**

Build-up the restoration walls using Universal Enamel (or Generic Enamel); in the deeper area use Tender TMO (Orange) or T4.

Light cure in LaborluxL for 1 min. & 30 sec.

**INTERNAL STRATIFICATION**

Finish the build up of the internal nucleus with HRi Dentine of the chosen shade. Complete the morphology with IWS and Universal (or Generic) Enamel. Brown 2 Stain (dark brown), available in flow composite or acrylic can be introduced in the sulcus.

Final curing in LaborluxL for 9 min.

**FINAL CURING, FINISHING AND POLISHING**

Finish and polish using Enamel Plus Shiny system: only perfectly polymerised and polished composite are resistant to staining and the accumulation of plaque. Remove the inlay, and, after checking it on the complete model, sandblast the inside before sending it for cementing.

See page 11
2. FIXED PROSTHESIS IN COMPOSITE

2A. WAX-UP AND STRUCTURE CONDITIONING

**Diagnostic waxing and wax carving for Veneer**

Apply the separator and model the crown, using wax for modelling small areas. It is advisable to use a different coloured wax for the inner pattern, to show the thickness after carving. Make a silicone palatal stent as an aid to determining the extent of the carving and the volume between the dentine and the enamel in the aesthetic area. After creating the aesthetic outline of the veneer crown, remove the wax from the areas marked out to a depth of at least 1 mm.

**Adhesive for retentions - Temp Chips adhesive**

To facilitate greater compound adhesion it is advisable to apply retentions. Once carving has been completed, apply a layer of adhesive and leave to dry. Then allow the retention particles to fall freely over the area, avoiding excessive build-ups. In restorations that are entirely aesthetic and that have a metal base, it is advisable to model a support and retention structure, bearing in mind that a minimum space of 1 mm is required for composite application.

**Casting, sandblasting and applying Tender Bond metal primer**

It’s possible to use several type of alloys (gold, titanium, non precious metal) and also produce zirconium framework. After the model has been cast and finished (or the milling with CAD/CAM technique) it is important to sandblast the surface to be covered in composite, using aluminium oxide at a pressure of 1.5 bars. Clean using a jet of air and immediately apply a thin layer of Tender Bond with a brush (allow to dry for 1 min. and apply a second layer if any bare metal is visible).

**Tender paste opaque “Clear”**

Proceed to apply a very thin layer of paste with a brush. The paste should only be applied in very thin layers like a wash. If the paste layers are applied more thickly, it prevents optimum polymerization and weakens the bond. We suggest applying the paste Clear as a first layer as it is easily cured in all areas, thus giving a perfect link with the framework.

Light cure in LaboluxL for 3 min.
2. FIXED PROSTHESIS IN COMPOSITE

2b. ENAMEL PLUS: STANDARD STRATIFICATION

**Tender Paste Opaque “Light”**

Apply a second layer of paste opaque using the paste opaque Light that can be considered as universal (paste opaque Dark is also available). Apply further opaque layers until complete covering of the framework.

*Light cure in Laborlux, for 3 min.*

**Applying Tender and HRi Dentine Body**

Apply, by pushing it against the structure using silicone brushes (TPEN), Tender T5 in cervical area (pressing it on the framework in order to avoid bubbles) and Tender dentine in the colour of choice in the coronal area. Build up the dentine body using Enamel Plus HRi Dentine which, besides being more translucent, adds greater lustre to reconstructed areas due to its fluorescence.

*Light cure in Laborlux, for 1 min. & 30 sec.*

**Applying HRi Universal Enamel**

Build up the enamel layer with Universal Enamel (UE1, UE2, UE3). Which, that having the same refractive index as the natural enamel, reproduces the same blue amber effects. It is possible to increase the value by increasing the thickness just as in natural enamel. As economical alternative it is possible to use the Generic Enamel.

*Final curing in Laborlux, for 9 min.*

**Finishing and Polishing**

Finish the surface of the veneer, using a diamond or silicone carbide, reshaping the macro and micro geography of the tooth. Smooth the surface using paper cones and polish using goat hair brush and diamond paste. Create a high shine with aluminium oxide paste and felt.

