Noritake has 100 years of successful experience in ceramic technology. It is world famous for its exquisite china. During the past few decades, it has used its expertise in applied ceramic science to become a world leader in ceramic electrical insulators and abrasive materials. In 1987, Noritake brought its knowledge and years of experience to the dental field by developing and introducing NORITAKE SUPER PORCELAIN EX-3, a complete dental porcelain system of the highest quality.

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**Reproduction of Natural Tooth Color**

**Outstanding Resistance to Fractures**

**Outstanding Resistance to Greening**

**Natural Fluorescence**

**Exceptional Handling Characteristics**
Natural & Beautiful

Laminate Veneer Restorations using EX-3 and Screening Porcelain

Mechanical Properties

EX-3 has strong mechanical property among available PFM porcelains.

Paste Opaque EX-3

- Easy to use
- Thinner coat
- Allows more space for porcelain build-up
- Complete masking of metal oxides
- Prevents blackline at margin

Luster Porcelain

- Natural opalescence
- Fine polishable surface structure
- Less wear of the opposing tooth

Because of the fine particle size of its composition, Luster Porcelain can achieve the selective reflection which assures the Opalescence seen in the natural teeth. Noritake Luster Porcelain exhibits minimal wear in the mouth due to the smaller and consistent particle size resulting in less wear of the opposing teeth.

Comparison with natural tooth and other low wearing porcelains

Internal Stain

Internal Stain was first developed by Mr. Hitoshi Aoshima.

- Easy to reproduce the characterizations of natural tooth structure
- Can see characterizations before baking
- Matched CTE for EX-3

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Steps for IS

Baked Body and Enamel
Apply IS as if drawing on a canvas
After IS is baked, build-up with Translucent
Finished crown

Distinctive Features
Recreation of the natural dentition

With its outstanding resistance to greening and pinkish shade, Noritake Super Porcelain EX-3 has been proved to simulate the bluish white fluorescence of the natural dentition successfully by most analysis reports and ceramists. Furthermore, assured by the excellent chroma and brightness balance between Opaque and Body, even in the case of insufficient space of porcelain build-up, the natural simulation can be realized without the permeation of Opaque shades.

Noritake Shade Guide

Noritake Shade Guide is developed utilizing Noritake shade concept that is less greenish color and more pinkish color. It is composed of four basic shade series and two Noritake original shade series. Two series of Noritake original shade are intermediate shades (NP1.5, NP2.5) and bleached shades (NW0, NW0.5).

About n Color Shade

To improve the recreation of Noritake Shade, n color shade contains chroma intensified Body and Paste Opaque of the shade. With the intensified chroma, it even can be used in the case of insufficient space of porcelain build-up.

Metal Framework Preparation

Preparation Form of Abutment Tooth

Please make sure to keep an appropriate space for the incisal edge, the labial side and the lingual side in abutment tooth. Confirm the preparation form of abutment tooth. Wax the metal framework from for build-up of porcelain.

Metal framework adjustment

Follow the instructions of the metal manufacturers for degassing after the cleaning in aceton ultrasonically. Do proceed the degassing in order to increase the bonding between the porcelain and the alloy.

Degassing

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Opaque Porcelain (Paste or Powder Type)

Universal Paste Opaque

How to use Universal Paste Opaque
Scoop out the desired amount and the desired shade of Universal Paste Opaque and put it on the palette. The surface of Universal Paste Opaque is covered with extra liquid in order to avoid drying. Please incline the jar and clip up from the no-liquid part.

**Attention** Don’t mix liquid with paste opaque inside the jar. Don’t dispose liquid from the jar.

Wash Application
Be sure the surface of the metal framework is completely free of moisture. Using the tip of the brush, rub the surface with a small amount of Universal Paste Opaque to form a very thin layer.

**Attention** Only dry brush should be used. DO NOT mix with even a small amount of water.

1st Application
After a thin layer is rubbed, keep coating the metal framework with Universal Paste Opaque. 80% of the metal color should be hidden. Do not need too much condensation. Bake the metal framework after making sure that no residue remains. If Universal Paste Opaque residue is found, use a dry brush to remove it from inside of the metal framework. The surface has an almost egg shell look after first baking.

**Attention** When dilute the desired amount of Paste Opaque with UP Liquid. Be careful that over-dilute will lead to fractures after baking.

2nd Application
Apply the second layer of Universal Paste Opaque until the color of the metal framework is completely covered. Be sure that no Universal Paste Opaque residue remains inside of the metal framework.

**Attention** When using Universal Paste Opaque on Ni-Cr alloys without beryllium and Co-Cr alloys. Clean the entire surface of the baked opaque with the running water or steam cleaner to wash out substance that may cause greening.

Universal Paste Opaque Modifier Application
Universal Paste Opaque Modifier can be mixed with Universal Paste Opaque to customize the shade or can be applied alone for minor modifications. When Modifier is used as a stain, dilute it with UP Liquid to make desired viscosity and apply during the second application.

