

Technology Creates the Best Smile



**Glazic**  
**Instruction Manual**

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**BSM** 贝施美  
BESMILE

# Working Instructions



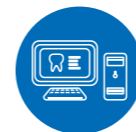
## Product introduction



## Application area



## Clinical requirements



## Note during fabrication process



## Sample display



## Security information

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## Product introduction

### Main components

Glazic is mainly composed of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, Zr(Hf)O<sub>2</sub>, P<sub>2</sub>O<sub>5</sub> and other oxides, suitable for CAD/CAM technology. Its material is evenly distributed, with 3 - point bending strength of  $\geq 450\text{Mpa}$ , and it's easy to be manufactured with high cutting precision, tight edge, excellent long-term stability attributed to its suitable strength and hardness before crystallization. Meanwhile it owns very lifelike translucency, so the clinical shade is very accurate, showing excellent aesthetic properties.



### Product superiority

**Minimal shrinkage:** Shrinkage of Glazic under crystallization is only two to three thousandths.

**Appropriate hardness:** It can reduce the wear and prolong the service life of the bur while ensuring the machining accuracy.

**High permeability:** Close to natural teeth, excellent aesthetic effect.

**Excellent cutting performance without chipping:** The strength is more than 400Mpa, which is 20% higher than that of other manufacturers, and can be applied to a variety of restorations.

**Thickness:** The minimum thickness can reach 0.3mm.

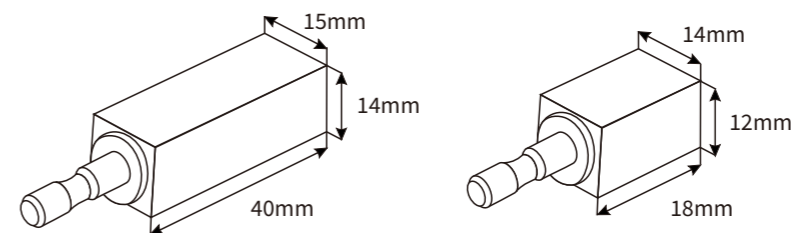


## Physical and chemical properties

Biological properties	
Intradermal reaction test	The difference between the comprehensive average score of the sample and the solvent control is less than 1.0
Delayed type hypersensitivity	No delayed type hypersensitivity
Cytotoxicity assay	Slightly cytotoxic (Grade 1)
Genotoxicity test	Negative for Ames test Negative for chromosomal aberration test Negative for TK gene mutation
Acute systemic toxicity test	No acute systemic toxicity
Subchronic Systemic Toxicity Test	No subchronic systemic toxicity
Physical and chemical properties	
Density	$\geq 2.2 \text{ g/cm}^3$
Flexural strength	$\geq 450 \text{ MPa}$
Chemical solubility	$< 100 \mu\text{g/cm}^2$
Radioactivity	The active concentration of uranium-238 $\leq 1.0 \text{ Bq/g}$
Glass transformation temperature	$530 \pm 20^\circ\text{C}$
Coefficient of linear expansion	$(9.7 \pm 0.5) \times 10^{-6} \text{ K}^{-1}$

## Specification and shade classification

### Specification for Glazic



### Shade for Glazic



### Translucency for Glazic

**HT:** Ideal for small restorations such as inlays, onlays, and for restorations on normal-colored abutments.

**LT:** It has a certain color-masking effect and can be used for the restorations of mildly discolored abutments and the restorations of the back-cut process.

## Indications

Product type	Indication										Processing technology		
	Inlay	Onlay	Veneer	Reduced crown	Full contour anterior crown	Single posterior crown	Partial crown	Full contour anterior 3 unit bridge	Implant upper crown	Dyeing	Cut-back		
HT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Suitable for fabricating single crowns, inlays, veneers and three-unit bridge restorations that do not contain molars.