*See page 11*
2. FIXED PROSTHESIS IN COMPOSITE

2C. ENAMEL PLUS: ANATOMIC STRATIFICATION

**Applying Tender Cervical Body, Modifier Orange & Yellow Tender Body**

It’s possible to proceed with an individual anatomic stratification technique. Apply T5 Tender body in the cervical area. The colour of the cervical area can be further intensified by using high-chromaticity bodies (MY-MO).

Light cure in Laborlux for 1 min. & 30 sec.

**Applying Tender Modifier White and Tender Dentine Opaque Body**

Using the silicone stent as a guide, apply Tender dentine-opaque body, in the appropriate colours in alternate layers and with varying intensity, in order to give the stratification a more natural appearance. It is important to apply Modifier White (MW) at the body level, so that the overall chromatic performance of the tooth is high from the early stages of stratification.

Light cure in Laborlux for 1 min. & 30 sec.

**Applying HRi Universal Enamel and HRi Dentine Body**

In order to obtain an incisal margin of exact dimensions, it is important to use a silicone stent and to stratify the HRi Universal Enamel. As economical alternative it is possible to use the Generic Enamel. Check the incisal translucency obtained, and proceed to build up the body of the tooth using Dentine HRi with stratification that results in desaturation of the colouring selected e.g. UD4 (A4), UD3 (A3), UD2 (A2).

Light cure in Laborlux for 1 min. & 30 sec.

**Applying Enamel Plus Stain and Opalescent Enamels**

To reproduce the incisal effects it’s possible to use florescent flow or acrylic stains directly on the dentine body (Blue in interproximal area, Orange and Yellow for mamelons, Transparent incisally). To reinforce the blue-amber opalescent effect, apply in the incisal area Opalescent Blue (OBN) and Amber (OA), while to reproduce hypocalcification area use Intensive Enamel (IW-IWS-IM).

Light cure in Laborlux for 1 min. & 30 sec.
2. FIXED PROSTHESIS IN COMPOSITE

2c. ENAMEL PLUS: ANATOMIC STRATIFICATION

**Applying vestibular HRi Universal Enamel (or Generic Enamel)**

Build up the vestibular wall with HRi Universal Enamel that having the same refraction index of the natural tooth, increase the value by increasing the thickness. UE1 has an amber hue and used in thinner layer reproduces the elderly, UE3 has very high value to reproduce very white teeth and it is optimal for reproducing cuspids, UE2 is the intermediate enamel.

Alternatively we can use Generic Enamel, available in 3 values (GE1, GE2, GE3), whose luminosity can be increased by using Glass Connector between dentine and enamel.

*Final curing in LaborluxL for 9 min.*

**Finishing**

Apply a layer of Air Block to the surface of the crown to ensure complete polymerization. Finish the surface of the veneer, using a diamond-tipped grinder or carborundum tool, reshaping the macro and micro geography of the tooth in a vertical direction first, and then horizontally. Smooth the surface using paper cones.

**Final Polishing**

Polish using a goat-bristle brush wheel and Shiny diamond paste, first A (3 µ) and then B (1 µ). After final polishing using C (aluminium oxide paste) and felt, the surface will be compact and have a natural appearance.

**Case Finished**

Composite restoration after polishing.
It is possible to use the flasking technique to create the aesthetic composite on an implant prosthesis, saving more than 50% of working time, as in this case of removable implant prosthesis. Temp Red resin pattern is applied to fix the abutment replicas and with Enamel Plus Temp resin the framework is manufactured and transformed in milled titanium with CAD-CAM system.

On titanium frame work the final aesthetic wax-up is created.

Abutment replicas are screwed onto the frame work to stabilize the frame in the flask. Mix Temp Silic paste A and B and add the retarding (see picture below). It is possible to place in the flask base an insert to reduce the amount of silicone needed.

Apply the silicone in the Tender Flask base and around the teeth, before placing them on the base. When the silicone is hard, remove the model and eliminate the silicone excess and interferences. Isolate with silicon spray and replace the model in the silicone base.

Flask patented by Sig. Davide Scalavino (European Patent. No. 1 108 399)
Remove the transparent silicone from the cover flask. Reduce the wax elements to create the enamel space and use the silicone stent to control the dimensions.

Apply Temp Silic Clear silicone on the wax elements and in the flask cover and close the flask. Let the silicone hardening 15-20 minutes on the bench, or 10 minutes under pressure at 2 atm (dry and cold setting). After setting, open the Tender Flask, check the mould and remove the material in excess.

