DEPRAG

Instruction Manual for Glass Ceramic Blocks (CAD/CAM) for All-Ceramic Dentures

CAD/CAM

DEPRAG

Contents

Part I Product Introduction

Main Composition

Glass ceramic blocks(CAD/CAM) for all-ceramic dentures consist of silicon dioxide, lithium oxide, burnt potash, aluminium oxide, phosphorus pentoxide, boron oxide, zinc oxide, zirconium dioxide, vanadium oxide, cerium oxide, erbium oxide and manganese dioxide.

Specifications and Shades

DEPRAG		Specifications(mm)	Pcs/Pack
	C14	18*15*13	5Pcs
	B40	40*15*15	4Pcs

Shades	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4	BL1	BL2	BL3	BL4
HT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
MT	•	•	•														•	•	•	•

Advantages

·Easy to operate , patients can experience a convenient restoration process.

·The preferred material for rapid crystallization and immediate restoration.

·High strength without chipping, can be applied to the fabrication of various restorations.

·Highly translucent properties, restoring the natural color of the teeth.

Part II Applicable Indications

Indications

Inlay, onlay, veneer, full crown, partial crown, not more than 3-unit bridges(B40).

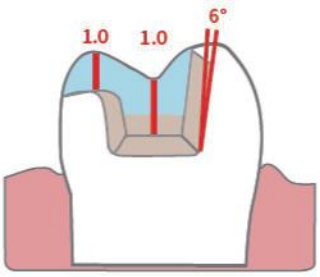
Part III Preparation Guidelines

Preparation Guidelines

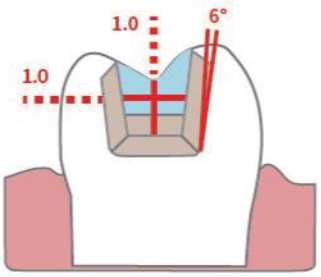
·Shoulder preparation should not be located in the areas of the corners and sharp edges and with rounded inner edges and/or chamfer preparation.

·The incisal edge of the preparation should be at least 1.0 mm in order to permit optimum milling during CAD/CAM processing.

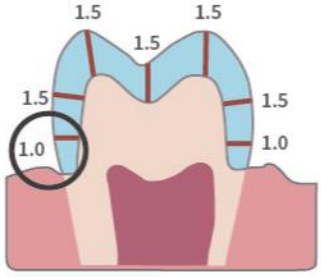
·If possible, the preparation should be located in the enamel layer, not in the stress concentration area.



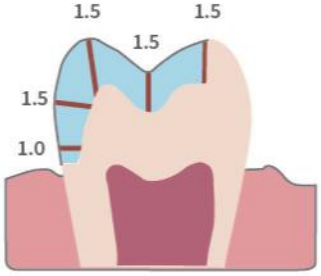
Onlay



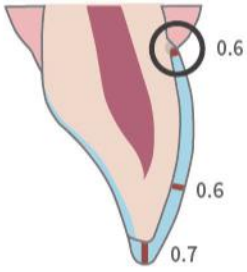
Inlay



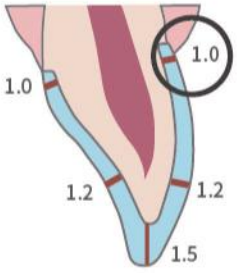
Posterior Crown



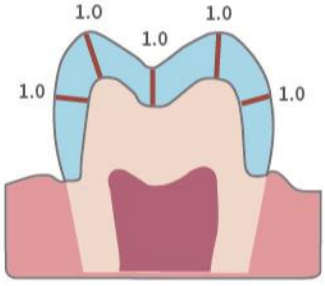
Partial Crown



Veneer



Anterior Crown



Overlay

Please strictly follow the figures above to make the preparations.

Part IV Working Steps

Intraoral Imaging

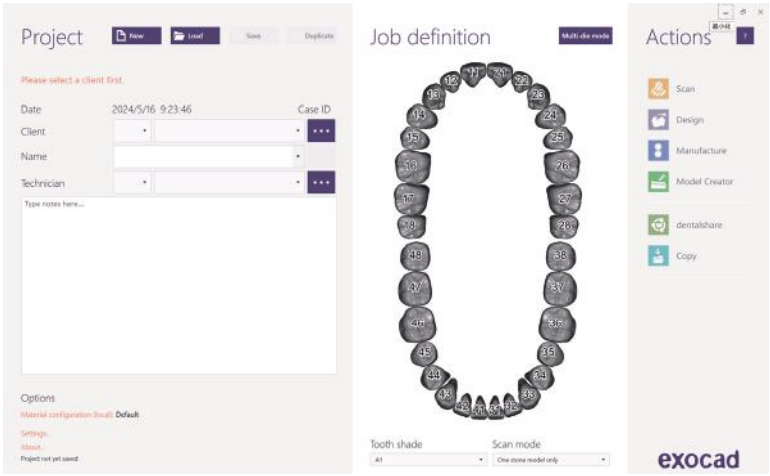
Support conventional techniques and intraoral imaging to obtain the appropriate intraoral data and transfer the data to CAD design software for restoration design.