## Contraindication

It is contraindicated for those who are allergic to any component of glass ceramic and for patients with full veneer for molars, very deep subgingival preparations, severely atrophied residual teeth, night grinding, excessive occlusal force etc.

## Shade determination of teeth and abutments

The aesthetic result of all-ceramic restorations is influenced by: shade of preparation (natural tooth preparation, post and core preparation), shade of restoration (shade of crown, veneer, personalization) and shade of cement material. Patients demand real, natural aesthetic and functional all-ceramic restorations. To achieve this, dentists and dental technicians must follow the following guidelines:

### 1. Shade of Glazic

The shade change of the restoration visual effect cannot be underestimated in aesthetic restorations. The shade of the restoration depends on the correct choice of the shade of material which shall correspond with desired tooth shade. The material shade is extremely important especially for some heavily stained preparations, or restorations with abnormal tooth shade. In order to obtain the desired esthetic result, the shade of the abutment must be accurately determined.



## 2. Natural tooth shade determination

After teeth cleaning and before tooth preparation, the tooth is in a normal, dehydrated state. When determining tooth shade, the characteristics of individual tooth must be considered. For example, when making a crown, the shade of the neck of the tooth should also be considered. In order to obtain a real and natural aesthetic effect, the determination of tooth shade must be carried out under natural light during the day, or under a light with a color temperature of 5500k-6500k. In addition, patients should not wear clothes that are too strong, nor can they apply lipstick to avoid colorimetric errors caused by strong color contrast environments.



## Tooth preparation requirements (shoulder, incisal, thickness of each side)

### Tooth preparation guide

If tooth preparation guide is strictly followed and the crown thickness is also strictly adhered to the standard, a successful restoration can be fabricated by using Glazic glass ceramic.

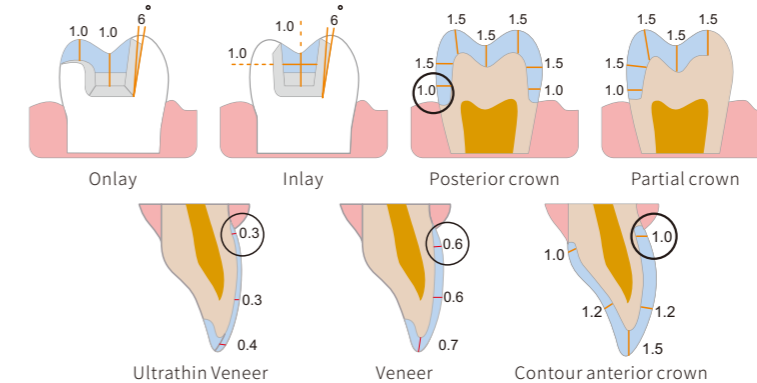
### Guide for the tooth preparation of all-ceramic restorations

No sharp corners and edges.

Create rounded inner edges or bevels of the shoulder.

The thickness of each side cannot be thinner than the requirements of the restoration.

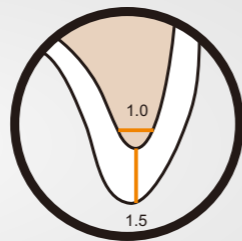
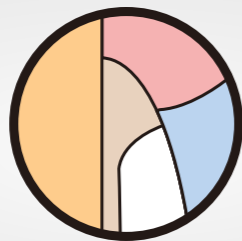
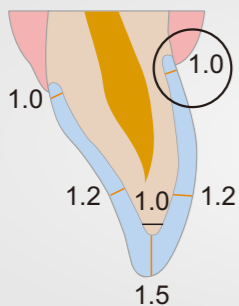
When make the tooth Preparation of incisal margins, especially the anterior teeth, make the thickness at least 1mm to ensure the ideal fit after milling.



