Super Porcelain
EX-3
Porcelain for metal ceramic dental restorations
Noritake Super Porcelain EX-3

Technical Instructions

• Printed color can be slightly different from actual color.
• Read the IFU (Instructions For Use) before procedure.
• The specification and appearance of the product are subject to change without notice.

Kuraray Noritake Dental Inc.
300 Higashiyama, Miyoshi-cho
Miyoshi, Aichi 470-0293, Japan
http://www.kuraraynoritake.com
Contraindications:

If the patient is hypersensitive to potassium-aluminosilicate glass or any other components, this product must not be used.

Caution:

1. If the patient or the dental professional demonstrates a hypersensitivity reaction, such as rash, dermatitis, etc., discontinue use of the product and seek medical attention immediately.
2. When mixing materials or grinding a restoration being fabricated, use an approved dust mask and vacuum with air filter to protect your lungs from inhaling the dust.
3. When mixing materials or grinding a restoration being fabricated, use safety glasses to prevent the dust from getting into your eyes. If the dust gets into your eyes, immediately rinse with copious amounts of water and consult a physician.
4. Do not use for any purposes except for fabricating dental restorations. This product is for dental application only.
5. Do not touch the items heated by the furnace with your bare hands.
6. Paste Opaque, Paste Opaque Modifier, PASTE OPAQUE LIQUID, IS LIQUID, and ES LIQUID are flammable. Do not use them near fire or high-temperature objects.
7. IS LIQUID is a stimulant liquid. When using it, have good ventilation and if necessary wear an approved dust mask, safety glasses, and gloves.
8. Stain and plaque can accumulate on a restoration, once it has been put in position in the patient’s oral cavity depending on the patient’s eating habits or food choices. Instruct patients about the importance of cleaning their restorations.

Precautions in use:

1. For metal framework made of Cobalt-Chrome alloy, Nickel-Chrome alloy without Be and Noble alloys containing 75-85 percent Palladium and Copper, use NiP Bonded Paste Opaque for the first application.
2. When using a porcelain furnace for the first time, perform a baking test run in advance, since the working temperatures of porcelain furnaces may vary from one device to another.
3. Adjust the temperature and time according to the size of the restoration, referring to Baking schedule page 25.
4. Use only the product with the LIQUID named in the Technical Instructions; otherwise, the restoration might change color when it is baked.
5. Do not use Internal Stain as an alternative to External Stain. Do not use External Stain as an alternative to Internal Stain.
6. Paste Opaque and Paste Opaque Modifier have liquid on the surface. Do not discard this liquid or stir the liquid into the paste. Tilt the container to reveal a portion of Paste Opaque where there is no liquid, and put this paste onto a pallet and blend to a smooth consistency.
7. Use caution when mixing two shades of Paste for color adjustment to avoid air bubbles from entering the mixture.
8. Paste Opaque will harden gradually over time after it has been dispersed onto the pallet. Use as soon as possible after dispensing. Do not use hardened Paste Opaque.
10. Do not mix this product with other porcelain materials or use it in unauthorized combinations.

Storage:

1. Store in a cool and dry place. Keep away from direct sunlight.
2. The product should be stored at 1-30°C (33.8-86°F).
3. Place the cap securely back on the container after use.
4. The product must be stored in an appropriate place where only dental personnel have access.
5. The product must be used by the expiration date indicated on the package.
6. Do not store Paste Opaque, Paste Opaque Modifier, PASTE OPAQUE LIQUID, IS LIQUID, and ES LIQUID near fire or high-temperature objects.
### Color Combination table

#### Paste Opaque
- 6g / 7.2ml
- **PO White**: PO White
- **PO Gray**: PO Gray
- **PO Pink**: PO Pink
- **PO Blue**: PO Blue
- **PO Orange**: PO Orange
- **PO Yellow**: PO Yellow

#### Powder Opaque Modifier
- 5g / 5.6ml
- **PO White**: PO White
- **PO Gray**: PO Gray
- **PO Pink**: PO Pink

#### Paste Opaque Modifier
- 3g / 1.2ml
- **PO White**: PO White
- **PO Gray**: PO Gray
- **PO Pink**: PO Pink
- **PO Blue**: PO Blue
- **PO Orange**: PO Orange
- **PO Yellow**: PO Yellow

#### Universal Paste Opaque
- 6g
  - **UP White**: UP White
  - **UP Gray**: UP Gray
  - **UP Pink**: UP Pink
  - **UP Blue**: UP Blue
  - **UP Orange**: UP Orange
  - **UP Yellow**: UP Yellow

#### Universal Paste Opaque Modifier
- 3g
  - **UP White**: UP White
  - **UP Gray**: UP Gray
  - **UP Pink**: UP Pink
  - **UP Blue**: UP Blue
  - **UP Orange**: UP Orange
  - **UP Yellow**: UP Yellow

#### Powder Opaque Modifier
- 50g / 560g / 206g
- **PO White**: PO White
- **PO Gray**: PO Gray
- **PO Pink**: PO Pink
- **PO Blue**: PO Blue
- **PO Orange**: PO Orange
- **PO Yellow**: PO Yellow

#### Powder Opaque Modifier
- 10g / 56g
- **OM Gray**: OM Gray
- **OM Orange**: OM Orange
- **OM Pink**: OM Pink

#### Margin
- 10g / 56g
- **M-1**: M-1
- **M-2**: M-2
- **M-3**: M-3
- **M-4**: M-4
- **M-5**: M-5
- **M-6**: M-6
- **M-7**: M-7
- **M-8**: M-8
- **M-9**: M-9
- **M-10**: M-10

