

YOUR CONTACT

Kuraray Europe GmbH
BU Medical Products
Philipp-Reis-Strasse 4
65795 Hattersheim am Main
Germany

Phone DACH	+49 (0) 69-305 35 835
Phone REST OF EUROPE	+49 (0) 69-305 85 980
Fax	+49 (0) 69-305 98 35 835
E-Mail	dental.eu@kuraray.com
Website	www.kuraraynoritake.eu



Kuraray Noritake Dental Inc.

300 Higashiyama, Myoshi-cho, Miyoshi, Aichi 470-0293, Japan

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kuraray

Noritake

Comprehensive Instructions for Zirconia Solutions

CZR • CZR Press • CZR Press LF

CZR

- 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 cervicals 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.

N. Hayashi
NAOKI HAYASHI



CZR PRESS

H-Ingots (High Translucency) for Staining Method.
L-Ingots (Low Translucency) for Layering Method

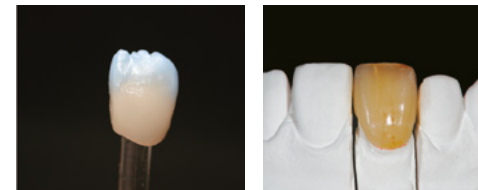
- Indicated for use in fabricating crowns and bridges in the anterior and posterior regions.
- Consistent precise and predictable fit with superior marginal integrity.
- Ideal for use with pure zirconia framework.
- Natural opalescence and translucency for true-to-life restorations.
- Provides an esthetically perfect balance of chroma and value.
- Ideal stability with outstanding resistance to fractures and chipping.



CZR PRESS Ingots are both fluorescent and opalescent, available in 24 shades and 2 translucencies.

CZR PRESS LF

- 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.
- 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.



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CZR

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

- 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.
- Excellent compatibility and bonding with zirconia frameworks
- Exceptional Easy of Use
- Ideal stability with outstanding resistance to fractures and chipping

Coefficient of Thermal Expansion (50-500°C 10⁻⁶ K⁻¹)

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.

WORKING PROCEDURES

PROCEDURE A

Please proceed with



steps in case of using colored zirconia frameworks (KATANA™ HT and ML) with high translucency.

PROCEDURE B

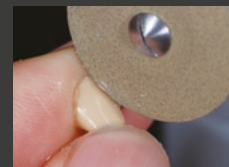
Please proceed with



White zirconia frameworks (KATANA™ HT) covered with Shade Base Porcelain and/or Shade Base Stain (Refer to the page 14-15).

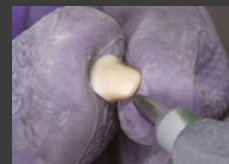
1 Zirconia framework trimming

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 2 bar (<0.2 MPa).



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



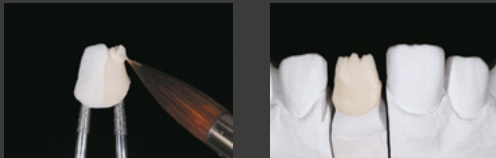
4 1st Opacious Body application

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 mamelon 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.



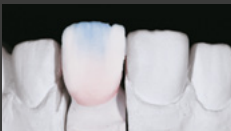
9 Cut Back

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.



13 Translucent and Luster Porcelain application

Translucent and Luster Porcelain should be overlaid by approximately 10 percent bigger than a target shape allowing for their shrinkage.



14 Translucent and Luster Porcelain baking

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



15 Morphological Correction, Glazing and Final polishing

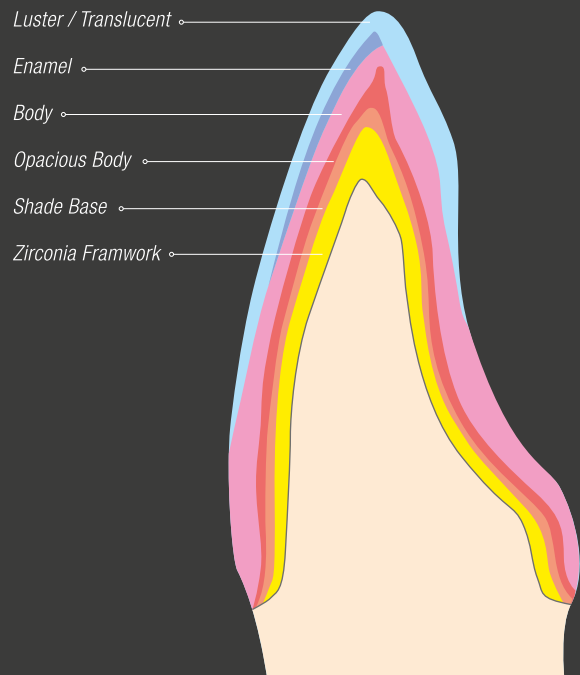
Noritake Meister Point and Meister Cones are recommended for the morphological correction. After the morphological correction, please make a next steps to steam cleaning and self glaze baking. For final polish, using Noritake Pearl Surface is recommended. Due to the translucency of the zirconia framework,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



16 Completion



Layering



FOR ADJUSTING MARGIN AREA AFTER GLAZING

In case of adjusting margin area after glazing, Margin Repair Porcelain (MRP) should be used.

- MRP application: Before setting a crown on the die, layer MRP slightly to the margin area of the restoration.
- Remove the Excess MRP: After re-seating 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.
- Morphological Correction: Polish the rough surface at the margin with silicone point such as Meister Point (SF-41).

USING MARGIN PORCELAIN

For adjusting margin area of zirconia framework

- Magic Separator application: Apply Noritake Magic Separator to the margin area of the die in order to avoid of adhering Margin Porcelain to the die.
- Margin Porcelain application: Apply the adequate amount of mixture of Margin Porcelain with Noritake Magic Former to the gingival part. If Margin Porcelain is too thick, this area tends to look artificial. Apply the Margin Porcelain in a triangular structure.
- Baking of Margin Porcelain: Follow the baking schedule on page 28. If additional Margin Porcelain is required, bake again according to schedule.

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

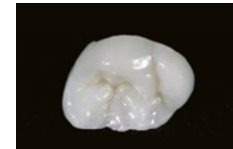
Features

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

Physical Properties

Ceramic Ingots

Flexural Strength (MPa)	92.7
Coefficient of Thermal Expansion (50-500°C $10^{-6}K^{-1}$)	10.1
Transformation Temperature (°C)	615



*Beautiful Opalescent of CZR PRESS Ingot.
(Photo by Mr. Brian Lindke)*

WORKING PROCEDURES

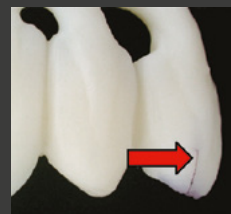
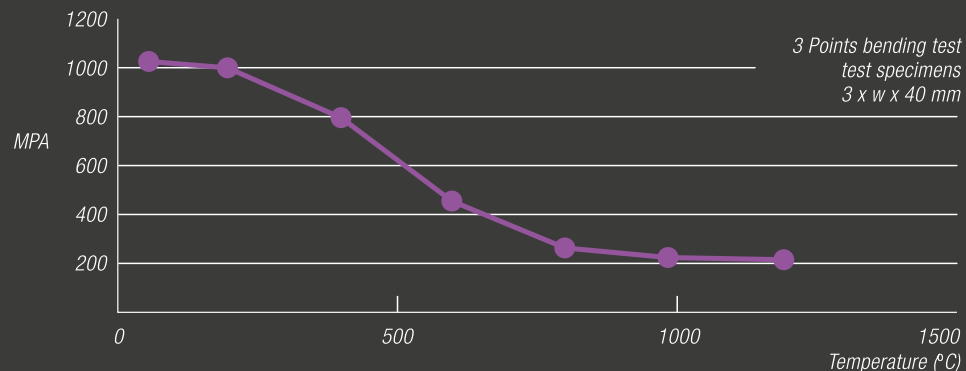
CZR PRESS with the zirconia framework



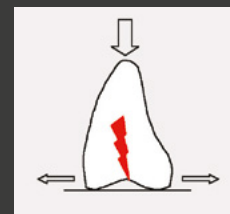
1 Zirconia materials for CZR PRESS

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.

