



New Frontier of Lithium Disilicate CAD/CAM Blocks

Amber[®] Mill

User's Manual

Human-Aid
System Supplier

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Amber[®] Mill

User's Manual

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Amber[®] Mill



Aesthetic Values

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

Mechanical tests on lithium disilicate

Mechanical tests on lithium disilicate glass-ceramics after translucency heat-treatment show that Amber[®] Mill crowns can achieve a higher strength (over 450 MPa) than existing glass-ceramic products.



Resulting from its excellence

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 best machinable lithium disilicate block for CAD/CAM system.



1 Indications / Prep Guide

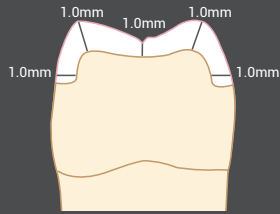
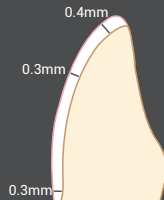
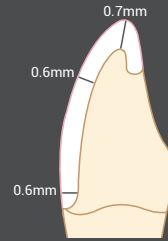


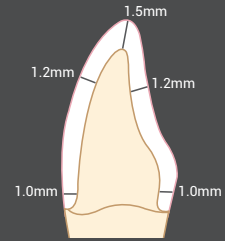
Table Top



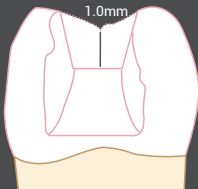
Thin Veneer



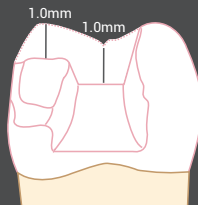
Veneer



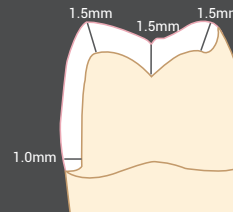
Anterior Crown



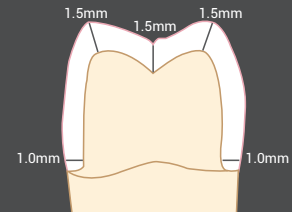
Inlays



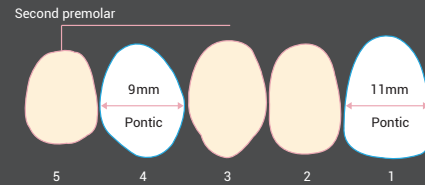
Onlays



Partial crown



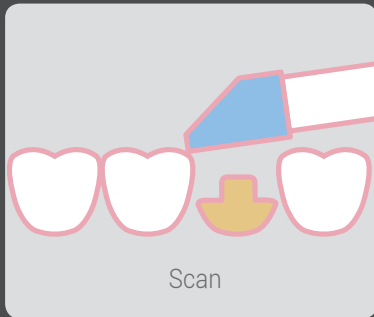
Posterior crown



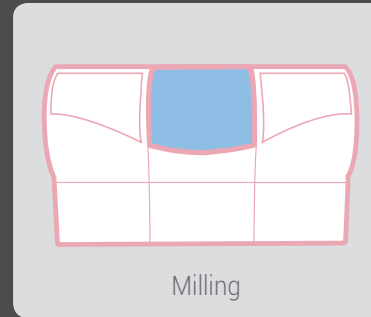
2 Selecting Blocks

| Translucency Levels | Processing Technique | | | Indications | | | | | | | | |
|---------------------|----------------------|--------------------|--------------------|-------------|--------------|---------|--------|--------|----------------|-----------------|------------------|----------------|
| | Staining Technique | Cut-Back Technique | Layering Technique | Table Tops | Thin Veneers | Veneers | Inlays | Onlays | Partial Crowns | Anterior Crowns | Posterior Crowns | 3-Unit Bridges |
| ↑ High Translucency | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | | |
| Medium Translucency | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | |
| Low Translucency | ★ | ★ | ★ | | | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Medium Opacity | | ★ | ★ | | | | | | | ★ | ★ | ★ |

3 Imaging



4 Milling



5 Translucency Heat-treatment



Finish surface with grinding instrument.
Use putty before translucency heat-treatment.

