

## cameo Dental Glass Ceramics (CAD/CAM) User Instruction



# CONTENTS

<b>product description</b>	
• Main ingredients	01
• Specification and colors	01
• Product advantages	01
<b>Application range</b>	02
<b>Preparation standard</b>	02
<b>Production process</b>	03
• Scanning	03
• Design	03
• Typesetting	08
• Cutting	10
• Polishing	10
• Calcined and glazed	14

### 1 Main ingredients

cameo glass ceramics, the main components are silicon dioxide ( $\text{SiO}_2$ ), lithium oxide ( $\text{Li}_2\text{O}$ ), aluminum oxide ( $\text{Al}_2\text{O}_3$ ), potassium chloride ( $\text{K}_2\text{O}$ ) and other oxides, made by special processes. Because of its scientific, fast crystallization process and ultra-high aesthetic restoration effect, it has become the best choice for CAD efficient and high-intensity restoration.

### 2 Specifications and colors

#### Specifications

- 1) 18\*13\*15
- 2) 40\*15\*14
- 3) 15.5\*11\*13

#### Colors

VITA 16 and 4 bleached whites:

A1、A2、A3、A3.5、A4

B1、B2、B3、B4

C1、C2、C3、C4

D2、D3、D4

BL1、BL2、BL3、BL4

### 3 Product advantages

- 1) High strength  $400 \pm 60\text{MPa}$ .
- 2) Simple and rapid crystallization process.
- 3) Suitable for CAD/CAM.
- 4) Two permeability HT LT.
- 5) Good bonding performance.
- 6) Low wear on natural teeth.

## Application

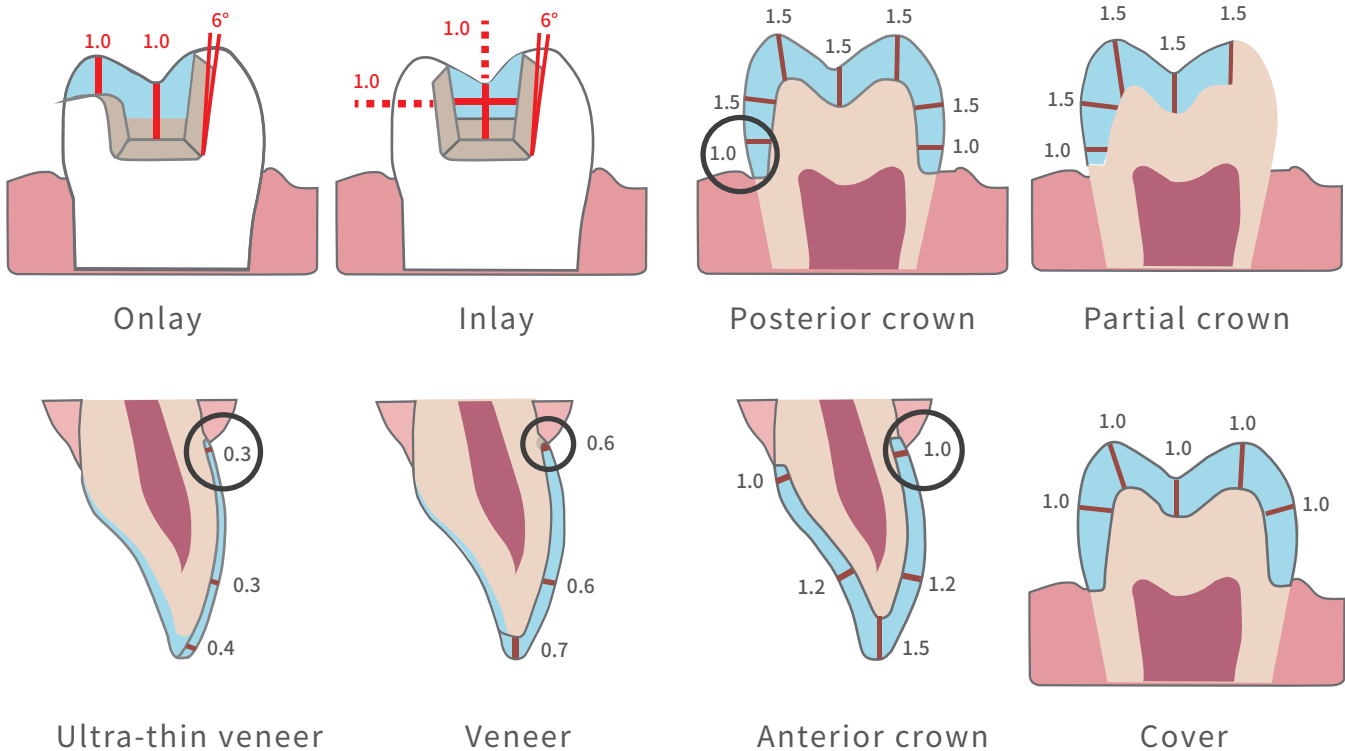
HT ( high translucency): inlay, onlay, veneer, single crown, partial crown,3 units bridge.

LT (low translucency): inlay, onlay, coping, full crown, 3 units bridge.

## Preparation standard

1. Shoulder preparations should not be prepared at corners and sharp edge areas. Shoulder preparations must be rounded Inner edge or bevel.
2. It is required to reserve 1mm space for cutting edge preparation to ensure that the ceramic block can achieve the ideal grinding effect during CAD / CAM processing.
3. If possible, it is best to prepare only the enamel layer of the incised edge, and avoid preparing in the stress concentrated point area.

Please prepare teeth according to the diagram



## 1 Scanning

Support the traditional process and scanning, to obtain the corresponding data in the mouth, and scan the data to the CAD design software, repair the design.

