VINTAGE ZR

ZR Bond Porcelain

Instructions for Use

SHOFU INC.

VINTAGE ZR

Instruction for use

VINTAGE ZR porcelain system has been developed especially for the metal free restoration based on extra strong zirconium oxide frameworks according to the latest research in porcelain knowledge.

In combination with these substructures it offers unlimited possibilities in the reproduction of life like appearance for crowns and bridge works.

Opaque liners ensure the bonding to the zirconium frameworks, eliminate the whiteness issue and provide a patient specific coloration.

In addition VINTAGE ZR offers the light-optical aspects of natural teeth because of the micro fine particle structure of the opalescent Incisal and Translucent powders.

Contents

1 Notes

1-1. Notes

(1) Use of eye-protective glasses is recommended for contouring work.

(2) Use of dust extractor or mask is recommended for contouring work.

(3) This product must only be used for the intended purpose.

(4) This product must only be used by dental professionals.

1-2. Important Notes

(1) If allergic reactions occur such as eruption or skin inflammation while using this product, discontinue use immediately and seek medical advice.

(2) Avoid contacting soft tissues, skin or eyes. In case of eye contact, rinse immediately with copious amounts of water and seek medical advice.

2 System components

2-1. Reproduction of life-like shades

(1) Restorations with enhanced esthetics can be fabricated thanks to the wide ranging shade system such as Cervical Trans and/or Opal Porcelain.
(2) More life-like enamel shades can be reproduced using Opal Porcelain with the simplified 2-layer technique.
(3) Opaque Liner enables more stable shades to be reproduced, regardless of the die shade.

2-2. Fluorescence resembling that of natural teeth

(1) Fluorescence resembling that of natural teeth - Vintage ZR is uranium-free and especially biocompatible.
(2) Margin and Cervical Trans porcelains are especially fluorescent for creating restorations with life-like cervical areas.

2-3. System and shades

SYSTEM	SHADES
Opaque Liner (23 shades) 5g	A_1O, A_2O, A_3O, $A_{3.5}O$, A_4O, rootAO B_1O, B_2O, B_3O, B_4O, C_1O, C_2O, C_3O, C_4O D_2O, D_3O, D_4O , W_1O, W_2O, W_3O OM-Y, OM-LP, OM-DP
Opaque Dentin (9 shades) 15g and 50g	OD-N, OD-A_3, OD-rootA, OD-B_2, OD-B_4, OD-C_2, OD-C_4, OD-D_3, OD-W_1
Margin (11 shades) 15g	CLM, NM, A_3M, rootAM, B_2M, B_4M, C_2M, C_4M, D_3M, LPM, W_1M
Body (20 shades) 15g and 50g	A_1B, A_2B, A_3B, $A_{3.5}B$, A_4B, rootAB B_1B, B_2B, B_3B, B_4B, C_1B, C_2B, C_3B, C_4B, D_2B, D_3B, D_4B, W_1B, W_2B, W_3B,
Opal (5 shades) 15g and 50g	Opal 56, Opal 57, Opal 58, Opal 59, Opal 60
Opal Effect (8 shades) 15g and 50g	Opal T, Opal SL, Opal WE, Opal MI, Opal OC, Opal AM-R, Opal AM-Y, Opal AM-V
Enamel Effect (5 shades) 15g and 50g	BT, OT, PT, GT, T-Glass
Cervical (4 shades) 15g and 50g	AC, BC, CC, DC
Cervical Trans (5 shades) 15g and 50g	CT-CL, CT-W, CT-A, CT-B, CT-R
Color Effect (8 shades) 15g	MP, MY, MIv, RED, Y, O, G, W
Gum (2 shades) 15g	Gum-LP, Gum-DP
Correction (3 shades) 15g	ADD-ON B, ADD-ON T, CPM FINE

2-4. Components

① Opaque Liner (23 shades, 5g each)

Opaque Liner is used to create the base shade.

Apply on the zirconia coping to produce a base for each shade. Opaque Liner is a paste which is easily applied in thinner layers. It masks discolored abutment teeth or metal cores and can be applied as a base shade for the Zirconia core frame. 3 modifier shades are available for reproducing a wider range of shades. The layer thickness and viscosity are easily adjusted as this material is supplied in paste form.

- OM-Y : Yellowish shade
- OM-LP: Light pinkish shade
- OM-DP: Deep pinkish shade

② Opaque Dentin (9 shades, 15g and 50g each)

This porcelain has the same shade as body porcelain, but is more opacious. It is used in lingual areas or the gingival aspects of bridge pontics where only limited space is available for the porcelain.

- OD-N: Diluent color porcelain for mixing with basic Opaque Dentin shades
- OD-W1: This porcelain is used for Whitening shades.

③ Margin (11 shades, 15g each)

This porcelain has the same shade as body porcelain, but has a higher firing temperature and increased fluorescence.

It is used for optimizing the marginal areas of zirconia copings or building up porcelain margins.

- CLM: Transparent shade-also for mixing with basic Margin porcelain shades for adjusting the transparency.
- NM : Diluent color porcelain for mixing with basic Margin porcelain shades.
- LPM: Light pinkish shade for mixing with basic Margin porcelain shade.
- W1M: This porcelain is used for Whitening shades.

④ Body (20 shades, 15g and 50g each)

This porcelain is used to reproduce dentin shades.

⑤ Opal (5 shades, 15g and 50g each)

This enamel porcelain transmits light similar to natural enamel (opal effect). Applying it in two layers, together with Body porcelain, enables life-like enamel shades to be reproduced.