## Anterior Crowns



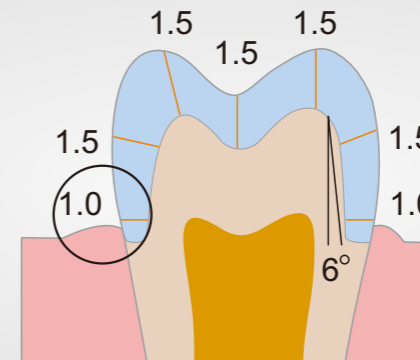
- A circumferential chamfer is required for the shoulder preparation. Sharp-edged transitions and intricate bevelling should be avoided. Shoulder width at least 1 mm.  
**The minimum wall thickness must be strictly adhered to:**
- Cutting edge is at least 1.5 mm.
- Labial and lingual wall is 1.2 mm.
- The prepared tooth must have good adhesion.



## Posterior crowns



- A circumferential chamfer is required for the shoulder preparation. Sharp-edged transitions and intricate bevelling should be avoided. Shoulder width at least 1 mm.  
**The minimum wall thickness must be strictly adhered to:**
- Cutting edge is 1.5 mm.
- Labial and lingual wall is 1.5 mm.
- The prepared tooth must have good adhesion.

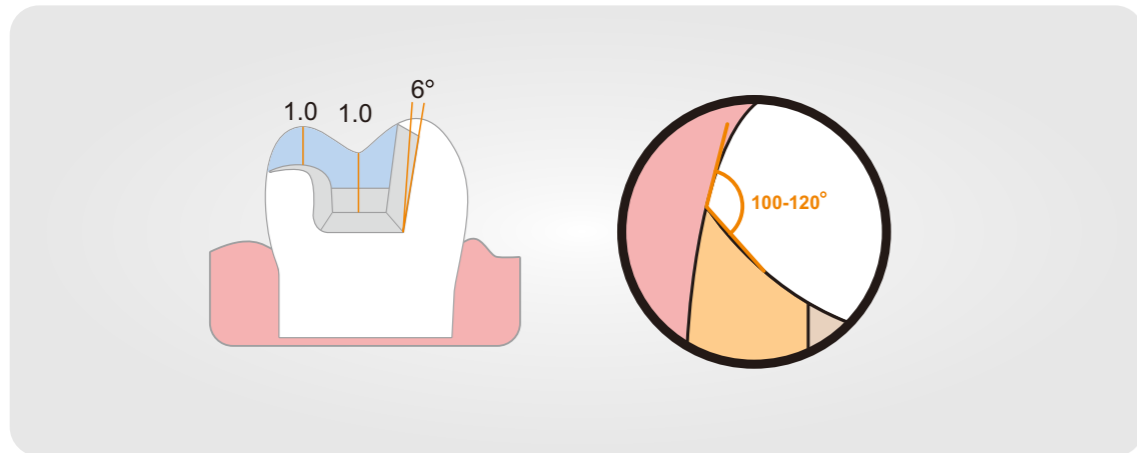


## Inlays

Inlays: must consider the static and dynamic antagonistic contacts



- The prepared edge can not be the stress concentration points.
- The prepared depth should be no less than 1mm. The fissure area separating edges should be no less than 1mm.
- The abutting surfaces angel should be obtuse angle. The angle should be 100~120° between decayed tooth wall and veneer contact surface.
- Avoid to do the umbonate veneer which doesn't have a good shoulder and bearing point.
- The protrude edges can avoid the stress concentration on inlays/onlays. Don't prepare the sharp and plumelike edge.