Design

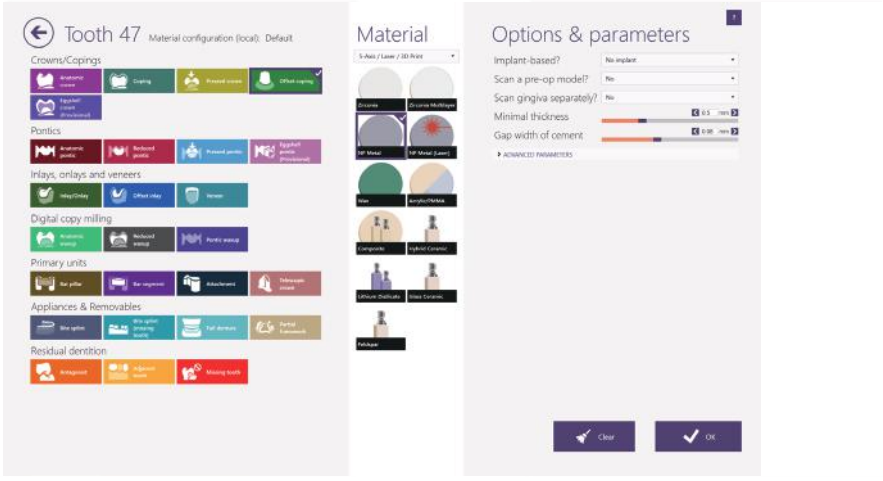
Take the EXO CAD design software as an example (see the below) to make designs for inlay, single crown, veneer and 3-unit bridge.

1 Set up Digitized Order

Input the names of customer, patient, technician, relative information and etc. Select the proper restoration type and others.

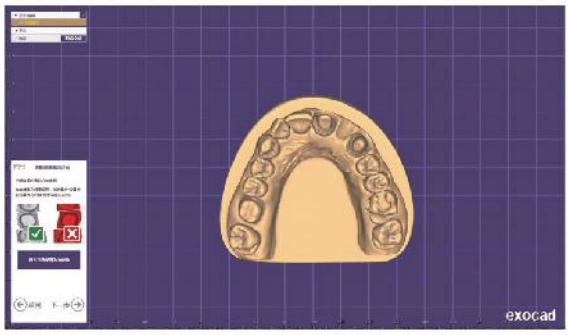


2 Import Maxillary and Mandible Data.

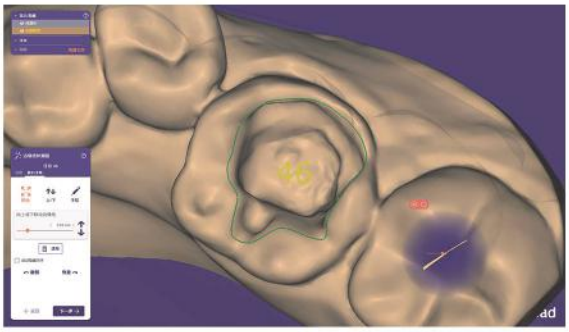


Part IV Working Steps

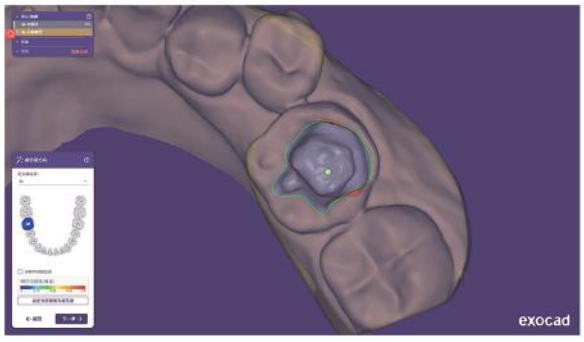
3 Set the View Orientation



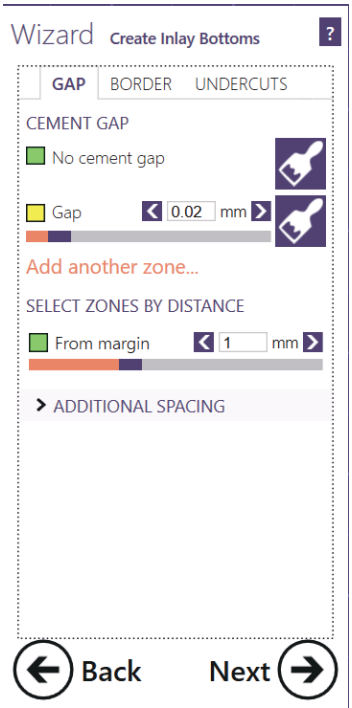
4 Make the edge line along the shoulder at the cervical edge.