Freedom of Translucency (Recommended Translucency Heat-treatment Schedule)

It is possible to differentiate translucency with a single block of Amber[®] Mill. Just decide what shade you will use, then choose the translucency heat-treatment temperature according to your targeted translucency. This will enhance the efficiency in work process and inventory management for CAD/CAM milling blocks.

VITA VACUMAT¹⁾

| Predry °C | $\frac{\text{---}}{\text{min.}}$ | $\frac{\text{↗}}{\text{min.}}$ | | $\frac{\text{↗}}{\text{°C/min.}}$ | T °C | $\frac{\text{---}}{\text{min.}}$ | VAC min. | $\frac{\text{↘}}{\text{°C*}}$ | | |
|-----------|----------------------------------|--------------------------------|------|-----------------------------------|------|----------------------------------|----------|-------------------------------|-------|-----|
| 400 | 3.00 | HT | 6.50 | 60 | HT | 815 | 15.00 | HT | 21.50 | 690 |
| | | MT | 7.05 | | MT | 825 | | MT | 22.05 | |
| | | LT | 7.20 | | LT | 840 | | LT | 22.20 | |
| | | MO | 7.40 | | MO | 860 | | MO | 22.40 | |

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

1) VACUMAT is a registered trademark of VITA.

IVOCLAR VIVADENT PROGRAMAT²⁾

| B °C | S min. | $\frac{t}{\text{°C/min.}}$ | T °C | | H min. | VAC. 1 / VAC. 2 °C | L °C | tL* | |
|------|--------|----------------------------|------|-----|--------|--------------------|---------|-----|---|
| 400 | 3.00 | 60 | HT | 815 | 15.00 | HT | 550/815 | 690 | 0 |
| | | | MT | 825 | | MT | 550/825 | | |
| | | | LT | 840 | | LT | 550/840 | | |
| | | | MO | 860 | | MO | 550/860 | | |

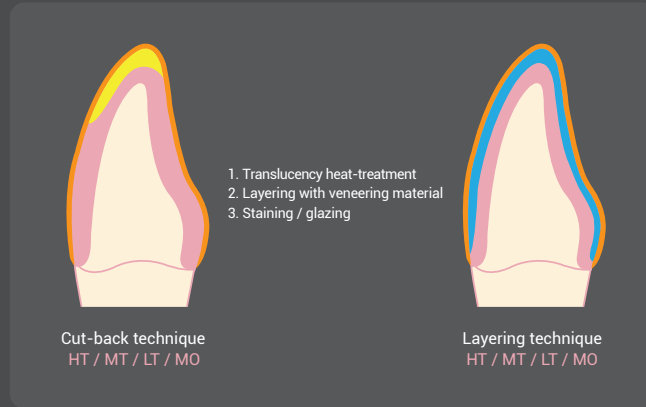
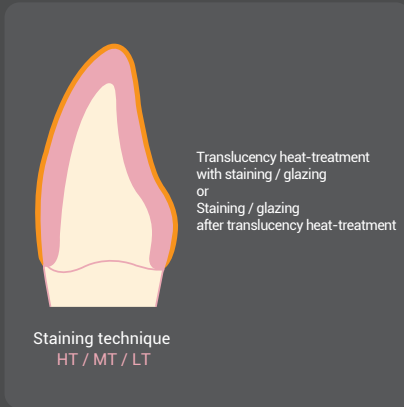
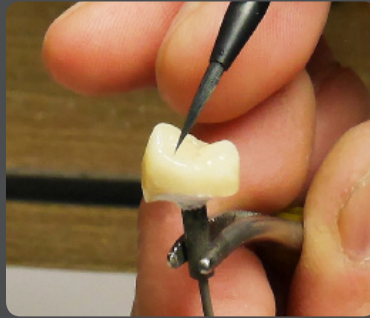
* The firing chamber must not be opened during long term cooling.

2) PROGRAMAT is a registered trademark of IVOCLAR VIVADENT.