FLEXURAL STRENGTH AT HIGH TEMPERATURE



Crack that is made during pressing



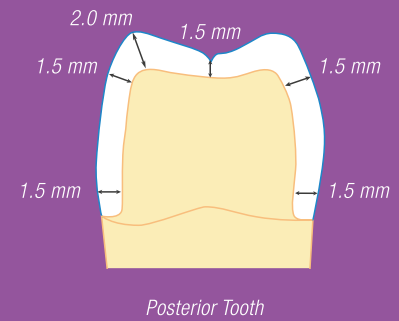
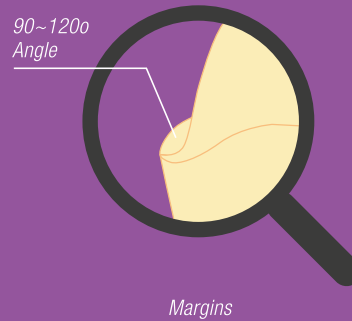
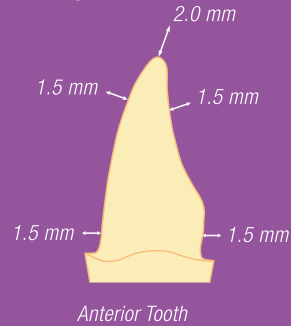
Pressure by the press force

2 Preparation guidelines and framework design:

To ensure a strong and esthetic restoration, please follow the guideline:

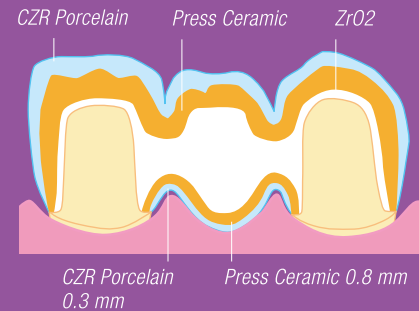
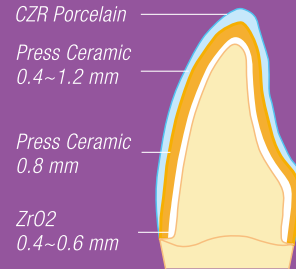
- The basic preparation is to allow the pressed ceramic to cover a 360 degrees shoulder with rounded edge or chamfer.
- The thickness of the zirconia framework should be **at least 0.4 mm.**
- The thickness of the connectors of the zirconia bridge, please follow the manufacturer's instruction.

PREPERATION



FRAMEWORK DESIGN

- **Single Crowns:** Maintain 0.8mm Thickness of pressed ceramic in all areas.
- **Bridges:** Maintain 0.8mm Thickness of pressed ceramic on abutments, embrasures, pontic tissue area and at the papillae.



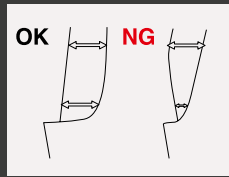
NOTE: This technique is not suited to a severely discolored tooth.

3 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.



Ideal margin design

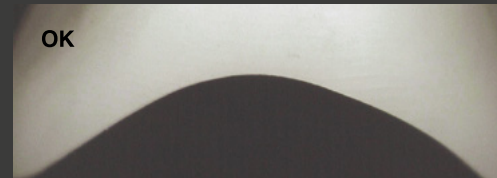


Knife edge margin is not recommended.

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.

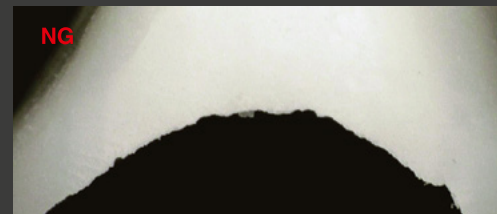
- The margin line should be smooth.
- When grinding zirconia framework, it is recommended to use burs/discs with minute diamond particles such as Noritake Meister Points SC-51 and SD-61. If using tools with rough diamond particles, it may cause sharp scratch on the surface and/or cracks into the framework. In addition, cooling the framework with water is necessary to avoid heat generation caused during grinding.



Correct smoothed margin line



Meister Points SC-51 and SD-61



Serrated margin line is should be corrected.



Crack is happened during grinding

4 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.

NOTE: 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.

5 Alumina Sandblasting of zirconia framework surface

Create a matt-finish surface by sandblasting with 50µm alumina at 2 bars pressure.

6 Cleaning of the zirconia framework

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

7 1st Shade Base Stain application

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.

THE DIFFERENCES BETWEEN CZR SHADE BASE PORCELAIN AND CZR PRESS SHADE BASE STAIN

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



Mix the shade base stain with Internal



Stain Liquid Shade Base Stain Color Guide



Application of the Shade Base Stain

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.

8 2nd Shade Base Stain application

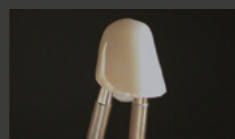
Apply the Shade Base Stain again in a thickness of about 0.15 mm. To produce an even basic color, be sure to perform the 2nd application and baking. For the 2nd Shade Base Stain baking, please refer to the baking schedule, page 28. Also refer to the Shade Base Stain Color Guide for checking the shades.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



After baking of the Shade Base Stain Thin



Application of Shade Base Stain Thick



Application of Shade Base Stain

9 Wax-Up

• Layering Method

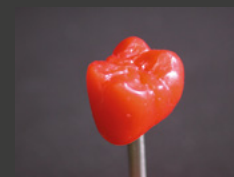
The 90% size of restored crown should be formed with wax-up. Margin area should be formed with wax-up as well. But, forming of mamelon structure is not necessary at this wax-up stage. Mamelon structure will be formed after pressing ingot. Before pressing, please make sure of the sufficient thickness of wax for the pressed ceramic. Please refer to the picture on page 12.

• Stain Method

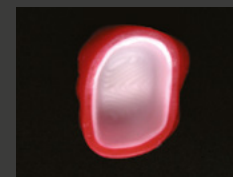
Almost 100% full-contour of restored crown should be formed with wax-up. Margin area should be formed with wax-up as well.



Wax-up for "Layering Method"



Wax-up for "Staining Method"



Wax thickness at the shoulder

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.

10 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. (See A , 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 (See B , page 17)



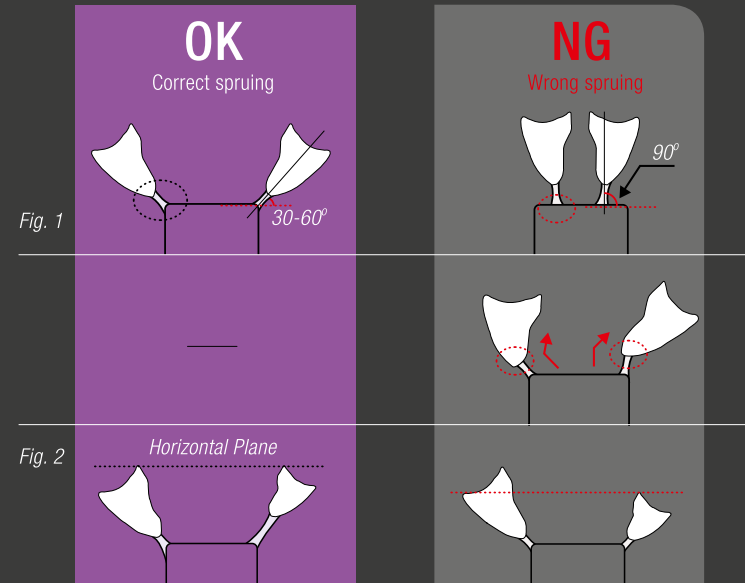
After attaching the sprue

A

B

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 ingot 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. (Fig.1) 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.



