



EN



New Frontier of Lithium Disilicate-Based
CAD/CAM Blocks & Disks

Amber[®] Mill

User's Manual



www.hassbio.com

CE2195



RX Only



Human-Aid
System Supplier

Amber[®] Mill

Table of Contents

1	Introduction	3
2	Preparation Guide	4
3	Block Selection	5
4	CAD/CAM Process	6
5	Before Crystallization	7
	Check the furnace	8
	Furnace Calibration Guide	9
6	Furnace Placement Tips	12
7	Recommended Heat-treatment	13
8	Crystallization Results	14
9	Re-Firing	15
10	Build up	16
11	Co-Firing	17
12	Characterizing & Glazing	18
13	Cementation	19
14	Indications / Contra-Indications	20
15	Product Line-up	21
16	FAQs	22

1. Introduction



New Frontier of Lithium Disilicate-Based
CAD/CAM Blocks & Disks

Amber[®] Mill



Aesthetic values

Resulting from its excellent opalescence, fluorescence and innate controllable value, Amber[®] Mill restorations feature the most natural and lifelike looks in multi-chromatic gradations.

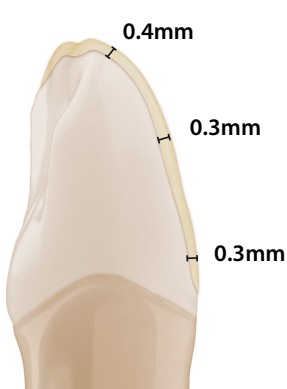
Structural stability

Cross-linked lithium disilicate after translucency heat-treatment allows that Amber[®] Mill crowns can achieve a high mechanical properties (over 450 MPa)

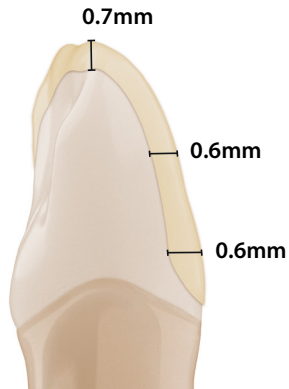
Edge stability on NLD technology

Outstanding machinability of Amber[®] Mill is clearly proven by stable edges of the milled restorations. Less chipping occurrence with Amber[®] Mill tells you that Amber[®] Mill is the machinable lithium disilicate block for CAD/CAM system.

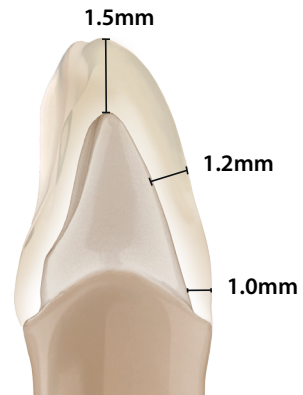
2. Preparation Guide



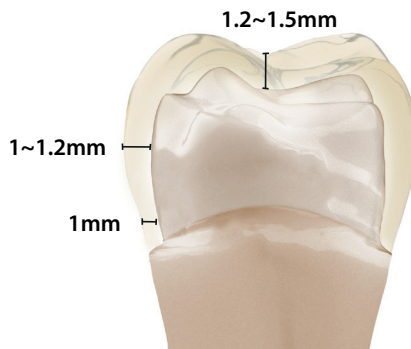
Thin Veneer



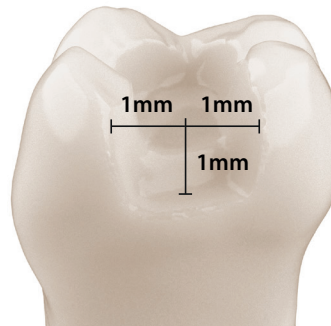
Veneer



Anterior Crown



Posterior Crown



Inlay/Onlay

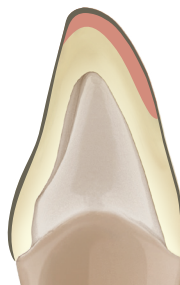
3. Block Selection

Processing Technique & Indications



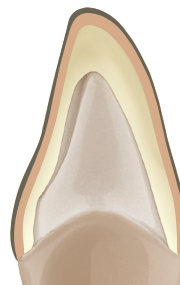
Staining technique

HT⁺ / HT / MT / LT



Cut-back technique

HT⁺ / HT / MT / LT / MO



Layering technique

HT / MT / LT / MO

- Amber[®] Mill
- staining & glazing
- incisal veneering materials
- veneering materials

Indications

Table Tops	Thin Veneers	Veneers	Inlays	Onlays	Partial Crowns	Anterior Crowns	Posterior Crowns	3-Unit Bridges
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High Translucency⁺