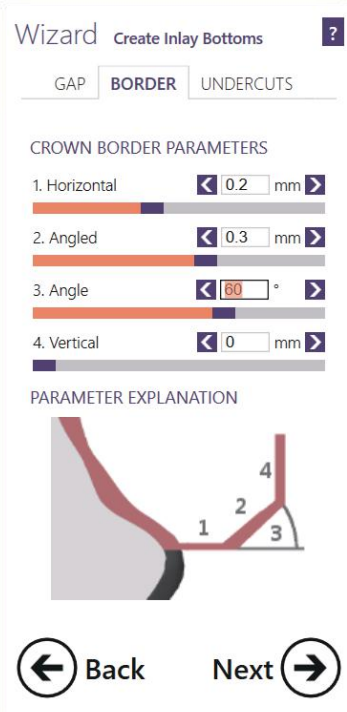


5 Set the seating direction: The red color represents the undercut area, when setting the seating direction, try to avoid undercut, if not possible, make the red undercut area as even as possible.

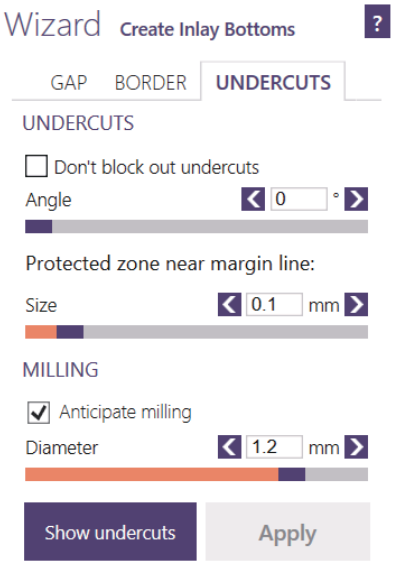


6 Set the parameters of the crown base: Adjust them accordingly based on the model and milling machine.



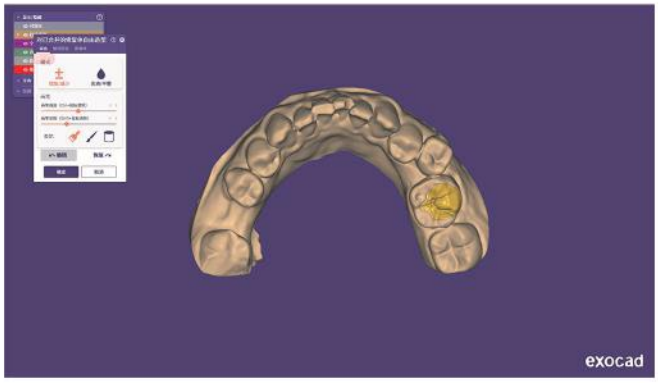


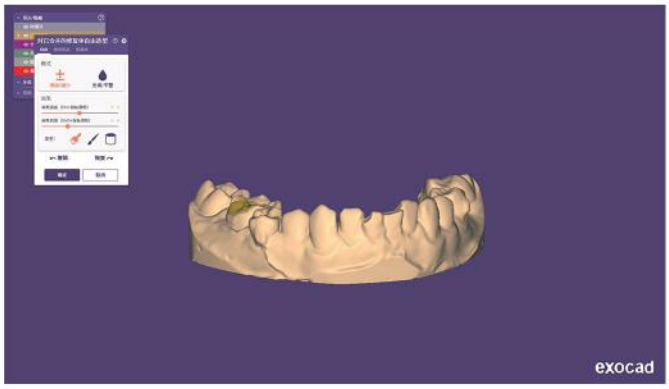
Part IV Working Steps



Back Next

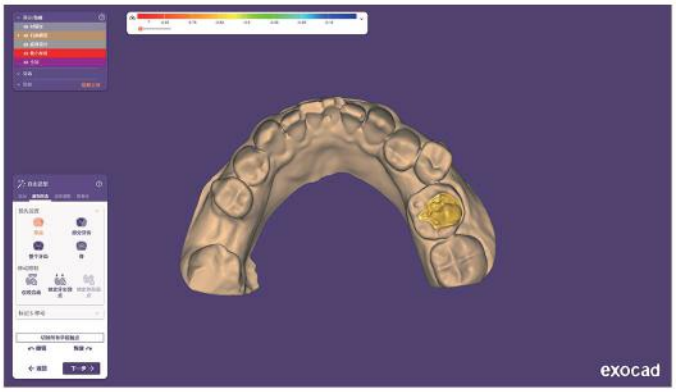
8 Layout of teeth position: Adjust it accordingly based on the observations from multiple view directions such as labial, maxillofacial, proximal and distal surfaces.