11 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.



Mix with Vacuum



Mixer Investing



Bench set 1/2 hour

12 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.



Remove the button of investment created by leveling cap



Carefully level the ring so that the top and bottom are perpendicular to the sides of the ring

13 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.)



Bench set 1/2 hour

14 Selection of CZR PRESS ingots

Select ingots dependent upon the method. For the Layering method, select L-Ingots with low transparency and for the Stain method, select H-Ingots with higher transparency.

15 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.



Insertion of the Ingots



Insertion of the plunger

Relation of Wax Weight and Number of Ingot

Wax weight	Number of 2g Ingots
0.6g or less	1
0.7g up to 1.4g	2

16 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 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.



Pressing cycle completed

17 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.



Marking the top position of the plunger



Section with a separating disk



Final removal with a plaster nipper

18 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 4-6 bar (0.4 MPa~0.6 MPa). Once the pressed ceramic is exposed, lower the sandblasting pressure to less than 2 bar (0.2 MPa) 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.



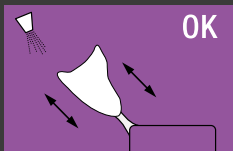
Roughly remove the investment



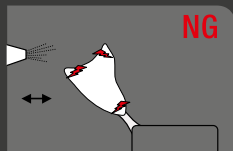
Exposing the pressed ceramic



After completion



Correct sandblasting



Wrong sandblasting

When divesting the pressed ceramic, blast from the direction indicated in the drawings on the left.

19 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.



Sprue separation

20 Morphological correction of pressed ceramic

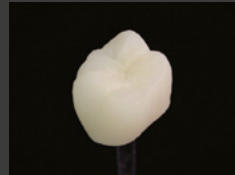
Place the pressed restoration on the model and check the fit at the margin under magnification. This depends on which technique is chosen: For the "Layering Method", create the mamelon structure with Noritake Meister Points. Special care should be taken to maintain a minimum thickness of entire pressed 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.



"Layering Method"
Pressed ceramic prior to cut-back



"Layering Method"
Cut-back to create mamelon structure



"Staining Method"
After morphological correction

21 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.

NOTE: Refer to page 5~9 for the build-up techniques for CZR Porcelain.

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(ES) or Glaze power and bake them. Refer to the baking schedule at page 28.



Completed crown after glaze bake

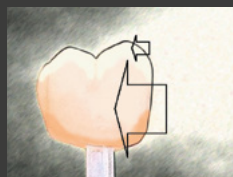
STAIN METHOD

S1 Application and baking of CZR ES

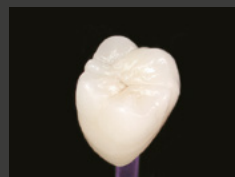
Mix CZR ES with ES Liquid. The viscosity of the mixture is the same as ordinary stains. If too much liquid is used, since the stain will move easily after application, a certain viscosity is necessary. For creating A shades, apply ES stain A+ over the area except the incisal edge or occlusal surface, apply ES stains such as Blue, Gray and White. When creating characterization with more than two ES, it is recommended not to bake simultaneously.



Application of ES



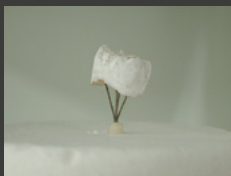
Example of ES



After ES baking

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.



After dry out



After 1st glazing

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 Tsolution using an ultrasonic cleaner.



Adjusting the contact area

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.



Completed crown after second glaze baking



Completion

CZR PRESS LF

Noritake CZR PRESS LF is low fusing porcelain to build up an enamel layer after pressing CZR PRESS ingot. By using this porcelain with CZR Press ingot and without a zirconia framework, you can make an anterior single crown, a porcelain laminate veneer, an inlay and an onlay.

PRODUCTS – LF PORCELAIN

Features

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

PRODUCTS – LF STAINS

Features

- **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.
- **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.
- **Easy Reproduction of shades:** By applying internal stains, characterization and chroma-up on the crown can be realized like painting a picture.
- **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 page 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 page 33-35

5 Divesting and sprue-cutting

Carefully deinvest 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

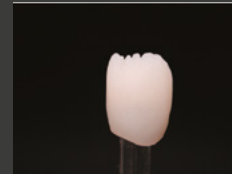
Securing enough space for the Enamel, Translucent (Luster) Porcelains that are built-up later. Before layering those porcelains, adjust the thickness of labial surface and make the mamelon structure.

7 Alumina sandblasting

Blow Alumina sandblasting all over the surface of the pressed ceramic at the pressure of 0.2 MPa (2 bar).

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 overlayered LF Enamel. Therefore please pay attention to layering thickness.



11 LF Translucent and LF Luster Porcelain application

LF Translucent and LF Luster Porcelain should be overlayered 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.



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.



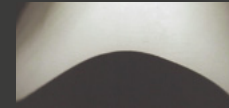
12 Baking

Bake the built up crown according to the baking schedule, page 28.



13 Baking

Bake the built up crown according to the baking schedule, page 28.



14 Cleaning

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

15 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.)

16 Completion



Stain and Glaze Method for A

A 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.

Stain and Glaze Method for B

B1. Application of Stain and Baking. Mix LF ES with Noritake ES Liquid. If too much liquid is used, the stain will move after the application. Apply the mixture over the surface of the restoration for the final shades. Then, bake it according to the baking schedule, page 28. This procedure is not required in the clinical cases which stain is not needed. Please proceed to the next step B2.

B2. Glaze Baking. Mix LF Glaze Powder with ES Liquid to create a “honey-like” glaze paste. Do not wet the surface of the restoration with ES Liquid prior to glaze application. Otherwise, application is not even on entire surface of the crown. After mixing, apply glaze thinly on the surface is covered with glaze, bake it in accordance with the baking schedule. In case of making more glossy on the surface where CZR PRESS LF is not baked, apply glaze again and bake.