High Translucency

Medium Translucency

Low Translucency

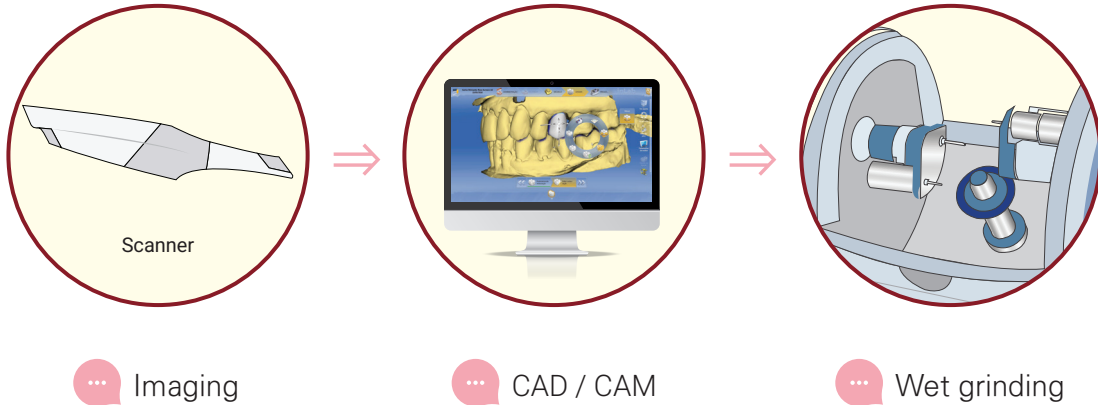
Medium Opacity

TIP!



For use in anterior and premolar bridge restorations can be expected.

4. CAD/CAM Process

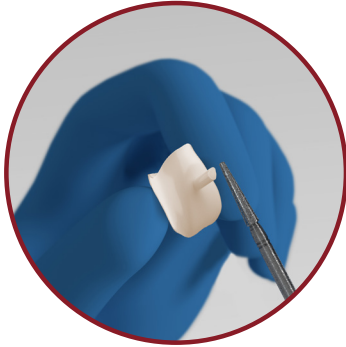


TIP!

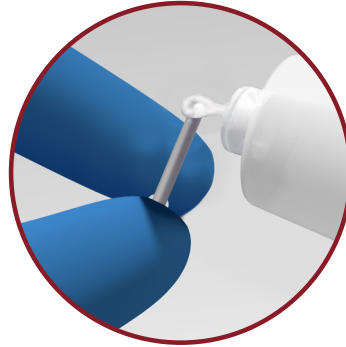


Amber Mill is available in various CAD / CAM systems.

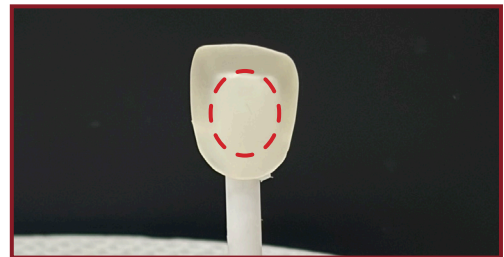
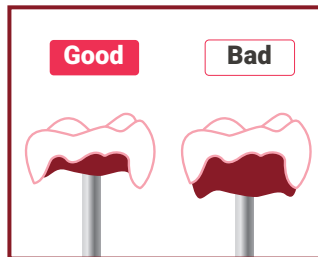
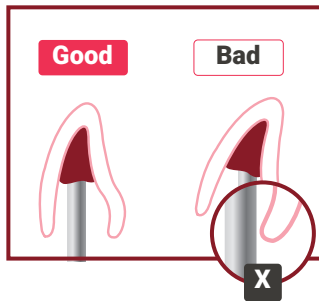
5. Before Crystallization



... Finish surface with grinding instrument.



... Use peg putty before crystallization.



TIP!



Fill the entire inside of the crown with a sufficient amount of peg putty to ensure full



If an excessive amount of peg putty is used, the liquid component within the paste may burn off more slowly, resulting in gray discoloration on the surface.

Extending the drying time to at least 2 minutes can help prevent this discoloration.

Please Make Sure to Check the Furnace Before Using the Amber[®] Mill

The firing parameters provided in this document are reference example used to evaluate the performance of Amber[®] Mill. Actual results may vary depending on your clinical environment and the condition of your furnace. We strongly recommend verifying and optimizing the settings for each individual furnace prior to use.



1. When using the furnace for the first time or applying a new furnace:

Each furnace has different heat distribution characteristics.

Pre-verification procedures are mandatory before applying the given firing parameters directly. Please use a temperature verification tool such as a *Amber Mill Calibration Kit to confirm temperature accuracy inside the furnace.



2. When using multiple furnaces at the same location:

Even within the same location, temperature variations may occur between different furnaces. Please ensure separate verification and setup for each unit.



3. Periodic calibration is recommended:

To maintain consistent condition, perform periodic calibration and verification using tools such as *Amber Mill Calibration Kit.(heat emission characteristics of furnaces may change over time)
Recommended frequency: **At least once every 6 months.**



The firing schedule provided here is not an absolute standard applicable for any equipment or environment. Users should check and adjust the conditions to suit their own operating environment.