**Attention** Apply earth brown or reddish brown separately. If earth brown or reddish brown is mixed with other shades, the desired color can not be obtained after baking. The desired color can be changed after baking due to the storage condition. Internal Stain can be used on Paste Opaque also.

In case of using conventional Paste Opaque and POBA, please see page 40 (Baking Schedule Type A and B)
After the completion of the first Opaque layer, apply the Opaque of 0.3mm thickness to cover the metal color and bake it.

Application of 2nd Opaque Layer
After the completion of the first Opaque layer, apply the Opaque of 0.3mm thickness to cover the metal color and bake it.

Wash Bake
Wet the metal framework surface with a moist brush. Then apply a thin layer of Opaque to the surface with an instrument or a brush and bake it. Follow the baking schedule precisely.

2nd Baking
The surface should have egg-shell gloss appearance after the second baking.

**Powder Opaque**

**Preparation of Opaque Mixture**
Pour the suitable amount of Opaque powder and mix it with Meister Liquid.

*Attention* DO NOT mix Opaque powder with Paste Opaque. If Opaque powder has to use with Paste Opaque, only apply Opaque powder after the first Paste Opaque is baked.

**Wash Bake**
Wet the metal framework surface with a moist brush. Then apply a thin layer of Opaque to the surface with an instrument or a brush and bake it. Follow the baking schedule precisely.

**Application of 2nd Opaque Layer**
After the completion of the first Opaque layer, apply the Opaque of 0.3mm thickness to cover the metal color and bake it.

**2nd Baking**
The surface should have egg-shell gloss appearance after the second baking.

See page 40 **(Baking Schedule Type E)**

Build-up of Cervical Porcelain
Refer to Color Combination Table to mix Body and Cervical for the desired cervical color. Apply the mixture of Body and Cervical at the gingival and the proximal regions. After adequate condensation, place the crown onto the die. If Cervical is not used, apply Body in the same manner.

Cervical Porcelain

See page 37, 38 **(Color Combination Table)**

**Build-up Techniques of Porcelains**

**Build-up of Body Porcelain**
Build up with the desired Body color. Match the dimension and form to the symmetric tooth in order to recreate the shade precisely.

Body Porcelain

Build-up of Body porcelain is accomplished. Keep a 1.5 ~ 2.0mm thickness on the lingual side of the incisal edge in order to make the cut-back easy.

**Cut-back**
Cut back Body in order to make a space for building up Enamel Porcelain. First, divide the crown into three parts along the length and mark the guidelines with a knife.
On the labial surface, cut back one-third part from incisal edge (about 1.0mm to the lingual side) and connect the guideline. Then, divide the incisal edge into three parts from the mesial side to distal side and mark the guideline.

Cut back the central one-third part about 0.3mm on the labial surface.

Cut-back of Proximal Surface
Cut-back the proximal area (about 0.5mm) with a cutting-knife to the lingual side.

Create the Mamelon Structure
Create the mamelon structure with reference to the three guidelines on incisal edge.

Some irregular structure can recreate natural feeling.

The Thickness Confirmation
Confirm the thickness of porcelain after the build-up of Body. The minimum thickness of Body porcelain should be at least 0.8mm.

Build-up of Enamel Porcelain
Build up one-third of the cut-back incisal edge with Enamel Porcelain. Over-built-up of Enamel porcelain causes the whiter shade. Be careful of the build-up thickness.

Don’t apply the Enamel porcelain to the lingual side. Smooth the lingual surface with an instrument.

Opaque Body, see page 21.
Luster or Translucent Porcelain

Build-up of Luster or Translucent Porcelain
Build up Luster or translucent porcelain to cover the whole crown surface.

With the consideration of shrinkage, build up the porcelain to 10% larger than that of the symmetric tooth.
The translucency degree of the translucent porcelain is as below:
Tx > T0 > T1 > T2
In four translucent shades, Tx shows the highest degree of transparency, and then, T0, T1, and T2 shows the lowest degree of transparency.

Apply the porcelain to the lingual side.

Build-up of Proximal Area
Remove the metal framework from the die and add the Translucent to the shortage part of the proximal area.

Condensation
To minimize shrinkage, hold the crown with tweezers and repeat the condensation with an instrument for 2 or 3 times.
Be careful not to do the condensation too much in order to avoid crumbling.

Brush off the excess porcelain with a dry brush.

Clean Up the Internal Surface
Examine the internal surface and eliminate the contamination with a dry brush.

Baking of 1st Body Porcelain
The surface should be egg-shell like appearance after the first body baking. Any shortage can be corrected by adding porcelain and baking again. In that case, the baking schedule should be as same as the first body baking. In the case of correcting the contact area with a little porcelain, the highest baking temperature should be about 10 degrees lower than the baking schedule.