INCISAL CUTS

2nd TRANSPARENT SILICONE MOULD FOR DENTINE

Apply Temp Silic Clear silicone on the wax elements and in the flask cover and close the flask.

Working time 5 min. Setting 15-20 min

FLASK OPENING

After setting, open the Tender Flask and remove the material in excess. Remove the model. Now we have two moulds available, the first one for pressing dentine and the second one for enamel.
3. IMPLANTS PROSTHESIS

3A. PRESSING TECHNIQUE WITH FLASK

SANDBLASTING AND TENDER PRIMER APPLICATION

Remove the wax and mechanically prepare the metal. Sandblast with 50 µm aluminium oxide - a.
Apply Tender Bond Metal Primer and let dry for 1 min., checking that the liquid is completely evaporated from the metal surface - b.

See page 8

OPAQUE APPLICATION

Apply a very thin layer (“wash”) of Clear opaque with a brush and cure it - c. Apply a second thin layer of Light opaque and cure it - d; apply further Light opaque layers till the structure is completely covered - e.

Light cure each layer in LaborluxL for 3 min.

See pag. 8-9

STRATIFICATION OF TENDER BODIES

Apply cervical, modifier and dentine Tender bodies and, after checking with the silicone stent the left space, cure. - f - g. Using a ball bar, create some grooves on the silicone base to allow the composite to flow - h.

Light cure in LaborluxL for 1 min. & 30 sec.

See page 10

PRESSING OF HRi DENTINE

Close the accesses for the screw holes with temporary composite EnaSoft, easy to remove, and cure it for 20 sec - i. Place the dentine HRi body in the composite heater EnaHeat that allow to obtain a flowable consistency of the composite needed for the pressing phase. Apply the dentine in the transparent silicone mould for dentine - j.
**Curing**

Close the flask and leave it to sit for about 8 min. in a curing chamber at 40°C without pressure. Light cure in LaborluxL. Open the flask and remove composite excess.

**Creating Opalescent, Intensive and Characterization**

Finish the incisal cuts and apply on the composite surface the liquid Temp Bonding Fluid (Ref. TEMPF) and cure it. Apply eventual opalescent, intensive and characterization bodies and cure it.

**Pressing of HRi Universal Enamel (or Generic Enamel)**

Apply Enamel plus HRi enamel in the silicone mould for enamel. Close the flask and leave it to sit for about 8 min. in a curing chamber at 40°C without pressure. Light cure in LaborluxL. Open the flask and make the final curing 9 min in LaborluxL.

**Pink Opaque Application**

After the pressing phases, place the restoration on the model. Apply Tender Pink opaque on the exposed metal. Light cure in LaborluxL for 3 minutes.

Pink Orange Flow available separately
3. IMPLANTS PROSTHESIS

3B. FLANGES IN COMPOSITE

Apply Tender Pink composite bodies to create the gum. See the below phases of composite characterization that can be followed also for resin gum.

**STRATIFICATION OF PINK TENDER BODIES**

Apply a layer of Tender Bonding Fluid and cure it - k. Apply Ena Tender Stain white (increases the opacity and shade of ischemic papilla or in bone prominence area), red (increases the chromaticity of pink composite, simulating veins) and blue (increases effects in foramen and small veins) - l. Apply Tender Pink Transparent body (reproduces the cervical area where the gum cover the tooth and not the bone - m).

Light cure each layer in LaborluxL for 1 min. & 30 sec.

**REMOVABLE PROSTHESIS CHARACTERIZATION**

Apply Tender bodies Pink Light (reproduces the area over the tooth root where the gum is tight and transparent - n), Pink Dark (reproduces the less thigh and less adherent to the bone gum, highly blood supplied with a red blue shade in the area of the foramen - p) and Pink Orange (used as first layer or combined with White Stain reproduces the typical colour of bone prominence of natural flanges - q).

Light cure each layer in LaborluxL for 1 min. & 30 sec.

**REMOVABLE PROSTHESIS CHARACTERIZATION**

Composite gum details.

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FINISHING
Use a green carborundum bur (D4049) for incisal edge finishing. Use a diamond round big bur (D717), then a diamond round small bur (D727), and after a diamond flame bur (D725).

FINISHING
Use for occlusal areas a diamond flame bur (D725) and a titanium bur (D2304). Use for interproximal area a diamond disc (D751) and paper cone for last finishing (COSSHINYCON).