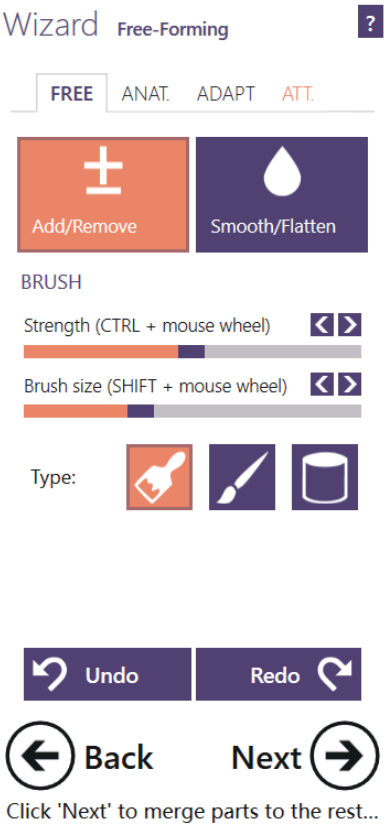


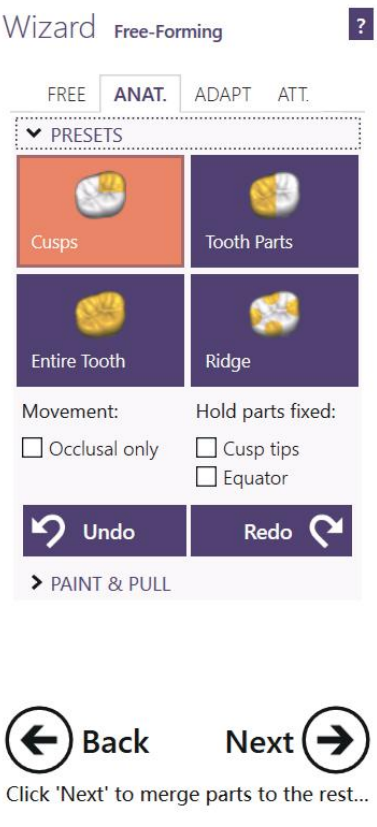
7 Load the customized tooth morphology: the desired one can be selected from the tooth database.

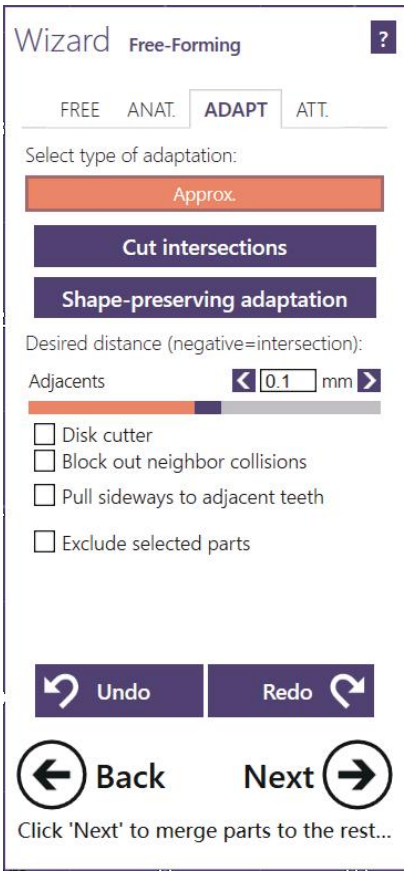
9 Free Styling: Drag by means of 4 different areas, with plus/minus, and smooth options to adjust the teeth morphology.