See page 40 (Baking Schedule Type H, I, J)
Morphological Correction

First, start the morphological correction from the proximal area. Polish it by using the straight part of the Meister Point (DP-05), which makes it easy to modify the contact area.

Likely, create the labial groove with DP-05. Proceed it by vertical direction first, then by horizontal direction.

Use Meister Point (DP-02) to create the serration and the natural tiny grooves.

Use Detail Checker to check the surface texture and the shade in the middle of morphological correction. Glossy surface can be appeared by applying Detail checker thinly on the surface.

The Final Polish with Meister Cones
Perform the final morphological correction with the reference of the symmetric tooth. Polish the roughness specially on the proximal and margin area with Meister Cones.

Polish with Pearl Surface C and the Glazing
Polish with Pearl Surface C before glaze baking.

Polish with Pearl Surface F
Perform a fine polish with Pearl Surface F to achieve a partial gloss after self glazing in a lower temperature (30-40°C lower than the Body baking temperature).

Build-up of Add-On Porcelain
Any shortage can be corrected by adding Add-On porcelain (AD-T, AD-B) after the glazing. It can be done by baking it simultaneously with the glazing without vacuum.

Completion
Finished crown in the mouth.
Advanced Technique

Margin Porcelain

Special Features
1. Because of its small shrinkage, the margin porcelain retains a good fitting after baking. Furthermore, it can avoid rounding off after the consecutive bakings of body porcelain.
2. With its appropriate opacity, 13 basic shades can recreate the excellent natural chroma around the cervical area.
3. A new additional shade “Clear Margin” has been introduced to recreate a more vivid appearance.

Preparation Form for Porcelain Margin
In order to fabricate a porcelain margin, a shoulder or a deep chamfer is required. The common bevel chamfer preparation is too thin, which might cause the breakage and make the color simulation difficult.

Metal Framework Form
The porcelain margin of the metal framework should be made approximately half (1/2) of the width on the shoulder. Following the instruction, apply Opaque and baking.

Magic Separator Application
Apply Noritake Stone Hardener or Cyanoacrylate thinly on the margin area of the abutment tooth. Remove the excess. Apply Magic Separator after it is dried.

Build-up of Margin Porcelain
Mix Margin Porcelain with Forming Liquid or Magic Former. Apply the adequate amount of Margin Porcelain to the gingival part. Make sure if the inside of the metal framework is clean. Then, put the metal framework onto the abutment die.

NOTE Margin Porcelain mixed with Magic Former becomes hard after drying.

Application on the Die
Press Margin Porcelain to the cervical area with a spatula. Do not apply too much Margin Porcelain in order to avoid the opacity.

Condensation
In order to minimize the shrinkage, repeat the condensation with an instrument.

Brush off excess Margin Porcelain with a dry brush.

NOTE Please dry enough when Magic Former is used.
Removal form the Die
Carefully and gently twist and pull the framework upwards away from the die to remove.

Internal Examination and 1st Margin Bake
Carefully examine internal framework surface. Eliminate any excess particles using a dry porcelain brush, then fire on first Margin bake.

After 1st Margin Bake
Perform with additional Margin build-up if shrinkage occurs.

The 2nd Margin Application
Apply Magic Separator to the margin area of the die again and reseat the coping on the die. Next, create a slightly wetter, thinner mix of margin ceramic, apply it to the margin area and vibrate gently into the gap. Finally, brush away excess ceramic from the margins, examine the internal coping surface and bake as directed for the first margin bake.

The 2nd Baking
The adequate view after the second baking shows that the metal framework and the porcelain join smoothly. If necessary, use Margin Porcelain Retouching Powder (MRP) to correct the shortage of the margin area after glazing.

Attention: MRP can’t be used before glazing because of its lower temperature.

Margin Correction with MRP
Build-up MRP
Apply a thin mixture of MRP (Margin Retouch Powder) porcelain to the marginal area of the restoration after glazing.

Remove the Excess
Re-seat the restoration on to the die, vibrate to condense the ceramic and ensure that the restoration is completely seated on the die. Remove the excess MRP porcelain with a brush and took the crown from the die carefully. Then, bake it according to the baking schedule.

Morphological Correction
Polish the serration and roughness at the labial margin with a silicone point such as Meister Point (SF-41).
Opacious Body Porcelain

**Special Features**
Opacious Body Porcelain is formulated with an intermediate degree of translucency between that of opaque and body porcelain. By using opacious body, the degree of translucency can be easily controlled.

1. In the cervical areas of tooth crown where thick body porcelain becomes too translucent, by using Opacious Body in this area, the degree of translucency can be easily controlled.
2. Some other different situations due to the different thickness area of porcelain.
   a. The porcelain in the bonding basal surface area is thick and has a different translucency in the abutment tooth area.
   b. In the case of a bridge, the porcelain in the abutment tooth area has a different translucency and thickness.

