Compatibility Chart of CZR & CZR Press

**Framework**
- **Zirconia Framework**
  - KATANA / Nobel Procera Zirconia / Others (Pure Zirconia)
- **No Framework**
  - Stand Alone

**Shade Base**
- for controlling coping color
- CZR Press Shade Base Stain
  - 930°C
  - 1090°C

**Body & Enamel**
- 930°C

**Internal Stain**
- **CZR IS**
  - 900°C
- **CZR PRESS LF IS**
  - 800°C

**Translucent Luster**
- **CZR**
  - 930°C
- **CZR PRESS LF**
  - 840°C

**External Stain**
- **CZR ES**
  - 930°C
- **CZR PRESS LF ES Glaze**
  - 840°C

**Glaze**
- **CZR ES Glaze**
  - 930°C

**Liquids for CZR & CZR Press**
- **LF Liquid**
  - CZR PRESS LF
- **IS Liquid**
  - CZR Internal Stain
  - CZR Press LF Internal Stain
  - CZR PRESS Glaze
  - CZR PRESS Shade Base Stain
- **ES Liquid**
  - CZR External Stain (incl. ES Glaze)
  - CZR PRESS LF External Stain
Excellent compatibility and bonding with all pure zirconia substructures.
Ideal stability with outstanding resistance to fractures and chipping.
Perfectly matched coefficient to pure zirconia substructures.
Ease of handling.

Natural-looking cervicalis are easily achieved with CZR Margin Porcelain. Eliminating the high value at the margins. CZR restorations layered to zirconia are indicated in both posterior and anterior regions due to high flexural strength and inherent fracture toughness.

Natural opalescence and translucency for true-to-life restorations.
Provides an esthetically perfect balance of chorma and value.
Ideal stability with outstanding resistance to fractures and chipping.

CZR PRESS LF's lower fusing temperature (840°C) affords greater stability with repeated firings when layering CZR All-ceramic and CZR PRESS-to-Zirconia restorations.

CZR PRESS LF is indicated for layering CZR PRESS All-ceramic inlays, onlays, veneers and full crowns, as well as CZR PRESS-to-Zirconia crowns, bridges, inlay bridges and implant restorations.

PROVEN ZIRCONIA SOLUTIONS

CZR KATANA Zirconia Crowns & Bridges - Reliable Fit. Exceptional Esthetics. Proven Results.

Noritake Dental Supply Co., Limited sponsored a study to evaluate and compare the clinical success of single posterior porcelain-fused-to-zirconia and porcelain-fused-to-metal crowns in private practice.

Survival Analysis of PFZ (with CZR) and PFM (with EX-3) Crowns

<table>
<thead>
<tr>
<th>Group</th>
<th>Total # Crowns</th>
<th>Mean Survival in Days</th>
<th>Probability of Survival in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFZ Total</td>
<td>1944</td>
<td>1583.6</td>
<td>98.1</td>
</tr>
<tr>
<td>PFM Total</td>
<td>691</td>
<td>1570.0</td>
<td>95.8</td>
</tr>
</tbody>
</table>

Twenty-two dentists and over two thousand patients participated. The results of the study were presented at IADR 2010 Barcelona. For complete details, visit www.noritake-dental.co.jp
CERABIEN

CZR (Cerabien ZR) is a porcelain specifically developed for making all ceramic crowns in use with zirconia frameworks. Crown and Bridge made from CZR with zirconia can be used in the posterior as well as anterior due to its extremely high flexural strength and excellent fracture toughness. The combination of CZR and zirconia will give you enhanced esthetics and fit with maximum strength for an overall superior restoration.

Products

Features

1. Replication of the natural tooth shades
   Due to Luster’s exceptionally fine particle size, it can achieve the selective reflection that assures the opalescence seen in the natural tooth. Because of the consistently smaller particle size found with CZR Luster Porcelain, CZR exhibits minimal wear in the mouth, resulting in less deterioration of the opposing dentition.

2. Excellent compatibility and bonding with zirconia frameworks

3. Exceptional Easy of Use

4. Ideal stability with outstanding resistance to fractures and chipping

| Coefficient of Thermal Expansion ($50°C - 100°C \times 10^{-6}$) |
|-------------------|---------|
| CZR               | 9.1     |
| Cerabien          | 6.8     |
| Super Porcelain EX-3 | 12.4   |

The thermal expansion of CZR is entirely different from those of other porcelains. Therefore, mixing or using with other porcelains is not recommended.

Recommended Zirconia frameworks

<table>
<thead>
<tr>
<th>9 pre-colored Zirconia Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>KT-10</td>
</tr>
</tbody>
</table>

Working Procedures

Procedure A

Please proceed with

1. ✔  2. ✔  3. ✔  4. ✔  5. ✔  8. ✔

steps in case of using colored zirconia frameworks (Katana KT11~KT18) with high translucency.

Procedure B

Please proceed with

1. ✔  2. ✔  3. ✔  6. ✔  7. ✔  8. ✔

White zirconia frameworks (KT10) covered with Shade Base Porcelain and/or Shade Base Stain (Refer to the instruction of EX-3 PRESS).