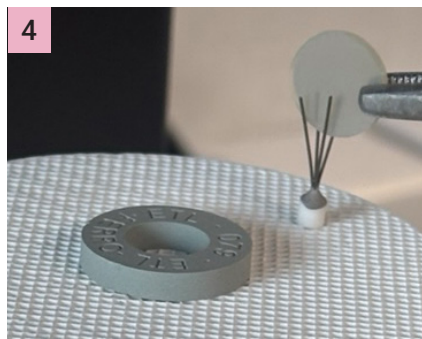
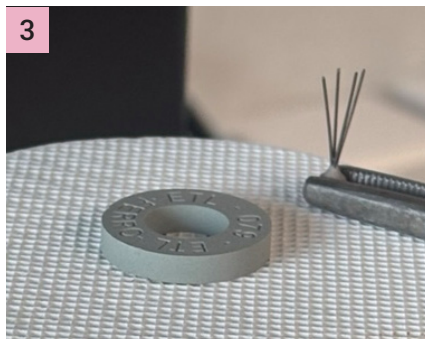
* Amber Mill Calibration Kit



- Calibration strip_HT/LT (2 ea)
- Test strip (6 ea)
- MCK (2 ea)
- Metal pin (1 ea)

* Furnace Calibration Using the Amber Mill Calibration Kit

① Place the MCK (Measurable Calibration Kit) and Test Strip on the honeycomb tray as shown in the reference image.



② Select the LT program (860 °C) and start the firing cycle.

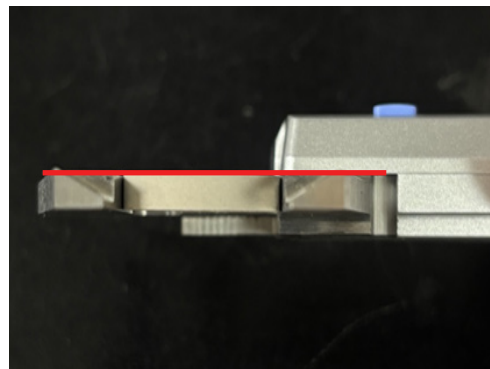
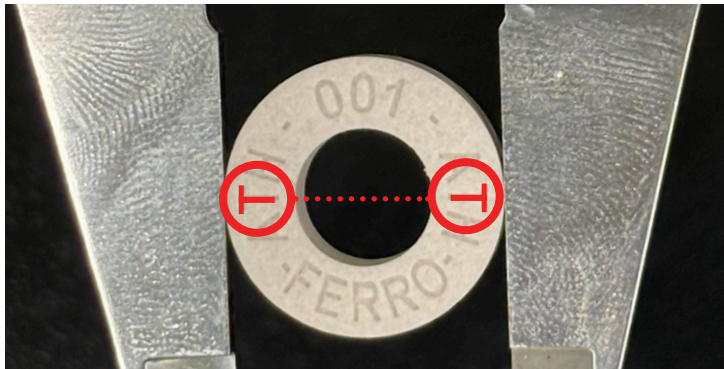
* Since the MCK provides the most stable results at 860 °C, it is recommended to begin calibration at this temperature.

LT			
Dry			---
Close			06:00
Preheat	430 °C		00:00
Temperature 1	860 °C	60 °C/min	15:00
Temperature 2	690 °C	60 °C/min	---
Temperature 3	---	--- °C/min	---
VAC (off/level/hold)	860 °C	100%	15:00

* Furnace Calibration Using the Amber Mill Calibration Kit

③ After the firing cycle is complete, measure the diameter of the MCK ring using a vernier caliper.

※ When measuring the ring diameter, ensure the measurement is taken between the “T” marks at the top of the ring.



④ Compare the measured diameter with the conversion chart to determine the temperature deviation between the programmed temperature and the actual furnace temperature.

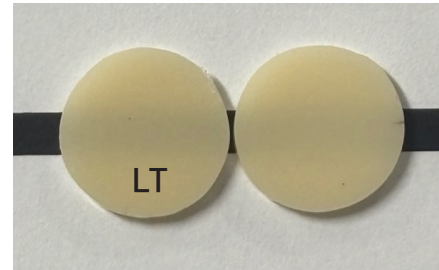
※ Temperature setting method (when fired at 860 °C)

No.	MCK Diameter	Conversion value (°C)	Temperature Difference	Furnace setting value(°C)
1	19.97	857	- 3°C	863
2	19.95	861	+ 1°C	859
3	19.93	866	+ 6°C	854

※ MCK Conversion Table.

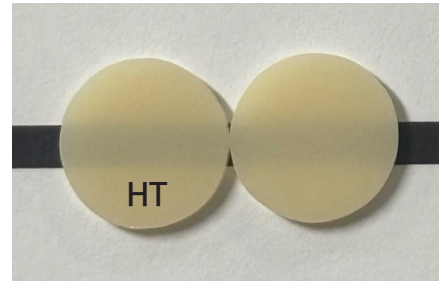
No.	Measurable Calibration ring	
	MCK Diameter	Temperature (°C)
1	20.00	849
2	19.99	852
3	19.98	855
4	19.97	857
5	19.96	860
6	19.95	861
7	19.94	863
8	19.93	866
9	19.92	868
10	19.91	870

- ⑤ Compare the fired Test Strip with the LT Calibration Strip to cross-verify the translucency result.