**Application**
Apply Opacious Body about 0.3mm thickness to the whole crown.

**Labial Side**
Build up the natural dentine incisal form.

**Lingual Side**
Clinically, it is widely used to the lingual side of anterior tooth and the occlusal surface of molar.

**After Baking (Labial Side)**
Bake it by following the baking schedule. Build up Body, Enamel and Translucent porcelain after baking.

**A Case of Pontic**
Compared with the translucency of abutment tooth, the porcelain on the pontic side looks very thick.

**A Case of Modifying the Frame Thickness**
In the case of making a bridge, Opacious Body can prevent the dispersion of translucency and shade color in the incisal area.
The thermal expansion coefficient (CTE) of External Stain (ES) is almost the same as that of EX-3 porcelain. Therefore, ES cannot be detached from the tooth surface by tooth brushing for a long time after its oral insertion. A wide availability of ES will enable easy characterization. The IS has also has the same CTE as that of EX-3 porcelains. Bubbles and cracks cannot be generated by the baking of porcelain after IS application on the porcelain. It will not only produce very delicate colors but also prevent opaque color permeation by IS staining even when there is not enough space for porcelain build-up.

Internal Stain is made exclusively for internal staining and does not make the porcelain surface glossy by itself. External Stains are recommended for the staining on the porcelain surface. Finer grain size due to our new technology will further improve reproduction of more natural delicate colors.

The newly introduced A+, B+, C+ and D+ in ES and IS will intensify chroma of the build-up porcelain. ES and IS have an ideal fluorescence as EX-3 porcelain does.

Confirm if there is no dust or grease on the tooth. When applying IS after morphological correction, clean the tooth ultrasonically in acetone solution or water.

Stain Porcelain

Special Features

1. The thermal expansion coefficient (CTE) of External Stain (ES) is almost the same as that of EX-3 porcelain. Therefore, ES cannot be detached from the tooth surface by tooth brushing for a long time after its oral insertion. A wide availability of ES will enable easy characterization.
2. The IS has also has the same CTE as that of EX-3 porcelains. Bubbles and cracks cannot be generated by the baking of porcelain after IS application on the porcelain. It will not only produce very delicate colors but also prevent opaque color permeation by IS staining even when there is not enough space for porcelain build-up.

Remarks

1. Internal Stain is made exclusively for internal staining and does not make the porcelain surface glossy by itself. External Stains are recommended for the staining on the porcelain surface.
2. The newly introduced A+, B+, C+ and D+ in ES and IS will intensify chroma of the build-up porcelain.
3. ES and IS have an ideal fluorescence as EX-3 porcelain does.

Operation Procedure

1. Build-up and bake the Opaque layer.
2. Build-up and bake the Margin layer.
3. Internal staining on the Opaque layer if desired.
4. Build-up and bake the Body and Enamel layers.
5. Create the mamelon structure in the incisal edge.
6. Steam and/or ultrasonically clean.
7. Bake the first application of Internal Stain. *1
8. Bake the second application of Internal Stain. *2
9. Build-up and bake the Translucent/Luster translucent layers.
11. Steam and/or ultrasonically clean.
12. Bake the application of External Stain (Glaze).
13. Polish/Natural Glaze.

Remarks

1: Stain the white bands the cervical area and proximal region in a horizontal direction. *2: Stain vertical check-lines if any.

Remarks

1: ES Earth Brown is a new name for former Brown 3.
2: ES Reddish Brown is a new name for former Brown 4.

1: Stain the white bands, the cervical area, and proximal region in a horizontal direction.
2: Stain vertical check-lines if any.

Remarks

1: Stain the white bands, the cervical area, and proximal region in a horizontal direction.
2: Stain vertical check-lines if any.

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1: Stain the white bands, the cervical area, and proximal region in a horizontal direction.
2: Stain vertical check-lines if any.
External Stain

Chroma Intensifier (A⁺, B⁺, C⁺, D⁺)
If more chroma is needed after morphological correction, intensify chroma using External Stain A⁺ in order to match the exact shade of A.₂

After steaming or ultrasonically cleaning, apply Noritake ES liquid first. Then, apply ES A⁺ on the tooth.

In order to match the shade exactly, apply ES A⁺ comparing shade with Noritake Shade Guide.

IS Fluoro

IS Fluoro, is the clear Internal Stain to increase the fluorescence. Not only applying it after baking of Body and Enamel porcelains, but also applying to surface of zirconia coping for PFZ (porcelain fused to zirconia) and to surface of opaque for PFM (porcelain fused to metal).

Internal Stain

Internal Staining on Opaque/OB/Margin
Application of IS directly on cervical, incisal or occlusion area of Opaque/OB/Margin is very useful for producing natural color in less porcelain space area.

Surface Treatment of Body and Enamel
After baking Body and Enamel, make the mamelon structure and internal shape with discs or points where necessary. After shape correction, clean the surface with aluminum oxide sandblast (0.3MPa), ultrasonically or steam clean.