⑥ Opal Effect (8 shades, 15g and 50g each)
This enamel effect porcelain transmits light similar to natural enamel (opalescence).

Æ OPAL T (Translucent)
Regular opalescent translucent porcelain.
Æ OPAL SL (Superlucent)
A slightly bluish porcelain with higher opalescent translucency.
Æ OPAL WE (White Enamel)
A slightly whitish porcelain for use in marginal or interproximal areas.
Æ OPAL MI (Milky)
Milky shade porcelain for use in molar cusps or whitish areas.
Æ OPAL AM-R (Amber Red)
A slightly reddish amber porcelain for reproducing enamel shades.
Æ OPAL AM-Y (Amber Yellow)
A slightly yellowish amber porcelain for reproducing enamel shades.
Æ OPAL AM-V (Amber Violet)
A slightly violet amber porcelain for reproducing enamel shades.
Æ OPAL OC (Occlusal)
A slightly dull yellowish porcelain for use in the occlusal areas of molars.

⑦ Enamel Effect (5 shades, 15g and 50g each)
Translucent enamel effect porcelain without opalescence.
Æ BT (Blue Translucent) : Bluish translucent porcelain
Æ OT (Orange Translucent) : Orangish translucent porcelain
Æ PT (Pink Translucent) : Pinkish translucent porcelain
Æ GT (Grey Translucent) : Greyish translucent porcelain
Æ T-Glass : Highly translucent (glass-like) porcelain

⑧ Cervical (4 shades, 15g and 50g each)
Cervical porcelain for reproducing cervical areas. When mixed with Body porcelain, especially dark shades such as A4 or B4 are more effective.

⑨ Cervical Trans (5 shades, 15g and 50g each)
This translucent cervical porcelain has a slightly lower firing temperature than Body porcelain. It reproduces deeper translucent shades in cervical areas and creates smooth surfaces for tissue compatibility.
It is highly fluorescent.

Æ CT-CL: Translucent porcelain.
Æ CT-W: A slightly translucent porcelain, used for turning cervical areas whitish.
Æ CT-A : Orangish translucent porcelain for use with A shade groups mixed with CT-CL.
Æ CT-B : Yellowish translucent porcelain for use with B shade groups mixed with CT-CL.
Æ CT-R : Reddish translucent porcelain for use with R shade groups mixed with CT-CL.

2-4. Components

⑩ Color Effect (8 shades, 15g each)

This Effect porcelain can be used with or without Body porcelain, as required.

- MP (Mamelon Pink)
  Pinkish and intensive porcelains for reproducing mamelons in the incisal areas of younger patients' teeth.
- MIv (Mamelon Ivory)
  Ivory and intensive porcelains for reproducing mamelons in the incisal areas of middle-aged patients' teeth.
- MY (Mamelon Yellow)
  Yellowish and intensive porcelains for reproducing mamelons in the incisal areas of elderly patients' teeth.
- RED (Red) Pinkish porcelain.
- Y (Yellow): Yellowish porcelain.
- O (Orange) Orangish porcelain.
- G (Grey) : Greyish porcelain.
- W (White) : Whitish porcelain.

⑪ Gum (2 shades, 15g each)

This pink shaded porcelain is for reproducing gum shades and is fired at lower temperatures.
Due to the lower firing temperature, it can be used after firing the regular porcelain.

- Gum-LP (Light pink) : Lighter pink shaded porcelain
- Gum-DP (Dark pink) : Darker pink shaded porcelain

⑫ Correction (3 shades, 15g each)

Can be used in small amounts for correcting after contouring or self-glazing.

- ADD-ON B Shade A3B Body correction porcelain.
- ADD-ON T Translucent porcelain for correcting enamel areas.
- CPM Fine Finer particle porcelain than ADD-ON B. Used for adjusting of marginal fit after glazing.

⑬ VINTAGE AL/ZR Opaque Liner Liquid (3mL)

Opaque Liner mixing liquid for adjusting the viscosity of the paste.

⑭ VINTAGE Modelling Liquid (50mL, 500mL)

Mixing liquid for the VINTAGE porcelain system (except Opaque Liner).
Prevents mixed powder from drying and enhances the handling properties when building up.

2-4. Components

⑮ VINTAGE CPM Modelling Liquid (3mL)
Mixing liquid for Margin porcelain and Correction porcelain.

⑯ VINTAGE Margin Porcelain Isolation Liquid (7mL)
Applied to the plaster model to allow separation from the porcelain.

⑰ VINTAGE AL/ZR Color Indicator (7 types)
Color indicators are available for all VINTAGE AL/ZR shades.

Æ Opaque Liner	20 shades
Æ Body	20 shades
Æ Enamel	18 shades
(Opa, Opal Effect, Enamel Effect)	
Æ Margin Porcelain (Including CPM FINE)	12 shades
Æ Opaque Dentin	9 shades
Æ Color Effect	13 shades
(Opaque Liner Effect, Color Effect, Gum)	
Æ Cervical, Cervical Trans, Correction (ADD-ON B, ADD-ON T)	11 shades

2-5. Package [Set composition]

VINTAGE ZR AB Set — 34 shades

Opaque Liner (10 shades / 5g) : A_1O, A_2O, A_3O, $A_{3.5}O$, A_4O, rootAO, B_1O, B_2O, B_3O, B_4O
Cervical (2 shades / 15g) : AC, BC
Body (10 shades / 15g) : A_1B, A_2B, A_3B, $A_{3.5}B$, A_4B, rootAB, B_1B, B_2B, B_3B, B_4B
Opaque Dentin (5 shades /15g) : OD-N, OD-A_3, OD-rootA, OD-B_2, OD-B_4
Opal Enamel (4 shades / 15g) : Opal 57, Opal 58, Opal 59, Opal 60
Opal Effect (1 shade / 15g) : Opal T
Correction (2 shades / 15g) : ADD-ON B, ADD-ON T
VINTAGE AL/ZR Opaque Liner Liquid (1 bottle / 3mL)
VINTAGE Modelling Liquid (1 bottle / 50mL)