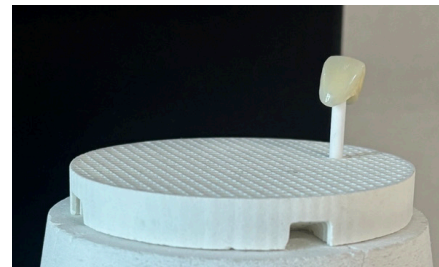


- ⑥ If the translucency of the Calibration Strip differs from the Test Strip, adjust the final firing temperature and repeat the firing using new MCK and Test Strips. (Refer to page 9 for details.)

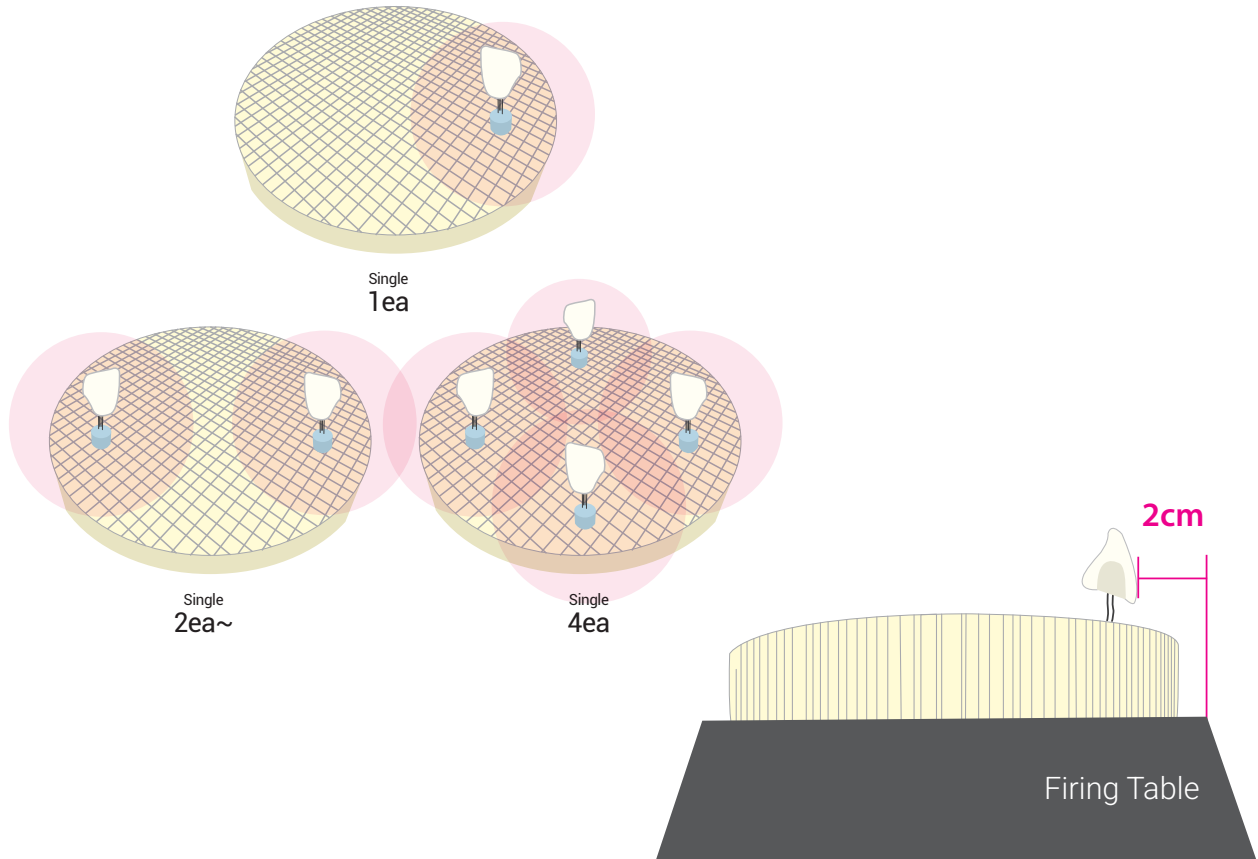
* If further confirmation is required after temperature adjustment, fire a Test Strip using the HT schedule and verify it with the HT Calibration Strip.



- ⑦ Once the desired translucency is achieved, refer to the manufacturer's recommended translucency firing schedules (HT+, HT, MT, LT, MO). These can then be fine-tuned according to your furnace's characteristics. Enter the optimized schedule and proceed with the final firing of your restorations.



6. Furnace Placement Tips



TIP!