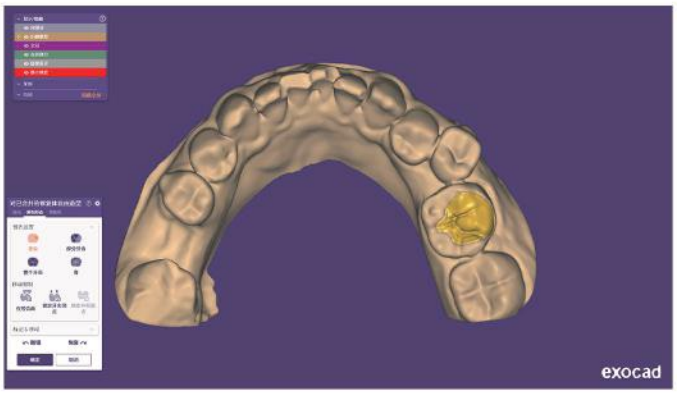
Part IV Working Steps

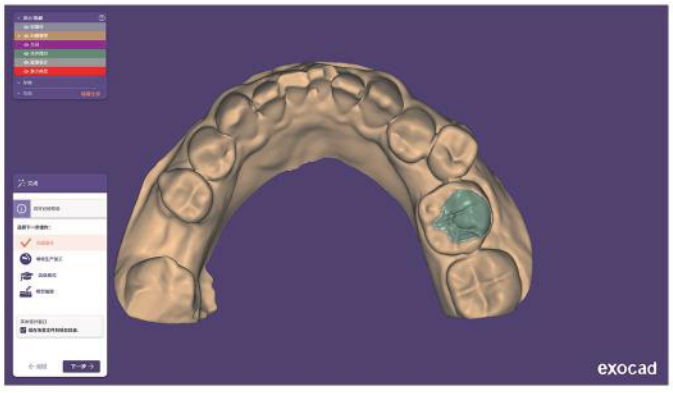






10 Completed





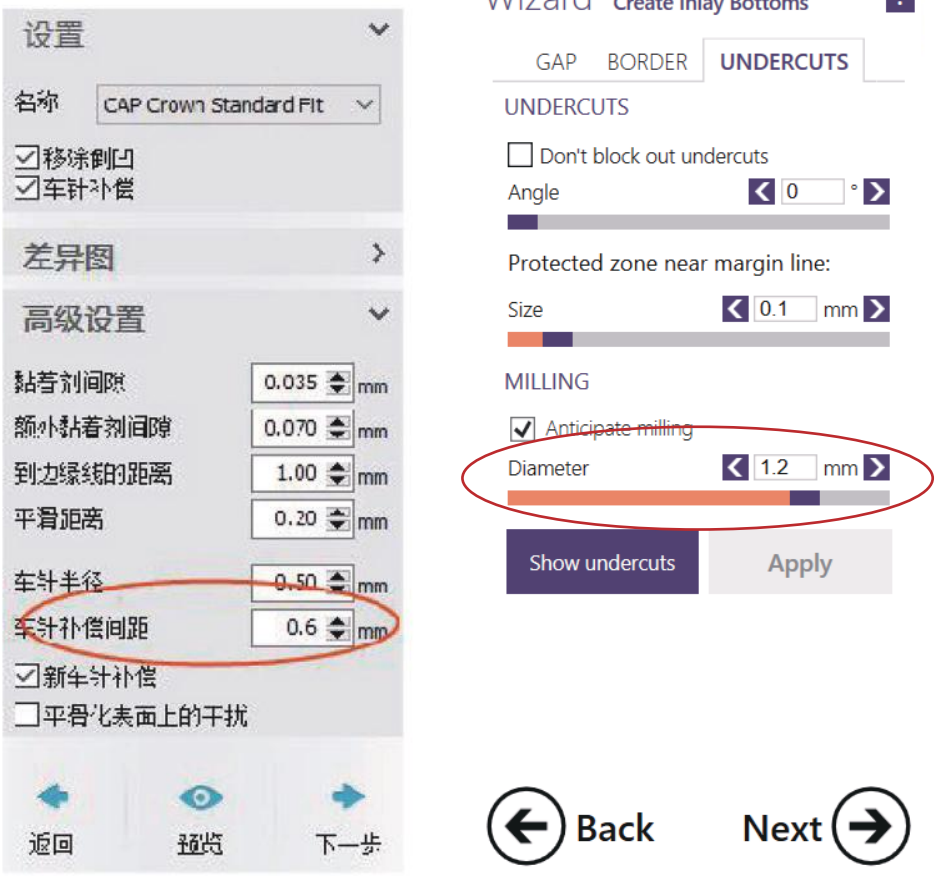
Cautions

In cases where the incisal edge of abutment tooth is extremely sharp:

Increasing the compensation value of milling bur can effectively alleviate seating problems caused by overly sharp incisal edges of both anterior teeth and veneer abutment tooth.

Part IV Working Steps

The figures below show the adjustment of milling bur compensation value shown in the 3 Shape and EXOCAD design softwares respectively.