1st Application and Baking of IS
Wet the surface with IS Liquid before application of IS. First application of IS should be in a horizontal direction. In this case, apply the mixture of Incisal blue 2 and Bright (Dilution) on the mesial and distal angle. The ratio is 1:1. And apply A⁺ on cervical and central area of lingual side. After finish of first IS application, bake it according to baking schedule.

2nd Application and Baking of IS
Apply second IS in a vertical direction. In this case, apply the mixture of Mamelon Orange 2 and White to create enamel crack. The ratio is 2:1. In order to model the crack, apply Incisal Blue 2 very slightly beside the crack. After baking IS, it looks whitish. When confirming the actual characterizations after IS baking, wet the surface with Noritake Detail Checker or IS Liquid.

Completion
After baking Translucent or Luster Porcelain, make morphological correction. The characterizations of natural tooth structure is reproduced very easily.
ADDMATE is a correction porcelain which can be used with any porcelain fused to metal (PFM) with a thermal expansion coefficient range of 12.0~13.0×10⁻⁶/C, except porcelain fused to titanium (PFT). ADDMATE makes even the most difficult porcelain corrections possible, such as post-solder corrections, fine morphological adjustments after glazing and the correction of air bubbles.

**Applications and usage of ADDMATE**

**Post-glazing Morphological/Re-attaching and correction**

- **Build-up ADDMATE on contacts and areas of insufficient porcelain, then bake it.**
- **Correction of areas contaminated by dust particles**
  - Remove dust particles lodged in the porcelain, often appearing as black spots, with a carbide bur. Clean the contaminated area by alumina sandblasting at 0.1MPa. After steaming or ultrasonic cleaning, build-up ADDMATE in a shade compatible to the area of correction, then bake it.

**Correction of Bubbles**

- **Correction of porosities:**
  - Porosities are present in bubbles that emanate from within the porcelain to the surface. The correction is made by using a tapered instrument to apply ADDMATE into the porosity. Do not expand the size of the porosity. Build-up with slightly excessive ADDMATE, in consideration of shrinkage then bake it. Grind away excess porcelain with a stone point and polish it.
- **Correction of swell and air bubbles:**
  1. Grind away the swollen air bubble and surrounding porcelain with a carbide bur and widen the pit. To make the correction look natural, we recommend that the pit be ground vertically when the pit is near the incisal 1/3, and in the mesiodistal direction when the pit is near the cervical 1/3.
  2. Sandblast the metal at the bottom of the pit by alumina sandblasting at 0.1MPa.
  3. Build-up ADDMATE in the same thickness as the surrounding opaque. Avoid excess build-up of opaque as shrinkage is minimal. Using a brush, thoroughly remove all excess ADDMATE opaque adhering to the body porcelain layer.
  4. Before the opaque dries, build-up ADDMATE in a shade compatible with the body porcelain. Build-up ADDMATE slightly to allow for shrinkage after baking.
- **After baking,** grind away excess porcelain and finish.

**Correction of Cracks**

- **Before baking,** grind away porcelain in a gradient to allow additional build-up.
- **Apply ADDMATE with slightly more ADDMATE forming liquid than usual.** Apply a single layer to the area of the crack.
- **Apply additions using an ultrasonic conditioner or a similar tool.**
- **Bake at a temperature 40°C (72°F) less than the normal glazing temperature of your PFM.** For example, if your normal glazing temperature is 900°C (1640°F), bake at 800°C (1470°F). (For hard porcelain, allow a final glazing firing.

**Correction of Porcelain Detached from Metal**

- **Apply Porcelain’s ADDMATE Separator to the working model and fit the PFM to be corrected onto the model.**
- **Mix ADDMATE body and opaque at a ratio of 10:1 and build-up on the chipped area or portion of the margin which needs correction.**
- **Cameo® removes the PFM from the working model and bake it at a relatively low temperature, to avoid glossiness or rounding of edges, Polish to desired finish.**
- **Apply Porcelain’s ADDMATE Separator to the master model.**
- **After filling PFM to the master model build-up ADDMATE to the deficient area.**
- **Remove PFM from the master model, Bake at a relatively low temperature on a porcelain mat, to avoid glossiness or rounding of edges. Polish to desired finish.**