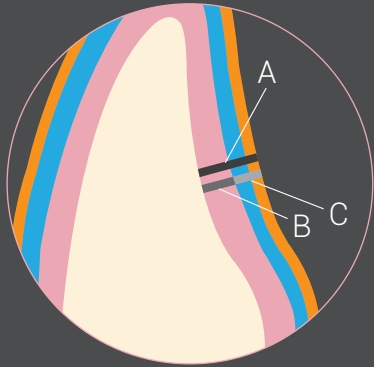
Ⓞ Note

- * There may be a slight difference between the displayed temperature and the actual temperature of each furnace. Before you heat-treat Amber[®] Mill, please verify that the above recommended schedule is suitable for the furnace in use. In case the resulted translucency is deviated from your target, try the following process:
 - Measure the actual working temperature of the furnace and validate if the temperature matches the display;
 - Or find your own version of the optimal temperature per each translucency level for the furnace in use.
- * If there are some changes in the shape of restoration during the translucency heat-treatment, please reduce the final temperature by 10-15°C.

6 Characterizing



Amber[®] Mill staining & glazing incisal veneering material veneering material



① Note

Layer thickness

Dimension in mm

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| A | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 |
| B | 0.3 | 0.6 | 0.8 | 1.1 | 1.3 | 1.6 |
| C | 0.2 | 0.4 | 0.7 | 0.9 | 1.2 | 1.4 |

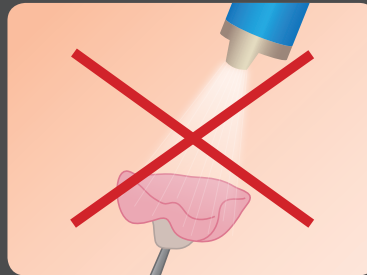
A : Overall thickness

B : Framework thickness

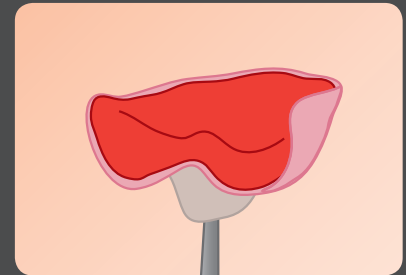
C : Veneering material thickness

$B > C$, Framework is to be thicker than veneering material

7 Preparing for Cementation



Do not blast restoration.



Etch for 20 sec with 5% hydrofluoric acid.*

* Respect all information given in the manufacturer's usage regulations.

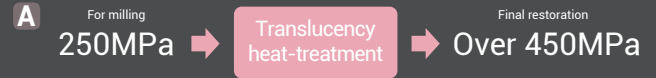
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Amber[®] Mill Product Q&A



Product Q&A

Q 01. What is Amber[®] Mill's strength? (Before & after the translucency heat-treatment)



Q 02. Will there be any change in the strength after veneering and baking?

A Veneering powder supplements microcracks on surface of core and relieves surface compressive stress from coefficient of thermal expansion (CTE) difference. This has a positive influence on the strength increase.

Q 03. 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 04. How is the milling processability of Amber[®] Mill? (For a single crown milled by Sirona CEREC MC XL)

A

| Evaluation criteria | Amber [®] Mill | Competitor (Lithium Disilicate) |
|---------------------|-------------------------|---------------------------------|
| Milling time | ○ | ○ |
| Tool consumption | △ | ○ |
| Edge stability | ○ | △ |

Product Q&A

Q 05. What shades and thickness are available for Amber[®] Mill Disk?

A Shade (19)

| | | | | | | | |
|----|----|----|------|----|----|----|----|
| A1 | A2 | A3 | A3.5 | B1 | B2 | B3 | B4 |
| C1 | C2 | C3 | C4 | D2 | D3 | D4 | |
| W1 | W2 | W3 | W4 | | | | |

Thickness (3)

| Indication | 6T | 8T | 10T |
|------------|----|----|-----|
| Inlay | ○ | | |
| Onlay | ○ | ○ | |
| Veneer | | | ○ |
| Crown | | | ○ |

Q 06. What sizes are available?