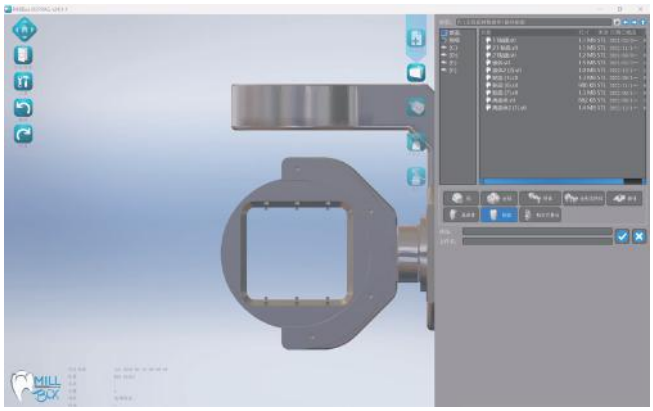
Part IV Working Steps

Layout

1 Work the CAM Layout Software

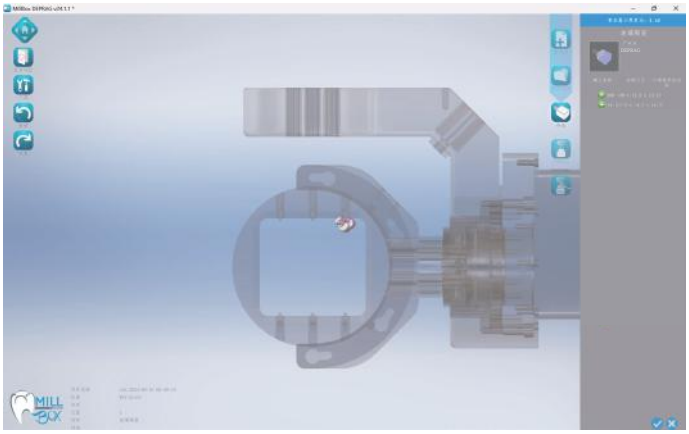
2 Import Data

Import the CAD data into the CAM software.



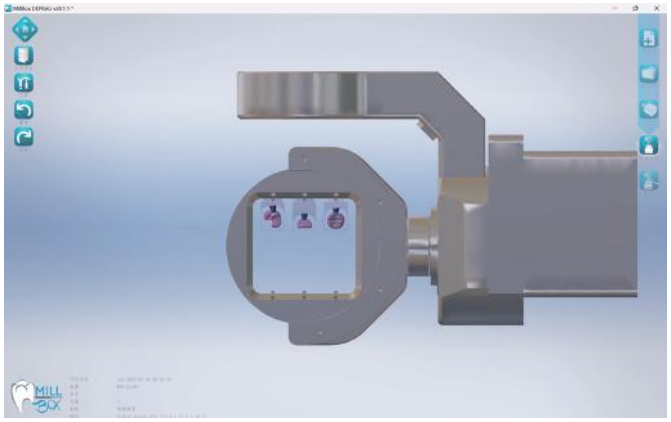
3 Select/Create New Ceramic Block Model

First of all, select the appropriate tray in the software, if not available,you need to create a new one, its size should be consistent to the specification of the selected glass ceramic block.



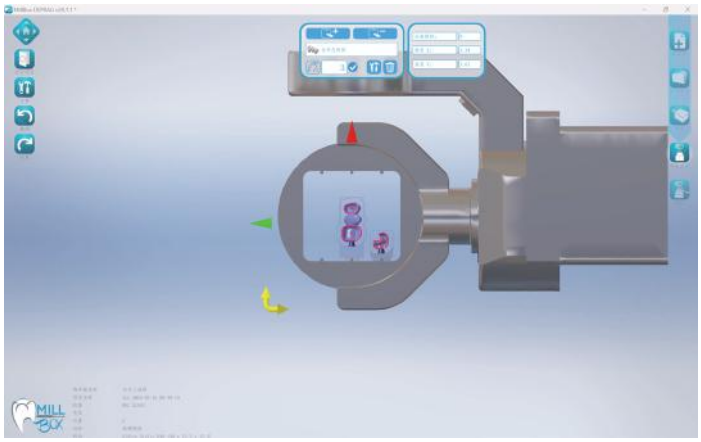
4 Adjust the Angle and Position of the Restoration treated

The design seating direction should be treated as the milling direction to adjust the restoration position.



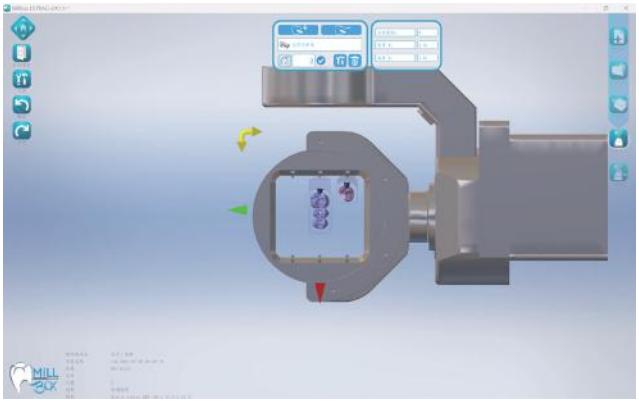
Part IV Working Steps

5 Make a Cervical Margin

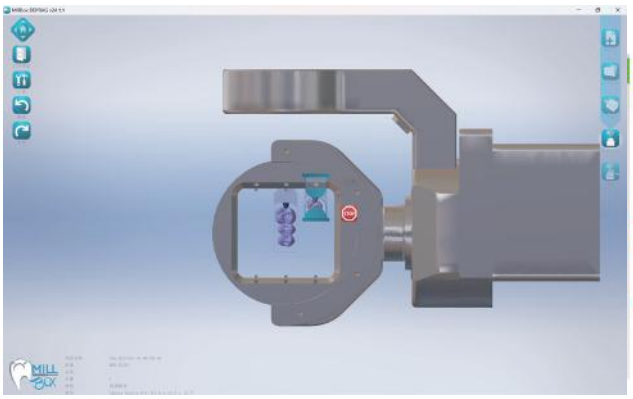


6 Add a Connector

Add a connector to the proper restoration protrusion and its diameter can be adjusted according to the restoration size, ranging from 2.0 to 3.0 mm in dia. The connector should not be too close to the cervical edge and should avoid the mesial/distal contact area as much as possible.