VINTAGE ZR CD Set — 19 shades

Opaque Liner (7 shades / 5g) : C_1O, C_2O, C_3O, C_4O, D_2O, D_3O, D_4O
Cervical (2 shades / 15g) : CC, DC
Body (7 shades / 15g) : C_1B, C_2B, C_3B, C_4B, D_2B, D_3B, D_4B
Opaque Dentin (3 shades / 15g) : OD-C_2, OD-C_4, OD-D_3
VINTAGE AL/ZR Opaque Liner Liquid (1 bottle / 3mL)

VINTAGE ZR Whitening Set — 11 shades

Opaque Liner (3 shades / 5g) : W_1O, W_2O, W_3O
Body (3 shades / 15g) : W_1B, W_2B, W_3B
Opaque Dentin (2 shades / 15g) : OD-N, OD-W_1
Opal Enamel (2 shades / 15g) : Opal 56, Opal 57
Opal Effect (1 shade / 15g) : Opal T
VINTAGE AL/ZR Opaque Liner Liquid (1 bottle / 3mL)

VINTAGE ZR Enamel Effect Set — 18 shades

Opal Effect (8 shades / 15g) : Opal T, Opal SL, Opal WE, Opal MI, Opal OC, Opal AM-R, Opal AM-Y, Opal AM-V
Enamel Effect (5 shades / 15g) : BT, OT, PT, GT, T-Glass
Cervical Trans (5 shades / 15g) : CT-CL, CT-W, CT-A, CT-B, CT-R

VINTAGE ZR Margin Porcelain Set — 13 shades

Base shades (10 shades / 15g) : CLM, NM, A_3M, rootAM, B_2M, B_4M, C_2M, C_4M, D_3M, W_1M
Effect shades (1 shade / 15g) : LPM
Correction (2 shades / 15g) : ADD-ON B, CPM, FINE
VINTAGE CPM Modelling Liquid (1 bottle / 3mL)
VINTAGE Margin Porcelain Isolation Liquid (1bottle / 7mL)

VINTAGE ZR Color Effect Set — 13 shades

Opaque Liner Effect shades (3 shades / 15g) : OM-Y, OM-LP, OM-DP
Color Effect (8 shades / 15g) : MP, MY, MIv, RED, Y, O, G, W
Gum (2 shades / 15g) : Gum-LP, Gum-DP

Individual products

- Opaque Liner (23 shades / 5g)
- Margin (11 shades / 15g)
- Opaque Dentin (9 shades / 15g, 50g)
- Body (20 shades / 15g, 50g)
- Opal (5 shades / 15g, 50g)
- Opal Effect (8 shades / 15g, 50g)
- Enamel Effect (5 shades / 15g, 50g)
- Color Effect (8 shades / 15g)
- Cervical (4 shades / 15g, 50g)
- Cervical Trans (5 shades / 15g, 50g)
- Gum (2 shades / 15g)
- Correction (3 shades / 15g)

Related products

- VINTAGE AL/ZR OPAQUE LINER LIQUID (3mL)
- VINTAGE MODELLING LIQUID (50mL, 500mL)
- VINTAGE CPM MODELLING LIQUID (3mL)
- VINTAGE MARGIN PORCELAIN ISOLATION LIQUID (7mL pen type)
- VINTAGE PORCELAIN ISOLATION LIQUID (10mL)

- VINTAGE AL/ZR COLOR INDICATOR (7 types)
  - Opaque Liner
  - Body
  - Enamel (Opal, Opal Effect, Enamel Effect)
  - Margin (Including CPM FINE)
  - Opaque Dentin
  - Color Effect (Opaque Liner Effect, Color Effect)
  - Cervical, Cervical Trans, Correction

- SHOFU DIE COLOR CHECKER (Light-cure composite for dies)
  - SHOFU DIE COLOE CHECKER (7 colors)
  - SHOFU DIE COLOR CHECKER INDICATOR (1 set)
  - SHOFU DIE STICK (30 pcs)
  - VINTAGE Porcelain Isolation Liquid (10mL)
  - UniBrush No.1 (1 pc)

3-1. VINTAGE ZR Shade Charts

Table 1 - Basic Shades

Shade	A1	A2	A3	A3.5	A4	rootA
Opaque Liner	A_1O	A_2O	A_3O	$A_{3.5}O$	A_4O	rootAO
Cervical	-	-	A_3B : 2 AC : 1	$A_{3.5}B$: 1 AC : 1	A_4B : 1 AC : 1	AC
Body	A_1B	A_2B	A_3B	$A_{3.5}B$	A_4B	rootAB
Opal	57	58	59	59 : 1 60 : 1	60	60

Shade	B1	B2	B3	B4
Opaque Liner	B_1O	B_2O	B_3O	B_4O
Cervical	-	-	B_3B : 1 BC : 1	BC
Body	B_1B	B_2B	B_3B	B_4B
Opal	57	58	59	60