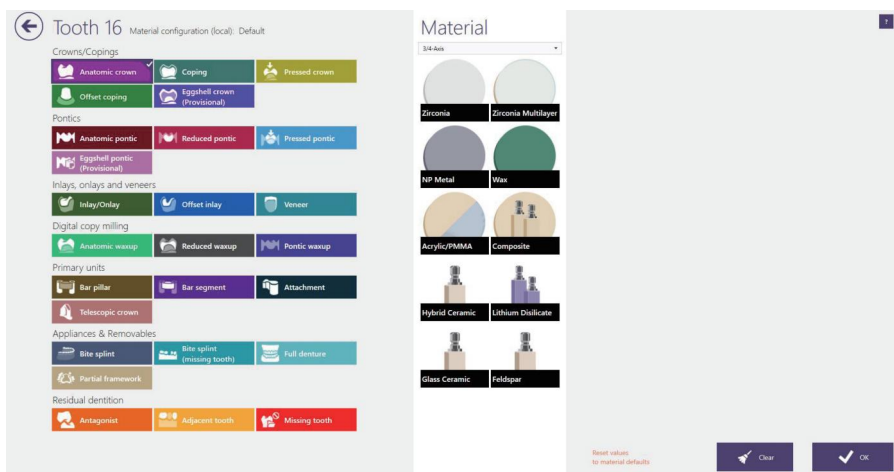
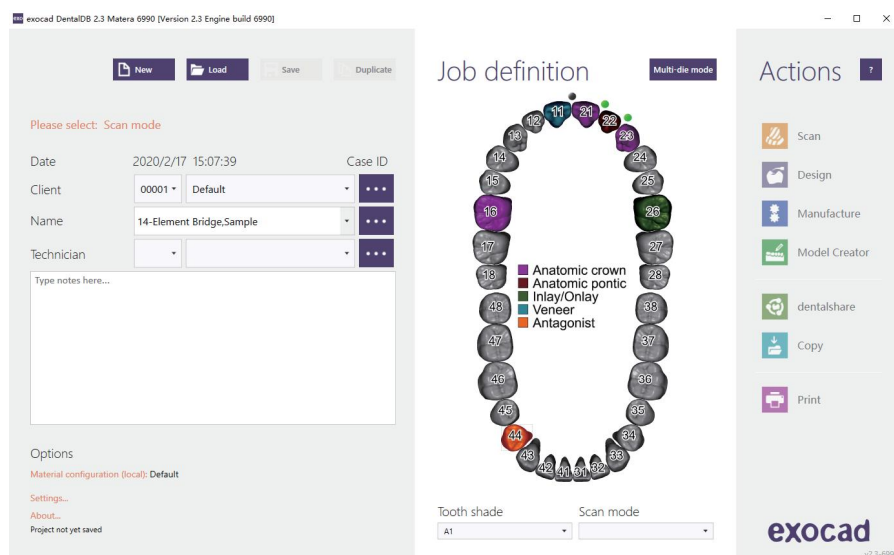
## 2 Design

The following uses EXO CAD design software as an example to design the inlay, single crown, veneer and triple bridge.



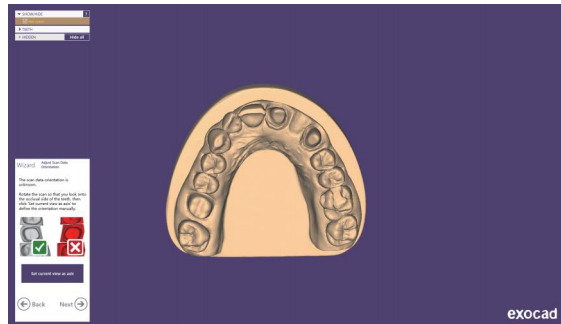
### ① New digital order

Input customer, patient name, technician and note information, Click on the target tooth to select the restoration type and other information.

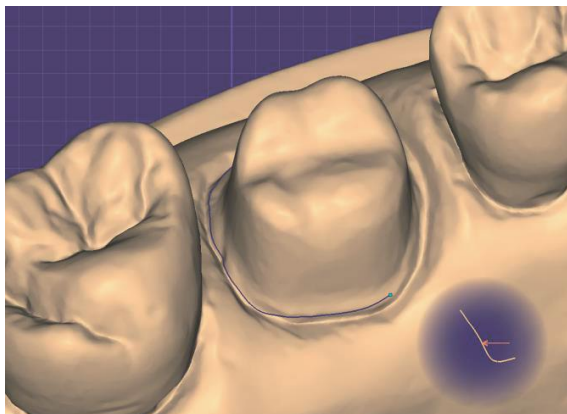


### ② Import scan data of upper and lower jaw model .

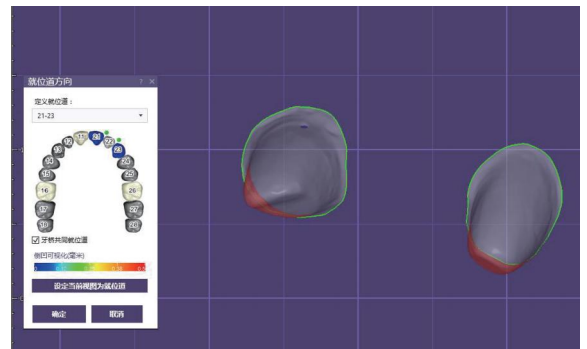
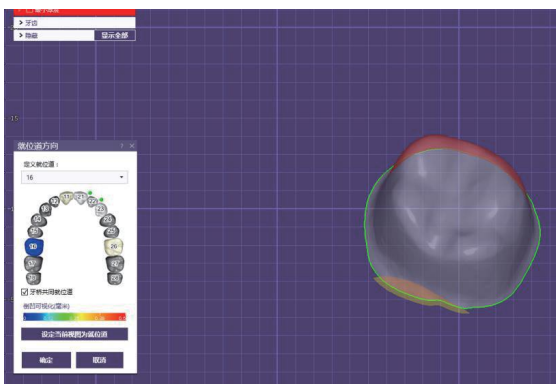
## ③ Set the view direction.



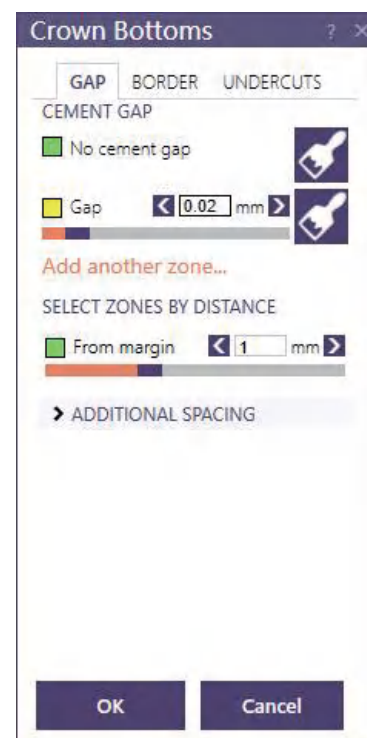
## ④ Draw the edge line along the neck edge shoulder.