7 Calculation



Part IV Working Steps

Milling

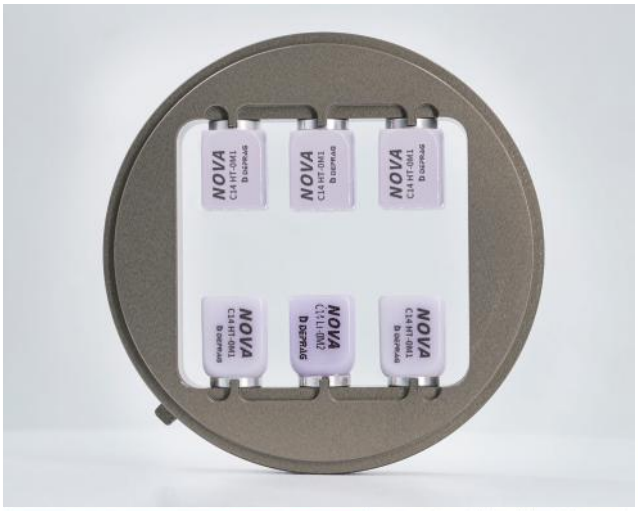
Check Milling Machine

-Regularly calibrate, clean, lubricate and maintain the milling machine to ensure that there is no wobbling or rattling when milling, and accessories should be replaced in a timely manner upon going wrong number

-Keep a record of the milling number of the bur and once going beyond its service life, it is not allowed to use anymore

-Ensure the milling burs are fixed in correct sequence.

-Ensure that the concentration and the level of the milling fluid are up to the required standard, and that it can be sprayed completely to the cusp of the milling bur.



Cautions

-When fixing the ceramic block, be sure to check that its holder is in place, otherwise inaccurate milling data will occur.

-Keep the air pressure up inside the milling machine.

Part IV Working Steps

Grinding

Check Grinding Tools

·It is a must to use the special grinding tools for glass ceramic blocks.
It is vital to use the correct grinding tools to grind and adjust the restorations. if not so, then edge grinding marks, or overheating will occur,

·Handpieces should be used in a stable and non-vibrating working conditions.

·A clean soft towel or sponge pad needs to be placed on the table to avoid hidden cracks or breakages from falling restorations.

Working Steps:

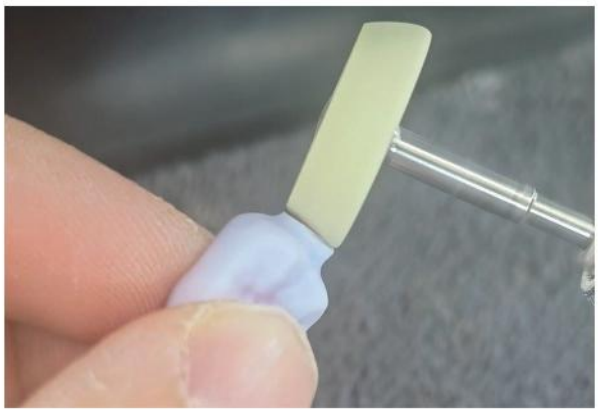
Separate Restorations:

·Separate the restoration using a diamond disc: the disc should be close to the holder side upon milling while eschewing the edge of the restoration to avoid any damage to it.

·Remove the Connector: Prior to grinding, apply an appropriate amount of water to the grinding areas, to avoid the restoration surface from overheating.

Part IV Working Steps

- **When the milling machine is in good working condition, the restorations are milled with a lustrous , smooth surface and no need to make any adjustment, Upon the completion of the removal of connectors and smoothing out the attachment points, the restorations can be put into firing directly. If any adjustment is needed, please refer to the grinding methods below.**



Firstly Rough Grinding

It is adopted upon making try-ins, adjusting proximities, occlusal surfaces, entire surfaces, and grinding connectors.

Grind from the right to the left so that the grain is fine and regular. It is more efficient to grind in the correct direction, while grinding in the opposite direction is less efficient and increases wear on the grinding head.

Prepare some cooling water and apply it to the grinding area with your one finger every 3 times of grindings. Usually the restoration surface temperature will not exceed 60°C for three times of point grindings, and it can be reused after the water has cooled down to ensure that its temperature does not exceed 60°C.

The contact time between the grinding head and the restoration should not exceed 1 second each time to avoid local overheating or stress concentration. Continuous grinding at various areas and it is not allowed to have continuous grinding in the same area.

Cautions

·Rough Grinding RPM:

·Excessive pressure is not allowed during grinding.