Shade	C1	C2	C3	C4	D2	D3	D4
Opaque Liner	C_1O	C_2O	C_3O	C_4O	D_2O	D_3O	D_4O
Cervical	-	C_2B : 2 CC : 1	C_3B : 1 CC : 1	CC	D_2B : 1 DC : 1	D_3B : 1 DC : 1	DB : 2 BC : 1
Body	C_1B	C_2B	C_3B	C_4B	D_2B	D_3B	D_4B
Opal	58	58	59	60	58	59	59

Table 2 - Whitening Shades

Shade	W1	W2	W3
Opaque Liner	W_1O	W_2O	W_3O
Cervical	-	-	-
Body	W_1B	W_2B	W_3B
Opal	56	56 : 2 57 : 1	56 : 1 57 : 2

Table 3 - Opaque Dentin

Shade	1	2	3	3.5	4	root
A	OD-N	OD-N : 1 OD-A_3 : 1	OD-A_3	OD-A_3 : 2 OD-rootA : 1	OD-A_3 : 1 OD-rootA : 2	OD-rootA
B	OD-N : 1 OD-B_2 : 1	OD-B_2	OD-B_2 : 1 OD-B_4 : 1	-	OD-B_4	-
C	OD-N : 1 OD-C_2 : 1	OD-C_2	OD-C_2 : 1 OD-C_4 : 1	-	OD-C_4	-
D	-	OD-N : 1 OD-D_3 : 1	OD-D_3	-	OD-D_3 : 1 OD-B_4 : 1	-
W	OD-W_1	OD-W_1 : 2 OD-N : 1	OD-W_1 : 1 OD-N : 2	-	-	-

Table 4 - Margin porcelain

Shade	1	2	3	3.5	4	root
A	NM	NM : 1 A_3M : 1	A_3M	A_3M : 2 rootAM : 1	A_3M : 1 rootAM : 2	rootAM
B	NM : 1 B_2M : 1	B_2M	B_2M : 1 B_4M : 1	-	B_4M	-
C	NM : 1 C_2M : 1	C_2M	C_2M : 1 C_4M : 1	-	C_4M	-
D	-	NM : 1 D_3M : 1	D_3M	-	D_3M : 1 B_4M : 1	-
W	W_1N	W_1N : 2 NW : 1	W_1N : 1 NW : 2	-	-	-

3-2. Zirconia copings

Once the Zirconia coping has been adjusted, sandblast it with alumina oxide (about 50 microns) at an air pressure of 0.2-0.3 MPa, clean the surface with an ultrasonic cleaner, and fire it according to the following schedule.

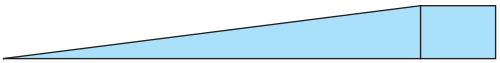
Adjusting with Diamond points.
NOTE: Excess pressure, coarse diamond points, and high speed grinding lead to chipping and cracking.

Shaping and finishing with

(diamond impregnated polisher).

After heat treatment.

Air firing



650 50~60 °C / min 1000°C Hold 5min.

Preheating zirconia copings

Hint
- For adjusting coping, use water cooling to avoid over-heating.
- After adjusting coping, heat treatment is necessary.

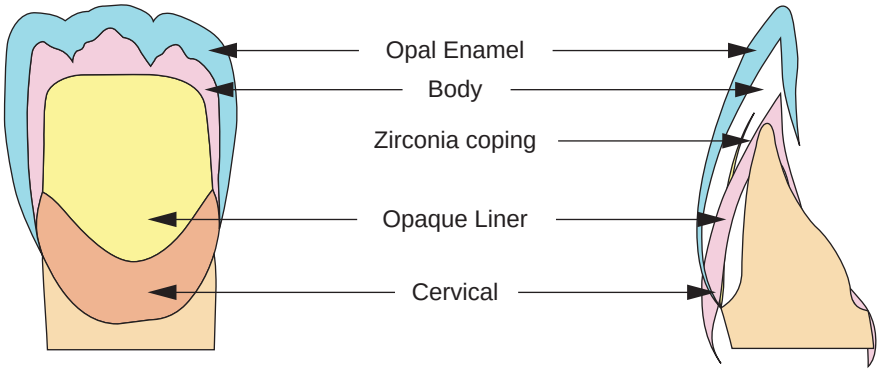
Note
For other type of metal free coping, such as glass infiltrated system, use of VINTAGE AL is recommended.

3-3. Layering diagram

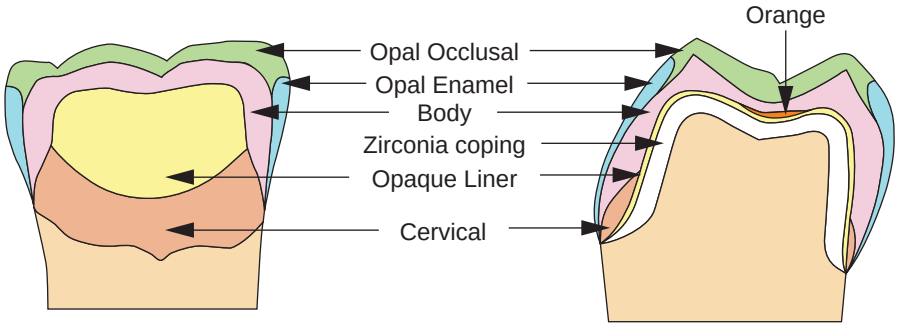
Basic layering 1 (when Opaque Liner is used)

In case of Zirconia coping, materials and production method are different depending on the manufacture, so there are varieties in shade and translucency. Before application, adjustment of shade of the coping is necessary based on the desired shade (foundation work).