1. Zirconia framework trimming
   Checking the framework if it is suitable to the die form. Adjusting the finishing line and the thickness in the margin area with Noritake Meister Point SC-51 or SD-61, carefully trimming them by using a diamond point under running water. After trimming, please check if there are any cracks on the zirconia framework with Noritake Crack Finder.

2. Alumina sandblasting on zirconia framework surface
   Create a matt-finish surface by sandblasting with 50 μm alumina sand under 29psi (<0.2MPa).

3. Cleaning the framework
   Clean the framework ultrasonically in acetone solution for 5 minutes, to avoid contamination on the surface. After cleaning, please refrain from touching it with bare fingers.
**Procedure A**

4. **1st Opacious Body application**
   To increase the bonding strength between zirconia framework and CZR, apply a very thin layer of Opacious Body Porcelain mixed with Noritake Meister Liquid or Forming Liquid. For the 1st Opacious Body baking, please refer to the baking schedule, page 28.

5. **2nd Opacious Body application**
   Apply Opacious Body in about 0.3mm thickness with considering the mameio structure. It is recommended to bake it without other porcelain at this stage. For the 2nd Opacious Body baking, please refer to the baking schedule, page 28.

**Procedure B**

6. **1st Shade Base application**
   To increase the bonding strength between zirconia framework and CZR, apply a very thin layer of Shade Base Porcelain mixed with Noritake Meister Liquid or Forming Liquid. Using an instrument is recommended to apply porcelain easily. For the 1st Shade Base baking, please refer to the baking schedule, page 28.

7. **2nd Shade Base Porcelain application**
   Apply 2nd Shade Base in about 0.2mm thickness. Repeat the same baking at the 1st Shade Base.

8. **Body / Cervical application**
   Apply Body and mixture Body and Cervical Porcelains at the neck. Please refer to page 31 for its mixture ratio. Match the dimension and form of the symmetric tooth in order to recreate the shape precisely.

9. **Cut Back**
   Cut Back one-third top of labial surface and the proximal area. After cut back, please make sure if the thickness of Body Porcelain should be necessarily at least 0.8mm.

10. **Enamel application**
    Apply Enamel on the incisal area. If necessary, Translucent and Luster Porcelains can be overlaid Enamel Porcelain. Layering excess Enamel Porcelain causes the whiter shade than expected. Therefore please pay attention to layering thickness.

11. **Body / Enamel baking**
    For the Body/Enamel baking, please refer to the baking schedule, page 28. If porcelain does not have a definite shininess, rebake with higher temperature.

12. **1st and 2nd Internal Stain (IS) application**
    CZR IS must be used with only CZR and its application must be done after baking Body and Enamel. 1st application of IS should be in a horizontal direction. And 2nd application of IS in a vertical direction. The 1st and 2nd baking of IS should follow the baking schedule. If applying IS in a horizontal direction and a vertical direction on the surface of crown at the same time, the cross-area is blurred. Therefore, it is recommended to bake them separately.
Translucent and Luster Porcelain application
Translucent and Luster Porcelain should be overlayed by approximately 10 percent bigger than a target shape allowing for their shrinkage.

Translucent and Luster Porcelain baking
For the Translucent/Luster Porcelain baking, please refer to the baking schedule, page 28.

Morphological Correction, Glazing and Final polishing
Noritake Meister Point and Meister Cones are recommended for the morphological correction. After the morphological correction, please make a next steps to steam cleaning and self glaze baking. For final polish, using Noritake Pearl Surface is recommended. Due to the translucency of the zirconia framework, it can be fabricated an All-ceramic crown which is more closely to natural dentition than porcelain fused to metal crown.

Completion

Using Margin Porcelain

For adjusting margin area of zirconia framework
1. Apply Noritake Magic. Separation to the margin area of the die in order to avoid of sticking Margin Porcelain to the die.
2. Noritake Porcelain application
   Apply the appropriate amount of mixture of Margin Porcelain with Noritake Magic. For the gingival part, if Margin Porcelain is too thick, this area tends to be optical. Apply the Margin Porcelain in a triangular structure.
3. Baking of Margin Porcelain
   Follow the baking schedule on page 28. If additional Margin Porcelain is required, bake again according to schedule.

For adjusting margin area after glazing
1. Use of adjusting margin area after glazing. Margin Repair Porcelain(MRP) should be used.
2. MRP application
   Before setting a crown on the die, layer MRP slightly to the margin area of the restoration.
3. Remove the excess MRP
   After reseating the restoration on the die, remove the excess MRP with a brush and take the crown from the die carefully. Then, bake it according to the baking schedule.
4. Morphological correction
   Polish the rough surface at the margin with silicon pumice such as Meister Pumice (SP+4).

CZR PRESS
CZR PRESS is an innovative breakthrough in ceramic nano-technology which consists of the marriage of two time-proven technologies, oxide ceramics and pressable ceramics. This synergy combines the strength, fracture toughness and cementability of pure zirconium oxide copings with the marginal integrity, versatility and beauty of pressable ceramics. Add opalescence and fluorescence to the Ingot and the result ...simply imPRESSive!

