

*PROCEDURES FOR*

# POSTERIOR DIRECT & SEMI-DIRECT COMPOSITE RESTORATIONS



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For

**DENTSPLY**  
DETREY Products

# Posterior Composite Restorations with

*ceram*•*x* **duo**  
nano ceramic restorative

Direct restorations are indicated for preventive, small and medium size cavities. According to these different clinical situations, the following restorative methods have to be applied: respectively, *horizontal*, *oblique* and *3-sided light curing* techniques

Restorative steps	materials, instruments, timing
<p><i>Tooth preparation (adhesive design):</i></p> <ul style="list-style-type: none"> <li>-removal of existing metallic restoration</li> <li>-removal of existing tooth-coloured restoration</li> <li>-internal cavity shape</li> <li>-cavity limits &amp; margins</li> </ul>	<ul style="list-style-type: none"> <li>carbide bur: cylindrical round or round</li> <li>regular diamond* bur: cylindrical round or round</li> <li>regular diamond* bur: round</li> <li>fine diamond** pear or flame shape</li> </ul>
Field isolation & tooth-cavity cleaning	<ul style="list-style-type: none"> <li>rubber dam (Latex or Vinyl)</li> <li>non-fluoridated cleaning paste or air-abrasive device (<i>Prohy-jet</i>)</li> </ul>
Biological protection: only for direct pulp capping in case of "bleeding" pulp	<ul style="list-style-type: none"> <li>Calcium-hydroxide application (i.e.: <i>Pulpdent paste</i>)</li> <li>Calcium-hydroxide hard cement (<i>Dycal</i>) as punctual application</li> </ul>
Adhesive procedures I: " <b>total etch technique</b> " Conditioning	<ul style="list-style-type: none"> <li>Enamel: H<sub>3</sub>PO<sub>4</sub> 36% (<i>Conditioner 36%</i>) for 15-30s</li> <li><i>prior to, and then together with:</i></li> <li>Dentin: H<sub>3</sub>PO<sub>4</sub> 36% (<i>Conditioner 36%</i>) 5 to 15s</li> <li>- rinsing: water stream, without excessive pressure, ≥15s</li> <li>- "blot drying": remove water in excess with suction, dentin remains moist (shiny but no water film on the surface), enamel got dryer</li> </ul>

<p>Adhesive application</p> <p><b>!!! Avoid using thick layers of adhesive at the margins to prevent rapid wear of the material and the formation of an irregular margin</b></p>	<p>Prime &amp; Bond system (<i>XP Bond</i>)</p> <ul style="list-style-type: none"> <li>- brushing on dentin surfaces, 2 x 15s</li> <li>- removal of solvent &amp; water excesses : suction, light air-spray</li> <li>- bonding resin: cover all surfaces (thick layer, except on margins), wait 30s</li> <li>- light activation: min 20s, direct irradiation (<i>Smartlite PS</i>)</li> </ul>
<p>Adhesive procedures II: “self etch adhesive - single bottle system”</p> <p>Conditioning</p>	<p>Enamel: H<sub>3</sub>PO<sub>4</sub> 36% (Conditioner 36%) for 15 to 30s</p> <ul style="list-style-type: none"> <li>- rinsing: water stream, ≥15s</li> <li>- drying with air spray</li> </ul>
<p>Adhesive application</p> <p><b>!!! Avoid using thick layers of adhesive at the margins to prevent rapid wear of the material and the formation of an irregular margin</b></p>	<p>One step adhesive system (<i>Xeno V</i>)</p> <ul style="list-style-type: none"> <li>- place adhesive over all surfaces and wait for 20s</li> <li>- dry adhesive layer for ≥ 2s with light air spray</li> <li>- light activation for ≥ 10s (<i>Smartlite PS</i>)</li> </ul>
<p><i>Matrix placement:</i></p> <ul style="list-style-type: none"> <li>-horizontal technique 2-3 surfaces</li> <li>- horizontal technique 2-3 surfaces</li> <li>-3-sided-light-curing technique 2/3 surfaces</li> </ul>	<p>Sectional matrixes + ring (i.e.: <i>Palodent system</i>) &amp; plastic wedges (i.e.: <i>Lucifix wedges, Hawe Neos-Kerr or Wandwedges, Garisson Dental</i>)</p> <p>Tofflemire metal matrixes + wood or plastic wedges</p> <p>Plastic translucent matrixes and reflecting wedges (<i>Lucifix system, Hawe Neos-Kerr</i>)</p>
<p><i>Base-lining:</i></p> <ul style="list-style-type: none"> <li>- base with gingival margin relocation (cavity deeper than 3 mm, intra-sulcular preparation)</li> <li>- lining (cavity depth 2-3mm)</li> </ul>	<p>≤1mm layer of flowable composite (<i>X-flow</i>) or flowable composite + restorative composite (<i>Ceram-X enamel</i>)</p> <p>≤1mm layer of flowable composite (<i>X-flow</i>)</p>
<p>Filling technique:</p> <ul style="list-style-type: none"> <li>-horizontal technique 2/3 surfaces</li> <li>-3-sided-light-curing / oblique technique 2/3 surfaces</li> </ul>	<p>Ceram-X dentins (D2-D4) &amp; enamels (E1-E3)</p> <p>Composculp kit (<i>DD3 to DD6; Suter dental</i>): application of layers 1-1.5 mm, 40s direct irradiation (<i>Smartlite PS</i>)</p> <p>Composculp kit (<i>DD3 to DD6; Suter dental</i>): application of layers 1-1.5 mm, 40s indirect-transcuspal and direct irradiation (<i>Smartlite PS</i>)</p>
<p>Occlusal sculpting – final polymerization</p>	<p>Composculp kit (<i>DD1 &amp; 2; Suter dental</i>): general anatomy (<i>DD1</i>); fine sculpting (<i>DD2</i>)</p> <p>Ramp-curing: 10s distant irradiation (1cm from the surface), get closer and 20-30s direct irradiation (<i>or select appropriate mode on your curing unit</i>) (<i>Smartlite PS</i>)</p>
<p>Occlusal characterisation</p>	<p>Intensive liquid resin colours (i.e.: <i>Dark Brown: Color Plus, Kerr</i>)</p>