For anterior teeth



For posterior teeth

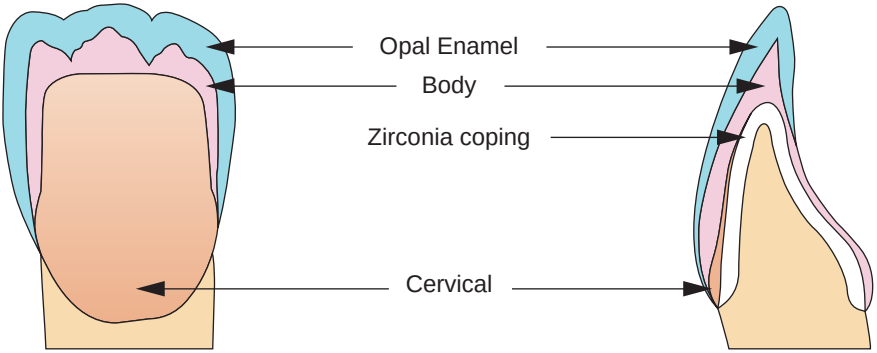


Layering structure using Opaque liner

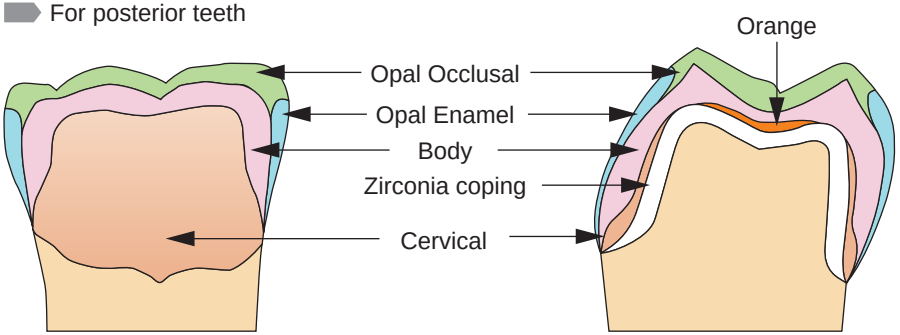
Basic layering 2 (when Opaque Liner is not used)

In cases with no discolored teeth, build-up without using Opaque Liner and apply Cervical porcelain from the cervical to incisal areas. For darker shades, apply Stain, fire it to fix in place and create the base shade of the coping before applying Cervical porcelain.

For anterior teeth



For posterior teeth



Layering structure without Opaque Liner

Hint

Foundation work
It is a procedure to adjustment shade of the coping .
In this work, Opaque Liner is used for the shade foundation and staining is recommended for the individual adjustment of the shade.

3-4. Basic layering

Shade Foundation

When using Opaque Liner

(1) First Opaque Liner firing

In case of discolored teeth or where a metal post has been placed, darker areas should be masked with Opaque Liner. Apply Opaque Liner to cover the whole zirconia coping and fire it.

Application of Opaque Liner

(2) Second Opaque Liner firing

After firing the first layer of Opaque Liner, apply a second layer to mask the zirconia coping.

Firing Opaque Liner

Note

- As the Opaque Liner liquid may separate, always mix it before use.
- If bubbles appear in the Opaque Liner, please note the following:
  - Please avoid applying Opaque Liner in excessively thick layers.
  - Dry thoroughly before firing.
  - Avoid placing copings coated with Opaque Liner on a hot firing tray.

Application of Cervical porcelain

(3) Firing Cervical porcelain

Apply Cervical porcelain to the cervical area and fire.

After firing Cervical porcelain

Hint

- The basic shade of Opaque Liner can be optimized by using Shofu Porcelain Stain (Shade No. 41-49).

Where no Opaque Liner is used

(1) Firing Cervical porcelain

Prepared teeth which are not discolored can be restored without using Opaque Liner. In such cases Cervical porcelain is applied and extended from the cervical area to the incisal edge. For darker shades, apply Stain, fire it to fix in place and create the base shade of the coping before firing Cervical porcelain.

Cervical

After firing

After staining

Application and firing of Body and Enamel porcelains

(1) Application of Body porcelain

Apply Body porcelain and condense it. The shape should match that of the adjacent tooth.

Application of Body porcelain

Hint

● Application of Body porcelain

We recommend condensing this porcelain more than metal-ceramics.

(2) Cut back of Body porcelain

① Cut back to1/3 point from incisal top.

② Cut 2/3 point from incisal top.

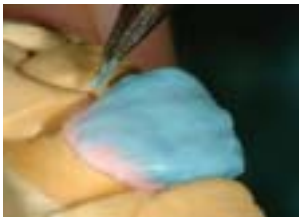
③ Cut the interproximal area up to lingual side.

④ Add mamelon (fingerlike) structure.

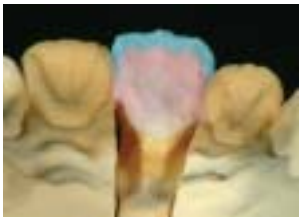
⑤ The correct Body shape.

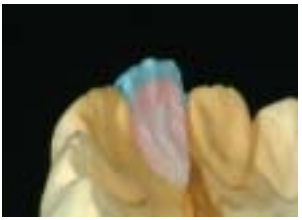
(3) Application of Opal porcelain

① Opal porcelain must be overdimensioned to compensate for firing shrinkage.

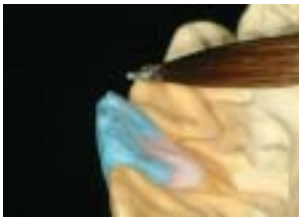


② Cut back the lingual incisal edge to confirm the shape of the dentin.





③ Build up the reduced lingual incisal edge with Opal porcelain.