POLISHING
Use 3 micron diamond paste Shiny A, 1 micron Shiny B and aluminium oxide paste Shiny C for polishing with a hair goat brush (Shiny S-HP). Polish with cotton felt wheel (Shiny F-HP).

CASE FINISHED
The case finished shows the natural effects of dental elements and gingival tissues.
4. COMBINATION & REMOVABLE PROSTHESIS

4A. COMBINATION PROSTHESIS: PRESSING TECHNIQUE WITH FLASK

Wax-up and applying into flask

Composite combination prosthesis pressed in Tender Flask.
Proceed with preparation of double crowns and casting of partial Veneers and wax-up of the aesthetic elements to be reproduced in composite.
Fix the framework in the flask base.

Duplication and pressing

Follow duplication and pressing steps as described in prosthesis on implants case.

Checking texture and polishing

After removing the excess composite, finish, check texture and macro-morphology with TEMPSILV silver powder. Polish with Enamel plus Shiny system.

Applying pink opaque and resin on partial

Apply Tender Pink Paste Opaque on the metal and light cure it. Create the flanges with Enamel plus Temp Pink. It is possible to enhance the front teeth in composite creating the papilla in Tender pink, after applying Temp Bonding Fluid. If used on a ceramic tooth, create adhesion with Tender Bond & Paste Opaque Clear.

Light cure in Laborlux for 1 min. & 30 sec.
The enamel on the teeth involved must be reduced using a carbide bur and diamond disc. Sandblast and apply Temp Bonding Fluid. Customise the elements using Stain intensive colours and OBN and OA opalescent bodies.

Using composite, an old removable prosthesis can be renewed, or a new one can be customized, thus improving both aesthetics and wear resistance that will become close to the one of natural enamel. Fix the prosthesis in the flask base with TEMP SILIC PUTTY, and then prepare the mould in transparent silicone.

Press the enamel chosen beforehand (UE1, UE2, UE3) in the silicone mould, close the flask and light cure. Open the flask, finish and polish with Enamel plus Shiny. This will produce an appearance that is more complete from an aesthetic point of view, as well as being stronger thanks to the mechanical properties of HRi Universal Enamel (or Generic enamel).
5. TRANSITION PROSTHESIS / REPAIR

5A. COMPOSITE ON FIBRE / 5B. REPAIR AND AESTHETIC CORRECTION

TEMPORARY REINFORCED WITH FIBER: FIBER APPLICATION

In the case of transitional prosthesis or lengthy temporary treatment, in individual cases it is possible to use Enamel Plus directly on composite-impregnated glass fibres. After preparing the plaster model, adapt the fibres and fix using Enamel Plus Flow.

Light cure for 20 sec.

TEMPORARY REINFORCED WITH FIBER: COMPOSITE STRATIFICATION

Stratify and complete the morphology using Enamel Plus HRi Tender system. After polishing and removing the element from the model, sandblast the inside parts of the fibre veneers. Before cementing it is advisable to reactivate the fibre surfaces using an adhesive resin.

See pages 9-11

TEMPORARY ON IMPLANTS REINFORCED WITH FIBER

Composite temporary with fibers can be pressed in Tender Flask, creating an ideal temporary also in case of immediate load implant.

Repair / aesthetic corrections in composite

Roughen up the surface of the composite using a diamond tipped rotary or dome-headed bur, and smooth again by sandblasting. Soak the surface to be repaired by applying Temp Bonding Fluid using a paintbrush. Complete shaping, using Dentine mass and HRi Universal Enamel. After finishing and final polishing the work will be completely restored.

See pages 8-9
ENAMEL plus TEMP

6. TEMPORARY PROSTHESIS

6A. DENTINE CASTING AND INCISAL CUTS

DIAGNOSTIC WAXING AND TYPE OF TEMPORARY

Since it forms the functional and aesthetic basis for the metal-ceramic fabrication, the temporary prosthesis requires complete wax analysis in order to determine the shape. The choice of a temporary prosthesis in simple resin, or reinforced by an aesthetic structure in fibre or metal (in combination with Temp opaque and light curing liquid), depends on the treatment period and the size of the intermediate elements.

PREPARING STENTS

Two high definition, hard, silicone stents must be prepared (1 vestibular and 1 lingual). These are used for constructing a dentine core in resin and then for pressing the enamel.