BAKING SCHEDULE

	Dry-Out Time	Low Temperature		Start Vacuum		Heat Rate		Vacuum Level	Release Vacuum		Hold Time		High Temperature		Cool Time		
		min.	°C	°F	°C	°F	°C/min		°F/min	kPa	°C	°F	with vacuum	in the air		°C	°F
													min.	min.			
CZR																	
Margin porcelain 1st and 2nd	5	600	1112	600	1112	50	90	96*	1000	1832	1	1	1000	1832	4		
Shade Base porcelain 1st and 2nd	5	600	1112	600	1112	45	81	96*	930	1706	-	1	930	1706	4		
Shade Base Stain 1st (CZR PRESS)	5	700	1292	700	1292	65	117	96*	1090	1994	-	1	1090	1994	4		
Shade Base Stain 2nd (CZR PRESS)	5	700	1292	700	1292	65	117	96*	1080	1976	-	1	1080	1976	4		
Body/Enamel/Translucent	7~10	600	1112	600	1112	45	81	96	930~940	1706~1724	-	1	930~940	1706~1724	4		
Internal Stain 1st and 2nd	5	600	1112	-	-	50	90	0	-	-	-	-	900	1652	4		
Minor Adjustment	7	600	1112	600	1112	45	81	96	930	1706	-	0.5	930	1706	4		
Self Glaze	5	600	1112	-	-	50	90	0	-	-	-	0.5	930	1706	4		
Glazing Powder and External Stain	5	600	1112	-	-	50	90	0	-	-	-	-	930	1706	4		
MRP and AD-T/AD-B	5	600	1112	-	-	45	81	0	-	-	-	-	880	1616	4		
CZR PRESS																	
Shade Base Stain 1st	5	700	1292	700	1292	65	117	96*	1090	1994	-	1	1090	1994	4		
Shade Base Stain 2nd	5	700	1292	700	1292	65	117	96*	1080	1976	-	1	1080	1976	4		
ES stain (Staining Method)	5	600	1112	600	1112	50	90	87**	850	1562	-	-	850	1562	4		
CZR PRESS Glaze 1st and 2nd	5	600	1112	600	1112	65	117	96*	850	1562	-	1	900	1652	4		
CZR PRESS LF																	
Internal Stain 1st and 2nd	5	600	1112	-	-	45	81	-	-	-	-	-	800	1472	4		
LF Porcelain 1st and 2nd	7	600	1112	600	1112	45	81	96*	840	1544	-	1	840	1544	4		
Self Glaze and External Stain	5	600	1112	-	-	45	81	-	-	-	-	1	840	1544	4		
Glaze with Glazing Powder	5	600	1112	600	1112	45	81	96*	800	1472	-	1	840	1544	4		
AD-T/AD-B	5	500	932	500	932	45	81	96*	750	1382	-	1	750	1382	4		

NOTE: The above program is only a guideline. Baking Temperature may be varied with the peculiarities of different furnace. * 96kPa = 72cmHg (29 inchesHg) ** 87kPa = 65cmHg (26 inchesHg)

PRODUCTS

10g 50g 200g

CZR														
Shade Base	•	•	•	SBA1	SBA2	SBA3	SBA3.5	SBA4	SBB1	SBB2	SBB3	SBB4	SBC1	SBC2
				SBC3	SBC4	SBD2	SBD3	SBD4	SBNW0	SBNW0.5	SBNP1.5	SBNP2.5	SBWhite	
Margin	•			MA1	MA2	MA3	MA3.5	MA4	MB2	MB3	MB4	MC2	MC4	MD3
				MD4	MNW0	MNW0.5	MNP1.5	MNP2.5	M Clear	M Orange	M Peach	MDL	MRP	
Opacious Body	•	•	•	OBA1	OBA2	OBA3	OBA3.5	OBA4	OBB1	OBB2	OBB3	OBB4	OBC1	OBC2
				OBC3	OBC4	OBD2	OBD3	OBD4	OBNP1.5	OBNP2.5	OB Pale Pink	OB White	OB Orange	OB Enamel
Body	•	•	•	A1B	A2B	A3B	A3.5B	A4B	B1B	B2B	B3B	B4B	C1B	C2B
				C3B	C4B	D2B	D3B	D4B	NW0B	NW0.5B	NP1.5B	NP2.5B	EW00B	EW0B
				EWB	EWYB									
Cervical	•	•	•	CV-1	CV-2	CV-3	CV-4	CCV-1	CCV-2	CCV-3	CCV-4			
Enamel	•	•	•	E1	E2	E3	SilkyE1	SilkyE2						
Translucent	•	•	•	Tx	T0	T1	T2							
Luster	•	•	•	LT0	LT1	T Bule	Aqua Blue1	Aqua Blue2	LT Natural	LT Super Gray	Creamy Enamel	Sun Bright	Incisal Aureola	Creamy White
				LT Yellow	ELT1	ELT2	ELT3							
Modifier	•	•		White	Gray	Blue	Yellow	Light Orange	Orange	Brown	Pink	Dark Pink	Coral Pink	Mamelon 1
				Mamelon 2	Green									
Add-On	•	•		AD-T	AD-B									
Tissue	•	•		Tissue 1	Tissue 2	Tissue 3	Tissue 4	Tissue 5	Tissue 6	Tissue 7				
External Stain	3g			A+	B+	C+	D+	Gray	Black	Blue	Green 1	Green 2	Yellow	Orange 1
	10g, 30g			Orange 2	Cervical 1	Cervical 2	Cervical 3	Earth Brown	Reddish Brown	Pure White	Pink	Salmon Pink	Red	
				Glaze										
Internal Stain	3g			A+	B+	C+	D+	Incisal Blue1	Incisal Blue2	Mamelon Orange 1	Mamelon Orange 2	Reddish Brown	Earth Brown	Cervical 1
				Cervical 2	Cervical 3	White	Red	Salmon Pink	Gray	Bright	Fluoro			

Forming Liquid	100 ml
Meister Liquid	100 ml
ES Liquid	10 ml
IS Liquid	10 ml

2g	5g
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CZR PRESS													
Shade Base Stain	6g		SS A1	SS A2	SS A3	SS A3.5	SS A4	SS B1	SS B2	SS B3	SS B4	SS C1	SS C2
			SS C3	SS C4	SS D2	SS D3	SS D4	SS NP1.5	SS NP2.5	SS NW0	SS NW0.5	SS White	
Shade Base Stain Modifier	3g		A+	B+	C+	D+	Cervical Orange	Inciscal Blue 1	Inciscal Blue 2	Gray	Salmon Pink	Earth Brown	Fluoro
Press Ingots Low Translucency 5 Ingots per pkg	•	•	L A1	L A2	L A3	L A3.5	L A4	L B1	L B2	L B3	L B4	L C1	L C2
			L C3	L C4	L D2	L D3	L D4	L NW0	L NW0.5	L NP1.5	L NP2.5		
Press Ingots High Translucency 5 Ingots per pkg	•	•	H A1	H A2	H A3	H A3.5	H A4	H B1	H B2	H B3	H B4	H C1	H C2
			H C3	H C4	H D2	H D3	H D4	H NW0	H NW0.5	H NP1.5	H NP2.5		
Press Ingots 5 Ingots per pkg	•	•	EW00	EW0	EW	EWY							

CZR PRESS Glaze	10 g
Crack Finder	20 ml x 2 per pkg
Ring (Flexible rubber for mold)	100 g, 200 g, 300 g type
Ring (with Ring gauge)	100 g, 200 g, 300 g type
Plunger (Alumina Oxide)	3 pieces per pkg
Dispo Plunger / 2G (for 2 g ingots)	50 pieces per pkg
5G (for 5 g ingots)	50 pieces per pkg

10g	50g	200g
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CZR PRESS LF														
LF H Body & EW Body	•	•	•	EWOB	EWB	EWYB	H A1B	H A3B	H A4B	H B2B	H C2B	H D2B	H NWOB	
LF Enamel	•	•	•	E1	E2	E3	Silky E1	Silky E2						
Margin Retouching	•			MRP										
LF Clear Cervical	•	•	•	CCV-1	CCV-2	CCV-3	CCV-4							
LF Translucent	•	•	•	Tx	T0	T1	T2							
LF Luster	•	•	•	LT0	LT1	T Bule	Aqua Blue1	Aqua Blue2	LT Natural	LT Super Gray	Creamy Enamel	Sun Bright	Incisial Aureola	Creamy White
				LT Yellow	ELT1	ELT2	ELT3							
LF Mamelon	•	•		Mamelon 1	Mamelon 2									
Add-on	•	•		AD-T	AD-B									
LF Tissue	•	•		Tissue 1	Tissue 2	Tissue 3	Tissue 4	Tissue 5	Tissue 6	Tissue 7				
LF External Stain	3g			A+	B+	C+	D+	Gray	Black	Blue	Green1	Green 2	Yellow	Orange 1
				Orange 2	Cervical 1	Cervical 2	Cervical 3	Earth Brown	Reddish Brown	Pure White	Pink	Salmon Pink	Red	
	10g, 30g			Glaze										
LF Internal Stain	3g			A+	B+	C+	D+	Incisal Blue 1	Incisal Blue 2	Mamelon Orange 1	Mamelon Orange 2	Reddish Brown	Earth Brown	Cervical 1
				Cervical 2	Cervical 3	White	Red	Salmon Pink	Gray	Bright	Fluoro			

