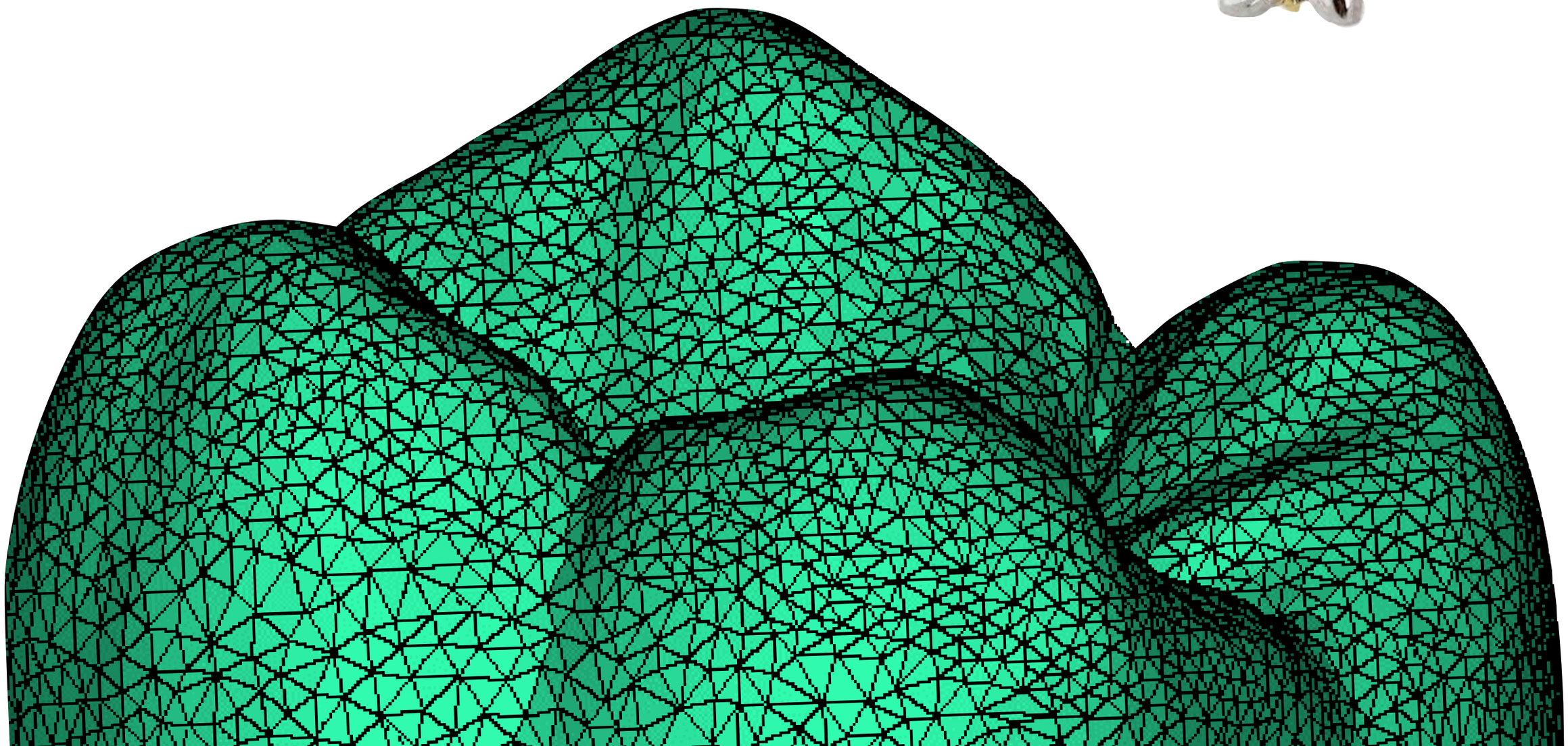
Digital Workflows with Area Dental Laboratories