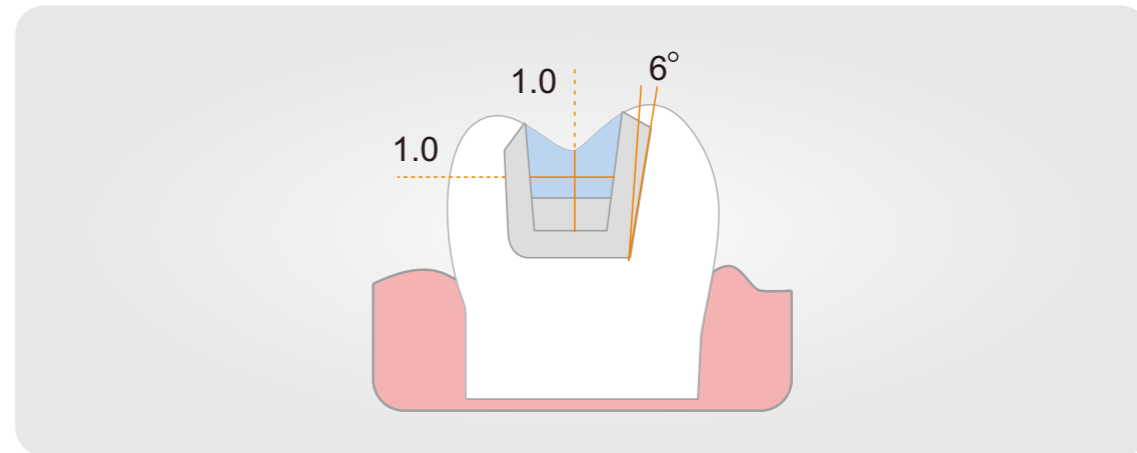


## Onlays

Onlays: must consider the static and dynamic antagonistic contacts



- The prepared edge can not be the stress concentration points.
- The prepared depth should be no less than 1mm. The fissure area separating edge should be no less than 1mm.
- The abutting surfaces angel should be obtuse angle. The angle should be 100~120° between decayed tooth wall and veneer contact surface.
- Avoid to do the umbonate veneer which doesn't have a good shoulder and bearing point.
- The protrude edges can avoid the stress concentration on inlays/onlays. Don't prepare the sharp and plumelike edge.
- The recommended layer thickness for cusp area should be no less than 1mm.