COLOR COMBINATION TABLE

CZR									
Layering Method									
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4
Shade Base (Shade Base Stain)	SBA1 (SSA1)	SBA2 (SSA2)	SBA3 (SSA3)	SBA3.5 (SSA3.5)	SBA4 (SSA4)	SBB1 (SSB1)	SBB2 (SSB2)	SBB3 (SSB3)	SBB4 (SSB4)
Margin	MA1	MA2	MA3	MA3.5	MA4	MB1* ¹	MB2	MB3	MB4
Opacious Body	OBA1	OBA2	OBA3	OBA3.5	OBA4	OBB1* ¹	OBB2	OBB3	OBB4
Body	A1B	A2B	A3B	A3.5B	A4B	B1B	B2B	B3B	B4B
Cervical	-	CV-1	CV-1* ³	CV-1* ³	CV-1* ⁴	-	CV-2* ³	CV-2* ⁴	CV-2
Enamel	E2	E2	E3	E3	E3	E1	E2	E3	E3
Translucent (Luster)	T1(LT1)								
	C1	C2	C3	C4	D2	D3	D4		
Shade Base (Shade Base Stain)	SBC1 (SSC1)	SBC2 (SSC2)	SBC3 (SSC3)	SBC4 (SSC4)	SBD2 (SSD2)	SBD3 (SSD3)	SBD4 (SSD4)		
Margin	MC1* ¹	MC2	MC3* ¹	MC4	MD2	MD3	MD4		
Opacious Body	OBC1* ¹	OBC2	OBC3* ¹	OBC4	OBD2* ¹	OBD3	OBD4		
Body	C1B	C2B	C3B	C4B	D2B	D3B	D4B		
Cervical	-	CV-3* ³	CV-3* ⁴	CV-3	CV-4* ³	CV-4* ⁴	CV-4		
Enamel	E2	E3	E3	E3	E2	E3	E3		
Translucent (Luster)	T1(LT1)								
	NP1.5	NP2.5	NW0	NW0.5	NW0.5	EW00	EW	EWY	
Shade Base (Shade Base Stain)	SBNP1.5 (SSNP1.5)	SBNP2.5 (SSNP2.5)	SBNW0 (SSNW0)	SBNW0.5 (SSNW0.5)	SBWWhite (SSWWhite)	SBWWhite* ⁵ (SSWWhite)	SBWWhite* ⁵ (SSWWhite)	SBB1 (SSB1)	
Margin	MNP1.5	MNP2.5	MNW0	MNW0.5	MDL	MDL	MNW0	MNW0* ²	
Opacious Body	OBNP1.5	OBNP2.5	-	-	-	-	-	-	
Body	NP1.5B	NP2.5B	NW0B	NW0.5B	EW00B	EW0B	EWB	EWYB	
Cervical	-	CV-1	-	-	-	-	-	-	
Enamel	E2* ³	E2	SilkyE2	SilkyE2	SilkyE1	SilkyE1	SilkyE2	SilkyE2	
Translucent (Luster)	T1(LT1)		T1(LT1)		ELT2		ELT1		

*1 To acquire shades of B1,C1,C3,D2 & EW, dilute B2,C2,C4,D3 & NW0 with MDL. The diluting ratio is 1:1

*2 To acquire shades of EWY, dilute MNW0 with MDL at the ratio 2:1

*3 Mix Body with Cervical at the ratio of 2:1

*4 Mix Body with Cervical at the ratio of 1:1

*5 As needed.

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

VITA® 3D-Master® Shade	Noritake Value Shade	Noritake Zirconia Shades	The Ideal Frame Shades	Shade Base Stain	Shade Base*1	Margin	Body	Opacious Body	Enamel	Translucent /Luster		
0M1	-	ZP / KD10	Non Colored White	SSNW0	SBNW0	MNW0	NW0B	-	Silky E2	T1 / LT1		
0M2	-			SSNW0	SBNW0	MNW0.5	NW0.5B	-	Silky E2	T1 / LT1		
0M3	-			SSNW0.5	SBNW0+SBNW0.5*2	MNW0.5	NW0.5B	-	Silky E2	T1 / LT1		
1M1	NV1110	ZP / KD10	Non Colored White	SSC1	SBC1	MA1	1110B	OB1110	E1	T1 / LT1		
1M2	NV1120			SSA1	SBA1	MA1	1120B	OB1120	E1	T1 / LT1		
2L1.5	NV2015	ZP / KD12	A1,B1,B2	SSB2	SBB2	MB2	2015B	OB2015	E1	T1 / LT1		
2L2.5	NV2025			SSB2	SBB2	MB2+MD4*2	2025B	OB2025	E1	T1 / LT1		
2M1	NV2110			SSC1	SBC1	MC1	2110B	OB2110	E1	T1 / LT1		
2M2	NV2120			SSB2	SBB2	MB2	2120B	OB2120	E1	T1 / LT1		
2M3	NV2130			SSB3	SBB3	MB3	2130B	OB2130	E1	T1 / LT1		
2R1.5	NV2215			SSA1	SBA1	MA2	2215B	OB2215	E1	T1 / LT1		
2R2.5	NV2225			SSA2	SBA2	MA2	2225B	OB2225	E1	T1 / LT1		
3L1.5	NV3015			ZP / KD13	A2,A3	SSC2	SBB3+SBC2*2	MC2	3015B	OB3015	E2	T1 / LT1
3L2.5	NV3025					SSB3	SBB3	MB3+MD4*2	3025B	OB3025	E2	T1 / LT1
3M1	NV3110	SSC1	SBC1			MC2	3110B	OB3110	E2	T1 / LT1		
3M2	NV3120	SSB2	SBB2			MB3	3120B	OB3120	E2	T1 / LT1		
3M3	NV3130	SSB3	SBB3			MB4	3130B	OB3130	E2	T1 / LT1		
3R1.5	NV3215	SSA2	SBA1			MA3+MC2*2	3215B	OB3215	E2	T1 / LT1		
3R2.5	NV3225	SSA3	SBA3			MA3+MC2*2	3225B	OB3225	E2	T1 / LT1		
4L1.5	NV4015	ZP / KD15	C1,D2			SSC2	SBC2	MA4+MC2*2	4015B	OB4015	E2	T1 / LT1
4L2.5	NV4025					SSB3	SBB3	MA4+MB3*2	4025B	OB4025	E2	T1 / LT1
4M1	NV4110			SSC2	SBC2	MC2	4110B	OB4110	E2	T1 / LT1		
4M2	NV4120			SSA4	SBB3	MA4	4120B	OB4120	E2	T1 / LT1		
4M3	NV4130			SSA4	SBB4	MA4	4130B	OB4130	E2	T1 / LT1		
4R1.5	NV4215			SSA2	SBA2	MD3+MC2*2	4215B	OB4215	E2	T1 / LT1		
4R2.5	NV4225			SSA4	SBB4	MA4	4225B	OB4225	E2	T1 / LT1		
5M1	NV5110			ZP / KD15	C1,D2	SSC2	SBC2	MA4	5110B	OB5110	E2	T1 / LT1
5M2	NV5120					SSA4	SBA4	MA4	5120B	OB5120	E2	T1 / LT1
5M3	NV5130	SSA4	SBA4			MA4	5130B	OB5130	E2	T1 / LT1		