The position of the transmitters may vary slightly depending on their placement within the furnace. When placing the prostheses, make sure they are evenly spaced to ensure consistent firing results. If you're firing a single prosthesis, place it near the edge of the firing table as shown in the image above. For four prostheses, arrange them in a cross pattern (north-south and east-west). Always keep a distance of 1–2 cm between the prostheses and the outer edge of the firing table.

7. Recommended Heat-treatment

DEKEMA Austromat 624i ¹⁾

	HT ⁺			HT			MT			LT			MO		
Dry			—			—			—			—			—
Close			06:00			06:00			06:00			06:00			06:00
Preheat/°C	430		00:00	430		00:00	430		00:00	430		00:00	430		00:00
Tem.1/°C	840	60/min	15:00	850	60/min	15:00	855	60/min	15:00	860	60/min	15:00	870	60/min	15:00
Tem.2/°C	690	60/min	—	690	60/min	—	690	60/min	—	690	60/min	—	690	60/min	—
Tem.3/°C	—	—/min	—	—	—/min	—	—	—/min	—	—	—/min	—	—	—/min	—
VAC (off/level/hold)	840	100%	15:00	850°C	100%	15:00	855	100%	15:00	860	100%	15:00	870	100%	15:00

* The firing chamber must not be opened during long term cooling.

1) Austromat 654 / 624i is a registered trademark of DEKEMA.

IVOCLAR VIVADENT PROGRAMAT CS ²⁾

B °C	S min.	t °C / min.	T °C		H min.	VAC. 1 / VAC. 2 °C		L °C	tL *
430	6:00	60	HT ⁺	840	15:00	HT ⁺	550/840	690	0
			HT	850		HT	550/850		
			MT	855		MT	550/855		
			LT	860		LT	550/860		
			MO	870		MO	550/870		

* The firing chamber must not be opened during long term cooling.

2) PROGRAMAT CS is a registered trademark of IVOCLAR VIVADENT.

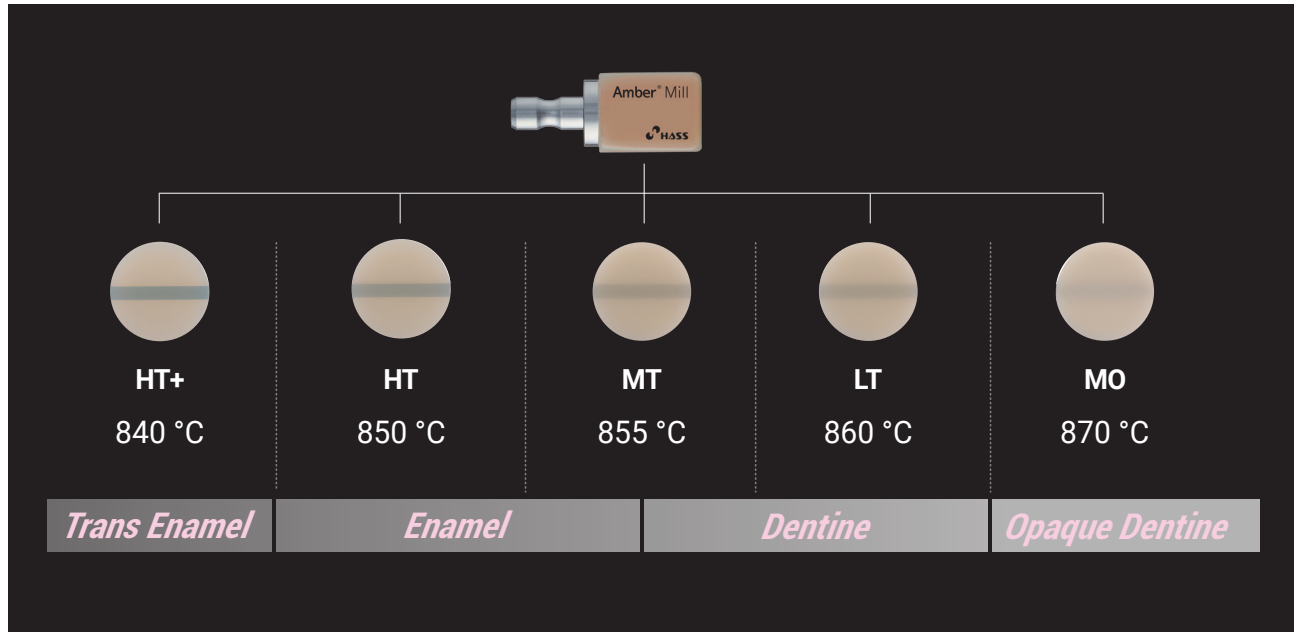
VITA VACUMAT ³⁾

Predry °C	→ min.	↗ min.	↗ °C / min.	T °C		→ min.	VAC min.		↘ °C *
430	6:00	HT ⁺	6:50	60	HT ⁺	840	HT ⁺	21:50	690
		HT	7:00		HT	850	HT	22:00	
		MT	7:05		MT	855	MT	22:05	
		LT	7:10		LT	860	LT	22:10	
		MO	7:20		MO	870	MO	22:20	

* The firing chamber must not be opened during long term cooling.