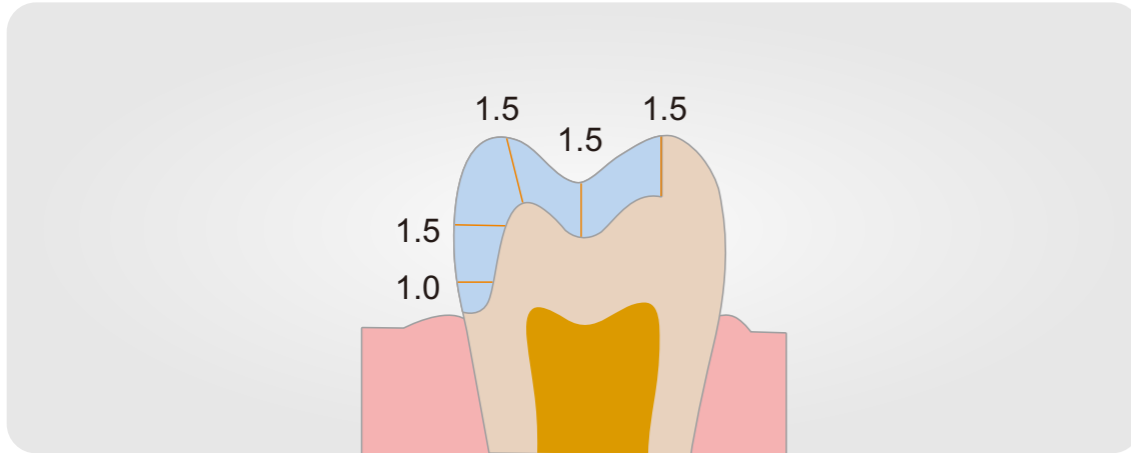


## Partial crowns

Partial crowns: must consider the static and dynamic antagonistic contacts



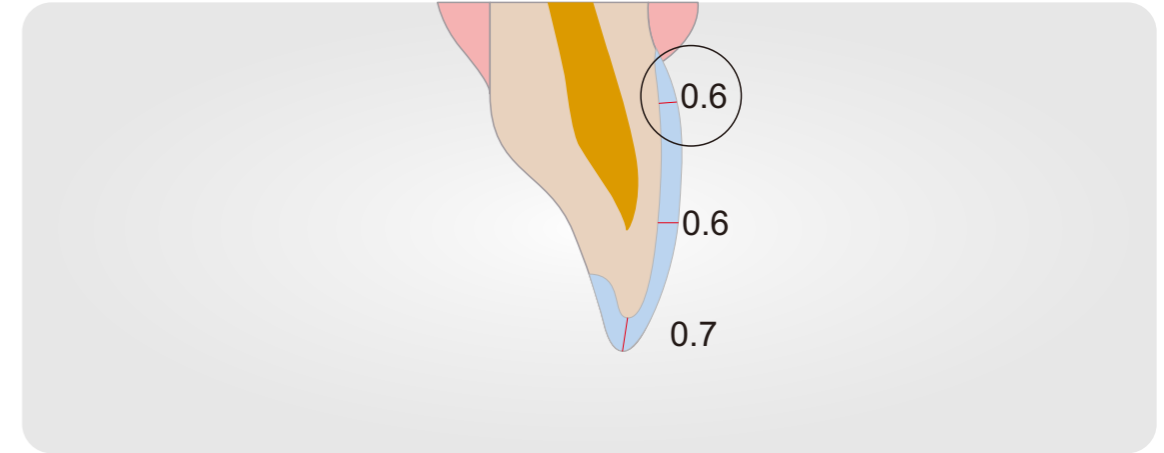
- The prepared edge should not be on the stress concentration points.
- The recommended layer thickness for cusp area should be no less than 1mm.
- The shoulder should be rounded or deep bevel, thickness should be no less than 1mm.



## Veneers



- If available, prepare only enamel layer.
- The prepared edge should not be on the stress concentration points.
- Cervical thickness should be no less than 0.6mm. Incisal thickness should be no less than 0.7mm.



## Note during fabrication process



### Scan

To ensure the accuracy of the scanner, regular calibration is necessary. Traditional model scanner or intraoral scanner are both OK.



### Design

When designing, pay attention to the minimum thickness of the restoration (refer to the teeth preparation guide) and bur compensation (especially for the cases where the incisal of the anterior teeth is too sharp), the thickness of the cement (considering the conditions of the abutment and milling machine), as well as undercut (try to avoid undercuts when setting path of insertion).



### Nesting

The diameter of the connector can be adjusted from 1.2 to 3mm according to the size of the restoration, the direction of the restoration (no undercuts) and the position of the connector (placed on the height of the contour, not too close to the margin, avoiding mesial and distal contacts).



### Milling

- Regularly calibrate, clean and lubricate the machine, ensure that there is no shaking or abnormal noise during milling, and spare parts should be replaced in time if there is any problem.
- Record the number of milling units of burs and ensure to use it only within its service life. Ensure the burs are installed in the correct order.
- Ensure that the concentration and level of the cutting fluid meet the requirements, and can be completely sprayed on the tip of the bur.
- When loading the block, make sure the iron holder of the block is loaded in place, otherwise the milling data will be inaccurate.
- Make sure the air pressure of the machine is sufficient.