Finishing	-Finishing discs (i.e.: <i>Softlex, Pop-on, 3M</i> ): crests, proximal areas (no water spray) -Fine diamond** burs – bud & flame shapes: on all accessible proximal, gingival and occlusal margins where necessary (light pressure, low speed and no water spray)
Rebonding	Sealing with bonding resin ( <i>XP BOnd</i> ), surface isolation ( <i>Air-Block</i> ); 20s irradiation on each surface ( <i>Smartlite PS</i> )
Occlusal adjustments	Fine diamond** bur bud shape (with water spray)
Fine polishing	Silicone points ( <i>Enhance or any composite finishing system</i> ) (with water spray) Soft wheel with polishing paste ( <i>Enhance</i> ) or polishing brush ( <i>Occlubrush; Hawe Neos; Brushine, Diatech</i> ) (dry) or polishing points ( <i>PoGo</i> )

\* medium or coarse grit: 85-100 mm or 125-150 mm

\*\* fine grit: 45-50 mm

## **Semi-direct intra-oral (chair-side) composite restorations:**

Semi-direct intra-oral restorations are indicated for large 1 and 2 surface cavities, including cusp coverage, usually for one single tooth (eventually two teeth) per quadrant or arch, which have a simple and even design.

<b>Restorative steps</b>	<b>materials, instruments, timing</b>
<p><i>Tooth preparation (taper design on margins):</i></p> <ul style="list-style-type: none"> <li>-removal of existing metallic restoration</li> <li>-removal of existing tooth-coloured restoration</li> <li>-internal cavity shape</li> <li>-cavity limits &amp; margins</li> </ul>	<p>carbide bur: cylindrical round or round</p> <p>regular diamond* bur: cylindrical round or round</p> <p>regular diamond* bur: cylindrical round or conical round</p> <p>fine diamond** pear or flame shape</p>
<p><i>Field isolation &amp; tooth-cavity cleaning</i></p>	<p>rubber dam (Latex or Vinyl)</p> <p>non-fluoridated cleaning paste or air-abrasive device (<i>Prohy-jet</i>)</p>
<p>Biological protection: only for direct pulp capping in case of "bleeding" pulp</p>	<p>Calcium-hydroxide application (i.e.: <i>Pulpdent paste</i>)</p> <p>Calcium-hydroxide hard cement (i.e.: <i>Dycal</i>): punctual application</p>
<p>Adhesive procedures I: "<b>total etch technique</b>"</p> <p>Conditioning</p> <p><b>! Adhesion to enamel will is not established at this stage</b></p> <p>Adhesive application</p>	<p>Dentin: H<sub>3</sub>PO<sub>4</sub> 36% (<i>Conditioner 36%</i>) 5 to 15s</p> <ul style="list-style-type: none"> <li>- rinsing: water stream, without excessive pressure, ≥15s</li> <li>- "blot drying": remove water in excess with suction, dentin remains moist (shiny but no water film on the surface), enamel got dryer</li> </ul> <p>Prime &amp; Bond system (<i>XP Bond</i>)</p> <ul style="list-style-type: none"> <li>- brushing on dentin surfaces, 2 x 15s</li> <li>- removal of solvent &amp; water excesses : suction, light air-spray</li> <li>- light activation: min 20s, direct irradiation (<i>Smartlite PS</i>)</li> </ul>
<p>Adhesive procedures II: "<b>self etch adhesive - single bottle system</b>"</p> <p>Adhesive application</p> <p><b>! Adhesion to enamel will is not established at this stage.</b></p>	<p>One step adhesive system (<i>Xeno V</i>)</p> <ul style="list-style-type: none"> <li>- place adhesive over dentin and wait for 20s</li> <li>- dry adhesive layer for ≥ 2s with light air spray</li> <li>- light activation for ≥ 10s (<i>Smartlite PS</i>)</li> </ul>