Products

Features
1. CZR PRESS can be used with pure zirconia framework.
2. Unlike traditional metal frameworks, Zirconia frameworks used in CZR PRESS facilitate light transmission into the root and papillae area, thus creating a natural, vita-looking smile.
3. CZR PRESS offers 24 shades of fluorescent ingots, each in 2 translucencies:
   - H-ingot — for use when utilizing the “Staining Method” & “L Layering Method”
   - L-ingot — for use when utilizing the “Layering Method” & “L Layering Method”
   - EW-ingot(4 whitening shades) — for creating whiter shades than the conventional bleach shades.
4. CZR PRESS features a “never before seen” opalescent quality which exhibits an exceptional vitality and luster similar to nature.
5. CZR PRESS may be used for single unit All-ceramic restorations without frameworks.
6. Noritake CZR layering porcelain perfectly complements CZR PRESS L-ingot to provide unsurpassed esthetic results.
7. Noritake CZR PRESS LF porcelain can be used for single unit restorations without frameworks after pressing.
8. CZR PRESS may be pressed in any conventional press furnace.

Physical Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexural Strength (MPa)</td>
<td>92.7</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>10.1</td>
</tr>
<tr>
<td>(50-500°C 10^-6/K)</td>
<td></td>
</tr>
<tr>
<td>Transformation Temperature (°C)</td>
<td>615</td>
</tr>
</tbody>
</table>

Beautiful Opalescent of CZR PRESS Ingot. (Press by Mr. Stefan Lindes)
1. Zirconia materials for CZR PRESS
The most popular dental zirconia materials available on the market are the “3YTZP” type. This is made by including a minute amount of Yttria (Y₂O₃) into solid-soluted Zirconia (ZrO₂) and it is called partial stabilized zirconia. As feature of zirconia, it has a high-strength in a room temperature but low-strength in a high-temperature such as 1000 °C and its strength will return to the original high-strength when it is cooled to the room temperature. The graph below shows the relationship between its strength and temperatures. Pressable ceramic ingots are pressed at a high temperature on a zirconia frameworks. If the framework design is not proper, zirconia framework may crack when ingots are pressed. Therefore, framework design is one of very important issues.

2. Preparation guidelines and framework design:
To ensure a strong and esthetic restoration, please follow the guideline:
① The basic preparation is to allow the pressed ceramic to cover a 360 degrees shoulder with rounded edge or chamfer.
② The thickness of the zirconia framework should be at least 0.4 mm.
③ The thickness of the connectors of the zirconia bridge, please follow the manufacturer’s instruction.

Preparation

Framework Design

① Single Crowns:
Maintain 0.8mm Thickness of pressed ceramic in all areas.

② Bridges:
Maintain 0.8mm Thickness of pressed ceramic on abutments, embrasures, pontic tissue area and at the papillae.

Note
This technique is not suited to a severely discolored tooth.
Trimming of the zirconia framework
The thickness of zirconia framework in all area should be 0.4mm at least to obtain a successful CZR pressing. And at this stage, please weigh the framework and record it. This weight information may be utilized later as a reference to determine how many ingots are used for pressing.

Checking of cracks in zirconia framework
In order to check if there are any cracks in the zirconia framework after grinding, apply Noritake Crack Finder all over the inside and the outside of zirconia framework and one minute later, rinse it with water to wipe off the extra liquid on the surface. If there are cracks, the liquid penetrates into the cracks, and make it easy to find them.

Never use the cracked zirconia framework
However small a crack is in a framework, please do not use such cracked framework. Because, a tiny crack can become bigger and wider during pressing and the strength of the framework can be lowered.

Alumina Sandblasting of zirconia framework surface
Create a matt-finish surface by sandblasting with 50μm alumina at 2 bars pressure.

Cleaning of the zirconia framework
Clean the framework ultrasonically for 5 minutes in an acetone solution to remove residual zirconia dust and other debris.

1st Shade Base Stain application

| Differences between CZR Shade Base Porcelain and CZR PRESS Shade Base Stain |
|-------------------------------|-------------------|-------------------|
| Baking temperature            | 1st.              | 2nd.              |
|                               | 930°C (1,706°F)   | 930°C (1,706°F)   |
|                               | 1,706°F           | 1,706°F           |
|                               | 1090°C (1,994°F)  | 1080°C (1,976°F)  |
| Grain size                     | 25μm              | 4μm               |
| Build-up thickness             | 1st.              | 2nd.              |
|                               | 0.2mm             | 0.2mm             |
|                               | 0.15mm            | 0.15mm            |
| Combination with CZR Porcelain | Good              | Good              |
| Combination with CZR PRESS     | Not acceptable    | Good              |
| Recommended Liquid             | Meister Liquid    | IS Liquid         |

Note
- Secure more than 0.4mm thickness in all area of the zirconia framework. In case of less than 0.4mm, cracks may be happened.
- The thickness of Margin area should also be 0.4mm at least. (Refer to the upper right illustration) So, such shoulder as Knife-edge is not acceptable.
- The margin line should be smooth.
- When grinding zirconia framework, it is recommended to use burs/discs with minute diamond particles such as Noritake Meister Points SC-51 and SD-61. If using tools with rough diamond particles, it may cause sharp scratch on the surface and/or cracks into the framework. In addition, cooling the framework with water is necessary to avoid heat generation caused during grinding.