CZR													
LF Layering Method													
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4
Shade Base Stain	SS A1	SS A2	SS A3	SS A3.5	SS A4	SS B1	SS B2	SS B3	SS B4	SS C1	SS C2	SS C3	SS C4
Press Ingot	L A1	L A2	L A3	L A3.5	L A4	L B1	L B2	L B3	L B4	L C1	L C2	L C3	L C4
Body	A1B	A2B	A3B	A3.5B	A4B	B1B	B2B	B3B	B4B	C1B	C2B	C3B	C4B
Enamel	E2	E2	E3	E3	E3	E1	E2	E3	E3	E2	E3	E3	E3
Translucent	T11(LT1)												
	D2	D3	D4	NW0	NW0.5	NP1.5	NP2.5						
Shade Base Stain	SS D2	SS D3	SS D4	SS NW0	SS NW0.5	SS NP1.5	SS NP2.5						
Press Ingot	L D2	L D3	L D4	L NW0	L NW0.5	L NP1.5	L NP2.5						
Body	D2B	D3B	D4B	NW0B	NW0.5B	NP1.5B	NP2.5B						
Enamel	E2	E3	E3	E1	E1	E2	E2						
Translucent	T1(LT1)												
Staining Method													
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4
Shade Base Stain	SS A1	SS A2	SS A3	SS A3.5	SS A4	SS B1	SS B2	SS B3	SS B4	SS C1	SS C2	SS C3	SS C4
Press Ingot	H A1	H A2	H A3	H A3.5	H A4	H B1	H B2	H B3	H B4	H C1	H C2	H C3	H C4
External Stain	A+	A+	A+	A+	A+	B+	B+	B+	B+	C+	C+	C+	C+
Glaze Powder	CZR PRESS Glaze Powder												
	D2	D3	D4	NP1.5	NP2.5	NW0	NW0.5						
Shade Base Stain	SS D2	SS D3	SS D4	SS NP1.5	SS NP2.5	SS NW0	SS NW0.5						
Press Ingot	H D2	H D3	H D4	H NP1.5	H NP2.5	H NW0	H NW0.5						
External Stain	D+	D+	D+	A+	A+	B+	A+						
Glaze Powder	CZR PRESS Glaze Powder												
Staining Method (EW shades)													
	EW00	EW0	EW	EWY									
Shade Base Stain	SS White			SS B1									
Body/Press Ingot	EW00	EW0	EW	EWY									
Enamel	Silky E1		Silky E2										
Luster Translucent	ELT2		ELT1										
External Stain	-			B+									
Glaze Powder	CZR PRESS Glaze Powder												

CZR													
LF Layering Method without framework													
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4
Ingot L	L A1	L A2	L A3	L A3.5	L A4	L B1	L B2	L B3	L B4	L C1	L C2	L C3	L C4
LF Enamel	LF E2	LF E2	LF E3	LF E3	LF E3	LF E1	LF E2	LF E3	LF E3	LF E2	LF E3	LF E3	LF E3
LF Translucent	LFT1 / LFLT1												
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4
Ingot L	L D2	L D3	L D4	L NP1.5	L NP2.5	L NW0	L NW0.5	EW00	EW0	EW	EWY		
LF Enamel	LF E2	LF E3	LF E3	LF E2	LF E2	LF E1	LF E1	Silky E1	Silky E1	Silky E2	Silky E2		
LF Translucent	LFT1 / LFLT1												
Staining Method without a framework													
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4
Ingot H	H A1	H A2	H A3	H A3.5	H A4	H B1	H B2	H B3	H B4	H C1	H C2	H C3	H C4
LF External Stain	A+	A+	A+	A+	A+	B+	B+	B+	B+	C+	C+	C+	C+
Glaze Powder	LFT1 / LFLT1												
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4
Ingot H	H D2	H D3	H D4	H NP1.5	H NP2.5	H NW0	H NW0.5						
LF External Stain	D+	D+	D+	A+	A+	B+	A+						
Glaze Powder	LF Glaze												
Staining Method without a framework (EW Shades)													
	EW00	EW0	EW	EWY									
Ingot H	EW00	EW0	EW	EWY									
LF External Stain	-			B+									
Glaze Powder	LF Glaze												

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 (0.4MPa) to 5 bar (0.5MPa). However, in the case of pressing of CZR PRESS ingots, this pressure is too high and often cause the following problems:

- Cracks on the zirconia frameworks after pressing
- 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.

Please check the latest parameters in our updated website at: www.kuraraynoritake.com

CZR PRESS							
EP500 (Ivoclar)							
Pressing in a 100g ring		2gx1 Ingot	Ring Size=wt.100g				
B	t*	T	H	V1	V2	Pressure	N
700°C	60°C	1045°C	15min.	700°C	1045°C	4.5bar	–
1292°F	108°F	1913°F	15min.	1292°F	1913°F	4.5bar	–
Pressing in a 200g ring		2gx1 Ingot/2 Ingots	Ring Size=wt.200g				
B	t*	T	H	V1	V2	Pressure	N
700°C	60°C	1065°C	20min.	700°C	1065°C	4.5bar	–
1292°F	108°F	1949°F	20min.	1292°F	1949°F	4.5bar	–
Pressing in a 300g ring		5gx1 Ingot	Ring Size=wt.300g				
B	t*	T	H	V1	V2	Pressure	N
700°C	60°C	1075°C	30min.	700°C	1075°C	4.5bar	–
1292°F	108°F	1967°F	30min.	1292°F	1967°F	4.5bar	–

EP600 (Ivoclar)				
Pressing in a 100g ring		2gx1 Ingot	Ring Size=wt.100g	
B	t*	T	H	E
700°C	60°C	1045°C	15min.	300µm/min.
1292°F	108°F	1913°F	15min.	300µm/min.
Pressing in a 200g ring		2gx1 Ingot/2 Ingots	Ring Size=wt.200g	
B	t*	T	H	N
700°C	60°C	1065°C	20min.	300µm/min.
1292°F	108°F	1949°F	20min.	300µm/min.
Pressing in a 300g ring		5gx1 Ingot	Ring Size=wt.300g	
B	t*	T	H	N
700°C	60°C	1075°C	30min.	150-300µm/min.
1292°F	108°F	1967°F	30min.	150-300µm/min.