AUG 2019



Fully-Digital Products from the ADL

1

Single Implant Restorations

2

CEREC Designed Crowns

3

Milled Nightguards

4

Printed Models

5

Printed Surgical Guides

6

Milled Wax Patterns

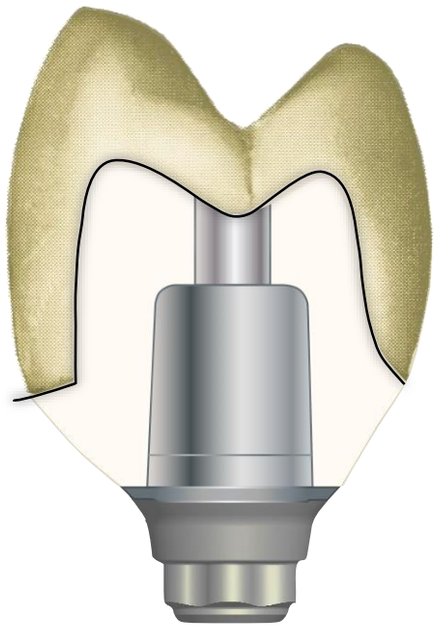
1

Single Implant Restorations

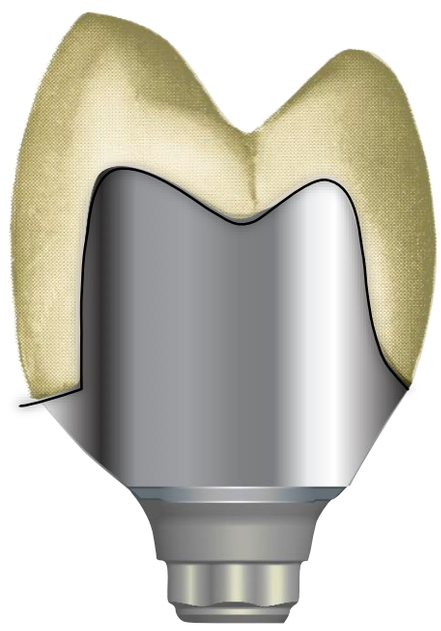
- Export STL scan files from Omnicam

Include: Upper Jaw, Lower Jaw, and Scanbody STL files.

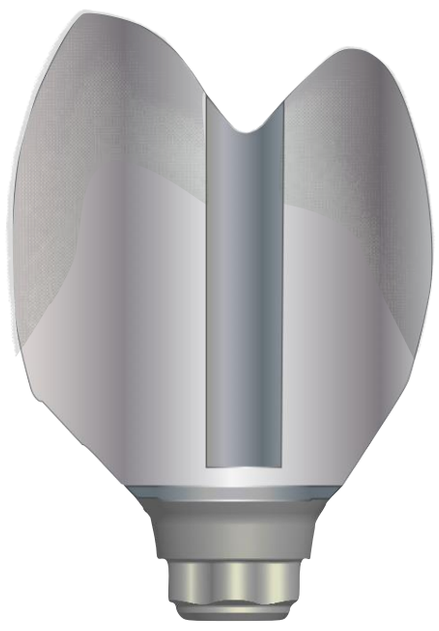
- Use implant scan body, available from Imagine or Sirona.
- Include the implant type/diameter on the DD2322.
- The Ti-base and abutment will be cemented by the ADL.
  - Exception: Screw-Retained Zirconia restorations cannot be cemented from all-digital workflow without a cast for indexing. These will corne un-cemmented from the ADL.