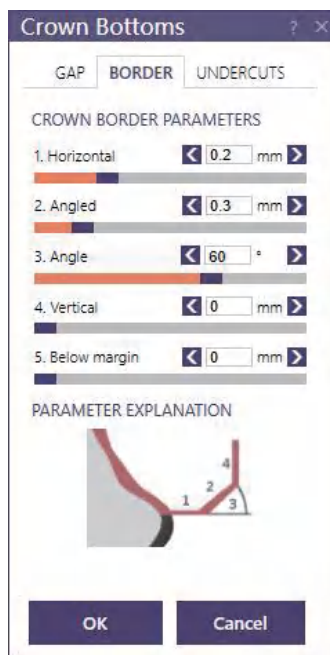


## ⑤ Setting the positioning direction: red is the recessed area. When setting the positioning direction, it is necessary to avoid recessed area as far as possible. If unavoidable, it is necessary to make the recessed part of red as even as possible.

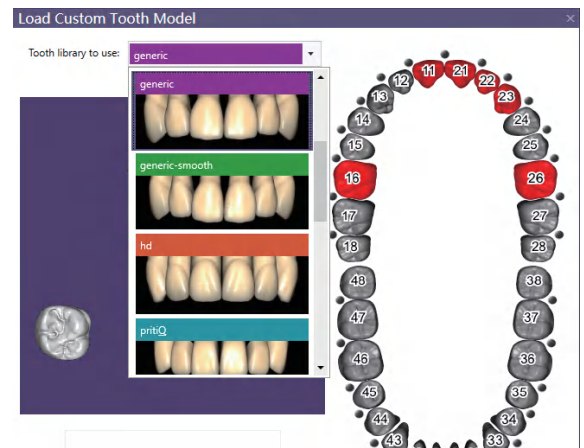


## ⑥ Setting the parameters at the bottom of the crown: adjust according to the model conditions and cutting machine and other equipment conditions.

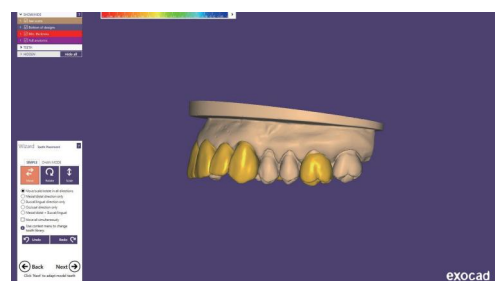
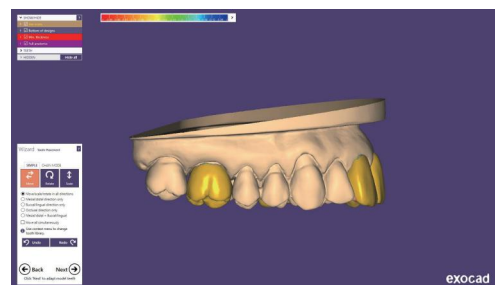
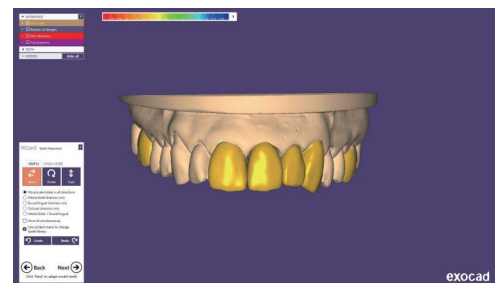
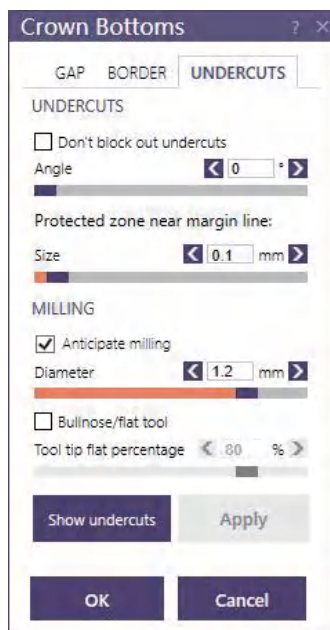




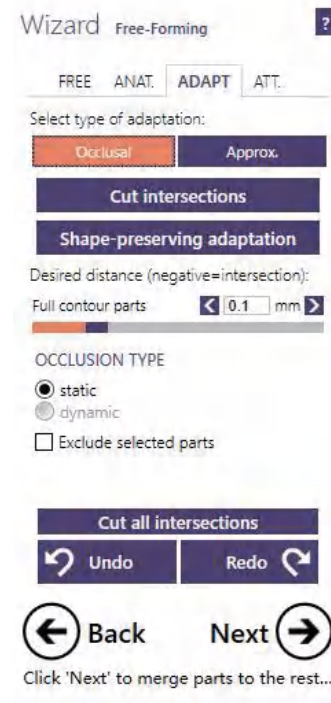
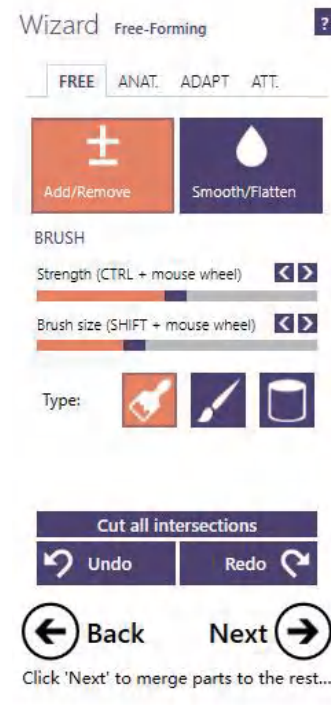
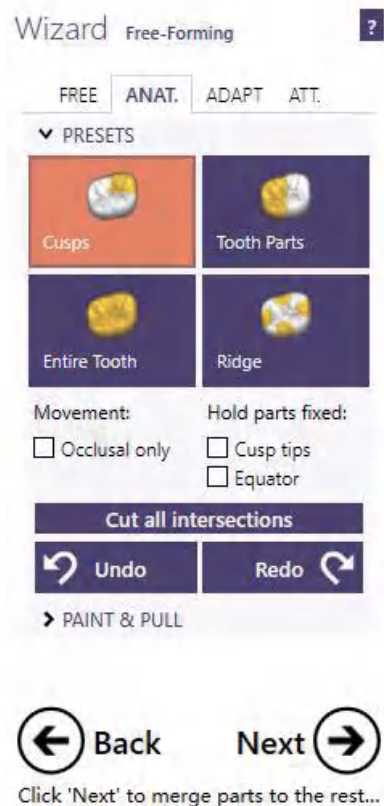
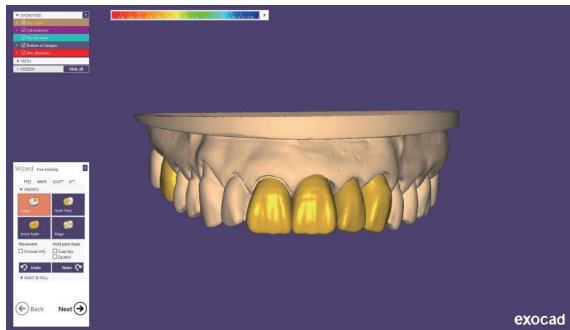
- ⑦ Load personalized dental morphology: the desired dental morphology can be selected from the dental database.