#### Opacious Body
- 10g / 56g / 206g
- **GB-10**: GB-10
- **GB-20**: GB-20
- **GB-30**: GB-30
- **GB-40**: GB-40
- **GB-50**: GB-50
- **GB-60**: GB-60
- **GB-70**: GB-70
- **GB-80**: GB-80
- **GB-90**: GB-90

#### Opacious Body
- **OB-10**: OB-10
- **OB-20**: OB-20
- **OB-30**: OB-30
- **OB-40**: OB-40
- **OB-50**: OB-50
- **OB-60**: OB-60
- **OB-70**: OB-70
- **OB-80**: OB-80
- **OB-90**: OB-90

#### Cervical
- 10g / 56g / 206g
- **CB-10**: CB-10
- **CB-20**: CB-20
- **CB-30**: CB-30
- **CB-40**: CB-40
- **CB-50**: CB-50
- **CB-60**: CB-60
- **CB-70**: CB-70
- **CB-80**: CB-80
- **CB-90**: CB-90

#### Body
- 10g / 56g / 206g
- **B-10**: B-10
- **B-20**: B-20
- **B-30**: B-30
- **B-40**: B-40
- **B-50**: B-50
- **B-60**: B-60
- **B-70**: B-70
- **B-80**: B-80
- **B-90**: B-90

#### Clear Cervical
- 10g / 56g / 206g
- **CC-1**: CC-1
- **CC-2**: CC-2
- **CC-3**: CC-3
- **CC-4**: CC-4

#### Tissue
- 10g / 56g / 206g
- **T-1**: T-1
- **T-2**: T-2
- **T-3**: T-3
- **T-4**: T-4
- **T-5**: T-5
- **T-6**: T-6
- **T-7**: T-7

#### Modifier
- 10g / 56g
- **White**: White
- **Gray**: Gray
- **Pink**: Pink
- **Green**: Green
- **Yellow**: Yellow
- **Light Orange**: Light Orange
- **Orange**: Orange
- **Brown**: Brown

#### Add-on
- 10g / 56g
- **AD-1**: AD-1
- **AD-2**: AD-2

#### Internal Stain
- 1g
- **ES**: ES
- **ET**: ET
- **ES/ET**: ES/ET
- **ES/ET**: ES/ET

#### Speed Enamel
- 10g / 56g / 206g
- **S**: S
- **Se**: Se
- **S**: S
- **Se**: Se

#### Translucent
- 10g / 56g / 206g
- **T**: T
- **T**: T
- **T**: T
- **T**: T

#### External Stain
- 1g / 56g
- **Pure White**: Pure White
- **Gray**: Gray
- **Black**: Black
- **Blue**: Blue
- **Green**: Green
- **Yellow**: Yellow
- **Orange**: Orange

#### Luster
- 10g / 56g / 206g
- **EL-1**: EL-1
- **EL-2**: EL-2
- **EL-3**: EL-3
- **EL-4**: EL-4
- **EL-5**: EL-5
- **EL-6**: EL-6
- **EL-7**: EL-7
- **EL-8**: EL-8
- **EL-9**: EL-9

#### Addmate
- 1g
- **Light Orange**: Light Orange
- **Dark Orange**: Dark Orange
- **Light Blue**: Light Blue
- **Dark Blue**: Dark Blue
- **Light Green**: Light Green
- **Dark Green**: Dark Green
- **Light Yellow**: Light Yellow
- **Dark Yellow**: Dark Yellow
- **Light Orange**: Light Orange
## Directions for use

### Preparation of metal framework

1. **Adjusting the metal framework**
   - Check the fit on the plaster model between the metal framework and the abutment at the inner surfaces, margins, etc. Confirm the thickness of the metal framework and adjust its contours using a carbide burr, or similar rotary instrument, so that a uniform layer of porcelain can be placed on it.
   - The appropriate thickness is 0.3 mm for precious metal alloys and 0.2 mm for Ni-Cr alloys. For the correct points to use, see the Instructions for Use supplied with the metal being used for the framework.

2. **Degassing**
   - After contouring, sandblast the veneering surface of the framework according to the Instructions for Use supplied with the metal being used for the framework. Then, clean the surface with ultrasound for about approximately 10 minutes. Perform degassing according to the Instructions for Use that apply to the metal being used. Degassing must be performed to ensure better wetting of the metal framework by the porcelain.

### Opaque application and baking

Apply Paste Opaque or Powder Opaque over the framework until the metal is completely hidden.

### Paste Opaque

1. **How to use Paste Opaque**
   - Scoop out the desired amount of the desired shade of Paste Opaque or Universal Paste Opaque and put it on the pallet. Note that the surface of the Paste Opaque or Universal Paste Opaque in the container will be covered with excess liquid; 1/4 the jar and dip out from the non-liquid-covered portion.

   **Attention**
   - Adjust the viscosity of the Paste Opaque or Universal Paste Opaque on the pallet using PASTE OPAQUE LIQUID or UP LIQUID. Do not over-dilute the paste; otherwise, cracks may form due to shrinkage when the restoration is baked. Only a dry brush should be used; DO NOT mix in even a small amount of water.