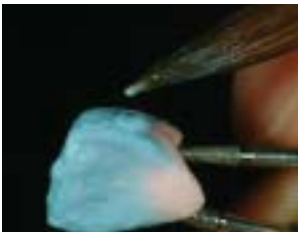
Hint

● Cutting back the lingual incisal edge

Check that the Body and Enamel porcelains have not blended and are still layered separately. If the layer is interrupted or the individual layers blend, the incisal area will not be properly translucent.

(4) Building-up the interproximal area

Remove the crown from the model, build-up Opal Porcelain to the interproximal area and condense. Covering the entire surface with opal porcelain creates a natural looking shade. (Wrap around effect)



Build up of interproximal area

Hint

● Wrap around effect

Coat the labial, lingual incisal, and interproximal surfaces with Opal Porcelain. Coating the entire surface with Opal Porcelain creates depth and translucency of shade.

※ The porcelain used in the photo has stronger pigments than the actual porcelain - this enables the positioning of the individual layers to be depicted more clearly.

(5) Firing

After building-up fully, adjust the shape and remove the excessive porcelain from the cervical area with a dry brush. Then remove the porcelain from inside the crown and fire.

(6) Contouring

After firing, contour the crown with Dura Green Stones and/or CeraMaster, SoftCut polishers and, if necessary, adjust the shade with VINTAGE Stain before glaze firing.

(7) Finish

Anterior teeth

By direct comparison, the VINTAGE ZR restoration matches perfectly with the shade Guide.

Posterior teeth

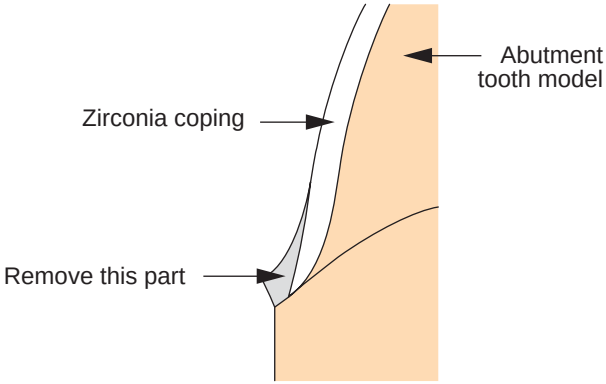
Bridgework

4-1. VINTAGE ZR Margin Porcelain

VINTAGE ZR Margin porcelain is used for adjusting zirconia frames.
It eliminates white lines along the margins of zirconia copings and easily reproduces the marginal shade.

(1) Adjusting an zirconia coping

The labial margin of a zirconia coping can be adjusted with an diamond point or



Adjusting a zirconia coping

(2) Application of Margin Porcelain Isolation Liquid

Apply one layer of Margin Porcelain Isolation Liquid to the marginal area of the working model and remove excess liquid by air.

Application of Margin
Porcelain Isolation Liquid

Note

- If Margin Porcelain Isolation Liquid is applied excessively, inside of the coping might become black after firing process.

(3) Application of Margin porcelain

Place the crown on the working model and apply Margin porcelain either mixed with distilled water or CPM Modeling liquid (for small corrections), and condense it.

After contouring dry it with a hair dryer, remove the crown from the working model and fire it.

(4) Second build-up and finish of Margin porcelain

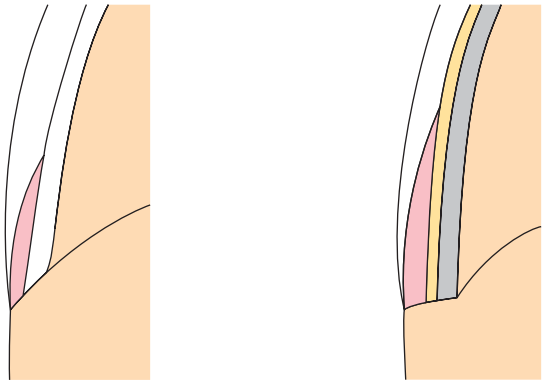
After firing, apply additional Margin porcelain where necessary and condense it. Then remove the crown from the working model and fire it. If necessary, please repeat this procedure to fix the margin area.

Finish of Margin porcelain

Hint

● Margin Layer

The layer of Margin porcelain applied to the margin area should be as thin as possible, which is different to when applying metal-ceramic Margin porcelain. If the layer is too thick, the full strength of the zirconia coping may not be obtained.



Zirconia coping　　Metal coping

Comparison of margin design

4-2. Cervical Trans

Cervical Trans was designed with a lower firing temperature to produce smooth surfaces for reproducing deeper translucent shades in cervical areas, easy cleaning, and tissue-compatibility. Its higher fluorescence creates cervical areas which are translucent and brightly shaded.

Comparison of fluorescence in cervial area.

CT-CL : Translucent porcelain.
CT-W : Slightly translucent porcelain for creating whitish cervical areas.
CT-A : Orange translucent porcelain for creating the A shade group when mixed with CT-CL.
CT-B : Yellowish translucent porcelain for creating the B shade group when mixed with CT-CL.
CT-R : Reddish translucent porcelain for creating the R shade group when mixed with CT-CL.