- ⑧ Alignment of teeth: multiple view directions should be observed and adjusted from the lip, maxillofacial, near and far.



- ⑨ Free modeling: four different parts of the drag, plus/minus/smooth options to adjust the shape of the teeth.

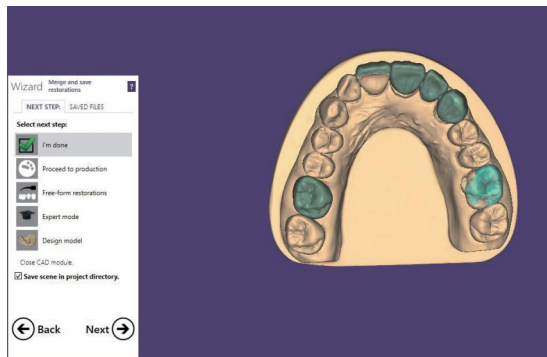
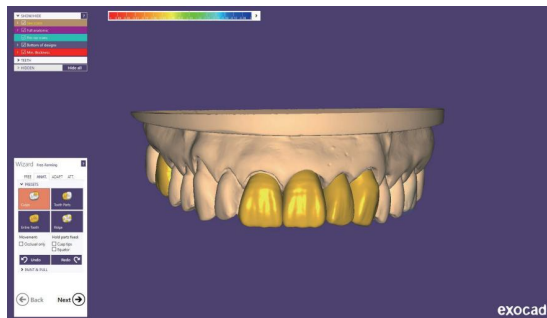




## ⑩ Generate connectome.



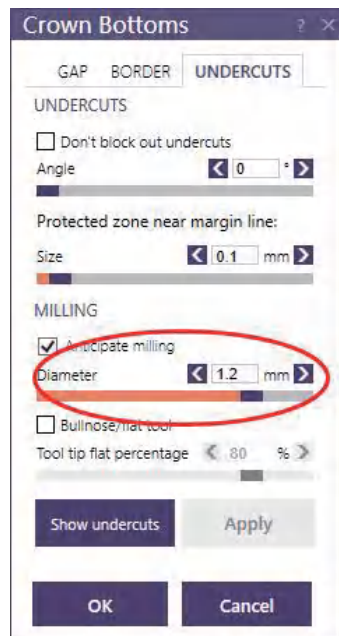
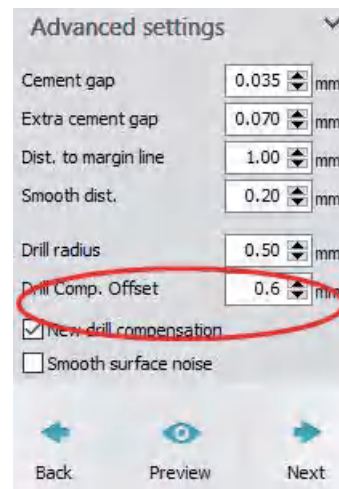
## ⑪ Design completed.

**Notes:**

If the abutment incisor is too sharp: Increasing the compensation value of the needle can effectively alleviate the emplacement problem caused by the sharp incisors of the front teeth and the base teeth.

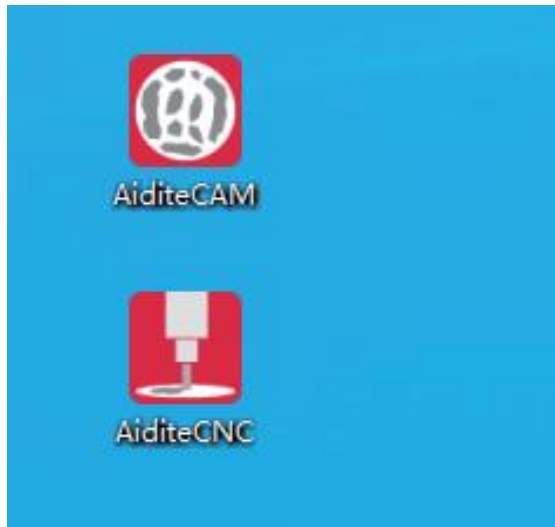


The figure below shows the compensation adjustment of 3Shape and EXOCAD respectively.



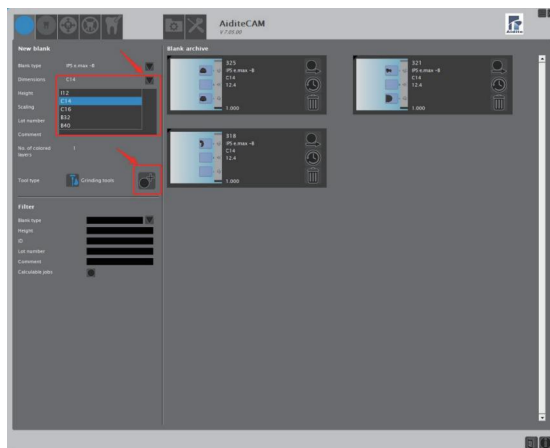
### 3 Typesetting

- ① Open CAM typesetting software and CNC milling software.