Zirconia Custom Abutment with Ti-base



Titanium Custom Abutment

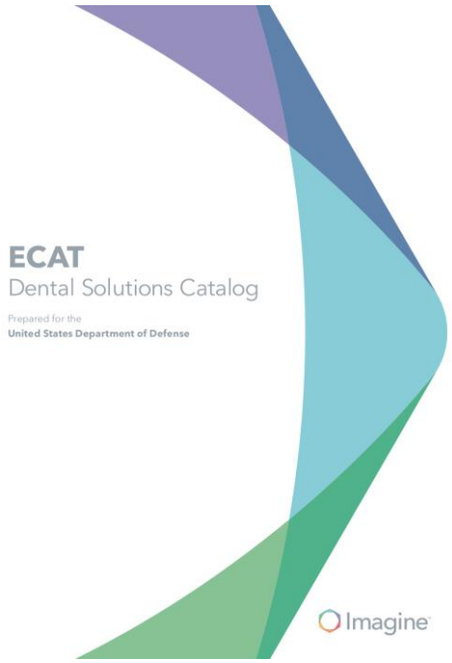


Titanium Screw-Retained Crown

Navy Scan Body Options

Sirona
Scan Post and Scan Cap

Imagine
MIST Scan body



Imagine ECAT Catalog
imaginedod.com

ECAT
Part Numbers

3IC = Certain
NBR = Tri-lobe

SBNBR35	**MIST IC Scan Body NBR 3.5**	$25.52
SBNBR43	**MIST IC Scan Body NBR 4.3**	$25.52
SBNBR50	**MIST IC Scan Body NBR 5.0**	$25.52
SBNBR60	**MIST IC Scan Body NBR 6.0**	$25.52
SB3IC34	**MIST IC Scan Body 3IC 3.4**	$25.52
SB3IC456	**MIST IC Scan Body 3IC 4.1/5.0/6.0**	$25.52

Sirona Scan Post
and Cap
Information

Not on ECAT
Credit Card Purchase from
Sirona.

Manufacturer / Implant	Implant Diameter	Platform	ScanPost	REF	Connection
Nobel Biocare					
Replace	3,5	NP	ScanPost NB RS 3.5 L	6430933	L
(Tri-channel inner connection)	4,3	RP	ScanPost NB RS 4.3 L	6430941	L
	5	WP	ScanPost NB RS 5.0 L	6430958	L
	6	6.0	ScanPost NB RS 6.0 L	6430982	L
Certain®	3,4	3.4	ScanPost B C 3.4 S	6431212	S
(Inner connection)	4,1	4.1	ScanPost B C 4.1 L	6431220	L
	5	5.0	ScanPost B C 5.0 L	6431238	L

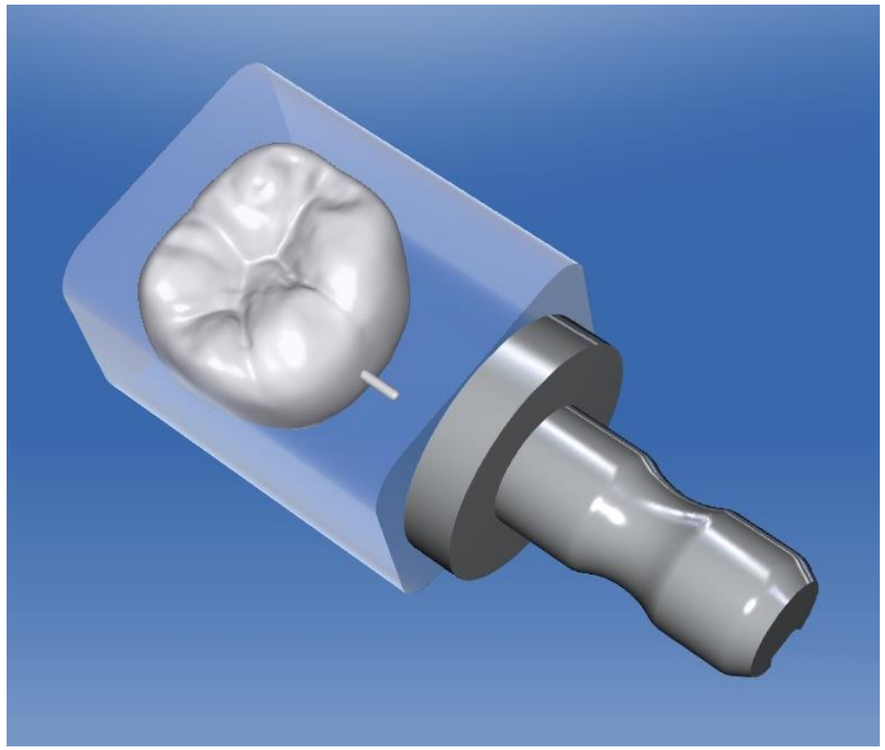
2

CEREC
Designed Crowns

- Follow normal CEREC scan and design sequence.
- Use published parameters for lab manufactured crowns.
- Send the completed restoration STL and the DD2322.
- Restoration cannot be altered by the ADL, simply milled.
- Proximal contacts may need to be heavier for gold crowns to allow for polishing process. Dial in your preferences.