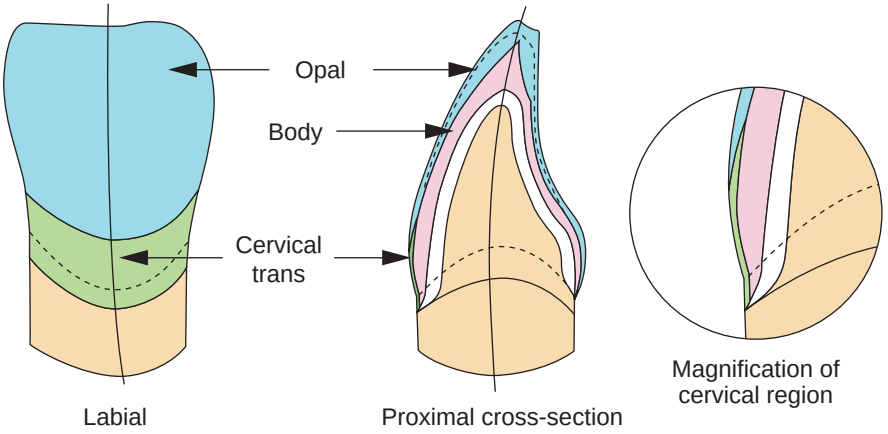


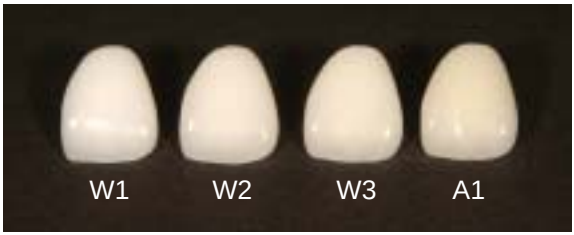
Figure 6 - Cervical trans build-up

Hint

● Cervical Translucency
In order to enhance the translucency of the cervical area and to increase tissue-compatibility, build-up Cervical Trans in the cervical area and fire with Opal Enamel porcelain. Since the firing temperature is set lower than that of enamel porcelain, smooth surfaces can be obtained.

4-3. VINTAGE ZR Whitening Porcelain

VINTAGE ZR includes Whitening Porcelain for bleach shades. It reproduces shades which are brighter and lighter than A1, previously impossible with conventional porcelain.



Shade comparison of W1, W2, W3, and A1

4-4. VINTAGE ZR Correction porcelain

VINTAGE ZR Correction porcelain is used for adding material when needed during the biscuit bake, contouring, or glazing.

If the crown shrinks excessively during the biscuit bake

- Contour and clean the surface before applying Correction porcelain. Then fire in air to self-glaze.

If the shrinkage is discovered after self-glazing

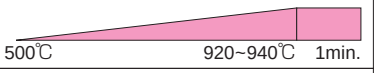
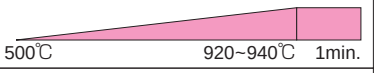
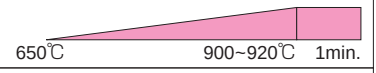
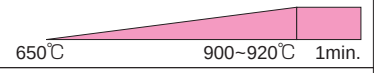
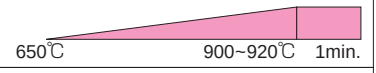
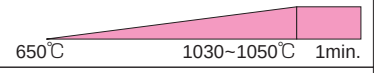
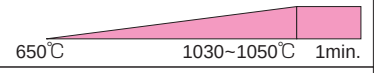
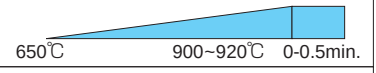
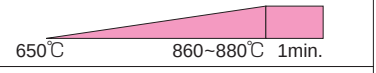
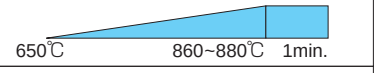
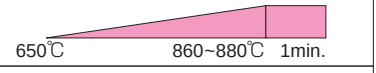
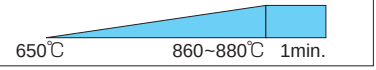
- Biscuit bake (in vacuum) the Correction porcelain before contouring, finishing and polishing with CeraMaster, Soft Cut polishers or Dura Polish Dia.

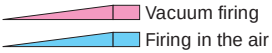
Hint

- Correction
  If the crown has shrunk considerably, apply Body or Opal porcelain and proceed with a regular 2nd firing.

5-1. Firing schedule

Table 6 - Firing schedule table

Type of porcelain	Drying time (min.)	Temperature raising speed (℃ /min.)	
1st Opaque Liner	7~8	45	
2nd Opaque Liner	7~8	45	
Cervical	5~6	45	
1st Body, Enamel	5~6	45	
2nd Body, Enamel	5~6	45	
1st Margin	5~6	45	
2nd Margin	5~6	45	
Self Glaze	5~6	45	
1st Gum	5~6	45	
Gum glaze	5~6	45	
1st Correction	5~6	45	
Correction Glaze	5~6	45	



PLEASE NOTE :
Firing conditions vary due to the different designs and operating voltages of porcelain furnaces. It is essential to carry out test firings before using the porcelain for actual restorations.

Hint

● Heat rate
As the heat conductivity of a zirconia coping is low compared with that of a metal coping, it is advisable to set the furnace to a low heat rate.

5-2. Physical Properties

(1) Coefficient of thermal expansion and Glass transition point

		Coefficient of Thermal Expansion (25~500°C)	Glass Transition Point
Opaque Liner	2.Firing	$9.3 \times 10^{-6}K^{-1}$	620℃
	4.Firing		
Margin	2.Firing	$9.3 \times 10^{-6}K^{-1}$	635℃
	4.Firing		
Body	2.Firing	$9.4 \times 10^{-6}K^{-1}$	605℃
	4.Firing		
Cervical Trans	2.Firing	$9.4 \times 10^{-6}K^{-1}$	595℃
	4.Firing		
Correction	2.Firing	$9.4 \times 10^{-6}K^{-1}$	585℃
	4.Firing		

PLEASE NOTE :

- As VINTAGE ZR has a different coefficient of thermal expansion to those of VINTAGE, VINTAGE HALO or VINTAGE AL never mix or combine them.
- For other type of metal free coping, such as glass infiltrated system, use of VINTAGE AL is recommended.