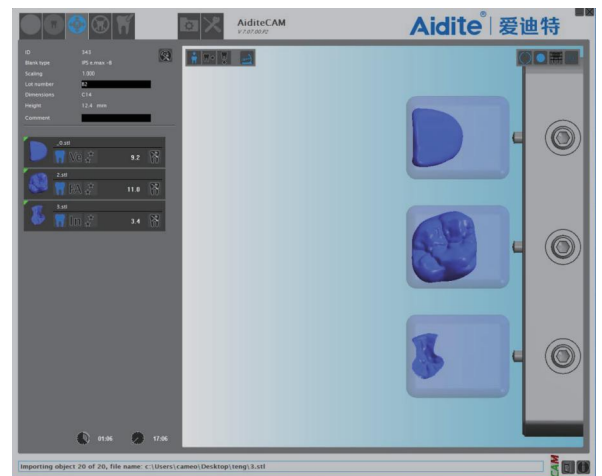
- ② New material tray.

The glass ceramic specification data in the software shall be consistent with the actual glass ceramic specification.



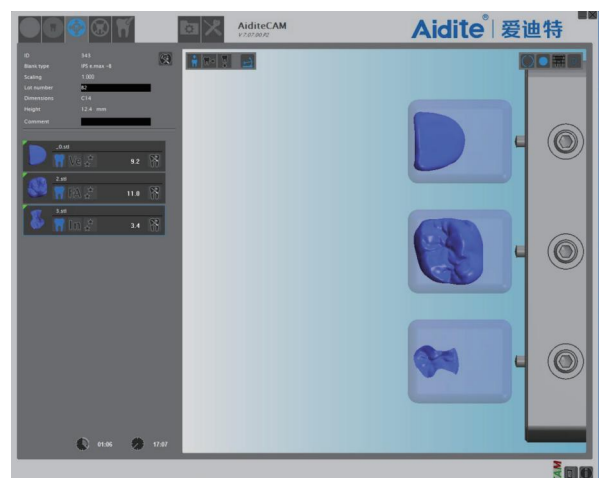
- ③ Import data.

Be sure to choose the appropriate restoration type.

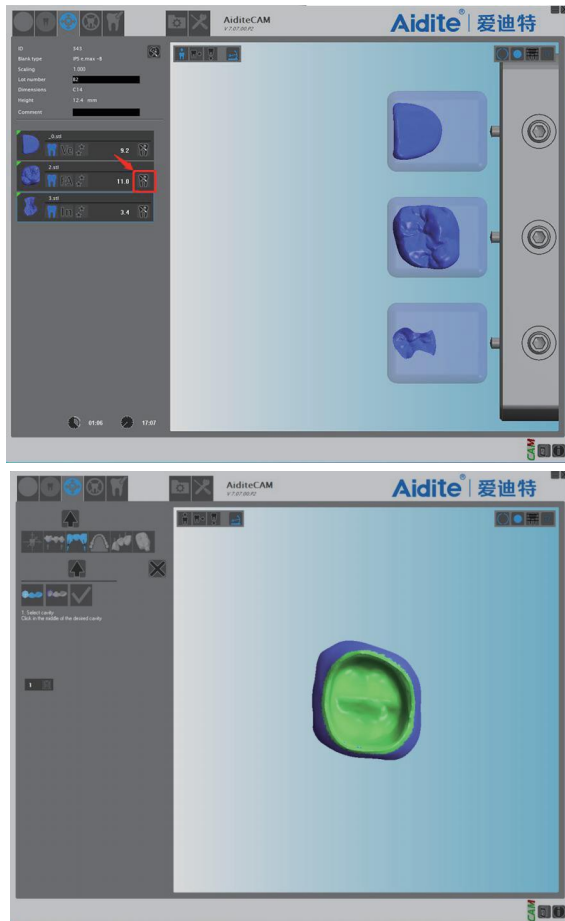


- ④ Adjust the angle and position of the prosthesis.

The position of the prosthesis should be adjusted according to the position direction at design time as the cutting direction.

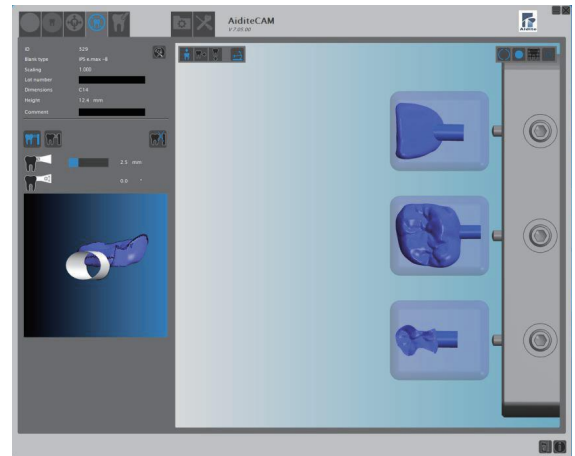


- ⑤ Edit the margin line.(the cavity covered with green is the correct state)

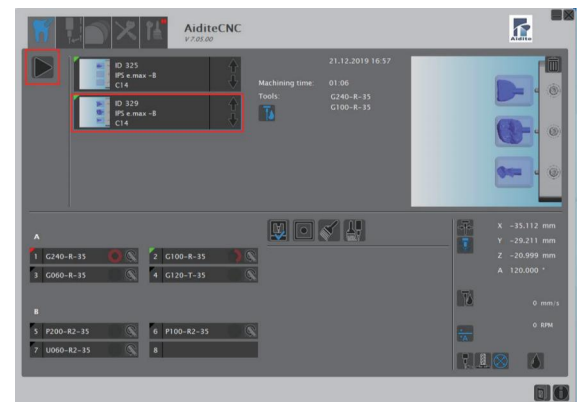


- ⑥ Add connecting rod.