Multimat2 Touch & Press (Dentsply DeTrey)						
Pressing in a 100g ring		2gx1 Ingot	Ring Size=wt.100g			
Start Temp.	Vacuum Level	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	50HPa	60°C/min.	1045°C	15min.	4min.	2.7bar
1292°F	50HPa	108°F/min.	1913°F	15min.	4min.	2.7bar
Pressing in a 200g ring		2gx1 Ingot/2 Ingots	Ring Size=wt.200g			
Start Temp.	Vacuum Level	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	50HPa	60°C/min.	1065°C	20min.	5min.	2.7bar
1292°F	50HPa	108°F/min.	1949°F	20min.	5min.	2.7bar
Pressing in a 200g ring		2gx1 Ingot	Ring Size=wt.300g			
Start Temp.	Vacuum Level	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	50HPa	60°C/min.	1065°C	20min.	6min.	2.7bar
1292°F	50HPa	108°F/min.	1949°F	20min.	6min.	2.7bar

Pro-Press100 (Whip Mix Intra Tech)							
Pressing in a 100g ring 2gx1 Ingot Ring Size=wt.100g							
Entry Temp.	Vacuum Level	Heat Rate	Final Temp.	Hold Time	Press Time	Cool Time	Pressure
700°C	Full	60°C/min.	1045°C	15min.	4min.	0.2min.	3.5bar
1292°F	Full	108°F/min.	1913°F	15min.	4min.	0.2min.	3.5bar
Pressing in a 200g ring 2gx1 Ingot/2 Ingots Ring Size=wt.200g							
Entry Temp.	Vacuum Level	Heat Rate	Final Temp.	Hold Time	Press Time	Cool Time	Pressure
700°C	Full	60°C/min.	1065°C	20min.	6min.	0.2min.	3.5bar
1292°F	Full	108°F/min.	1949°F	20min.	6min.	0.2min.	3.5bar
Pressing in a 200g ring 2gx1 Ingot Ring Size=wt.300g							
Entry Temp.	Vacuum Level	Heat Rate	Final Temp.	Hold Time	Press Time	Cool Time	Pressure
700°C	Full	60°C/min.	1065°C	20min.	8min.	0.2min.	3.5bar
1292°F	Full	108°F/min.	1949°F	20min.	8min.	0.2min.	3.5bar

NOTE: In case Special Function Button has been selected, enter "0min." for Re-Press time.

NOTE: In case Special Function Button has been selected, enter "2min." for Re-Press time.

NOTE: In case Special Function Button has been selected, enter "4min." for Re-Press time.

Ceram Press Qex (Dentsply Ney Tech)						
Pressing in a 100g ring 2gx1 Ingot Ring Size=wt.100g						
Start Temp.	Vacuum	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	ON	60°C/min.	1045°C	15min.	8min.	3.5bar
1292°F	ON	108°F/min.	1913°F	15min.	8min.	3.5bar
Pressing in a 200g ring 2gx1 Ingot/2 Ingots Ring Size=wt.200g						
Start Temp.	Vacuum	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	ON	60°C/min.	1065°C	20min.	11min.	3.5bar
1292°F	ON	108°F/min.	1949°F	20min.	11min.	3.5bar
Pressing in a 200g ring 2gx1 Ingot Ring Size=wt.300g						
Start Temp.	Vacuum	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	ON	60°C/min.	1065°C	20min.	14min.	3.5bar
1292°F	ON	108°F/min.	1949°F	20min.	14min.	3.5bar

Auto Press Plus (Pentron Lab)						
Pressing in a 100g ring 2gx1 Ingot Ring Size=wt.100g						
T1	T2	Heat Rate	H1	H2	Vacuum	Pressure
700°C	1045°C	60°C/min.	15min.	6min.	Max. Vacuum	3.5bar
1292°F	1913°F	108°F/min.	15min.	6min.	Max. Vacuum	3.5bar
Pressing in a 200g ring 2gx1 Ingot/2 Ingots Ring Size=wt.200g						
Start Temp.	Vacuum	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	1065°C	60°C/min.	20min.	7min.	Max. Vacuum	3.5bar
1292°F	1949°F	108°F/min.	20min.	7min.	Max. Vacuum	3.5bar
Pressing in a 200g ring 2gx1 Ingot Ring Size=wt.300g						
Start Temp.	Vacuum	Heat Rate	Press Temp.	Hold Time	Press Time	Pressure
700°C	1065°C	60°C/min.	20min.	8min.	Max. Vacuum	3.5bar
1292°F	1949°F	108°F/min.	20min.	8min.	Max. Vacuum	3.5bar

NOTE: For the pressing at low pressure, we have tested many times and decided the pressing schedule. But, please note that the pressing at lower pressure is recommended.

The above pressing times are recommended only as our guide. Please find the best pressing times that suit your furnace depending upon the size and number of the patterns.

CZR PRESS											
V.I.P. UNIVERSAL X-PRESS (Jelrus)											
Pressing in a 100g ring 2g×1 Ingot Ring Size=wt.100g											
Predry Time	Low Temp	Vac.Level	Start Vac.	Heat Rate	Press Temp	Hold Time	Press Time	Repress Time	Cool Time	Pressure	
0min	700°C	71	700°C	60°C	1045°C	15min.	4min.	0min.	0min.	3.5bar	
0min	1292°F	71	1292°F	108°	1913°F	15min.	4min.	0min.	0min.	3.5bar	
Pressing in a 200g ring 2g×1 Ingot Ring Size=wt.200g											
Predry Time	Low Temp	Vac.Level	Start Vac.	Heat Rate	Press Temp	Hold Time	Press Time	Repress Time	Cool Time	Pressure	
0min	700°C	71	700°C	60°C	1065°C	20min.	7min.	0min.	0min.	3.5bar	
0min	1292°F	71	1292°F	108°	1949°F	20min.	7min.	0min.	0min.	3.5bar	
Pressing in a 200g ring 2g×2 Ingots Ring Size=wt.200g											
Predry Time	Low Temp	Vac.Level	Start Vac.	Heat Rate	Press Temp	Hold Time	Press Time	Repress Time	Cool Time	Pressure	
0min	700°C	71	700°C	60°C	1065°C	20min.	10min.	0min.	0min.	3.5bar	
0min	1292°F	71	1292°F	108°	1949°F	20min.	10min.	0min.	0min.	3.5bar	
Pressing in a 300g ring 5g×1 Ingot Ring Size=wt.300g											
Predry Time	Low Temp	Vac.Level	Start Vac.	Heat Rate	Press Temp	Hold Time	Press Time	Repress Time	Cool Time	Pressure	
0min	700°C	71	700°C	60°C	1065°C	30min.	17min.	0min.	0min.	3.5bar	
0min	1292°F	71	1292°F	108°	1949°F	30min.	17min.	0min.	0min.	3.5bar	
CZR PRESS											
AUSTROMAT 3001 press-i-dent (DEKEMA)											
Pressing in a 100g ring 2g×1 Ingot / 2 Ingots Ring Size=wt.100g											
L9	C700	V9	T060.C1045	T900	L94	T480	L9	V0	C0	L6	T5
Pressing in a 200g ring 2g×1 Ingot / 2 Ingots Ring Size=wt.200g											
L9	C700	V9	T060.C1065	T1200	L97	T900	L9	V0	C0	L6	T5
Pressing in a 380g ring 2g×1 Ingot / 2 Ingots Ring Size=wt.380g											
L9	C700	V9	T060.C1065	T2400	L99	T1680	L9	V0	C0	L6	T5

PRECAUTIONS FOR HANDLING – CZR

- This porcelain is for zirconia frameworks.
- To avoid heat-shock of the framework, when grinding the framework, do not use excessive pressure or speed.
- Follow the manufacturer's instructions for handling the zirconia framework.
- Do not mix with any other porcelain, including another Noritake Porcelain or another manufacturers' porcelain.
- Before applying the wash-bake of Shade Base, steam clean the framework.
- Use Cerabien Forming Liquid, Meister Liquid or distilled water with CZR powder.
- For adequate bond strength as well as to achieve proper value, it is necessary that the 1st layer of Shade Base is a wash-bake layer.
- CZR is baked properly when the surface has a slight luster after baking. Please adjust your furnace to achieve this result.
- Observe the recommended cool time. Do not cool CZR too quickly.
- Do not use metal baking pegs. The metal may stain the inside of the framework. The peg must be clean: leftover porcelain may fuse to the inside of the framework.
- Keep all liquids in a dry and cool place, avoiding direct sunlight.