(2) Solubility Test (ISO Specification : Under 100 μg / cm^2)

	Solubility amount (μg / cm^2)
Body, Enamel	14.8

	Problem	Cause	Remedy	Note
Base	Opaque Liner difficult to apply	Too much liquid in Opaque Liner.	Mix well before use.	If only the surface layer is used without being mixed, the paste contains excessive liquid, making it difficult to apply to the base.
		Coping surface is too smooth.	Roughen the coping surface. (Use an abrasive such as a diamond point at low speed and water-cooled)	When coping surface is smooth, paste is difficult to apply.
	Cervical porcelain difficult to apply	Too much liquid mixed in.	Mix in less liquid.	
		Surface is too smooth.	Roughen the coping surface. (Use an abrasive such as a diamond point at low speed and water-cooled)	When coping surface is smooth, paste is difficult to apply.
	Bubblling of Opaque Liner	Inadequate pre-drying time.	Increase the pre-drying time.	Inadequate pre-drying causes the liquid in the Opaque Liner to be fired before being dried properly, which causes bubbles to form.
		Pre-drying temperature too high.	Lower the pre-drying temperature to 500°C.	If the pre-drying temperature is too high, the liquid bubbles while drying.
		The firing tray is too hot.	After lowering the firing platform and removing the restoration, wait 2-3 minutes before placing a new restoration on the firing tray.	If a coping coated with Opaque Liner is placed on a hot firing tray, the Opaque Liner liquid may boil and cause bubbles. Therefore, the coping must only be placed on a cool firing tray.
		Coping is contaminated.	Sandblast the coping with aluminum oxide to clean it.	Any remains of bonder from the rotary instruments left on the coping surface may cause bubbles. Sandblast with aluminum oxide (50μ, 1-2 bars) and clean with a steam cleaner, ultrasonic unit or distilled water. Then fire in air.
		Inadequate vacuum.	Check the vacuum.	Bubble incorporated during application.
Porcelain build-up	High firing shrinkage	Inadequate condensation.	Condense Body and Enamel porcelain more.	Compared with metal ceramic, the heat conductivity is low: the cervical area shrinks due to the firing shrinkage of the incisal porcelain. To avoid this, either condense the cervical area more with a brush or reduce the heat rate.
	Cervical area raised	Cervical area condensed inadequately.	Condense cervical area more.	
	Lingual surface cracked due to shrinkage	Inadequate condensation.	Condense Body and Enamel porcelain more or control the shrinkage by placing a cut in the lingual surface.	
		High shrinkage due to a large amount of material being applied.		

	Problem	Cause	Remedy	Note
Porcelain build-up	Explosive crack occurred.	Pre-drying time is too short.	Increase the pre-drying time.	The drying time is an important step in the firing process. If the drying time is too short, liquid remains inside the porcelain and when inserted into the furnace the rapid increase in temperature causes the liquid to boil and explode when fired. When the pre-drying time is too long, small cracks occur on the surface from drying shrinkage. These cracks spread due to firing shrinkage and create shallow cracks on the surface.
	Small cracks on the surface.	Pre-drying time is too long.	Decrease pre-drying time.	
	Bubbles form	Bubble entrapped during application	Make certain that no bubbles are entrapped while mixing the material on the palette.	As all-ceramic crowns exhibit lower thermo conductivity than metal-ceramic restorations, firing commences at the surface, which tends to trap the bubbles inside. Therefore, it is extremely important to mix and build up porcelain without entrapping bubbles. Also, remixing dried porcelain easily causes bubbles to be entrapped.
		Porcelain dried during application or was remixed.	Do not allow the porcelain to dry during build up.	
		Heat rate is too high.	Reduce the heat rate of the porcelain furnace.	
		Firing temperature of opaque liner is too low.	Increase the firing temperature.	
		Inadequate vacuum.	Check the vacuum level of your porcelain furnace.	
Abrasives	Chipped incisal edges	Inappropriate speed and direction of rotation of abrasive stone.	To prevent chipping of the incisal edge, select the correct speed and direction of rotation of the abrasive stone.	
Glaze	No glaze.	Uneven surface.	Glaze after smoothen the surface with Dura-Green Fine, CeraMaster, Silicon Point.	Glazing depends on the condition of the porcelain surface. The smoother the surface, the more stable the glaze. After rinsing, apply Stain Liquid and verify the shade, then glaze.
		Surface not cleaned thoroughly.	Rinse thoroughly.	
Shade	The shade of the crown is not saturated.	Zirconia copings influence the shade.	Adjust the coping surface with stain shade.	Shofu Porcelain Stain (Shade No. 41-49) is recommended.
			Use Opaque Liner or Cervical.	
		The layer of Body porcelain is too thin.	Apply a thicker layer.	
		Inadequate firing.	Check the firing temperature.	
	Enamel is not transparent.	Porcelains blended during building-up.	Take care not to blend the layers while building up.	Fire after body cutback, apply enamel and fire again.
		Insufficient burnout due to inadequate drying or incorrect vacuum starting time.	Burnout properly to ensure adequate drying or delay the vacuum starting time.	Porcelain contains organic pigments or is sometimes contaminated with tissue fiber while building up. These must be burned out during the pre-drying stage. If they are not burned out properly, they may cause bubbles or make the porcelain translucent.

CE 0120

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