Note
- Never use the cracked zirconia framework
- Knife edge margin is not recommended.
- Serrated margin line is should be corrected.
- Meister Points SC-51 and SD-61

13 14
Mix the shade base stain with IS Liquid. The viscosity of the mixture should be like "Maple Syrup", so that the mixture does not slip down from the framework or puddle at the margins. Apply the mixture evenly and thinly, covering the zirconia framework in 0.15mm thickness, which is slightly thicker than conventional external stain. Shade Base Stain is a necessary step to produce the basic one for color. For the 1st Shade Base Stain baking, please refer to the baking schedule, page 28.

**Note**

IS Liquid should never be mixed with water. If mixed, the color will not be clear and the applied mixture will detach from the zirconia framework during drying process. The application brush should be cleaned with IS Liquid only. Never use water for cleaning.

2nd Shade Base Stain application

Apply the Shade Base Stain again in a thickness of about 0.15 mm. To produce an even basic color, be sure to perform the 2nd application and baking. For the 2nd Shade Base Stain baking, please refer to the baking schedule, page 28. Also refer to the Shade Base Stain Color Guide for checking the shades. If applied too thinly, the shade will be low in chroma. If applied too thickly, the shade will be high in chroma.

Wax-up

**Layering Method**

The 90% size of restored crown should be formed with wax-up. Margin area should be formed with wax-up as well. But, forming of mamelon structure is not necessary at this wax-up stage. Mamelon structure will be formed after pressing ingot.

Before pressing, please make sure of the sufficient thickness of wax for the pressed ceramic. Please refer to the picture on page 12.

**Stain Method**

Almost 100% full-contour of restored crown should be formed with wax-up. Margin area should be formed with wax-up as well.

**Note**

Do not make sharp angles or deep under cuts. After wax-up, check if there is any wax left inside of the framework. If there is, carefully wipe off the wax. Also, confirm that there is no space between the If there is, wax and the margin line of die model fill in the space with wax.

Spruing, attaching to the pedestal base and ring preparation

Use 8 gauge (3.3mm diameter) and 2~3mm long sprues. Attach sprues to wax patterns and position it on pedestal base to facilitate a smooth flow of the pressable ceramic. If some parts of the wax pattern are thin, pressable materials may not reach those areas during pressing. So, more than one sprue may be used.

**Single crowns:**

For larger posterior teeth, position one sprue on convexity area, closer to the proximal wall so that pressed ceramic may flow smoothly. Spruing in this way preserves delicate wax contours and little morphological correction is needed. (See②, page 17).

**Bridges:**

Place each sprue on each abutment and each pontic. Make the sprue as short as possible: approximately 2~3 mm in length (See②, page 17).
After attaching sprues, weigh the waxed restoration and then deduct the weight of the zirconia framework recorded previously to find the net wax weight which is a guideline to determine later how many ingots to use. When attaching wax pattern to the pedestal base, place wax pattern where it should be apart by 8mm from the inner wall of the ring and by 10mm from the top-leveling cap. When attaching more than 2 wax patterns, the distance between each wax pattern should be 5mm at least. The ideal angle for attaching wax pattern to the pedestal base is 30°~60 degree. When attaching wax patterns in different size to the same pedestal base, those margins should be at the same height. (Fig.2) Then, spray dry Teflon r-Silicone to the inside of the ring, ring-gauge (leveling cap) and ring former (pedestal base) of Noritake Ring Former to prevent investment from sticking to their surfaces.

1. **Investing**
   Referring to manufacturer’s instructions, prepare for press investment. Then, mix the investment mechanically for 1 minute under vacuum and fill the investment in the ring without producing any bubbles.

2. **Preparation before burn-out**
   After investing, the ring should leave as it is at room temperature until the investment is concreted for around a half hour. And, remove the concreted investment from the ring former and ring gauge and cut the investment button created by the leveling cap with a dry knife. Before baking, make sure if the angle of ring top & bottom surfaces and the side should be 90 degrees.

3. **Burn-out of investment ring**
   Preheat the burn-out furnace to 850°C (1562°F). Place the investment ring in the center of the furnace. Preheating of the ceramic ingot and the plunger is not required. Do not burn-out press rings with other rings (e.g. soldering models, casting ring, etc.)

4. **Selection of CZR PRESS ingots**
   Select ingots dependent upon the method. For the Layering method, select L-Ingot with low transparency and for the Stain method, select H-Ingot with higher transparency.
**Inserting ingot and plunger**

One piece of ingot is to create up to two crowns and two pieces of ingots are to create three or more crowns, however, if the wax pattern(s) weight is 0.6g or less, use one piece of ingot and if the weight is between 0.7g and 1.4g, use two pieces of ingots. Pay special attention not to insert any foreign debris or not to adhere anything to the ingots or to the plunger. In addition, the plunger should be inserted into the pressing canal vertically.