PRECAUTIONS FOR HANDLING – CZR PRESS

Press Ceramic and Stain

- The only 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 without a zirconia framework.
- Use only CZR External Stain (ES) and CZR PRESS Glaze Powder for staining technique.
- If a CZR PRESS restoration is made without a zirconia framework and then layered with normal CZR Porcelain, the crown will deform. Please use CZR PRESS LF in this case.
- CZR Porcelain and CZR PRESS LF is precisely matched to CZR PRESS. Do not use other manufacturers' zirconia porcelains, metal porcelains and alumina porcelains.
- CZR PRESS cannot be used on alumina frameworks and metal frameworks.
- Do not use other manufacturers' Shade Base Stain.
- Due to lower baking temperature, CZR Shade Base Porcelain must not be used for CZR PRESS. CZR PRESS Shade Base Stain must be used for CZR PRESS restorations.
- 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. Be sure that the framework surface is clean before wax-up.

- Ceramic ingots cannot be re-used. Re-using ingots will cause certain restoration failure.
- 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.
- If the pressed ceramic needs to be removed after pressing over a zirconia framework, re-use of the zirconia framework should be limited to two times.
- Secure more than 0.4mm 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 0.4mm thickness evenly with a rounded shoulder in frame margin area. (Refer to the illustration) Knife-edge design toward the margin end 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 margin line serration-finish.

- Carefully grind the zirconia framework to use grinding burs/discs with minute diamond particles. Noritake Meister Points SC-51 and SD-61 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 be lowered. Naturally, it does not have the strength that can be fit in the mouth. If even a 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 split investment ring, movement and absorption of the Shade Base Stain into the pressed ceramic, porosity, brittleness 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 ingot material. Due to this circumstance, the Shade Base Stain may be carried away into the flow of pressed ceramic. Special care should be taken when waxing to provide adequate space for the subsequent flow of ingot material.
- The best thickness at the margin area of the CZR PRESS ceramic, not including the thickness of the zirconia framework, is less than 1.0 mm. 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 spruing and investing.

- Noritake Plungers must be used for CZR PRESS technique. Never use other manufacturer's plungers.
- Be sure to use dual-cured, not light 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

■ Spruing

- 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 8mm.
- Always use the new wax which does not contain impurities. Be sure that the framework surface is clean before wax-up.
- Always keep the sprue former very clean to avoid mixing any dust particles into pressings.

■ Mixing

- 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.

- The physical properties of phosphate-bonded investment change according to the temperature of the materials and equipment used in investing: therefore, maintain a constant temperature of approximately 23°C (73°F) for the powder, liquid, water and the mixing bowl.
- Use only distilled water for dilution of “special liquid”, but do not dilute more than specified.
- Use a separate mixing bowl for mixing phosphate- bonded investment. Never use the same mixing bowl for the gypsum-bonded investment or gypsum stone.
- Properly dispose of the excess investment material. Always use a plaster trap.

■ Baking

- After investing, leave the ring to bench-set (undisturbed) at room temperature for at least 30 min, then place it into the center of the burn-out furnace at 850°C (1562°F).
- If the ring is left more than 12 hours after investing, soak it in water for 3-5 minutes, then place it into a preheated furnace at 850°C (1562°F).
- Burn-out of the investment ring needs to be

done at sufficient oven temperature in order to prevent insufficient wax elimination and to burn-out the remaining ammonia gases from the investment ring.

- Do not proceed with the pressing process if cracks appear in the ring after burning-out.

■ Divesting

- Divesting must be carefully carried out to avoid any breaking the pressed ceramic.

■ Storage

- Keep in a dry, cool place.
- After opening the investment package, reseal the package tightly as the investment easily absorbs moisture. Never store investment in plastic bags or containers.
- To prevent the special liquid from being frozen, never store liquid at temperatures below 0°C (32°F). Do not use frozen (and then thawed) liquid.
- Press Investment may be stored until the expiration date if the package has never been opened. Always use before the expiration date. Once the package has been opened, use the investment immediately.

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.
- Do not use CZR PRESS LF for the clinical cases where the thickness of the pressed ceramic cannot be more than 0.8mm, cross bite and attrition of the tooth. The restoration receives unexceptionally strong pressure.
- In order to avoid chipping, the best thickness at the margin area of the framework should be more than 1.0mm.
- Be sure to read this technical instructions from wax-up to divesting and Sprue-cutting and follow the instructions.
- As to the investment powder/liquid ratio, refer to the baking schedule of manufacturer’s Instructions.
- For inserting CZR PRESS ingot, Noritake Disposable Plunger is recommended as it has a perfect matching CTE.
- Carefully grind the pressed ceramic not to produce cracks and chipping.
- Do not mix with other porcelain, including other Noritake Porcelain or other manufacturer’s porcelain.

- When without a zirconia framework, CZR Enamel, Translucent and Luster Porcelain cannot be used on the CZR pressed ceramic. Use CZR PRESS LF Porcelain only.
- Use only Noritake LF Liquid or distilled water.
- CZR PRESS LF is baked properly when the surface has a slight luster after baking. Please adjust your furnace to achieve this result.
- CZR PRESS LF is a low fusing porcelain. In case any fiber such as tissue paper remains after baking, it should be removed.
- For porcelain separation, please use Noritake Magic Separator that can be used for low fusing porcelain.
- Observe the recommended cool time. Do not cool CZR PRESS LF too quickly.
- Do not use metal baking pegs. The metal may stain the inside of the framework. The pegs must be clean. Leftover porcelain may fuse to the inside of the framework.
- Keep all liquids in a dry cool place, avoiding direct sunlight.
- Be sure to use adhesive resin cement for bonding.

Stain

- Be sure to use CZR PRESS LF Internal Stain (IS) or External Stain (ES) for staining and glazing powder. Other stains cannot be used.
- There is a risk of blackening when using the stain liquid of other manufacturers. It is very important to use IS Liquid or ES Liquid exclusively.
- CZR PRESS LF IS is made exclusively for internal staining.
- IS Liquid should not be mixed with water, use as is without diluting.
- After mixing Internal Stain with IS Liquid on the palette, avoid letting it sit for a long time and avoid making repeated additions to the original mixture. Using stain from which too much moisture has evaporated will result in bubbles.
- If different colored stains are applied over on the same area without baking between applications, they may blend unpredictably. To avoid this, divide the staining process into two parts and bake between applications.
- IS Liquid contains ingredients that dissolve some plastics. Please handle with extreme caution in the presence of plastic materials.

Resin Cement Examples	
Product Name	Manufacturer
Panavia F2.0	Kuraray
Panavia 21	Kuraray

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 non-edible. 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.
- For use only by dentists and dental technicians.

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

CZR PRESS & CZR PRESS LF

- Work in a well-ventilated room during firing porcelain.
- LF Porcelain contains Silica. Avoid inhaling the dust. Use a dust collector and an approved dust mask. Over exposures may cause delayed lung injury.
- Avoid exposure to eyes. 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 ingesting. 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.

COMPATIBILITY CHART OF CZR & CZR PRESS

CZR
CZR PRESS
CZR PRESS LF



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No Framework Stand Alone

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CZR PRESS H-Ingots
1045~1075°C

CZR PRESS H-Ingots
1045~1075°C

CZR PRESS L-Ingots
1045~1075°C

CZR
with Nori-Vest Zr

CZR ES
930°C

CZR
PRESS LF ES
840°C

CZR
PRESS LF IS
800°C

CZR IS
900°C

CZR
PRESS LF
840°C

CZR
930°C

CZR
PRESS Glaze
900°C

CZR
PRESS LF ES Glaze
840°C

CZR ES
930°C

CZR ES Glaze
930°C

ES Liquid

CZR PRESS
Shade Base Stain

CZR External Stain
(incl. ES Glaze)

CZR PRESS LF
External Stain