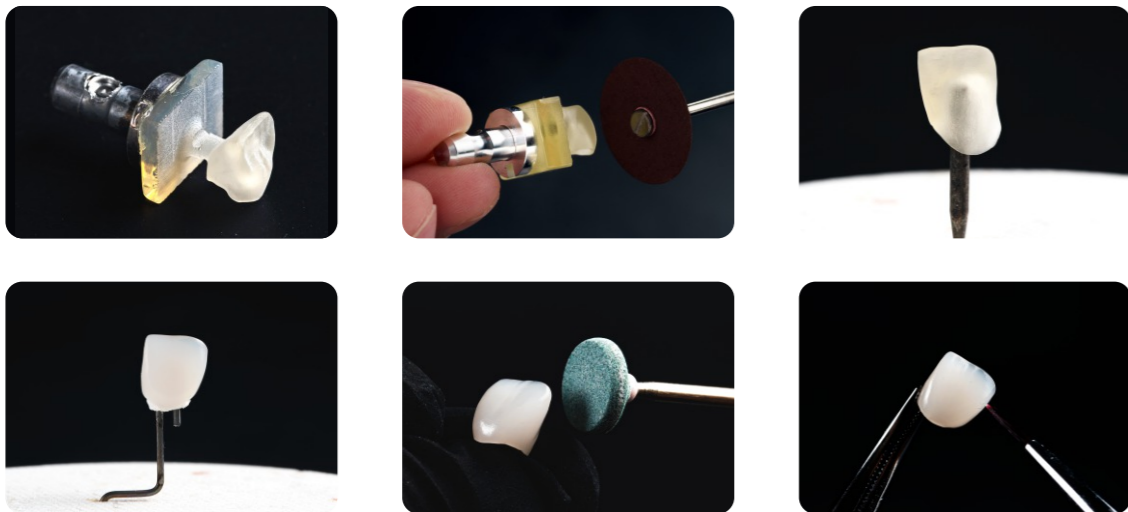


### Finishing

Make sure to use special glass ceramic milling tools. Finishing and reworking of restorations with suitable milling tools is essential. There will be edge chipping, or cracks when overheating if unsuitable milling tools are used. Water cooling is crucial during finishing; the hand piece should be stable without vibration; a clean soft towel or sponge mat should be placed on the desktop, to avoid cracked or broken of the restoration from falling out.

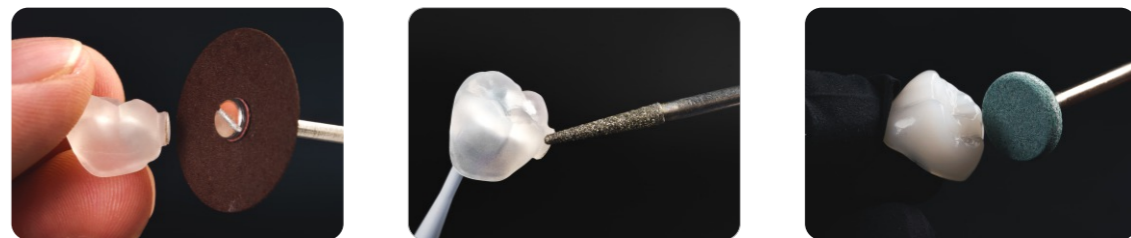
### Finishing steps

- Remove the restoration. Use a diamond-coated milling tool. Keep the tool close to the metal holder side to avoid damage to the restoration.
- Remove the connectors. Before finishing, dip some water and apply it to the parts that need to be finished to avoid excessive heat to the glass ceramic.
- When restoration shape is not needed to be modified, the crystallization procedure can be performed directly.
- For shape modification, please refer to the following recommended finishing steps (rough grinding, pre-polishing, high-gloss polishing, try-in).



### Recommended Finishing tips

- Finishing the restoration before crystallization.
- Try the restoration on the model and check the connecting surfaces and occlusal high points.
- After the restoration is milled, grind the occlusal high points with fine sand and polish the surface layer.
- Run the hand piece in single-direction, at low speed, with only light pressure, otherwise there will be edge grinding marks or overheating.
- Glass ceramic can not be overheated, it is recommended to cool down with water to avoid cracks.
- Before proceeding to other processing steps, ultrasonically clean the restoration and remove excess residue, which may affect the bonding effect or cause discoloration.
- After modifications, make sure that the minimum thickness of the restoration is within the effective range.
- Design the surface structure.
- The restorations must not be polished with Al<sub>2</sub>O<sub>3</sub> or glass polishing powder.