---

**Pressing in the press furnace**

Insert the ingots and press plunger into the ring, then place the ring on the center of pressing platform. The pressing schedule may differ depending upon the press furnace manufacturer. Adjust the schedule so as that pressing will stop once the ceramic is fully pressed into the cavity. Excessive press time may cause various problems including split rings, porosity, value shift and brittle or fractured restorations. Follow the pressing schedule according to the pages 33~35. After pressing, immediately remove the investment ring from the furnace and cool it down at room temperature until the ring is cool enough to be held.

---

**Removal of plunger**

Mark the top position of the plunger, and cut the investment ring with a separating disk. Separate the ring with a plaster nipper. Be careful not to damage the plunger. When removing the ceramic attached to the plunger, use with alumina sand blaster.

---

**Divesting**

Carefully divest the ring to avoid breaking the pressed ceramic. At first, remove the bulk of the investment material using sand blaster with 50μm alumina sands at a pressure of 58~87psi (0.4MPa~0.6MPa). Once the pressed ceramic is exposed, lower the sandblasting pressure to less than 29psi (0.2MPa) and continue alumina sandblasting carefully so as not to chip the thin areas such as the margins or incisal edge. Glass beads are recommended for the thin areas such as the margin and the incisal edge. When divesting patterns, the direction of sandblasting spray should be parallel to the long axis of each crown.

---

**Cutting off the sprue**

Using a diamond disk for sprue separation, 1st score a line around the sprue, at 2mm from the crown, then carefully cut through the sprue at low speed. In this way, even if the cracks are founded in the sprue, they will not spread into the crown. Next, eliminate the remaining sprue-button on the crown with a diamond point. During this process, do not generate excessive heat. Noritake Meister Points are recommended for sprue cutting and morphological correction of the crown.
Morphological correction of pressed ceramic
Place the pressed restoration on the model and check the fit at the margin under magnification. The depends on which technique is chosen: For the “Layering Method”, create the mamelon structure with Noritake Meister Points. Special care should be taken to maintain a minimum thickness of entire pressed restoration no less than 0.8mm. For the “Staining Method”, refine the surface and delicately. After the contours have been finalized, smooth the surface of the pressed ceramic by sandblasting with 50μm alumina at 2 bars pressure.

Cleaning
Clean the pressed ceramic for 5 minutes in an acetone solution using an ultrasonic cleaner.

Layering Method
L1. Build-up and baking of CZR Porcelain
Build-up CZR Enamel and Translucent over the pressed ceramic. The pressed ceramic will not “self-glaze” at the glaze temperature of CZR Porcelain, so be sure to cover the entire surface of the pressed ceramic with CZR Porcelain. The baking schedule for layering porcelain is the same as for CZR Porcelain. Refer to CZR baking schedule at page 28. If creating characterizing or adjusting chroma-up, apply CZR Internal Stain on the pressed ceramic and bake it before building-up Enamel, Translucent and Luster Porcelains.

L2. Morphological correction
After baking the layering porcelains, perform morphological correction as usual. When additional layering porcelains are required, apply the porcelains again and follow the baking schedule of CZR.

L3. Stain and glaze
If putting characterizations or glazing are required, apply the CZR External Stain or Glaze power and bake them. Refer to the baking schedule at page 28.

Stain Method
S1. Application and baking of CZR ES
Mix CZR ES with ES Liquid. The viscosity of the mixture is the same as ordinary stains. If too much liquid is used, since the stain will move easily after application, a certain viscosity is necessary. For creating A shades, apply ES stain A+ over the area except the incisal edge or occlusal surface, apply ES stains such as Blue, Gray and White. When creating characterization with more than two ES, it is recommended not to bake simultaneously.
S2. 1st Glazing with CZR PRESS Glaze Powder
Mix CZR PRESS Glaze Powder with IS Liquid to create a “cold honey-like” glaze paste. Do not wet the surface of the restoration with IS Liquid prior to glaze-application, otherwise, application is not even on entire surface of the crown. For even-application, its thickness should be 0.2mm. After check if the entire surface is covered with glaze, please bake it refer to the baking schedule, page 28.

S3. Adjusting the contact area and Morphological Correction
Using a rubber wheel such as the Meister Point SF-41, adjust the contact area of glaze layer. If necessary, make morphological correction. Finally, clean the restoration for 5 minutes in an acetone solution using an ultrasonic cleaner.

S4. 2nd Glazing and Completion
If applying diluted glaze mixture on the crown and bake it, the baked crown surface are variation in brightness because the mixture is running down during baking. In case of this, apply the glaze again and bake it.

Products — LF Porcelain
Features
1. CZR PRESS LF has an excellent match in CTE with CZR PRESS ingot.
2. CZR PRESS LF enables you to create All-ceramic restoration without a zirconia framework.
3. CZR PRESS LF has a sufficient strength in oral.
4. A wide variety of shades including aesthetic shades are available.
5. An ideal opalescence has been realized in Luster Porcelain.
6. CZR PRESS LF can also be used for correcting shades of CZR pressed ceramic and CZR Porcelain.