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### Table: Correct liquid to use

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<thead>
<tr>
<th>Component</th>
<th>PASTE OPAQUE LIQUID</th>
<th>UP LIQUID</th>
<th>OPAQUE LIQUID</th>
<th>FORMING LIQUID</th>
<th>Magic Former</th>
<th>MEISTER LIQUID</th>
<th>JR LIQUID</th>
<th>LS LIQUID</th>
<th>ADHESIVE FORMING LIQUID</th>
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* A liquid used for mixing the two-component porcelain provides a better finish to the porcelain, thus shortening the setting time.
* **Caution**: DO NOT use LIQUID for porcelain.
2 Wash application

Make sure the surface of the metal framework is dry. Apply a thin coat of Paste Opaque or Universal Paste Opaque to the entire surface of the metal framework, rubbing it in evenly.

However, note: for metal framework by rubbing made of semi-precious alloys containing 75 - 85 percent cobalt-chrome alloy, nickel-chrome alloy and palladium and also containing copper, use Paste Opaque’s NiP Binder. In this case, first apply a thin coat of NiP Binder to the entire dry surface of the metal framework and rub it in. Also note: NiP Binder should not be mixed with any other shade of Paste Opaque or Paste Opaque Modifier.

3 First application and baking

Apply an additional coat of Paste Opaque or Universal Paste Opaque, thick enough that it masks the metal under the porcelain paste by approximately 70 percent.

If Paste Opaque’s NiP Binder was used as the wash, that same product should also be used for the first application.

Check to determine if the Paste Opaque or Universal Paste Opaque has been layered too thickly in the proximal regions or near the lingual finishing line. Make sure that there is no residue of Opaque Paste remaining on the interdental surface of the metal framework. Then bake the restoration according to Baking Schedule 1, 3, 4. After the restoration is baked, there should be a slight luster across the opaque surface.

4 Second application and baking

After baking, apply an additional coat of Paste Opaque, Paste Opaque Modifier, Universal Paste Opaque, Universal Paste Opaque Modifier or a mixture of these. This time, completely mask the metal. Even if NiP Binder was used for the first application and baking phase, the target shade of Paste Opaque, Paste Opaque Modifier, Universal Paste Opaque, Universal Paste Opaque Modifier or a mixture of these should be used for the second application and baking.

Make sure that excess paste does not remain on the internal surface of the metal framework and bake the restoration according to Baking Schedule 1, 3, 4. After baking, the restoration should have a slight luster across the opaque surface.

**Attention:** Paste Opaque Modifier “PO Earth Brown” and “PO Reddish Brown” and Universal Paste Opaque Modifier “UP Earth Brown” and “UFB reddish brown” should be used separately. If Earth Brown or Reddish Brown is mixed with other shades, the desired color will not be obtained after baking.

The color of the Paste Opaque Modifier and Universal Paste Opaque Modifier may be different before rather than after baking, due to the storage conditions and duration. In particular, “PO Yellow” may lose greenish before baking. Be sure to perform a trial bake.

It is possible to use Powder Opaque for the second application.

1 First application and baking

Wet the surface of the metal framework with a moist brush. Apply a thin layer of Powder Opaque Vial has been made into a paste by mixing the powder with OPAQUE LIQUID. Powder Opaque Modifier or a mixture of both across the entire surface of the metal framework by rubbing. Bake the restoration according to Baking Schedule 5.

**Attention:** Do not mix Powder Opaque with Paste Opaque, Paste Opaque Modifier, Universal Paste Opaque or Universal Paste Opaque Modifier. If necessary, you can apply Powder Opaque separately, after the first layer of Paste Opaque has been baked.

2 Second application and baking

After the completion of the first baking, apply a layer of Powder Opaque, Opaque Modifier or a mixture of both, about 0.3 mm thick, and bake the restoration according to Baking Schedule 6.

After baking, the restoration should have a slight luster across the opaque surface.
**3 Cervical and Body building-up**

For a collarless metal framework, first apply Margin to the margin area. For Instructions how to use Margin, see page 13 of this manual.

**1 Cervical**

Mix Cervical, or a mixture of Body and Cervical, with FORMING LIQUID or MEISTER LIQUID. (See the section, “Color composition” on page 28 for the mixing ratio.) Layer the mixture on the cervical area of the metal framework.

**2 Body**

Mix the Body with FORMING LIQUID or MEISTER LIQUID and then apply the mixture on the metal framework to shape a proper crown contour.

Cut the gingival, labial, and proximal surfaces back to make space for building up with Enamel. Then create the mamelon structure. Make sure that the Body porcelain remains at least 0.4 mm thick after it has been cut back.

If there is not enough space available to layer on the opaque, use Opacifier Body. For Instructions how to use Opacifier Body, see page 15. Adjust the shade using Modifier and/or Matelene, if necessary.

**4 Enamel building-up**

Mix Enamel with FORMING LIQUID or MEISTER LIQUID, and apply the mixture one-third of the way from the incisal edge, so that the correct contour can be maintained. Be careful to avoid layering too much Enamel. Too much Enamel will result in a whitish appearance.

Apply Translucent and Luster over the Enamel, where needed, to provide the necessary appearance of depth. For instructions how to use Luster, see page 17.

To reproduce a gingival color, layer Tissue as necessary. For Instructions how to use Tissue, see page 20.

**5 Translucent building-up and baking**

Mix Translucent with FORMING LIQUID or MEISTER LIQUID and layer the mixture on the incisal area of the Body and Enamel building-up. With the consideration of shrinkage, building-up with translucent to 10% larger than the target size of the crown.

After building-up with Translucent, bake the restoration according to Baking Schedule 10. After baking, the restoration should have a slight luster across the porcelain surface. Corrections for any thin spots, hollows, etc., can be made by adding porcelain and baking again according to Baking Schedule 10. If the correction involves adding just a little porcelain in the contact area, the highest baking temperature should be approximately 10 degrees lower than the one given in the baking schedule.