Silicone working time 1-2 min. Setting 2-3 min.

CONSTRUCTION OF THE DENTINE CORE

Fill the undercuts with wax on the model and on the dies. After soaking the model with water, apply the separator. Mix Enamel plus Temp powder of the required colour with liquid. While in its plastic phase apply to the model and also into the vestibular mask that is to be inserted into the model later.

Use Temp Light or Dark Opaque to mask the abutment in temporary on implants.

PRESSING WITH THE STENTS

Press the remaining resin with the palatal stent and check that it matches the vestibular stent, then cure. If the temporary restoration does not have any specific aesthetic requirements, it can be finished and polished immediately. To produce a natural look use a layer of enamel and add affects that will help to imitate the behaviour of a natural tooth.

Curing in polymerization unit at 4 bars / 40° C
6. TEMPORARY PROSTHESIS

6B. ENAMEL PLUS TEMP ENAMELS

**INCLUSIONS**

In order to apply the enamel space must be made by accurately reducing the dentinal body to suit the stratification chosen. (Check the volumes using the stents). Establish the type of dentinal cut to be made, also taking the type of tooth into account. It is advisable to sandblast the surface slightly after the reduction phase.

**APPLICATION OF TRANSPARENT ENAMEL AND MODIFIER**

After moistening the surface with Temp liquid apply one layer of Transparent or Blue Temp Enamel and Orange or Yellow Modifier, using TEMPLC light curing liquid. It is possible characterizing temporary with Ena Tender Stain.

**APPLICATION OF ENAMEL**

Mix enamel with one of the three available liquids: hot or cold curing with stent, or hot curing in flask. Press the enamel. Once polymerization has been completed, use light abrasive points and smooth with pumice paste.

**FINISHING AND POLISHING**

Use soft felt wheels for final polishing, along with TEMPPOL liquid or TEMP99 stick. The product’s characteristics make excellent clinical integration possible.
In order to reproduce the tooth’s natural appearance for a temporary prosthesis (an important step in definitive metal-ceramic treatment), after making the dentinal cuts, use Enamel plus Temp Stain (Khaki, Orange and Brown for chromatic variations, White, Brown 2 and Blue for intensives and characterizations) or Stain Flow in composite.

We can use composite instead of resin enamel for long term temporary in order to improve aesthetics and wear resistance. Press Enamel plus Temp dentine using silicone stents. Go on with incisal cuts. Activate the composite surface with Temp Bonding Fluid (Ref. TEMP).

Press Enamel plus Temp dentine using silicone stents. Go on with incisal cuts. Activate the composite surface with Temp Bonding Fluid (Ref. TEMP).

Apply the Enamel plus Stains directly to the Enamel Temp dentinal body: Orange for canines, to increase the chroma and the cervical areas of the incisals. Blue to increase the opalescent effect on the incisals. On the incisal cuts, apply the composite opalescent bodies OBN (blue) and OA (amber) and light cure them.

Apply HRI Universal Enamel composite (or HFO Generic Enamel). Finish and polish with Shiny system.
NATURAL ENAMEL CLONED IN COMPOSITE

Using thickness close to natural enamel, we obtain same effects of natural tooth that increase in value while we increase the thickness. With direct light opalescence blue effect is put in evidence, while with diffused light we can observe the amber effects: in the pictures below we can clearly notice the difference in translucency when a thickness is changing.

HRi UNIVERSAL ENAMEL UE1 - low value

**UE1 - low value** in thin layer with amber effects, increasing thickness value increases

HRi UNIVERSAL ENAMEL UE2 - medium value

**UE2 - medium value** increasing thickness becomes high value

HRi UNIVERSAL ENAMEL UE3 - very high value

**UE3 - very high value** very white to be used for extremely white or bleached teeth

**RELATIVE REFRACTIVE INDEX OF LIGHT (n)**

<table>
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<tr>
<th>Material</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Enamel HRi (n 1.62)</td>
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</tr>
</tbody>
</table>

The relative refractive indexes of common materials measured at a temperature of 20°C and with a 589 nm** wavelength light indicates the deviation of the light that crosses a translucent area.**

**Vanini Mangani Klimovskaja “Conservative Restoration of Anterior Teeth” Acme 2005

1 mm 0.5 mm

APPLICATION OF DENTINE AND OPalescent

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