6

Milled Wax Patterns



ADL Materials for CEREC Crown / Patterns

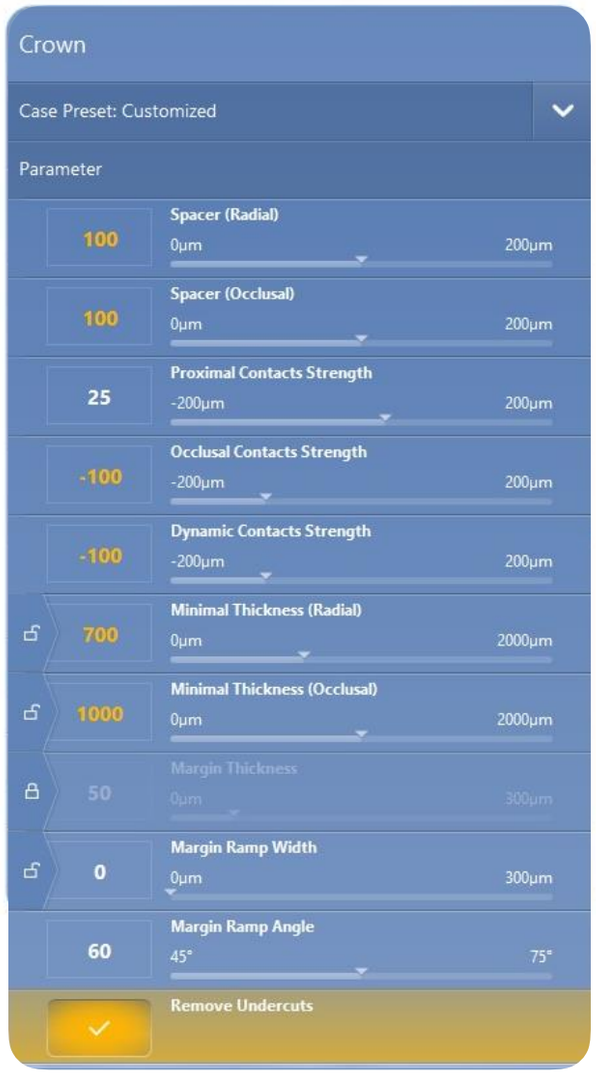
High-Strength Zirconia
Translucent Zirconia
Gradient High-Translucency Zirconia