<table>
<thead>
<tr>
<th>Baking Schedule</th>
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<tbody>
<tr>
<td>Time</td>
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<tr>
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<td>15min</td>
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<td>30min</td>
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</tbody>
</table>

**6 Morphological correction**

Use the straight part of a Meister Point (GP-05) to modify the contact area. Create the notch groove with a GP-05. Proceed by working in the vertical direction first, then in the horizontal direction. Use a Meister Point (GP-06) to create the serration and perikymate.

Performs the final morphological correction, paying special attention to the symmetry of the teeth, and distress away any roughness, especially on the proximal and marginal areas, using Meister Ceres. After completing the morphological correction, clean the surface, as necessary.
Glaze and Stain application, baking and finishing

1. Reproducing gloss using External Stain (Glaze)

Mix External Stain Glaze with ES LIQUID and apply a thin coat of the mixture. Then, bake the restoration according to Baking Schedule 13. If the shade needs to be adjusted, apply a mixture of External Stain and ES LIQUID and bake. Different shades of External Stain may be mixed, for details, see page 16. After baking, finish the restoration using silicone points, as necessary, and finish the restoration by polishing.

**Baking Schedule**

<table>
<thead>
<tr>
<th>Baking Schedule</th>
<th>Time</th>
<th>Preheating</th>
<th>Start</th>
<th>Rectangular</th>
<th>Round</th>
<th>High Temperature</th>
<th>Intermediate</th>
<th>Cool Time</th>
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<tbody>
<tr>
<td>13</td>
<td>1</td>
<td>450°C</td>
<td>650°C</td>
<td>80</td>
<td>0</td>
<td>930°C</td>
<td>1670°C</td>
<td>0</td>
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</tbody>
</table>

2. Reproducing gloss by self-glaze baking

Using Pearl Surface C (for semi-finishing), perform a medium fine-polish before self-glaze baking.

After polishing, bake the restoration according to Baking Schedule 12. To create varying levels of gloss on the surface, self-glaze the restoration at a lower temperature (30°C/86°F) to 40°C (104°F) lower than the usual glaze baking temperature. After baking, selectively fine-polish with Pearl Surface F (for finishing).

**Baking Schedule**

<table>
<thead>
<tr>
<th>Baking Schedule</th>
<th>Time</th>
<th>Preheating</th>
<th>Start</th>
<th>Rectangular</th>
<th>Round</th>
<th>High Temperature</th>
<th>Intermediate</th>
<th>Cool Time</th>
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</thead>
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<td>0</td>
<td>930°C</td>
<td>1706°C</td>
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</table>

Additional building-up

Margin (MRP) and Add-on

If there is insufficient contacts or contours on the margins after finishing, mix Margin MRP (Margin Repouching Powder) with FORMING LIQUID or Magic Former and build-up, followed by re-baking according to Baking Schedule 14. If there is insufficient contacts or contours on the crown, layer additional Add-on, followed by re-baking according to Baking Schedule 15. Add-on baking can be performed simultaneously with self-glaze baking, using Baking Schedule 12.

**Baking Schedule**

<table>
<thead>
<tr>
<th>Baking Schedule</th>
<th>Time</th>
<th>Preheating</th>
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<th>Rectangular</th>
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<th>High Temperature</th>
<th>Intermediate</th>
<th>Cool Time</th>
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</tbody>
</table>

Addmate

You can use Addmate to make additional layers. For instructions how to use Addmate, see page 21.

After baking, contour and polish the restoration using silicone points.
Margin

For a collarless metal framework, use Margin to reproduce excellent natural chroma around the cervical area. Keep in mind the instructions given below when preparing abutments.

In order to fabricate a porcelain margin, a shoulder or a deep chamfer is required. The common bevel chamfer preparation is too thin, and might result in breakage and/or make color accuracy difficult.

Applying and baking Opaque

The porcelain margin on the metal framework should be made approximately half (1/2) of the width on the shoulder. Mask the metal framework according to section, "2. Opaque application and baking" on page 6.

Applying the porcelain separating agent

Apply Vitrilac Stone Hardener or a cyanoacrylate adhesive thinly on the margin area of the abutment tooth. Remove any excess agent. After making sure the restoration surface is sufficiently dry, apply Magic Separator.

Building-up with Margin

Mix Margin with FORMING LIQUID or Magic Primer. Apply an adequate amount of Margin on the gingival part of the metal framework. Make sure the inside of the metal framework is clean. Put the metal framework onto the abutment die.

Adaptation to the die

Press Margin onto the cervical area with a spatula. Do not apply too much Margin, this will avoid creating an unattractive opaque appearance.

Condensation

In order to minimize shrinkage of the porcelain, make repeated condensation phases using an appropriate instrument. Brush off any excess Margin Porcelain with a dry brush.

First Margin baking

Carefully and gently twist and pull the framework upwards away from the die to remove it. Examine the framework's internal surface carefully. Eliminate any excess particles using a dry porcelain brush and bake the restoration according to Baking Schedule 7.

If there has been any shrinkage, perform additional applications of Margin.

Second application and baking

Reapply Magic Separator; Apply Margin to the margin area of the restoration by rubbing into the recess. Remove the restoration from the die. Check the internal surfaces of the metal framework before baking according to Baking Schedule 7.