The diameter of the connecting rod can be adjusted according to the size of the prosthesis. The diameter range is 1.2-3.0mm. The connecting rod should not be too close to the neck line and 14 should avoid the near/far contact area.



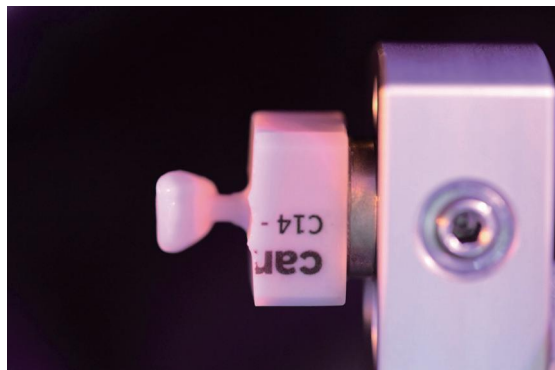
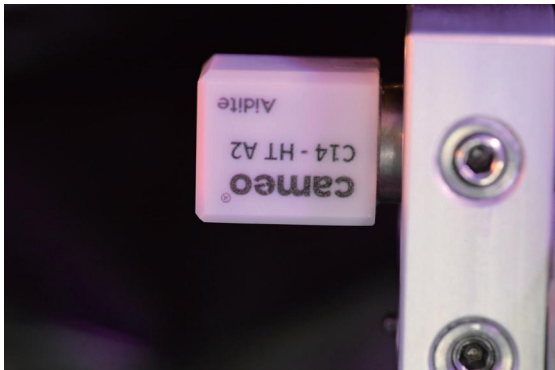
- ⑦ The software can be calculated while cutting: click the calculation, enter the CNC cutting software to start cutting.



#### 4 Milling

##### Confirmation facilities:

- ✓ Regular calibration, cleaning, lubrication, maintenance equipment, ensure no shaking while cutting or sound, Please replace the parts in time if there is any problem.
- ✓ Must record cutting needle milling quantity, within the scope of the service life can only be used for cutting restoration.
- ✓ Must check whether the needle order is installed correctly.
- ✓ Must assure cutting fluid concentration and liquid level is achieved, and can completely in the needle tip position.



##### Cutting considerations:

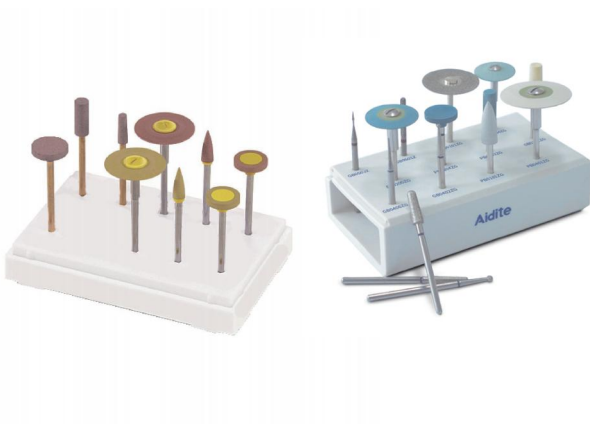
- ✓ When installing porcelain pieces must check whether the porcelain pieces of iron handle is installed, can appear otherwise cutting data is not accurate.
  - ✓ Must keep enough air pressure.
- 16When purple is semi-crystalline phase, the intensity is higher than that of glass phase. Compared with crystalline phase, the intensity is lower, the edge stability is higher, and the wear rate of turning needle is reduced. Therefore, if polishing is needed, please polish the restoration during the semi-crystalline phase.

#### 5 Polishing

##### Confirmation facilities:

- ✓ Must use a special glass ceramic grinding burs. It is recommended to use Aidite glass ceramic special grinding head. It is important to use the right grinding tools to polish and adjust the restorations. If improper grinding tools are used, edge marks may appear, or the temperature may be too high.

- ✓ Polishing hand piece is stable and no vibration.
- ✓ Need to put a piece of clean soft towel or desktop cushions, avoid teeth drop cracked or broken.



#### Operation steps:

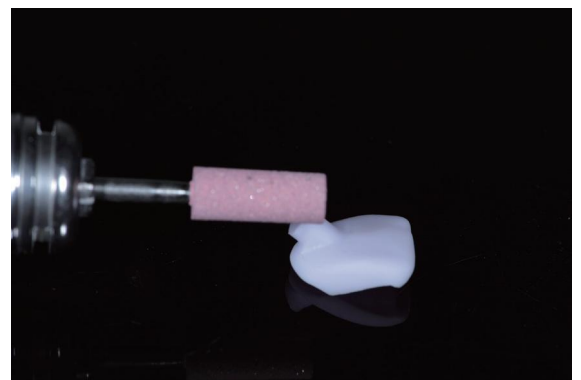
Detached prosthesis:

Use diamond sand sheet to separate the restoration body: during cutting, the sand sheet should be close to the iron handle and avoid the edge of the restoration body to avoid damaging the restoration body.



Remove the connecting rod:

before polishing, dip in appropriate amount of water and apply to the part that needs to be polished to avoid excessive temperature of glass ceramics.



Under the normal working condition of the cutting machine, the repair body cut out, the surface is bright, smooth, In addition, if there is no need to adjust the form, the connecting rod can be calcined directly after removal and grinding. Please refer to the following polishing methods if you need 18 form trimming.

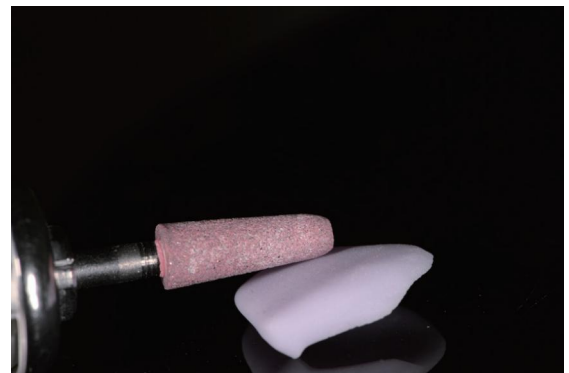
#### ① The coarse grinding

It is used for wearing teeth, adjusting adjacency, occlusal surface, whole surface and polishing connecting rod, etc., when more positions need to be removed.