A

| Mandrel type | C12 | C14 | C32 | C40 |
|-----------------|-----|-----|-----|-----|
| Disk type (∅98) | 6T | 8T | 10T | |

Product Q&A

Q 07. How many times is it possible to re-bake Amber[®] Mill?

A Generally speaking, 4-6 times of re-baking would be the maximum for chairside. When it comes to re-baking, temperature is more important factor than frequency. To re-bake Amber[®] Mill along with existing powders for lithium disilicate, up to 8 times are possible. For your information, it is achievable to re-bake a HT block to make it LT while the opposite (LT -> HT) is not possible.

Q 08. How is the CTE of Amber[®] Mill and its compatibility with veneering powders?

A Amber[®] Mill's CTE is lower than existing blocks and thusly Amber[®] Mill is compatible with a wide range of powders.

Q 09. Is it necessary to use putty for the translucency heat-treatment?

A If the thickness of restoration is thin or if metal pins are used, putty is recommended to prevent distortion and/or defect from heat conduction difference between ceramic pins and the metal pins.

Product Q&A

Q 10. What is the contraction ratio for the translucency heat-treatment? How does it affect the margin fitness?

A Average contraction ratio is 0.5%, which may have an influence on the fitness of final restoration for 1:1 processing ratio. Therefore, adjustment of parameters for cementation gap setting is mandatory for milling systems such as CEREC MC XL. The setting value for the adjustment normally lies between 80 and 100 μm . As each user's preference in the parameters varies, final adjustment of parameters for cementation gap setting needs to be decided by each user according to the fitness status. For single spindle machines, scale factor should be set to 1.005.

Q 11. What is the translucency heat-treatment for?

A In Amber[®] Mill, fine crystalline is embedded in glass matrix. When translucency heat-treatment is applied to Amber[®] Mill restorations, crystal size and density get increased and consequently mechanical properties get reinforced.

Q 12. 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.

Product Q&A

Q 13. 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.

Q 14. Any possibility of translucency alteration after multi-baking of veneering powder?

A In addition to temperature, holding time of heat-treatment is the determinant of translucency for Amber® Mill. Even if baking temperature is higher than translucency temperature, the result may retain the same translucency as far as the holding time is short. As usual, baking time for veneering powder is about a minute long so the baking has no significant influence on the translucency of Amber® Mill framework.

Q 15. Is it possible to change the translucency by re-firing?

A For highly translucent restorations, it is achievable to lower their translucency by re-firing them. For example, you may apply 5°C higher heating than normal low translucency (LT) translucency temperature to high translucency (HT) crowns and keep the same holding time of 15 minutes so that the final crowns can be low translucent (LT).

Product Q&A

Q 16. Is it advantageous for aesthetic results?

A Amber[®] Mill successfully represents the aesthetics of natural teeth which come from diverse variations of light ray reflection in natural teeth crystalline. As well-balanced distribution of fine crystalline and coarse crystalline in Amber[®] Mill scatters various waves of light in a dynamic manner, excellent opalescence and fluorescence are generated by using Amber[®] Mill and that is the key to the natural aesthetic features.

Q 17. Are the mechanical properties enough?

A Existing lithium disilicate blocks have coarse and less dense crystalline and thusly their mechanical flexure strength and toughness are relatively low. Amber[®] Mill blocks can transform cross-linked, dense and fine crystalline structure through the translucency heat-treatment and it results in higher strength, fracture toughness and consequently higher long-term clinical reliability.

Product Q&A

Q 18. What about the chemical durability?

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 19. How is Amber[®] Mill technically differentiated from high translucency zirconia blocks?

A

- Natural-like aesthetic features such as opalescence and fluorescence
- Diverse shade line-up: Reduced burden for additional characterizing works
- Additional fine adjustment even after seating
- Relatively less wear of antagonist teeth
- Less processing time
- Excellent bond strength after cementation
- Lower risk of degradation by exposure to moisture, etc. in long-term clinical cases

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User's Manual

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