Products — LF Stains
Features
1. Outstanding Resistance to Bubbles
CZR PRESS LF IS is specially formulated to have a similar coefficient of thermal expansion to CZR pressed ceramic and CZR PRESS LF Porcelain. CZR PRESS LF IS has outstanding resistance to bubbling and fractures. CZR PRESS LF ES has minimal risk of separation even after long term intraoral function.
2. Assortment of shades
The shades were line-uped after server check for replicating colors shown in natural teeth. Accurate color reproduction can be easily done by applying those stains.
3. Easy Reproduction of shades
By applying internal stains, characterization and chroma-up on the crown can be realized like painting a picture.
4. Controlling Reflectivity
By applying stain on the CZR pressed ceramic, excessive reflectivity can be easily controlled.
Working Procedures  Fabrication of a stand-alone single crown

1. Wax-up
   In case a zirconia framework is not used, directly wax-up to the dentin shape with about 90% size of a targeted restoration. Do not make a mamelon structure. The thickness in the margin area should be more than 1.0mm in order to avoid chipping.
   *Refer to page 16

2. Spruing and Investing
   Perform Spruing and investing.
   *Refer to pages 16-18

3. Preheating of investment ring
   After half an hour from investing, place the investment ring into the preheated burn-out furnace at 850°C (1,562°F) and hold for an hour.
   *Refer to page 18

4. Pressing of CZR PRESS Ingot
   Place the investment ring with the inserted ceramic ingot in the PRESS Furnace and heat-press at the specified temperature.
   *Refer to pages 93-95

5. Divesting and sprue-cutting
   Carefully divest the ring to avoid breaking the pressed ceramic. Using a diamond disk for sprue separation.
   *Refer to page 20

6. Morphological correction of pressed ceramic
   Securing enough space for the Enamel, Translucent (Luster) Porcelains that are built-up later. Before layering those porcelains, adjust the thickness of labial surface and make the mamelon structure.

7. Alumina sandblasting
   Blow Alumina sandblasting all over the surface of the pressed ceramic at the pressure of 0.2MPa (29psi).

8. Cleaning
   Clean the pressed ceramic for 5 minutes in acetone with an ultrasonic cleaner or steam cleaner.

   **Note**  This is a low fusing porcelain. In case any fiber such as tissue paper remains after baking, it should be removed.

9. LF Enamel application
   Apply LF Enamel on the incisal area. If necessary, LF Translucent and LF Luster Porcelain can be overlayerd LF Enamel. Therefore please pay attention to layering thickness.

10. LF Internal Stain (LF IS) application (If necessary)
    When ever using IS, mix it with Noritake IS Liquid. 1st application of LF IS should be in a horizontal direction. And 2nd application of LF IS in a vertical direction. If apply LF IS in a horizontal direction and a vertical direction on the surface of crown at the same time, the cross-area is blurred. Therefore, it is recommended to bake them separately.

11. LF Translucent and LF Luster Porcelain application
    LF Translucent and LF Luster Porcelain should be overlayer by approximately 10 percent bigger than a target shape allowing for their shrinkage. Please bake at the designate temperature in the baking schedule, page 28.

12. Baking
    Bake the built up crown according to the baking schedule, page 28.
4. **Morphological Correction**

Nortake Meister Point and Meister Cones are recommended for the morphological correction.

5. **Cleaning**

Clean the restoration for 5 minutes in acetone with an ultrasonic cleaner.

6. **LF External Stain (LF ES) application and Glaze baking**

A. In case of layering on the entire surface of the crown, (CZR pressed ceramic can not be seen.)

B. In case of layering on the surface of the crown partially, (CZR pressed ceramic can be seen partially.)

Bake the crown according to baking schedule, page 28. If necessary, Mix the LF Glaze Powder or LF ES with ES Liquid. Its viscosity is the same as ordinary stains. Then apply and bake it.

7. **Completion**

![Image of completed restoration]
## Products

### Shade Base

<table>
<thead>
<tr>
<th>Shade Base</th>
<th>10g</th>
<th>6g</th>
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</thead>
<tbody>
<tr>
<td>SBAa</td>
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<td>SBAa</td>
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### Margin

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MA1</td>
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### Opaque Body

<table>
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### Body

<table>
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<tr>
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<tbody>
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### Cervical

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### Enamel

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### Translucent

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### Luster

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### Modifier

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### Add-on

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<tbody>
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### External Stain

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### Internal Stain

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### Shade Base Stain

<table>
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### Shade Base Stain Modifier

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### Press Inlets

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### Low Transparency & Inlets per pkg

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### Press Inlets

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### High Transparency & Inlets per pkg

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### CZR PRESS Glaze

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### LF Enamel

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### LF Tissue

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### LF External Stain

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### LF Internal Stain

<table>
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<tbody>
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<td>B</td>
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</tbody>
</table>

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### Material

- CZR PRESS
- LF
- CZR LF
- Material
<table>
<thead>
<tr>
<th>Color Combination Table</th>
</tr>
</thead>
</table>

| Color Combination Method | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| A                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| B                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| C                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| D                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| E                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| F                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| G                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| H                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| I                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| J                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| K                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| L                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| M                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| N                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| O                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| P                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Q                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| R                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| S                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| T                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| U                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| V                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| W                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| X                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Y                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Z                        | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
Pressing Parameters

Recommendation of “Pressing at low pressure” during CZR Pressing

The press furnace pressure for the pressable technique is usually set at 4 bar (0.4 MPa) to 5 bar (0.5 MPa). However, in the case of pressing of CZR PRESS ingots, this pressure is too high and often cause the following problems.