Milled wax for casting / pressing

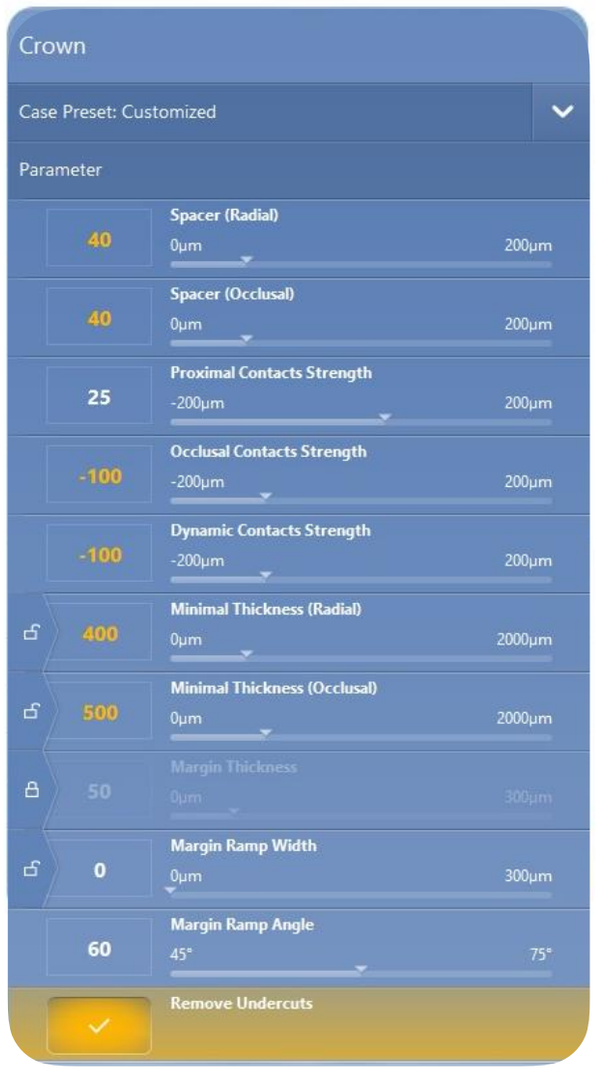
High Noble Gold Crown

CEREC Prescription and Parameters by Material/Milling Machine

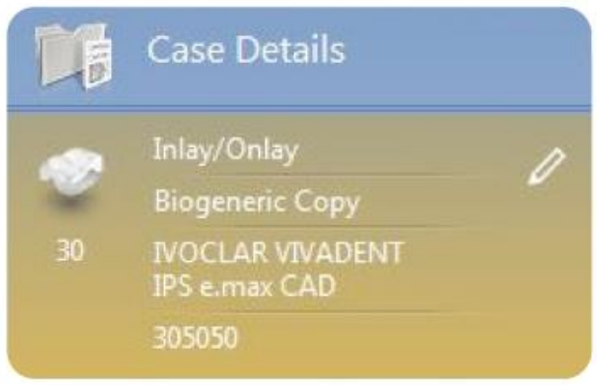
Glass Ceramic Crown MCXL

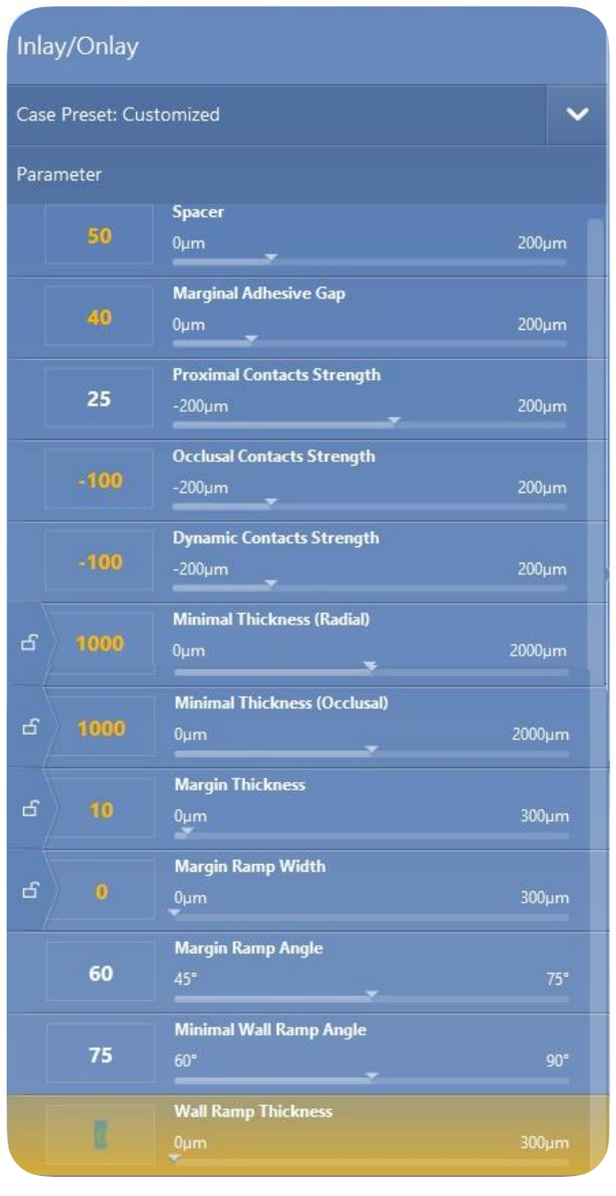


Wax Pattern, Zirconia or Strategy Milling Lab Crown

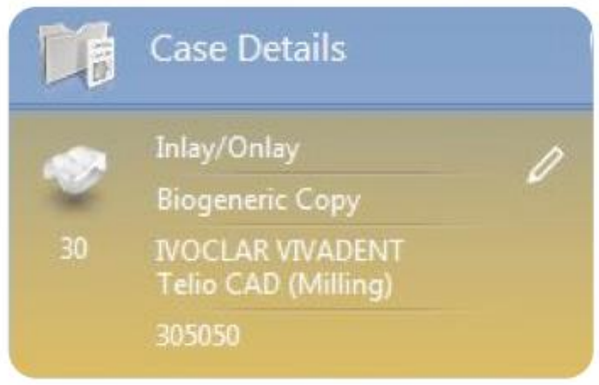


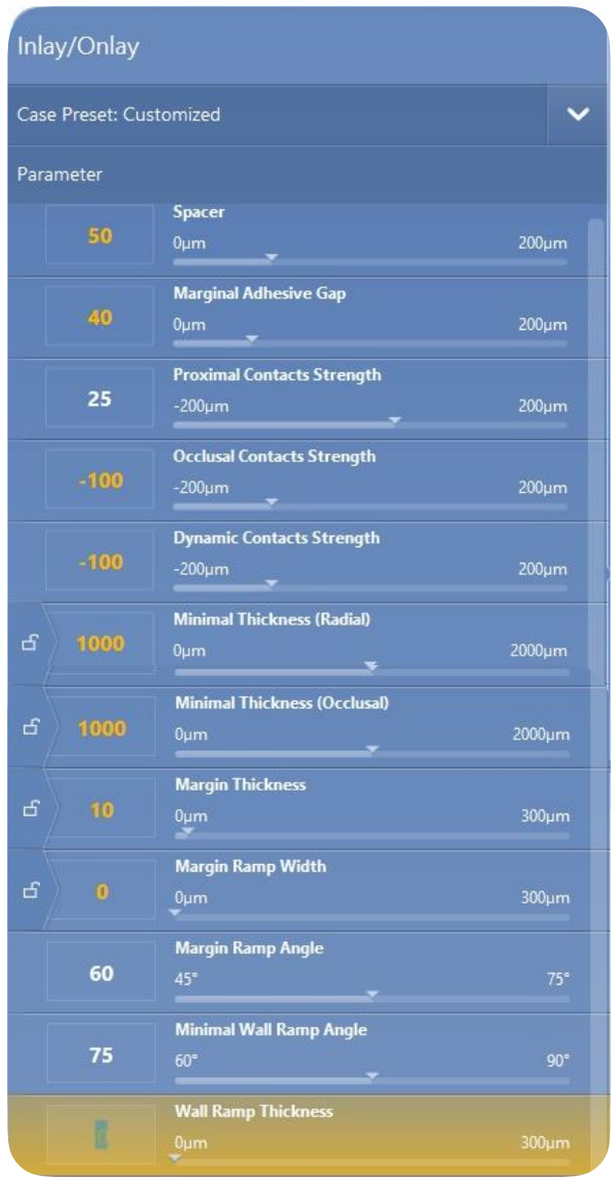
Glass Ceramic Inlay/Onlay MCXL





Gold Inlay/Onlay Strategy Milling





3

Milled Nightguards

Currently, submit only to Norfolk ADL

3

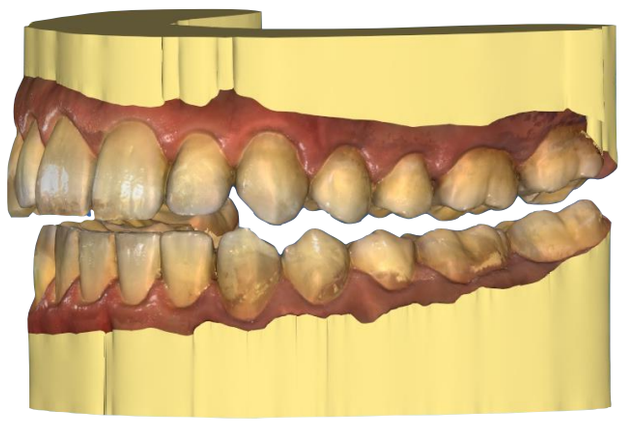
Milled Nightguards

- Intraoral Scan must be made using CEREC Ortho 1.2
- Scan patient in centric relation position, with anterior jig to position mandible at the occlusal vertical dimension that represents the desired nightguard thickness.
- Maxillary scan must be thorough for maxillary nightguard, opposing arch can be missing some areas of data.

Milled from Clear PMMA puck for passive fit.

Leaf gauge in place for buccal scan
Opening = Nightguard Thickness

CEREC Ortho Output



4

Printed Models

5

Printed Surgical Guides

- Intraoral Scan must be made using CEREC Ortho 1.2 for an accurate model
- You may request a digital wax-up and 3D-PDF review prior to printing