**Baking Schedule**

<table>
<thead>
<tr>
<th>STEP TYPE</th>
<th>DRY-OUT TIME</th>
<th>LOW TEMP</th>
<th>HEAT RATE</th>
<th>HIGH TEMP</th>
<th>VACUUM</th>
<th>RELEASE VACUUM</th>
<th>HOLD TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash bake of opaque</td>
<td>5min.</td>
<td>450°C</td>
<td>45°C/min.</td>
<td>700°C</td>
<td>96kPa</td>
<td>700°C</td>
<td>1min UNDER VACUUM</td>
</tr>
<tr>
<td>Correction after post-soldering</td>
<td>5min.</td>
<td>842°F</td>
<td>81°F/min.</td>
<td>1,292°F</td>
<td>96kPa</td>
<td>1,292°F</td>
<td>0</td>
</tr>
<tr>
<td>Correction on margin or PLV</td>
<td>5min.</td>
<td>450°C</td>
<td>40°C/min</td>
<td>660°C</td>
<td>96kPa</td>
<td>660°C</td>
<td>0</td>
</tr>
<tr>
<td>In case of self-glassing</td>
<td>5min.</td>
<td>842°F</td>
<td>72°F/min.</td>
<td>1,220°F</td>
<td>96kPa</td>
<td>1,220°F</td>
<td>0</td>
</tr>
</tbody>
</table>

**Note**

The above is only a guideline. Different porcelain furnaces may necessitate adjustments to recommended temperatures. 96kPa=73cmHg

**Color Table**

Use the table below as a guide for achieving desired shades when using ADDMATE.

<table>
<thead>
<tr>
<th>OPAQUE</th>
<th>CORRESPONDING SHADES</th>
<th>BODY</th>
<th>CORRESPONDING SHADES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Opaque</td>
<td>A10, A10, B30, B30, B30</td>
<td>Dark Body</td>
<td>A1B, A1B, B3B, B3B</td>
</tr>
</tbody>
</table>

For shades other than those listed above, use one of the following ADDMATE shades.

**E** For all enamelled shades

**T** For all translucent shades

**LT** For Luster Porcelain translucent shades

**Precautions when using ADDMATE**

1. ADDMATE is a low temperature fusing porcelain. The following precautions must be followed in order to avoid imperfections such as blackening or whitening of the porcelain.
2. Be sure to use only ADDMATE forming liquid when mixing.
3. Use only Norflake Magic Separator when separating PFM from the gypsum die.
4. If your paper fiber mixes with the porcelain slurry during water absorption of the condense procedure, the fiber will not completely burn off. After drying, check to make sure that no residual tissue fibers remain.
5. Periodically fire your porcelain furnace, while empty, at around 1,000°C (1,832°F) to keep the interior clean.
6. Temperature variations of the porcelain furnace may be significant at lower ranges. Determine the exact baking program by test before actual baking.
7. To prevent deformation of the sintered area when using sintering material of a low fusing temperature, that stabilize by using sintering investment. Avoid contact with porcelain. Then, proceed to correction baking.
8. When making corrections to areas near the sinter, thoroughly remove flux, etc.
9. Do not build-up and fire ADDMATE on top of sintering material. Cracks may result.
10. After firing ADDMATE, do not subsequently bake any higher temperature porcelains such as Super Porcelain EX-3.
11. After use, tightly close ADDMATE jars and store.
12. Always use appropriate protection to avoid inhalation of porcelain dust.
13. Always use protective eye goggles when grinding or polishing porcelain.
Tissue Porcelain

Noritake has line-uped 7 tissue colors in each category, EX-3 and EX-3 PRESS LF for PFM (porcelain fused to metal), CZR and CZR PRESS LF for PFZ (porcelain fused to Zirconia).

Line-up of Tissue Colors

These line-up tissue colors can reproduce lifelike gingival colors of crowns, bridges and implant-restorations.

- Tissue 1: Average tissue color
- Tissue 2: Light tissue color
- Tissue 3: Dark tissue color
- Tissue 4: Mix with 1.2 or 3 to increase value
- Tissue 5: Opaque reddish color for inside of tissue
- Tissue 6: Bright pink tissue color
- Tissue 7: Strong reddish color for the tissue surface

The Example of Build-up

To increase the bonding strength between zirconia framework and porcelain, apply a very thin layer of Tissue 4 as wash-bake.

1. Apply Tissue 4 (Low translucency and High value) to adjust translucency in the basal area of framework.
2. Apply Tissue 7 in the margin area of framework to create strong reddish gingival color.

Complication
To control Brightness, Opacity and Reddish level can reproduce lifelike gingival color.

Speed Enamel Porcelain

EX-3 Speed Enamel is a new item specially developed for 2 layers build-up technique. Comparing with the conventional enamel, Speed Enamel has a beautiful opalescent effect. The esthetic restoration can be obtained easily with a simple application method. It is suitable to not only esthetic work but mass-production.

Start your simple & beautiful work with Speed Enamel NOW!

Clinical Case Application

1. After Paste Opaque application and bake
2. Cut-Back (Inguinal side)
3. Body Application
4. Apply Speed Enamel on the lingual side
5. Cut-back
6. Mamelon Structure
7. After bake and morphological correction
8. Apply Speed Enamel on Mamelon Structure
9. Finish
Luster and CCV (Clear Cervical) Porcelain

Special Features

1. Luster Porcelain reproduces the fine surface structure and luster of natural teeth.
2. A unique combination of fine surface particles produces a selective reflection of light which results in the same opalescence seen in natural teeth.
3. Luster Porcelain has translucent, bright, vivid colors, therefore, darkening at the incisal edge or at the occlusal surface will not occur.
4. Color changes in natural teeth caused by aging have been thoroughly studied. Luster Porcelain features a complete line of colors consistent with these changes.