1. Cracks on the zirconia frameworks after pressing
2. Breaking on the investment ring after pressing

In order to avoid such problems, we would like you to lower the pressing pressure during CZR PRESS pressing. This is strongly recommended as well as the notes for the zirconia framework thickness and shape. Please adjust the pressing schedule referring to the following tables. As a general rule, longer pressing time is required at low pressure. Adjust the pressure regulator in the manufacturer’s Schedule.

### EP500 (ivoclar)

<table>
<thead>
<tr>
<th>Pressing in a 100g ring (2g × 1 Ingot)</th>
<th>Ring Size: ø100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>700°C</td>
<td>60°C</td>
</tr>
</tbody>
</table>

### EP600 (ivoclar)

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<tr>
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<th>Ring Size: ø100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>700°C</td>
<td>60°C</td>
</tr>
</tbody>
</table>

### Pro-Press100 (Whip Mix IntraTech)

<table>
<thead>
<tr>
<th>Pressing in a 100g ring (2g × 1 Ingot)</th>
<th>Ring Size: ø100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>700°C</td>
<td>60°C</td>
</tr>
</tbody>
</table>

### Ceram Press Qex (Dentsply NeTech)

<table>
<thead>
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<th>Pressing in a 100g ring (2g × 1 Ingot)</th>
<th>Ring Size: ø100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>700°C</td>
<td>1045°C</td>
</tr>
</tbody>
</table>

### Multimat2 Touch & Press (Dentsply DeTrey)

<table>
<thead>
<tr>
<th>Pressing in a 100g ring</th>
<th>Ring Size: ø100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>700°C</td>
<td>1045°C</td>
</tr>
</tbody>
</table>

### Auto Press Plus (Pentron Lab)

<table>
<thead>
<tr>
<th>Pressing in a 100g ring</th>
<th>Ring Size: ø100g</th>
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</thead>
<tbody>
<tr>
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<td>I</td>
</tr>
<tr>
<td>700°C</td>
<td>1045°C</td>
</tr>
</tbody>
</table>

Please check the latest parameters in our updated web-site at: [http://www.norolite.co.jp/dental](http://www.norolite.co.jp/dental)
Precautions for Handling — CZR

1. This porcelain is for zirconia frameworks.
2. To avoid heat-back of the framework, when grinding the framework, do not use excessive pressure or speed.
3. Follow the manufacturer's instructions for handling the zirconia framework.
4. Do not mix with other porcelain, including another Noritake Porcelain or another manufacturer's porcelain.
5. Before applying the wash-layer of Shade Base, steam-clean the framework.
6. Use Ceramill Finishing Liquid, Milli-Liquid or distilled water with CZR powder.
7. For adequate bond strength as well as to achieve proper value, it is necessary that the 1st layer of Shade Base is a wash-layer for the framework.
8. CZR is baked properly when the surface has a slight hazier after baking. Please adjust your furnace to achieve this result.
9. Observe the recommended cool time. Do not cool CZR too quickly.
10. Do not use metal welding pastes. The metal may stain the inside of the framework. The peg must be clean. Leftover porcelain may fuse to the inside of the framework.
11. Keep attitudes in a dry and cold place, avoiding direct sunlight.

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

Precautions for Handling — CZR PRESS

Press Ceramic and Stain
1. Only the method for fabricating a single anterior crown and inlay or onlay without a zirconia framework is by the "Staining Technique" or "LF Layering Technique". CZR PRESS is not indicated for bridges with a zirconia framework.
2. Use only CZR External Stain (ES) and CZR PRESS Glaze Powder for staining technique.
3. If a CZR PRESS restoration is made without a zirconia framework and then layered with normal CZR Porcelain, the crown will delaminate. Please use CZR PRESS in this case.
4. CZR Porcelain and CZR PRESS LF is precisely matched to CZR PRESS. Do not use other manufacturer's zirconia porcelains, metal porcelains and alumina porcelains.
5. CZR PRESS cannot be used on alumina frameworks and metal frameworks.
6. Do not use other manufacturer's Shade Base Stain.
7. Do not lower baking temperature. CZR Shade Base Porcelains must not be used for CZR PRESS. CZR Shade Base Stain must be used for CZR PRESS restorations.
8. To prevent contamination from foreign materials in the pressed ceramic, always use new wax which does not contain impurities and burns-out without leaving ash and other residues. The sure that the framework surface is clean before wax-up.
9. Ceramic Inlets cannot be re-used. Reusing Inlets will cause certain restoration failure.
10. Never use hydrofluoric acid when it becomes necessary to remove the pressed ceramic from the zirconia framework. The acid will melt the zirconia framework and its strength will be reduced.
11. If the pressed ceramic needs to be removed after pressing over a zirconia framework, reuse of the zirconia framework should be limited to two times.

Secure more than 0.6mm thickness in all parts of the zirconia framework. If the thickness is less than 0.4mm in any parts, there is a greater chance of cracks that will grow longer and wider. Secure at least more than 0.6mm thickness evenly with a rounded shoulder in frame margin area. (Refer to the illustration: Knowledge design toward the margin and is not acceptable as the thickness will gradually be less than 0.4mm. The frame margin line should be finished very smoothly. Do not give the frame margin line a serrated finish.