3) VACUMAT is a registered trademark of VITA.

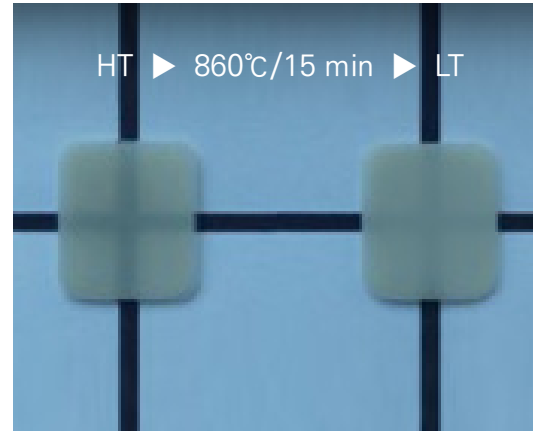
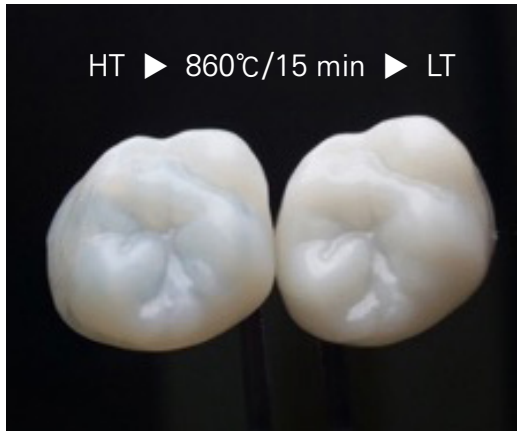
8. Crystallization Results



- ... 5 different translucencies (HT+, HT, MT, LT, MO) in one block.
Choose your own translucency just by changing crystallization temperature.

9. Re-Firing

... Change of Opacity(translucency) by Re-Firing



Amber® Mill A2



- Do not exceed 880°C as the maximum temperature for any heat treatment, including re-firing.
- The refiring schedule uses the same temperature as the initial firing schedule.
(HT+: 840°C / HT: 850°C / MT: 855°C / LT: 860°C / MO: 870°C)
- Use Amber Mill VCK* to measure the actual furnace temperature during the crystallization process. Based on the measurement results, adjust the maximum temperature of the crystallization schedule accordingly. * VCK (Visual Calibration Kit)

10. Build up

- ... Veneering powder for Amber Mill is highly compatible and can be used with LS₂ veneering powders that have a CTE* of $10.0 \times 10^{-6}/^{\circ}\text{C}$ or lower. It is also compatible with certain zirconia veneering powders, provided that their firing temperature does not exceed 850°C.