<table>
<thead>
<tr>
<th>Luster / Shades and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTz (Luster To)</td>
</tr>
<tr>
<td>LTl (Luster Ti)</td>
</tr>
<tr>
<td>TBlue (Translucent Blue)</td>
</tr>
<tr>
<td>Aqua Blue 1®</td>
</tr>
<tr>
<td>Aqua Blue 2®</td>
</tr>
<tr>
<td>LT Natural</td>
</tr>
<tr>
<td>LT Super Gray®</td>
</tr>
<tr>
<td>LT Yellow®</td>
</tr>
<tr>
<td>Incisal Auroda</td>
</tr>
<tr>
<td>Sun Bright</td>
</tr>
<tr>
<td>Creamy Enamel</td>
</tr>
<tr>
<td>Creamy White</td>
</tr>
</tbody>
</table>

Attention: When Luster Porcelain should not be used

1. When the distance between the tip of a metal frame and the incisal edge of the porcelain is too short.
2. When porcelain does not fully cover the molar occlusal surface.
3. When the thickness of the porcelain is extremely thin and, therefore, the opaque reflection rate is high.

For the above cases, the usual enamel and translucent porcelain should be used to produce a more natural appearance.

CCV (Clear Cervical) / Shades and Applications

| CCV-1®                           | For bright shades like shades A1 to A2 |
| CCV-2®                           | For dark shades like A3 to A4 |
| CCV-3®                           | For reproducing surfaces exposed by receding gums |
| CCV-4®                           | Same as CCV-3 but with a more reddish hue |
| CCV-5®                           | For anterior lingual fossa |

*Not available in Cerabien and Ti-22*
Clinical Cases

**case A**
Kurt R. Schneider, DDS
Naoki Hayashi, RDT

before

after

**case B**
Alan Sulikowski, DDS
Aki Yoshida, RDT

before

after

**case C**
Yasukazu Miyamoto, DDS
Kazunobu Yamada, RDT

before

after

**case D**
Gerard J. Chiche, DDS
Hitoshi Aoshima, RDT

before

after

**case E**
Gerard J. Chiche, DDS
Hitoshi Aoshima, RDT

before

after
## EX-3 Line-Ups

| Paste Opaque | 6g | POA/PoAa | POA/PoAa2 | POAa/POAa2 | POAa/POAa3 | POAa/POAa4 | POAa/POAa5 | POAa/POAa6 | POAa/POAa7 | POAa/POAa8 | POAa/POAa9 | POAa/POAa10 | POAa/POAa11 | POAa/POAa12 | POAa/POAa13 | POAa/POAa14 | POAa/POAa15 | POAa/POAa16 | POAa/POAa17 | POAa/POAa18 | POAa/POAa19 | POAa/POAa20 | POAa/POAa21 | POAa/POAa22 | POAa/POAa23 | POAa/POAa24 | POAa/POAa25 | POAa/POAa26 | POAa/POAa27 | POAa/POAa28 | POAa/POAa29 | POAa/POAa30 |
|--------------|----|----------|----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Paste Opaque Modifier | 3g | PO White | PO Gray | PO Orange | PO Earth Brown | PO Reddish Brown | PO Pink | PO Blue | PO Yellow |
| Universal Paste Opaque | 6g | UPKa | UPKb | UPKc | UPKd | UPKe | UPKf | UPKg | UPKh |
| Universal Paste Opaque Modifier | 3g | UP | UP | UP | UP | UP | UP | UP | UP |
| Powder Opaque | 10,50,200g | DoHmDoO | NPr6O | NP21O | Nw6O | Nw6O | Ew6O | Ew6O |
| Powder Opaque Modifier | 10,50,200g | OM Gray | OM Orange | OM Pink |
| Body | 10,50,200g | A8/Hm/A8 | A8/Hm/A82 | A8/Hm/A83 | A8/Hm/A84 | A8/Hm/A85 | A8/Hm/A86 | B8/Hm/B8 | B8/Hm/B8 |
| Enamel | 10,50,200g | E1 | E2 | E3 | Silky E1 | Silky E2 |
| Speed Enamel | 10,50,200g | S1 | S2 | S3 | S4 |
| Margin | 10,50,200g | MA | MA2 | MA3 | MA4 | MA5 | MB1 | MB2 | MB3 | MB4 | MC1 | MC2 | MC3 | MD1 | MD2 | MNP1 | MNP2 |
| Margin Modifier | 10,50,200g | M Clear | M Peach | M Orange |
| Margin Retouching | 10,50,200g | MRP |
| Margin Dilution | 10,50,200g | MDL |
| Opaquous Body | 10,50,200g | OBA1 | OBA2 | OBA3 | OBA4 | OBA5 | OBA6 | OBA7 | OBA8 | OBA9 | OBA10 | OBA11 | OBA12 | OBA13 | OBA14 | OBA15 | OBA16 | OBA17 | OBA18 | OBA19 | OBA20 | OBA21 | OBA22 | OBA23 | OBA24 | OBA25 | OBA26 | OBA27 | OBA28 | OBA29 | OBA30 |
| Cervical | 10,50,200g | CV-1 | CV-2 | CV-3 | CV-4 |
| Mamekel | 10,50,200g | Mamekel 1 | Mamekel 2 |
| Transparent | 10,50,200g | Tn | Tn | Tn | Tn |
| Luster | 10,50,200g | Lt | Lt | Lt | Lt |
| Clear Cervical | 10,50,200g | CcV-1 | CcV-2 | CcV-3 | CcV-4 |
| Modifier | 10,50,200g | White | Gray | Blue | Green | Yellow | Light Orange | Orange | Brown | Pink | Dark Pink | Coral Pink |
| Tissue | 10,50,200g | Tissue 1 | Tissue 2 | Tissue 3 | Tissue 4 | Tissue 5 | Tissue 6 | Tissue 7 |
| Add-on | 10,50,200g | Ao-T | Ao-B |
| External Stain | 3g | Black | Blue | Green | Green | Yellow | Orange | Orange | Orange | Cervical 1 | Cervical 2 | Cervical 3 | Earth Brown | Reddish Brown | Pure White | Pink |
| Internal Stain | 3g | Incisal Blue 1 | Incisal Blue 2 | Mamekel Orange 1 | Mamekel Orange 2 | Reddish Brown | Earth Brown | Cervical 1 | Cervical 2 | Cervical 3 | White | Red | Salmon Pink | A+ | B+ | C+ |
| Addinate | 10g | Light Opague | Dark Opague | Light Body | Dark Body | Enamel | Translucent | Lute Translucent |
## Color Combination Table