Carefully grind the zirconia framework to use grinding bundsides with minute diamond particles. Noritake Master Points 35-51 and 5-74 are ideal. Grinding by tools with rough particles will produce sharp scratches on the surface of the zirconia framework and eventually cause cracks to the framework. Excessive pressure during grinding may also cause cracks due to heat generation. Cooling with water is necessary to avoid heat generation during grinding.

From the characteristic of zirconia, even a very minute crack in the zirconia framework may be a cause for more cracks that grow bigger and wider after pressing. And then, the framework strength will greatly lowered. Naturally, it does not have the strength that can be seen in the process. Even a small crack can be found, never use the cracked framework.

Improper furnace parameters for the pressing cycle may lead to the problems such as an incomplete pressing, a self-investment ring, movement and absorption of the Shade Base Stain into the pressed ceramic, porosity, brilliance and value or shade changes. Every manufacturer’s press furnace is slightly different; therefore, observe the most appropriate heat pressing schedule with your press furnace. If excessive pressing time or pressure is maintained too long even after the ceramic is pressed into the cavity, the zirconia framework may crack.

On occasion, when tooth reduction is inadequate, less than ideal space is available for pressable thickness over the zirconia framework; consequently, the space created for pressable material is constricted and this, in turn, creates resistance against the flow of inlay material. Due to this circumstance, the Shade Base Stain may be carried away into the line of pressed ceramic. Special care should be taken when wanting to provide adequate space for the subsequent flow of inlay material.

The best thickness at the margin area of the CZR PRESS ceramic, not including the thickness of the zirconia framework, is less than 1.0mm. If it is thicker than 1.0mm, there may be deformation at the margin area after baking of the CzR Porcelain.

To prevent flash on the pressings, be sure to observe the above mentioned instructions during spraying and investing.

Never use other manufacturer's plunger.

Be sure to use disassembled, not tightly cured adhesive resin cement for a crown or inlay without a zirconia framework. This adhesive resin cement is also recommended for a crown with a zirconia framework.

Investment

1. The distance from the top of the wax pattern to the top of the ring should be at least 10mm, and the distance from the wax pattern to the inside wall of the ring should be at least 6mm.
Notes on Safety — CZR

- When grinding porcelain use an approved dust mask and a vacuum air filter to protect the lungs from breathing dust.
- When grinding porcelain, wear safety glasses.
- It is inadvisable to keep it out of the reach of children.
- Avoid eye contact with all liquids. In the event of eye contact, immediately rinse with a copious amount of water and consult a physician.
- Do not touch items heated by the furnace with your bare hands. Keep IS Liquid and ES Liquid away from flames and high temperatures. They are flammable.
- This porcelain is for dental use only. Do not use for other purposes.
- Do not use only by dentists and dental technicians.

All Noritake products mentioned in this manual except CZR-NA Noritake Magic Set, Forming Liquid, Noritake Master mold and Noritake Master Point are part of the CZR system and are covered by its registered trademark.

Material

- Work in a well-ventilated room during firing porcelain.
- CZR Porcelain contains silica. Avoid inhaling the dust. Use a dust collector and an approved dust mask. Over exposure may cause delayed lung injury.
- Avoid eye exposure. Wear the goggles for eye protection during cutting or polishing works. In case of contact with eyes, flush eyes with copious amounts of water and consult an eye-doctor.
- Avoid eye contact with Noritake LF Liquids. In case of contact with eyes, flush eyes with copious amounts of water and consult an eye-doctor.
- Do not touch items heated by the furnace with your bare hand. Noritake IS Liquid away from flames and high temperatures. They are flammable.
- Some people are sensitive to skin contact. Wear rubber gloves to protect your skin.
- Avoid ingestion. Keep out of the reach of children.
- This material is for dental application only. Do not use for any purpose not specified in the instruction manual.

Contraindications

- If the patient is hypersensitive to Dental Porcelains or any of the other components, this material should not be used. Or it should be only used under the strict supervision of the patient’s dentist.
- EU Authorized Representative
  
  Name: EMERGO EUROPE
  
  Address: Maastricht 16, 2013 BH, The Hague, The Netherlands

Precautions for Handling — CZR PRESS LF

Porcelain

- The only restorations that can be made by CZR PRESS Ingot and LF Porcelain without using a zirconia framework are an anterior single crown, a porcelain laminate veneer, an inlay and an onlay. Do not make a bridge without a zirconia framework.

Resin Cement Examples

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panavia F.2.0</td>
<td>Kuraray</td>
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<tr>
<td>Panavia 21</td>
<td>Kuraray</td>
</tr>
<tr>
<td>Relio Unicem</td>
<td>3M</td>
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</table>

<Images and descriptions of materials and processes related to dental technology>

**Symbols Used in a Label**

- **symbol**
- **meaning**
- **manufacturer**
- **use by**
- **LOT**
- **batch code**
- **attention, caution, consult accompanying documents, see instructions for use**
- **authorized representative in the European Community**