Polish from right to left in the same direction, so the polished grain is fine and regular. Grinding in the right direction is more efficient, while grinding in the opposite direction is less efficient and will increase the grinding head loss.

Prepare some cold water and rub with your finger every three times.- Generally, the temperature of glass and ceramics will not exceed 60°C after three times of point grinding. After water cooling, the temperature of porcelain body can be repeatedly guaranteed not to exceed 60°C.

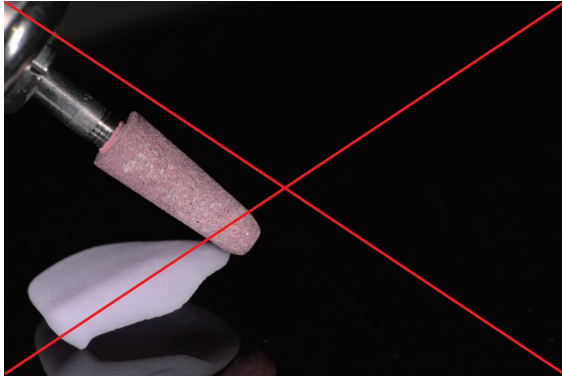
Using the method of rotating speed grinding of the grinding head to remove and point grinding, the contact time between the grinding head and the repair body should not exceed 1 second each time to avoid local overheating or stress concentration. Keep changing the position of continuous polishing, do not allow in a position of continuous polishing.



#### Notes for rough grinding:

- ✓ Coarse grinding speed range: 8000-12000 r/m.
- ✗ Pressure in the process of grinding can not be too big.
- ✗ Will never allow continued polishing in one place, avoid to produce too much heat lead to crack or break.
- ✗ Never can use coarse slow grinding head neck flange.





## ② Pre polishing

Carry on the rough grinding step, make the tooth surface grain neat, even, fine.

Polish the entire surface from right to left in the same direction as a rough mill.



### Precautions for pre-polishing:

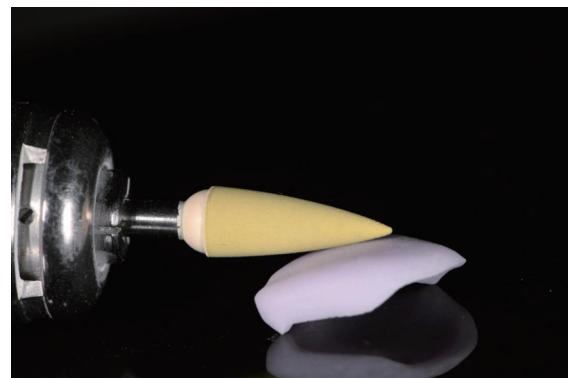
- ✓ Pre-polishing speed range: 7000-12000r/min.
- ✓ Glass ceramics after grinding has to be polished, otherwise it will appear white, white mist, don't connect fully, low saturation problem, affect the aesthetic effect.
- ✗ Pressure can not be too big.

- ✗ Do not stay too long in one place, avoid to produce too much heat.

## ③ Specular polishing

Make the surface more smooth and delicate, can effectively improve the overall effect.

Polish in the same direction from right to left as before.



### Highlights polishing notes:

- ✓ Highlights the polishing speed range: 7000-12000 r/min.
- ✓ Glass ceramics after grinding has to be polished, otherwise it will appear white, white mist, don't connect fully, low saturation problem, affect the aesthetic effect.
- ✗ Highlights polishing tool polishing surface needle speed depends on car polishing, do not have a downward pressure.
- ✗ Surface not smooth, adopt the method of slow pressure can be thrown into the brightness of the inferior smooth.

#### 4) Wearing



#### Precautions for wearing:

✓ Glass ceramic is half crystallization strength did not reach the best state, so try must accurately in place, gently bite, prevent cracked or broken.



#### 6 Sintering and glazing

This product is lilac before calcination, and will crystallize to normal tooth color after sintering

Sintering and glazing of glass ceramics can be divided into two schemes:

Method 1: Finish the sintering and glazing together

Method 2: First sintering and then glazing

Please strictly follow the sintering curve:

It is recommended to use Aidite external dyeing set for external dyeing for better effect.



#### Program 1 operation steps:

① Cleaning: please use steam or ultrasonic oscillation cleaning machine to thoroughly clean the repair body.



② Blow-dry the restoration.

③ Sintering retention adhesive.

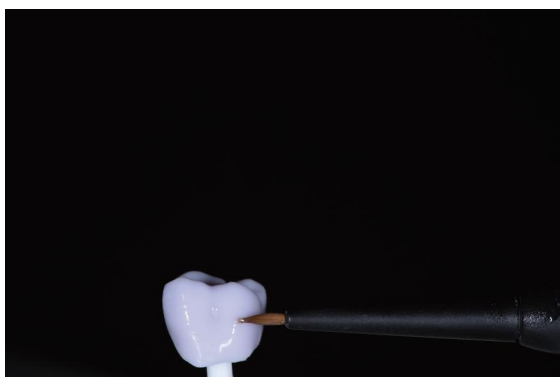


The sintered retainer must be crowded with the sharp parts of the restoration body, but cannot touch the surface of the restoration body. If the sintered retainer sticks to the surface of the restoration body, it will combine with the glaze and produce a chemical reaction, resulting in dense bubbles on the surface of the glaze.



#### ④ Glaze

Dip the glaze pen into the right amount of transparent glaze, evenly coated on the surface of the restoration body. Clay color can be used to deepen the jaw surface and brown to modify the groove gap.



## ⑤ crystallization

Please strictly follow the crystallization curve:

## (1) Ordinary crystallization

Start temp	Drying time	Heating rate	Highest temp	Holding time	Final temp
450°C	4min	40°C/min	840°C	2min or 6min	500°C

## (2) Fast crystallization

Start temp	Drying time	Heating rate	Temp	Holding time	Heating rate	Highest temp	Holding time	Final temp
403°C	18s	90°C/min	820°C	10s	90°C/min	820°C	2min or 6min	700°C

## Notes for crystallization and glazing:

- (1) The maximum temperature holding time of veneer ,single crown and inlay is 2min, and that of bridge is 6min.
- (2) Avoid direct air conditioner or fans to prevent potential fracture or cracking due to fast cooling. Take the restorations out after natural cooling .
- (3) Do not use quench cooling tools such as metal to contact high temperature restorations.
- (4) During the crystallization process, the crystallization paste must be packed in the restoration crown to prevent deformation of the restoration.