After the second baking, check to make sure that the metal framework and the porcelain (in smooth) on the labial side and at the margins.

Attention

If necessary, use Margin Porcelain Refinishing Powder MRP to correct any thin spots, gaps, or holes in the marginal area after finishing.

<table>
<thead>
<tr>
<th>Baking Schedule</th>
<th>First Time</th>
<th>Preheating Time</th>
<th>Start Temperature</th>
<th>Peak Temperature</th>
<th>Release Temperature</th>
<th>High Temperature</th>
<th>Hold Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>155°C</td>
<td>10min</td>
<td>232°C</td>
<td>62°C</td>
<td>89°C</td>
<td>96°C</td>
<td>117°C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>5min</td>
<td>202°C</td>
<td>86°C</td>
<td>119°C</td>
<td>135°C</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* MD = Margin Deformation

* MD: Margin Deformation
Opacious Body

Opacious Body is formulated to have an intermediate level of translucency between that of Opaque and Body. The use of Opacious Body permits easy control of translucency. Opacious Body can be used with good effect for the following cases:

1. When the Opaque layer is reflected too strongly, due to insufficient space for layering either across the whole area or a part of it;
2. In some situations, due to different thicknesses of porcelain, e.g.:
   a. The porcelain on the base of the pontic is as thick that the translucency there is different from that in the abutment area;
   b. The translucency on abutments is different on a bridge due to different thicknesses or heights of porcelain on abutments area.

If there is not enough space available to build-up with the Body:

Apply Opacious Body, approximately 0.3 mm thick to the entire crown.

Create the mamelon structure on the incisal edge of the framework.

Bake the restoration according to Baking Schedule 9.

Build up with Body, Enamel and/or Translucent after baking.

If the translucency of the pontic is different from that in the abutment area:

If the base of the pontic has a different level of translucency from that of the abutment because of a thick layer of porcelain on the pontic, apply Opacious Body on the base of the pontic.

Internal Stain

Internal Stain is used to reproduce the color of the dentin and special characterization. Apply Internal Stain over an area where there is not enough space for building-up with Body. This prevents transparency from the Body to the Opaque underneath, making it possible to adjust the color of the whole crown.

Internal Stain can be used when:
- Opaque application and baking of page 6.
- Cervical and Body building-up of page 9.
- Enamel building-up of page 9.
- Translucent building-up and baking of page 10.

Internal Stain is meant exclusively for Internal staining and will not leave the porcelain surface glossy if used by itself.

Before you use Internal Stain, make sure to bake the restorations.

If the surface of the crowns needs to be stained, use External Stain.

Morphological correction

After building-up a dentin structure using porcelain and then baking, adjust the thickness of the porcelain on the labial side, across the incisal edge and the incisal structure at the edges of the dentin, while checking the space allowed for building-up with Translucent and/or Enamel.

After the completion of the morphological corrections, sandblast the surface of the restoration at a pressure of 0.3 MPa (41.5 PSI or 3 bar) with alumina particles and then clean with ultrasonic or steam.

To stain the surface, while overlapping different colors vertically and horizontally, the baking process should be divided into two phases:

First staining

Mix Internal Stain with IS LIQUID. Apply the mixture horizontally on the white bands, cervical areas and proximal surfaces. Bake the restoration according to Baking Schedule 9.

Second staining

Mix Internal Stain with IS LIQUID. Apply the mixture vertically to create check lines and enamel cracks. Bake the restoration according to Baking Schedule 9.

These baking processes are performed mainly to make sure the Internal Stain is well secured to the restoration surface. The porcelain on the restoration may look whistish at this point. Wet the porcelain with IS LIQUID to ascertain the actual color of the porcelain.

External Stain

External Stain is used to make color adjustments on the crown surface and provide characterization details for the incisal, dentin, and cervical areas.

There are A*, B*, C* and D* chroma-adjusting shades available to enhance the chroma of the porcelain applied.

After completing morphological corrections, check the color on the surface of the restoration. Apply External Stain (mixed with ES LIQUID) if necessary, followed by baking according to Baking Schedule 13.
Luster

Use Luster instead of, or in combination with Translucent to reproduce the surface texture and color of the enamel.

**Cases where the use of Luster is not recommended:**
1. If the tip of a metallic framework is too close to the incisal edge of the porcelain.
2. If the occlusal surface of a rotor is not fully covered by porcelain.
3. If the porcelain is extremely thin, therefore, the reflection gives too opaque an effect.

In the above cases, the usual combination of Enamel and Translucent Porcelain should be used to produce a more natural appearance.