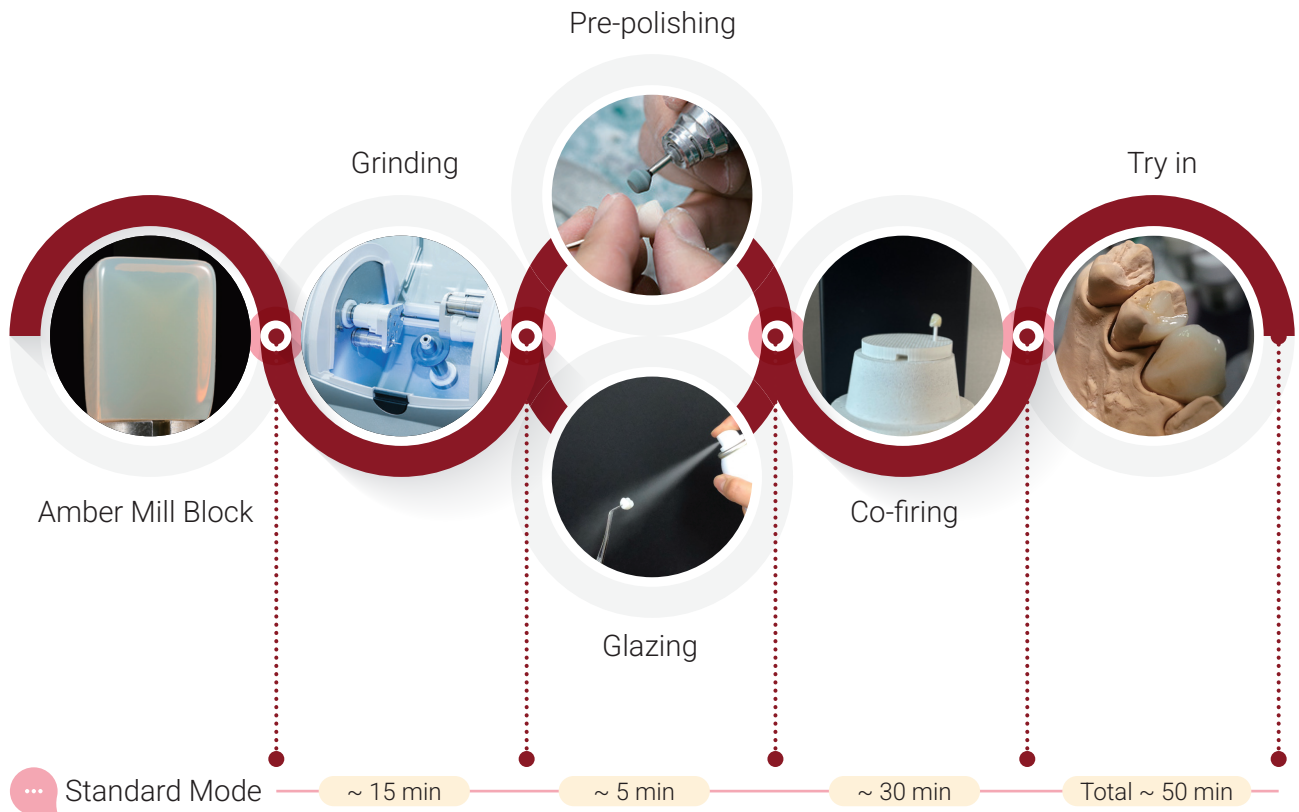
* Coefficient of Thermal Expansion

Translucency Designations by Porcelain Powder

- HT⁺ Transparent Enamel translucency
- HT Enamel translucency
- MT Medium translucency (between HT and LT)
- LT Dentin translucency
- MO Opaque Dentin translucency



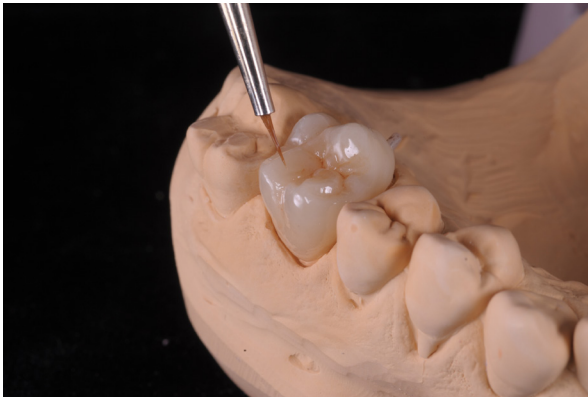
11. Co-Firing



12. Characterizing & Glazing

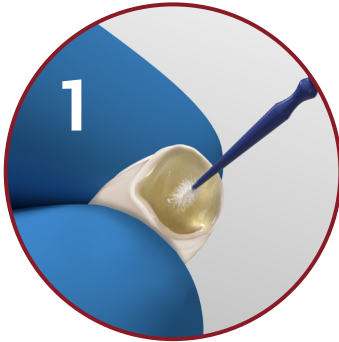


... Ensure the surface is clean by removing bubbles. At this time, it is also necessary to work while applying water.



... Apply the stain in accordance with the target shade. Select Stain & Glaze products that can be fired at temperature lower than 850°C.

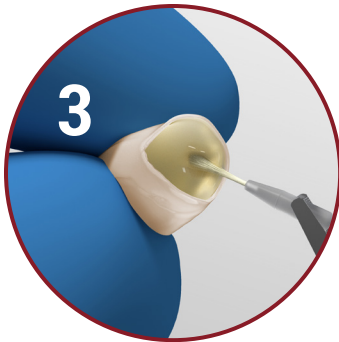
13. Cementation



... After try-in, etch the inner surface with 5% hydrofluoric for 20 seconds.



... Rinse out with water and blow air to dry.



... Apply silane to the surface and blow air for 20 seconds to dry.



... Use self adhesive resin cement to bond.

TIP!



Please keep the etching time indication; exceeding the time can cause fragility.



Please refer to the manufacturer's guideline for the usage of silane.

14. Indications / Contra-Indications

Indications



Inlays



Onlays



Veneers



Anterior Single Crowns



Posterior Single Crowns



3-Unit Bridge
*up to the second Premolar

Contraindications

- Very deep subgingival preparations
- Maryland bridges
- Patients with severely reduced residual dentition
- Bruxism
- Cantilever bridges

15. Product Line-up

Available Shade

	A1	A2	A3	A3.5	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4	W1	W2	W3	W4
HT ⁺																			
HT																			
MT																			
LT																			
MO																			

* Available shades (disk type): A1, A2, A3, A3.5, B1, B2, W1, W2, C2, D2

*The light transmission rates shown above are examples based on Amber Mill Blocks with a thickness of 0.9 mm to 1.5 mm.