## Crystallization

The following 3 crystallization methods could be selected to complete the final restoration of Glazic:

1. Full contour crown: Combination firing (Crystallization incl. Stains/Glaze Firing, corresponding max firing temperature is 820°C )



Glazic crystallization firing curve

Start temp (°C)	Holding Temp (°C)	Heating rate (°C)	Highest temp	Holding time (°C)	Cooling rate	Final temp
550°C	3 min	60°C/min	820°C	10 min	50°C/min	700°C

\*Vacuum through full circle

2. Crystallization first, then staining and glazing (BSM stain & glaze paste or low temperature stain & glaze is recommended)



Glazic crystallization firing curve

Start temp (°C)	Holding Temp (°C)	Heating rate (°C)	Highest temp (°C)	Holding time (min)	Cooling rate (°C)	Final temp (°C)
550°C	3 min	60°C/min	820°C	10 min	50°C/min	700°C

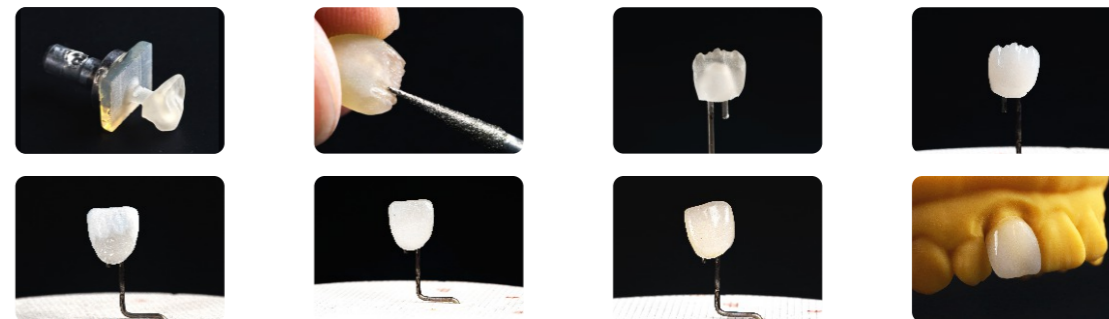
\*Vacuum through full circle

BSM Stain & Glaze firing curve

Start temp (°C)	Rise Rate (°C/min)	Highest temp (°C)	Holding time (min)	Down Rate (°C/min)	End Temp (°C)	Natural Cooling
550°C	55	760	1	55	600	Open/4min

3. Cut-back, crystallization, layering (Low temperature ceramic powder below 800°C is recommended), staining & glazing ( Max firing temp should be below 800°C)

Cut-back process



### Glazic crystallization Firing curve

Start temp (°C)	Holding Temp (°C)	Heating rate (°C)	Highest temp (°C)	Holding time (min)	Cooling rate (°C)	Final temp (°C)
550°C	3 min	60°C/min	820°C	10 min	50°C/min	700°C