<table>
<thead>
<tr>
<th>Shade</th>
<th>How to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT</td>
<td>Used mainly for a highly translucent incisal edge and for the simulation of highly translucent enamel, likely to be seen through to the dentin.</td>
</tr>
<tr>
<td>LTa</td>
<td>Used for areas built up with Translucent T, effective for achieving the brightness of natural tooth enamel.</td>
</tr>
<tr>
<td>LT Natural</td>
<td>Used mainly on incisal edges and proximal surfaces, to reproduce a high level of translucency, as seen especially among the elderly.</td>
</tr>
<tr>
<td>LT Super Gray</td>
<td>More gray than LT Natural. Useful for reducing brightness on incisal edges and for creating beautiful contrast effects. Use this alone or as a mixture with another shade of Luster or Translucent T.</td>
</tr>
<tr>
<td>T Blue</td>
<td>Used mainly for the incisal edges of young people’s teeth, to reproduce their pale blue and youthful translucency.</td>
</tr>
<tr>
<td>Aqua Blue 1</td>
<td>Somewhat bluer than T Blue. Used to reproduce the blue zone. This shade is used alone or mixed with another shade of Luster or Translucent T.</td>
</tr>
<tr>
<td>Aqua Blue 2</td>
<td>Somewhat bluer than T Blue, with a slight gray cast. Used to reproduce the blue zone at a lower tone than Aqua Blue 1. This shade is used alone or mixed with another shade of Luster or Translucent T.</td>
</tr>
<tr>
<td>LT Yellow</td>
<td>Used to reproduce a light “HALO EFFECT”, to show depth in the central occlusal surface. Apply LT Yellow over Mamelon shade to suppress the orange tone.</td>
</tr>
<tr>
<td>Incisal Aureola</td>
<td>Used to reproduce the “HALO EFFECT” caused by the full reflection of light on the incisal edge.</td>
</tr>
<tr>
<td>Sun Bright</td>
<td>Used to reproduce the orange tone on the incisal edge of enamel, seen among the middle aged and elderly. Also used to reproduce a deeper orange or amber enamel color.</td>
</tr>
<tr>
<td>Creamy Enamel</td>
<td>Used mainly on the cusps and ridges of mortars, and occasionally on the area from the marginal ridge to the incisal edge of anterior teeth to the area near the corners of the incisal edge.</td>
</tr>
<tr>
<td>Creamy White</td>
<td>Used to reproduce a dense, milky effect, mixed with another shade of Luster.</td>
</tr>
<tr>
<td>ELT1</td>
<td>Used when the target shade is EW / EWY.</td>
</tr>
<tr>
<td>ELT2</td>
<td>Used when the target shade is EWs / EW.</td>
</tr>
<tr>
<td>ELT3</td>
<td>This is the brightest of the ELTs. Suitable for EW shades (EW / EWY / EWs / EW).</td>
</tr>
</tbody>
</table>

Luster LT is the basic Luster shade. Here are some examples of how to use Luster shades to reproduce natural tooth color accurately.

**Examples of how to use Luster shades**

- Application of T Blue near the incisal edges of both proximal surfaces and LTs for the mamelon structure.
- Application of Creamy Enamel near the central part of the crown and the marginal ridges on the lingual side.
- Application of LTs over the entire crown except the incisal area and LT1 or LT Yellow for the area near the lingual fossa.
- Application of Clear Ceramica CCV-1 or CCV-2 near the cervical area.

After building-up with Luster or Clear Ceramica, bake the restoration according to Baking Schedule 10.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>7</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Clear Ceramica**

Use Clear Ceramica to reproduce internal coloration resembling the natural tooth without negatively affecting the chroma.

<table>
<thead>
<tr>
<th>Shade</th>
<th>How to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCV-1</td>
<td>Used for the cervical area, to reproduce brighter shades (A1 to A3)</td>
</tr>
<tr>
<td>CCV-2</td>
<td>Used for the cervical area, to reproduce darker shades (A3.5 to A4)</td>
</tr>
<tr>
<td>CCV-3</td>
<td>Used for the cervical area, in cases where the root is exposed or the crown is long</td>
</tr>
<tr>
<td>CCV-4</td>
<td>1. When more red is required than can be reproduced by CCV-3. 2. Used for deep fossa on the lingual side of anterior teeth</td>
</tr>
</tbody>
</table>

---

*Directions for use / Luster*
**Speed Enamel**

Speed Enamel is a newly developed porcelain specifically designed for the two-layer build-up technique. As compared with conventional enamels, Speed Enamel has a beautiful opalescent effect. An esthetic restoration can be easily created with a simplified build-up technique. It is suitable for both boutique esthetic work and mass-production lab settings. Start your simple and esthetic work with Speed Enamel NOW!

### Clinical Case Application

- **Correct finish after Paste Opaque or Universal Paste Opaque applications and baking.**
- **Apply Body to fit contour dimensions.**
- **Cut-back incisal edge, proximal contacts, and bevel incisal 1/6 of crown. Define marginal structure.**
- **Cut-back the lipgual and proximal line angles.**
- **Apply Speed Enamel to these lingual cut-back areas.**
- **After the restoration according to Baking Schedule # and morphological correction.**
- **Continue applying Speed Enamel to cover 1/6 of the crown surface.**
- **Finished crown made simply!**

### Layering Sketch

#### 3 BASIC LAYER BUILD-UP

- **Luster** (Translucent)
- **Enamel**
- **Body**
- **Opaques**
- **Opaque Metal**
- **Cervical**

#### 2 LAYER BUILD-UP with SPEED ENAMEL

- **SPEED ENAMEL**
- **Body**
- **Opaque**
- **Metal**
- **Cervical**

### Tissue

Tissue comes in 7 shades total. These can also be used to reproduce gingival color on implants.