<p><i>Base-lining:</i></p> <ul style="list-style-type: none"> <li>- base with gingival margin relocation (cavity deeper than 3 mm, intra-sulcular preparation)</li> <li>- lining (cavity depth 2-3mm)</li> </ul>	<p>≤1mm layer of flowable composite (<i>X-flow</i>) or flowable composite + restorative composite (<i>Ceram-X enamel</i>)</p> <p>≤1mm layer of flowable composite (<i>X-flow</i>)</p>
<p><i>Preparation isolation:</i></p>	<p><i>Rubber-Sep (Kerr-BelleGlass)</i></p>
<p><i>Matrix placement</i></p>	<p>Tofflemire metallic or plastic preformed matrixes (i.e.: <i>Lucifix system, Hawe Neos-Kerr</i>)</p>
<p><i>Restoration fabrication:</i></p> <ul style="list-style-type: none"> <li>- dentin base</li> <li>- crest and cusp contours</li> <li>- occlusal surface</li> </ul>	<p>In mouth</p> <p>Ceram-X dentin (<i>D2-D4</i>). Composculp kit (<i>DD3 to DD6; Suter dental</i>), light irradiation (20s/1-1.5mm layer) (<i>Smartlite PS</i>)</p> <p>Ceram-X enamel (<i>E1 to E3</i>). General anatomy (<i>DD1</i>); fine sculpting (<i>DD2</i>); light irradiation (10-20s for /1-1.5mm layer) (<i>Smartlite PS</i>)</p>
<p><i>Restoration try in, adjustments</i></p>	<ul style="list-style-type: none"> <li>- Intrados trimmed with regular diamond burs (pulpal walls)</li> <li>- Margins, proximal &amp; occlusal contacts checked et corrected if needed (<i>fine diamonds bur, discs</i>)</li> </ul>
<p><i>Occlusal characterisation</i></p>	<p>Intensive liquid resin colours (<i>Brown: Color Plus, Kerr</i>)</p>
<p><i>Post-curing (post-polymerization)</i></p>	<p>Post-curing for 5 to 7 min: light and temperature (~120°C for 5 to 7min) (<i>any post-curing unit</i>)</p>
<p><i>Enamel conditioning</i></p>	<p>Enamel: H<sub>3</sub>PO<sub>4</sub> 36% (<i>Conditioner 36%</i>) for 20-30s</p> <ul style="list-style-type: none"> <li>- rinsing: water spray, 15s</li> <li>- "drying": air spray</li> </ul>
<p><i>Adhesive procedures</i></p>	<p>In/onlay treatment:</p> <ul style="list-style-type: none"> <li>- Sandblasting: Al<sub>2</sub>O<sub>3</sub> (50 microns at 2 bars) or <i>Rocatec (3M/ESPE)</i></li> <li>- Silane (i.e.: <i>MonobondS, Vivadent</i>)</li> </ul> <p>Wetting of all cavity and inlay surfaces with the bonding resin (<i>XP Bond</i>)</p> <p><b>-no light activation!</b></p>
<p><i>Cementation</i></p>	<p>Rubber dam still in place. <i>Ceram-X enamel</i>, same as used for proximal and occlusal surfaces of the restoration</p> <ol style="list-style-type: none"> <li>1) Manual insertion (<i>burnihser or DD3 / 5</i>)</li> <li>2) Composite pre-heating: optional (<i>Calset, Addent</i>)</li> <li>2) Ultrasonic assisted insertion (<i>Luting tip, EMS or KVo</i>)</li> <li>3) Removal of cement excesses (<i>probe, floss, brush</i>)</li> </ol>

<i>Finishing</i>	-Finishing discs (i.e.: <i>Softlex, Pop-on, 3M</i> ): crests, proximal areas (no water spray) -Fine diamond** burs – bud & flame shapes: on all accessible proximal, gingival and occlusal margins where necessary (light pressure, low speed and no water spray)
Rebonding	Sealing of margins with bonding resin ( <i>XP Bond</i> ), surface isolation ( <i>Air-Block</i> ); 20s irradiation on each surface ( <i>Smartlite PS</i> )
Occlusal adjustments	Fine diamond** bur bud shape (with water spray)
Fine polishing	Silicone points ( <i>Enhance or any composite finishing system</i> ) (with water spray) Soft wheel with polishing paste ( <i>Enhance</i> ) or polishing brush ( <i>Occlubrush; Hawe Neos; Brushine, Diatech</i> ) (dry) or polishing point ( <i>PoGo</i> )

\* medium or coarse grit: 85-100 mm or 125-150 mm

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