Product Line-up

Amber [®] Mill		Dimensions (mm)	pcs / Pack
	C12	10 x 12 x 15	5 blocks
	C14	12 x 14 x 18	
	C32	14 x 14 x 32	3 blocks
	C40	15 x 15 x 38	
	P9812	Ø98 x 12T	1 disk

16. FAQs

Q 1. What is Amber[®] Mill's strength?(Before & after the translucency heat-treatment)

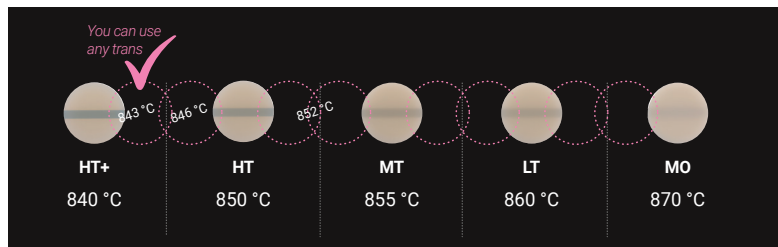


Q 2. What powders are compatible with Amber[®] Mill?

A Amber[®] Mill is compatible with a wide variety of veneering powders. As to the powders for lithium disilicate, those powders with CTE(coefficient of thermal expansion) less than or equal to $10.0 \times 10^{-6}/^{\circ}\text{C}$ are compatible. Zirconia powders with baking temperature under 850°C are also compatible with Amber[®] Mill.

Q 3. What should be mainly considered for the translucency heat-treatment?

A Combination of two factors-temperature and holding time-for the translucency heat-treatment of Amber[®] Mill differentiates the resulted translucency. Based on the recommended translucency heat-treatment schedule, each user is advised to verify his or her own optimized conditions for the furnace to use. Once the optimized version is identified, you will be able to create a wide range of translucency with just one Amber[®] Mill block and choose the exact translucency level as targeted. Do not exceed 880°C as the maximum temperature for any heat treatment. As you gain experience, you can set the intermediate light intensity to adjust to your desired transition.



Q 4. How is the translucency heat-treatment temperature difference changing the translucency?

A When applying the translucency heat-treatment, distribution of fine crystalline and coarse crystalline as well as crystal density are changed, which changes the transmission ratio of visible light. Usually, the higher heat-treatment temperature gets, the more coarse crystalline and density Amber[®] Mill block has. This scatters light ray more and, consequently, the translucency gets lower.

**Q 5. If crystallization is performed under HT+ conditions (840°C / 15 mins) and the build-up powder is fired at 850°C for 1 min, will there be any change in translucency?
(In general, the holding time at the peak temperature during powder firing is less than 1 min.)**

A Even if the peak firing temperature of the build-up powder is higher than that of the crystallization process, there is no change in translucency because the holding time at the peak temperature is less than 1 min.

Q 6. What about the chemical stability?

A When ceramic materials are exposed to moisture for a long time, degradation of material properties usually takes place because of ionic dissociation. Production process of Amber[®] Mill hires high purity raw materials and minimizes uninvited alkali impurities so that it generates fine crystalline structure and chemically durable glass matrix. This is why Amber[®] Mill performs more excellent chemical durability than existing products and ensures high long-term clinical reliability.

Q 7. What if the restoration feels too tight?

A The fit of the restoration may vary depending on the type of milling machine and its operating conditions (e.g., the type and condition of the bur).
The average shrinkage rate of Amber Mill before and after heat treatment is approximately 0.5%, which can affect the final fit of the restoration. Therefore, it is recommended to set the scale value to 1.005 during milling.

Product Usage Guidelines

1. Follow the User Manual

- Amber® Mill products must be used in accordance with the user manual provided with the product.
- HASS shall not be liable for any results arising from improper use or operation under inappropriate equipment conditions.

2. Pre-use Environment and Equipment Inspection

- Prior to use, verify that this product is suitable for your facility's environment and equipment.
- Prior to use, perform temperature verification and optimization of each furnace.
- Use a Calibration Kit or similar tool to measure temperature and perform calibration procedures as necessary.

3. Possibility of Performance Deviations

- Amber® Mill performance may vary depending on furnace or environmental conditions.
- HASS shall not be liable for any damages or quality degradation resulting therefrom.

4. Scope of Liability

- Within the limits permitted by law, HASS shall not be liable for indirect damages, business losses, third-party claims for compensation or other damages exceeding the product price.
- Liability for damages arising from negligence shall be limited to the amount of damages actually incurred by the customer, provided that such damages are not intentional or grossly negligent.
- Claims for compensation for damages related to negligence shall only be valid if intentional or gross negligence is proven.

5. Firing Conditions

- Firing conditions listed in this document are examples for reference only.
- Firing conditions suitable for the actual usage environment must be reviewed and set separately by the user.



HASS Corporation

77-14, Gwahakdanji-ro, Gangneung-si, Gangwon-do,
KOREA 25452
Tel: +82-70-7712-1300 / Fax: +82-33-644-1231
Customer Support : +82-2-2083-1367
E-mail : hasscorp@hassbio.com
Website : www.hassbio.com

HASS BIO America, Inc.

10400 Eaton place, Suite 220 I Fairfax, VA I 22030
Tel : 703-537-0333
E-mail : info@hassbioamerica.com
Website : www.hassbioamerica.com

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