<table>
<thead>
<tr>
<th>Shade</th>
<th>How to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tissue1</td>
<td>Reproduce general gingival color.</td>
</tr>
<tr>
<td>Tissue2</td>
<td>Reproduce light gingival color.</td>
</tr>
<tr>
<td>Tissue3</td>
<td>Reproduce dark gingival color.</td>
</tr>
<tr>
<td>Tissue4</td>
<td>Mix with Tissue 1, 2 or 3 to enhance brightness. Suitable for adjustment of brightness in cases where the space of the gingiva is wide.</td>
</tr>
<tr>
<td>Tissue5</td>
<td>Used for areas where a opaques red tone is required.</td>
</tr>
<tr>
<td>Tissue6</td>
<td>Used to reproduce bright pink.</td>
</tr>
<tr>
<td>Tissue7</td>
<td>Used for areas where a strong red tone is required.</td>
</tr>
</tbody>
</table>

Use Paste Opaque Modifier PD Pink, Opaque Modifier CM Pink or Universal Paste Opaque Modifier UP Pink on a substrate that forms the gingival area. Use Internal Stain and External Stain, as necessary.
Addmate is a low-temperature baking porcelain. The following precautions must be taken to avoid problems, such as blokening or whitening of the porcelain.
1. Use Addmate Forming Liquid when mixing.
2. Use Risten Magee Separator for separating any porcelain-fused-to-metal from the opacifier die.
3. If tissue paper filters get mixed with the porcelain slurry during water absorption in the condensation procedure, these filters will not completely burn off.
4. After baking, make sure that no residual tissue filter remains.
5. Porcelain formasite temperature variations may be significant in the lower ranges (700°C / 1292°F or lower).
6. Determine the exact baking schedule by performing a trial bake.

Other precautions:
1. If there is concern that a post-ceramic soldered area may be deformed because the welding point is lower than that of the post-ceramic soldering material, secure the soldered corners with a soldering investment before baking. (Use caution to prevent the porcelain from contacting the investment.)
2. When making any connection to an area near a post-ceramic soldered area, thoroughly remove any flash, etc., before layering on the porcelain and baking.
3. Do not layer Addmate on the solder; otherwise, cracks might occur.
4. Do not use any porcelain except for Addmate after baking Addmate.

Shade table
Select the right shade of Addmate to suit the restoration shade.

<table>
<thead>
<tr>
<th>Restoration shades</th>
<th>Addmate shades</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1O · A2O · A3O · B2O</td>
<td>Light Opaque</td>
</tr>
<tr>
<td>A1O · A2O · B3O · B4O</td>
<td>Dark Opaque</td>
</tr>
<tr>
<td>A1B · A2B · A3B · B2B</td>
<td>Light Body</td>
</tr>
<tr>
<td>A1B · A2B · B3B · B4B</td>
<td>Dark Body</td>
</tr>
<tr>
<td>All Enamel shades</td>
<td>Enamel</td>
</tr>
<tr>
<td>All Translucent</td>
<td>Translucent</td>
</tr>
<tr>
<td>LTb</td>
<td>Luster Translucent</td>
</tr>
</tbody>
</table>

*For restoration shades either that those listed in the table, select the appropriate Addmate shades that suit their best.*

How to use

Use Addmate for the following applications.

**Application**

**Morphological correction after finishing**
1. Layer an appropriate Addmate shade in areas where the porcelain is insufficient. Bake the restoration according to Baking Schedule 19.

**Correction of areas contaminated by dust particles**
1. Remove dust particles lodged in the porcelain, often appearing as black spots, with a carbide bur.
2. Clean the contaminated area using akrotina sandblasted at 0.15 MPa / 22 PSI or 1.5 bar.
3. After cleaning, before using Addmate, build-up with Addmate in a shade that is compatible with the corrected area. Then, bake the restoration according to Baking Schedule 19.

**Correction of air bubbles**
1. When correcting air bubbles, use a warned instrument to compact Addmate into the particles. Slightly overfill to have account of shrinkage due to baking. Bake the restoration according to Baking Schedule 19.
2. a. When correcting a covered air bubble, grind the area around the bubble, using a carbide point to widen the pit. It is advisable to widen the pit in the longitudinal direction from the inside / squeeze edges, and in the mesial and distal directions towards the cervical area.
   b. Sandblast the metal at the bottom of the pit and areas around it using akrotina at 0.15 MPa / 22 PSI or 1.5 bar.
   c. Apply Light Opacite or Dark Opacite into the pit. Before the porcelain dries, build up with Light Body or Dark Body, Bake the restoration according to Baking Schedule 19. Note that the porcelains should be overbuilt, to account for possible shrinkage due to baking.

**Correction of cracks**
1. Mix Addmate with slightly more Addmate Forming Liquid than usual, apply a single-layer of the mixture to the area where the crack occurs.
2. Make required condensation.
3. Bake the restoration at a temperature that is a maximum of 40°C / 72°F lower than the normal glass baking temperature.
   - For example, if your normal glass baking temperature is 980°C / 1796°F, bake at 880°C / 1614°F.
   *Correcting cracks might be difficult if they occurred due to differences in thermal expansion between the metal and the porcelain.
   *After post-ceramic soldering, the soldered corners needs to be allowed with an investment.

**Correction of porcelain that has become detached from the metal**
1. Grind the porcelain around any exposed metal in a gradient.
2. Akrotina sandblast the exposed metal at 0.55 MPa / 22 PSI or 1.5 bar.
3. Apply a single layer of Addmate Light Opacite or Dark Opacite and bake the restoration according to Baking Schedule 16.
4. Build-up with Addmate Light Opacite or Dark Opacite at the same thickness as the surrounding Opacite Porcelain. Before this applied Opacite Porcelain dries, apply another layer of Addmate in a shade that is compatible with the Body Porcelain. Overbuild is account for possible shrinkage due to baking.
5. Bake the restoration according to Baking Schedule 19.

**Correction of margin areas**
1. Apply Magic Depasser on the working model and fill the crown to be corrected until the model.
2. Mix Light Body or Dark Body with Light Opacite or Dark Opacite in a ratio of 10:1 and apply the mixture on the area to be corrected.
3. Remove the crown from the working model carefully. Bake the restoration according to Baking Schedule 19.