## ⑥ Complete



- ② Color contrast of abutment teeth.
- ③ Make base tooth resin.
- ④ The calcined prosthesis was placed on the abutment resin and dyed against the colorimetric plate to imitate the aesthetic effect of the highly permeable prosthesis worn in the mouth.

## Plan 2 operation steps:

## ① The calcined

Calcining curve and matters needing attention are the same as plan 1.

The final color of the restoration is determined by the coordination between the abutment color and the desired color effect ratio.



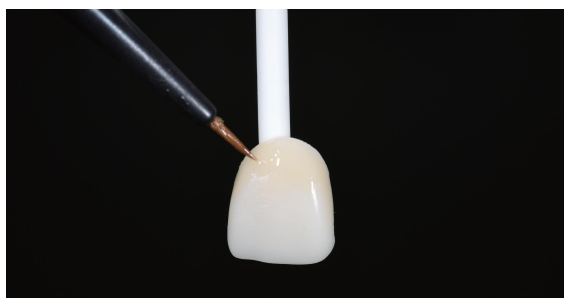


### ⑤ Staining

After calcination, use a low-temperature paste for staining. It is recommended to use Aidite Biomic paste for better effect. Please refer to the Biomic product instructions for specific usage.



Brush neck color



Brush the transition color in the middle part.



Brush incisal 1/3



Finish external dyeing



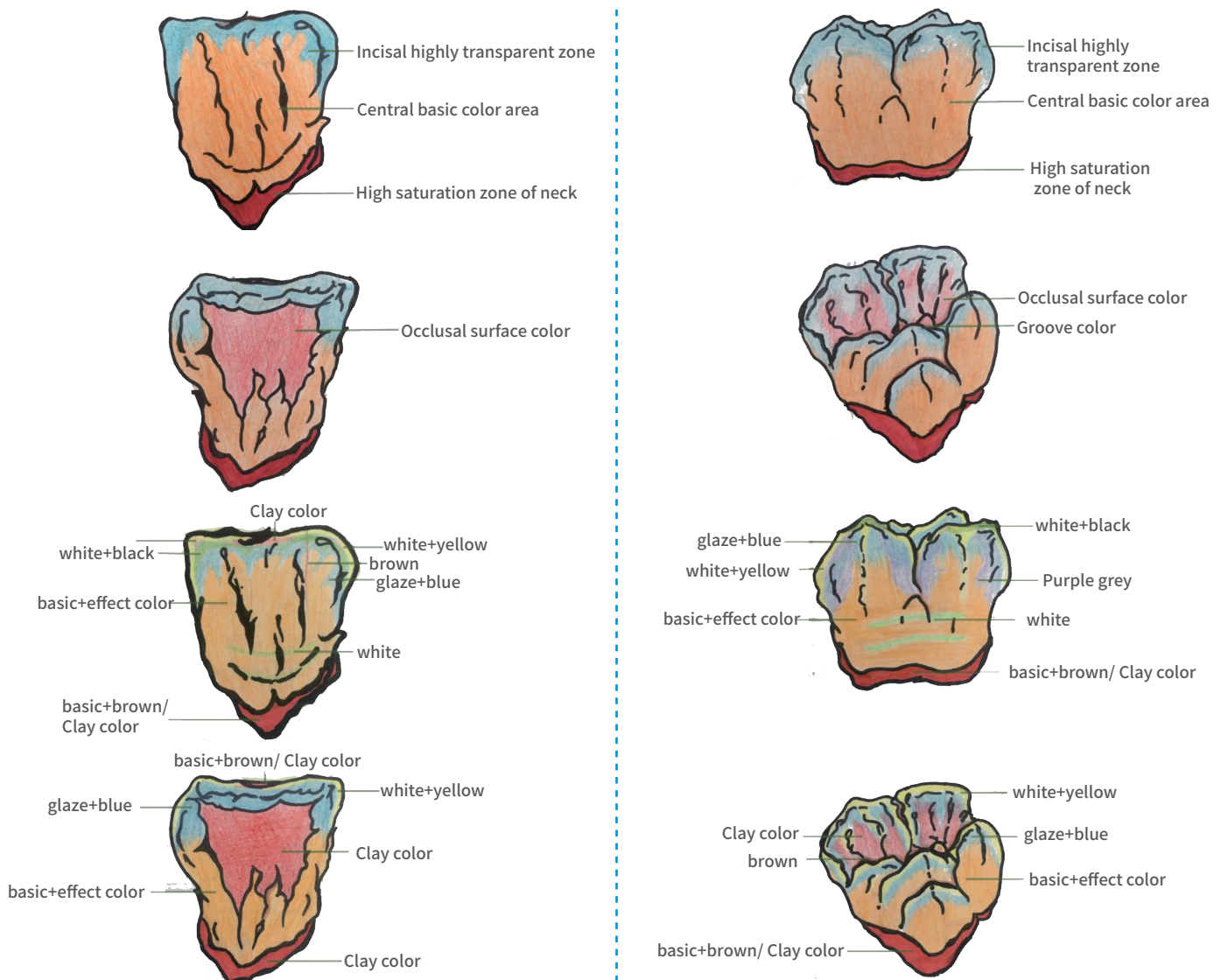
Case completion



The final aesthetic effect of all-ceramic restorations is the result of the combined influence of the following factors.

- ① Color of the final restoration.
- ② Abutment color or abutment color.
- ③ Type of prosthesis.
- ④ The thickness of the restoration or the depth of the preparation.
- ⑤ Processing technology (dyeing technology, back cutting technology or layer technology)
- ⑥ Bonding material.

### Staining reference:



# Aidite

Aidite (Qinhuangdao) Technology Co.,Ltd.

Tel : 0086-335-8587898

Fax: 0086-335-8587198

Web: [www.aidite.com](http://www.aidite.com)

Email: [info@aidite.com](mailto:info@aidite.com)



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