<table>
<thead>
<tr>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>B1</th>
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### Color Combination Table of Noritake Value Shade

Converting VITA® 3-D-Master® Shades to Noritake Value Shades

<table>
<thead>
<tr>
<th>VITA® 3-D-Master® Shade</th>
<th>Noritake Value Shade</th>
<th>Opaque</th>
<th>Margin</th>
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### Baking Schedule

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**Notes:**
- The above program is only a guideline. Baking temperature may be varied with the peculiarities of different furnace.
- Baking ≤ 7 months (292°C)
- This case is for 2-4 units, set the high temperature the same as Body baking
- This baking might be necessary depending on the peculiarities of different furance,
Precaution for Handling EX-3

1. Follow the alloy manufacturer’s instructions for handling metal framework.
2. This porcelain is for metal framework, PJC or PLV restorations. Do not apply it to Alumina, Zirconia or Titan frameworks.
3. Do not mix with other porcelain, either other Noritake porcelain or other manufacturers’ porcelain.
4. The purpose of excess liquid in Paste Opaque jar is to avoid drying. Do not mix excess liquid and Paste Opaque in the jar.
5. Before applying the Paste Opaque or Opaque Powder, clean the metal framework ultrasonically in acetone solution.
6. Use only Noritake Forming Liquid, Meister Liquid or distilled water with EX-3 porcelain powders.
7. For adequate bonding strength, it is necessary that the first layer of Powder Opaque is a wash bake layer.
8. EX-3 is properly finished when the surface has a slight gloss after baking. Please adjust your furnace to achieve this result.

Read the instructions carefully, keep them in a safe place for future reference.

Notes on Safety

1. When mixing or grinding porcelain, use an approved dust mask and a vacuum air filter to protect the lungs from breathing dust.
2. When mixing or grinding porcelain, wear safety glasses.
3. It is non-edible. Keep it out of the reach children.
4. Avoid eye contact with all liquids. In the event of eye contact, immediately rinse with a copious amount of water and consult a physician.
5. Do not touch items heated by the furnace with your bare hands.
6. Keep Paste Opaque, PO Liquid, IS Liquid and ES Liquid away from flames and high temperatures. They are flammable.
7. Keep Paste Opaque and all liquids in a dry and cool place, avoiding direct sunlight.
8. This porcelain is for dental use only. Do not use for other purposes.
9. For use only by dentists and dental technicians.

All products mentioned in this manual are part of EX-3 system and are covered by its registered trade mark.

<table>
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Contraindications
If the patient is hypersensitive to Dental Porcelain or any of the other components, this medical product should not be used. Or it should be only used under the strict supervision of the patient’s dentist.

EU Authorized Representative
Name: Kuraray Europe GmbH
Address: PH-Postfach 37 40529 Düsseldorf
Hattersheim am Main, Germany