*Adjust the baking schedule to compensate for the removal of glass.*
### Color Combination Table

<table>
<thead>
<tr>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A3.5</th>
<th>A4</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>NP1.5</th>
<th>NP2.5</th>
<th>EWOo</th>
<th>EWO</th>
<th>EW</th>
<th>EWY</th>
<th>NWo</th>
<th>NWo.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0A1</td>
<td>P0A2</td>
<td>P0A3</td>
<td>P0A3.5</td>
<td>P0A4</td>
<td>P0B1</td>
<td>P0B3</td>
<td>P0B3</td>
<td>P0B4</td>
<td>P0C1</td>
<td>P0C2</td>
<td>P0C3</td>
<td>P0C4</td>
<td>P0D1</td>
<td>P0D2</td>
<td>P0D3</td>
<td>P0D4</td>
<td>P0NP1.5</td>
<td>P0NP2.5</td>
<td>P0EWOo</td>
<td>P0EWO</td>
<td>P0NWo</td>
<td>P0NWo.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P0D1</td>
<td>P0D2</td>
<td>P0D3</td>
<td>P0D4</td>
<td>P0D1</td>
<td>P0D2</td>
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<td>P0D1</td>
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<td>P0D3</td>
<td>P0D4</td>
<td>P0NP1.5</td>
<td>P0NP2.5</td>
<td>P0EWOo</td>
<td>P0EWO</td>
<td>P0NWo</td>
<td>P0NWo.5</td>
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<tr>
<td>Universal Paste Opaque</td>
<td>UPnA1</td>
<td>UPnA2</td>
<td>UPnA3</td>
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<td>UPnA4</td>
<td>UPnB1</td>
<td>UPnB3</td>
<td>UPnB3</td>
<td>UPnB4</td>
<td>UPnC1</td>
<td>UPnC2</td>
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<td>UPnEWO</td>
<td>UPnNWo</td>
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</tr>
<tr>
<td>Powder Opaque</td>
<td>A10</td>
<td>A20</td>
<td>A30</td>
<td>A3.5</td>
<td>A40</td>
<td>B10</td>
<td>B20</td>
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<td>D40</td>
<td>NP1.5</td>
<td>NP2.5</td>
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<td>EWO</td>
<td>NWo</td>
<td>NWo.5</td>
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<tr>
<td>Margin</td>
<td>MA1</td>
<td>MA2</td>
<td>MA3</td>
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<td>MA4</td>
<td>MB1</td>
<td>MB2</td>
<td>MB3</td>
<td>MB4</td>
<td>MC1+</td>
<td>MC2</td>
<td>MC3+</td>
<td>MC4</td>
<td>MD1+</td>
<td>MD2</td>
<td>MD3</td>
<td>MD4</td>
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<td>MNP2.5</td>
<td>MDP1</td>
<td>MDP2</td>
<td>MNP1</td>
<td>MNP2</td>
<td></td>
</tr>
<tr>
<td>Opacious Body</td>
<td>OBA1</td>
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<td>OBA3</td>
<td>OBA3.5</td>
<td>OBA4</td>
<td>OBB1</td>
<td>OBB2</td>
<td>OBB3</td>
<td>OBB4</td>
<td>OBC1</td>
<td>OBC2</td>
<td>OBC3</td>
<td>OBC4</td>
<td>OBD1</td>
<td>OBD2</td>
<td>OBD3</td>
<td>OBD4</td>
<td>OBNP1</td>
<td>OBNP2</td>
<td>EWOo</td>
<td>EWO</td>
<td>NWo</td>
<td>NWo.5</td>
<td></td>
</tr>
<tr>
<td>Cervical (+Body)</td>
<td>-</td>
<td>CV-3</td>
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<td>CV-3</td>
<td>CV-3</td>
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*1 Please use Silky E1 for 2 layer build-up  
*2 Please use Silky E2 for 2 layer build-up

### Color Combination Table

#### - Converting VITA 3D-Master™ Shades to Noritake Value Shades

<table>
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<th>3M3</th>
<th>3R1.5</th>
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VITA™, 3D-Master™ and OM1-5M3 are trademarks of VITA Zahnfabrik H. Rauter GmbH & Co.
## Baking Schedule

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<th>Baking Schedule</th>
<th>Porcelain Type</th>
<th>Dry-Out Time</th>
<th>Predrying Temperature</th>
<th>Start Vacuum</th>
<th>Heat Rate</th>
<th>Vacuum Level</th>
<th>Release Vacuum</th>
<th>High Temperature</th>
<th>Hold Time with vacuum in the air</th>
<th>Cool Time</th>
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**Attention:** The above program is only a guideline. Baking temperatures may vary due to different furnaces.

*1 96 kPa = 72 cmtg (29 inchesig).  
*2 When Magic Former is used, the dry-out time should be 7 min, pre-drying temperature 700°C(1292°F), and start vacuum temperature 700°C(1306°F).  
*3 This is the baking temperature for cases when Opalicious Body, Body, Cervical, Clear Cervical, Enamel, Speed Enamel, Translucent, Luster, Mamelon, Modifier and Tissue are applied additionally.  
*4 The baking conditions are established on the assumption that 1-3 units are baked, in cases of 4-6 units, the dry-out time should be 10 min, release vacuum 925°C(1696°F), high temperature 935°C(1706°F), in cases of over 7 units, the dry-out time should be 15 min, release vacuum 935°C(1706°F), high temperature 940°C(1724°F).