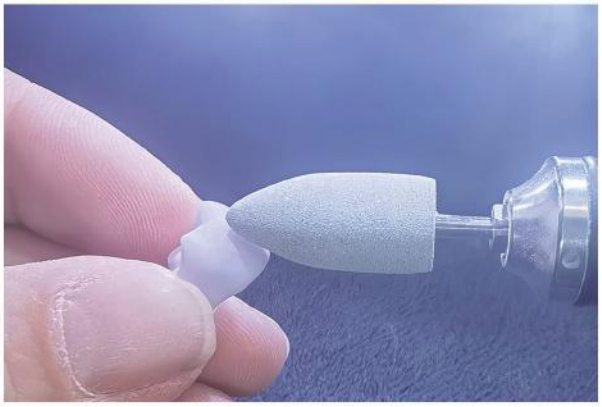
·Not allowed to make continuous grinding in the same area to prevent the excessive heating from causing hidden cracks or breakages.

·Do not use a rough grinding head to grind the cervical margin.

Part IV Working Steps

Secondly Pre-Polishing

Following the rough grinding to make the restoration grain neat, homogeneous and fine. As with the rough grinding, the entire surface should be polished from the right to the left.



Cautions

·Pre-polishing RPM:

·Polishing is a must upon the grinding completion of the CAD/CAM glass ceramic restoration, otherwise white spots, white haze, opacity, and low saturation will occur, affecting the aesthetic effects.

·Excessive pressure is not allowed.

·Don't grind in the same area long time, otherwise the overheat will occur.

Thirdly High Gloss Polishing

Smoother and more delicate surfaces enhance the overall effect.

As with pre-polishing, do it from the right to the left.

Cautions:

·High Gloss RPM:

·Polishing is a must upon the grinding completion of the CAD/CAM glass ceramic restoration, otherwise white spots, white haze, opacity, and low saturation will occur, affecting the aesthetic effects.

·Polish the restoration surface with the revolutions of polishing tool, but without downward pressure.

·The surface should not be made extremely smooth. Polish it to matte brightness with a low revolution and gentle pressure.

Fourthly Try-in

Cautions:Be sure to seat them accurately and bite gently when making a try-in to avoid any possible hidden cracks or breakages.

Crystallization and Stain/Glaze Firing

- The restoration is in “light purple” prior to crystallization, and after that, it will display the natural teeth color.

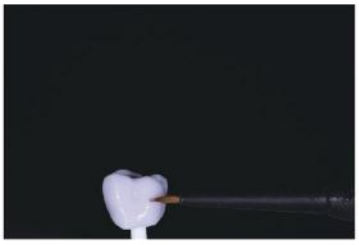
Two Options in Total:

Option 1: Crystallization and Stain/Glaze Firing in One Step

1) Clean: Please clean the restoration thoroughly with steam or ultrasonic oscillating cleaner.

2) Dry the restoration.

3) Fully fill the sharp areas of the restoration with fix putty, but don’t touch the restoration surface, if so, it will generate the chemical reaction with the glaze to cause the dense bubbles on the glaze layer.



4) Apply an appropriate amount of clear glaze by glazing pen evenly to the surface of the restoration. The maxillofacial surface can be darkened with clay color and the fissure area with brown color.

Option 2 Customized Staining After Crystallization

1) After cleaning the polished/grind prosthesis, place it directly on a honeycomb tray and use a matching temperature program for crystallization

2) Apply glaze/dye evenly on the surface ofthe crystallized prosthesis and place it on a honeycomb tray for glazing and sintering.

Crystallization Curve

CRYSTALLIZATION CURVE

Two-Stage Crystallization	Stand-by Temp	Drying Time	Heating Rate	Firing Temp	Holding Time	Heating Rate	Firing Temp	Holding Time	Opening Temp
	403°C	2min	90°C/min	830°C	10s	30°C/min	850°C	7min	650°C

Exception handling

Problem description	Solution
1 . Slight deformation and shrinkage of the edges occur after sintering.	> Used in conjunction with sintered paste.
2 . Whitening after sintering, high crystallization amount .	> Calibrate furnace temperature. > The crystallization temperature is too high,decrease 5 °C each time .
3 .After sintering, it turns gray and turns blue.	> Calibrate furnace temperature. > The crystallization temperature is too low, increase 5 °C each time.
4 . Porcelain block off handle.	> Contact sales and service personnel for replacement.
5 . Cracks after glazing and sintering.	> Avoid accelerated cooling, such as direct air blowing problems from air conditioning fans. > Glaze and a small amount of porcelain can be used with high-temperature cotton.
6 .Chips and pieces appear on the edges during cutting.	> Check the wear and tear of the bur. > The cutting fluid has not been replaced for a long time or is insufficient. It is recommended to replace it with new cutting fluid. > If this happens frequently in the same batch, please contact sales service personnel.

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