### BSM Stain & Glaze Firing curve

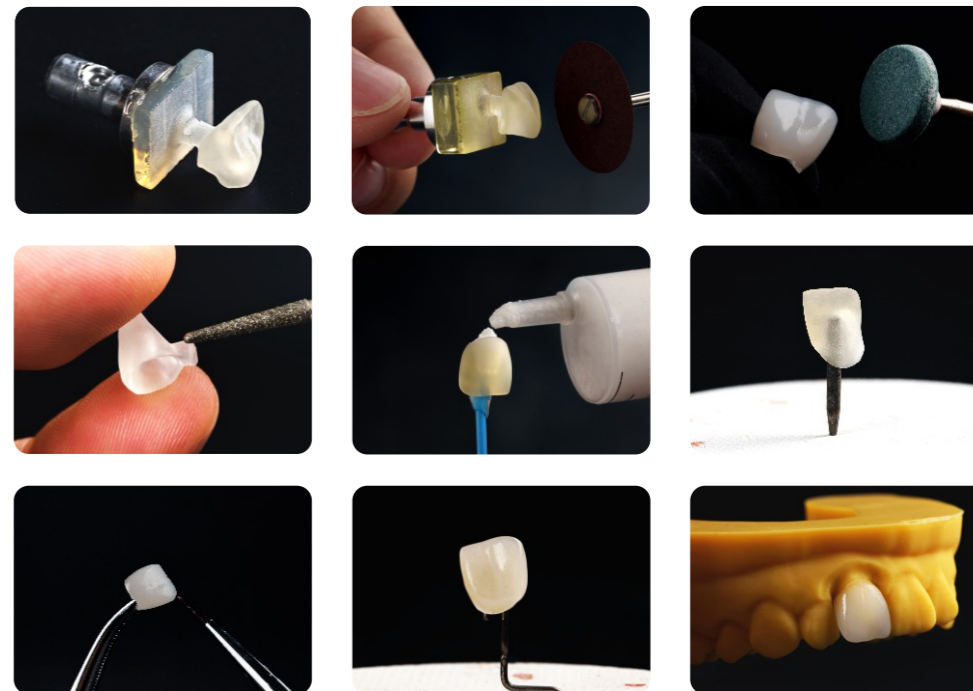
The firing temperature should not be higher than 800°C. The stain & glaze firing shall be done adhere to the firing curve requirements provided by the manufacturer.

Start temp (°C)	Rise Rate (°C/min)	Holding Temp (°C)	Holding Time (min)	Down Rate (°C/min)	End Temp (°C)	Natural Cooling
550°C	55	760	1	55	600	Open/4min

### Note

- If the restoration appears to be too translucent after crystallization firing, the opacity can be increased using a second crystallization firing process at 870°C. This is not possible when combined with the combination firing.
- Please clean the restoration thoroughly with a steam or ultrasonic oscillator washing machine.
- Please dry the restoration thoroughly before crystallization firing.
- It is recommended to apply a firing paste to the pin for fixation of the restoration for firing.
- The firing paste must be filled with the sharp parts of the restoration, but not on the surface of the restoration, in case the chemical reaction with the glaze leads to dense air bubbles.
- The restoration cannot be in direct contact with the pin. Because the specific heat of the metal is greater than the air and ceramics, the heating and cooling rate of the metal in the furnace is higher than other materials, which may result in local high temperature and cracking.
- Take out the restoration after natural cooling, please do not use air conditioning or natural wind blowing for cooling directly, to prevent the breakage or cracking caused by sudden cooling. Do not touch hot restorations with metal pliers, and do not cool them by quenching.
- Do not use the incompatible CAD/CAM systems to cut the Glazic glass ceramic.
- Porcelain furnace is suggested to fire in a vacuum state, and remove the restoration from the porcelain furnace after circulating firing.
- Place the restoration at a place far from external forces until it becomes natural cooling.

### Sample display









## Security information

- Please check the packaging and the inside products,products of any damages shall not be used.Carefully reading of operation manual is necessary before usage.
- Please avoid crashing with hard objects, and be careful without violent force and shock during the carrying and transportation.
- It is forbidden to apply the dental restoration directly without firing.
- The product should be made into requisite teeth by professional dental technicians.And adjustment or placement should be done by licensed doctors.
- When working with the product, wear suitable face protection mask and safety goggles for dust protection.

### Warnings and Precautions:

- In the process of using the Glazic, please handle it with care, and avoid collision with hard objects. And it should be fired according to the firing curve requirements provided by the manufacturer.
- This product is of Type II Class 4,and it is intended for non-cement-retained single anterior or posterior restorations, three-unit anterior bridge restorations.



	Date		Expiration Date	<b>LOT</b>	Batch No.
	Note		Operation Manual		Fragile
	Keep Dry				