- Surgical guides need to have been exported from Blue Sky Bio (BSB) for printing at the ADL.
  - Your command should also supply the guide tubes.
  - You can elect to dial-in your guide tube resin diameter to match exactly your Sx guide spoons, and potentially eliminate the need for metal guide tubes.

Technical Instructions for ADL Workflows

1. Export of Jaw Scans
2. Export of CEREC-Designed Restorations
3. Digital Submission of Cases with SAFE site

Exporting CEREC files for use at the Area Dental Lab

Provided by Sirona to every Navy Dental Clinic with CEREC machines.

CEREC

Start Screen | Save | Save As... | Import | Export | Run Application... | Sirona Connect | License Manager | Configuration | Window Mode | Help | Exit CEREC

ADMINISTRATION | ACQUISITION | MODEL | MANUFACTURE | CEREC

License Manager

Search Patient Database | Show All Patients | Add New Patient

Patient Database

CEREC

ADMINISTRATION | ACQUISITION | MODEL | DESIGN | MANUFACTURE | CEREC

License Manager V4.4.0.138073

Introduction | Internet Connection | USB License Drive | License Key | Activation | Status

Status

Component	Unit Counter	Expiration Date
CEREC Ortho SW 1.1	0	
CEREC Ortho SW 1.2	0	
CEREC Premium CAM SW 4.4	0	
CEREC Premium SW 4.4	0	
CEREC Premium SW 4.5	0	
CEREC SW 4.0	0	
CEREC SW 4.4	0	
CEREC SW 4.5	0	

USB License Drive

3-4015571

Firmware Update

Dropdown for licenses

Search Patient Database | Show All Patients | Add New Patient

Patient Database

License Manager V4.4.0.138073

Introduction | Internet Connection | USB License Drive | License Key | Activation | Status

Status

Component
inLab SW CAM 18
inLab SW Demo
Open CEREC
Open GALILEOS Implant
Open Scan Export
Sirona CAM
Sirona Connect SW 4

These license components will be present on every updated CEREC license for export. (CEREC SW 4.5 and 4.6)

USB License Drive

3-4015571

Firmware Update

Check USB

CEREC File Types

RST - Conventional CEREC file, contains all acquisition images and has large file size. Not directly compatible with Sirona Lab systems.

DXD - Condensed CEREC file, contains only finalized models (no color) and none of the design sequence.

STL - Generic file type that can be utilized by any open source design/planning software. This file type can be used to export models and completed restorations. This file type can be read used by Area Dental Labs.

ORTHO - The CEREC Ortho SW file type, similar to a DXD. This file type can only be opened by CEREC Ortho SW. It does not contain the original acquisition images.

Final Note regarding CEREC Exports:

There is no easy way to mark a margin in CEREC and pass this onto the dental lab.

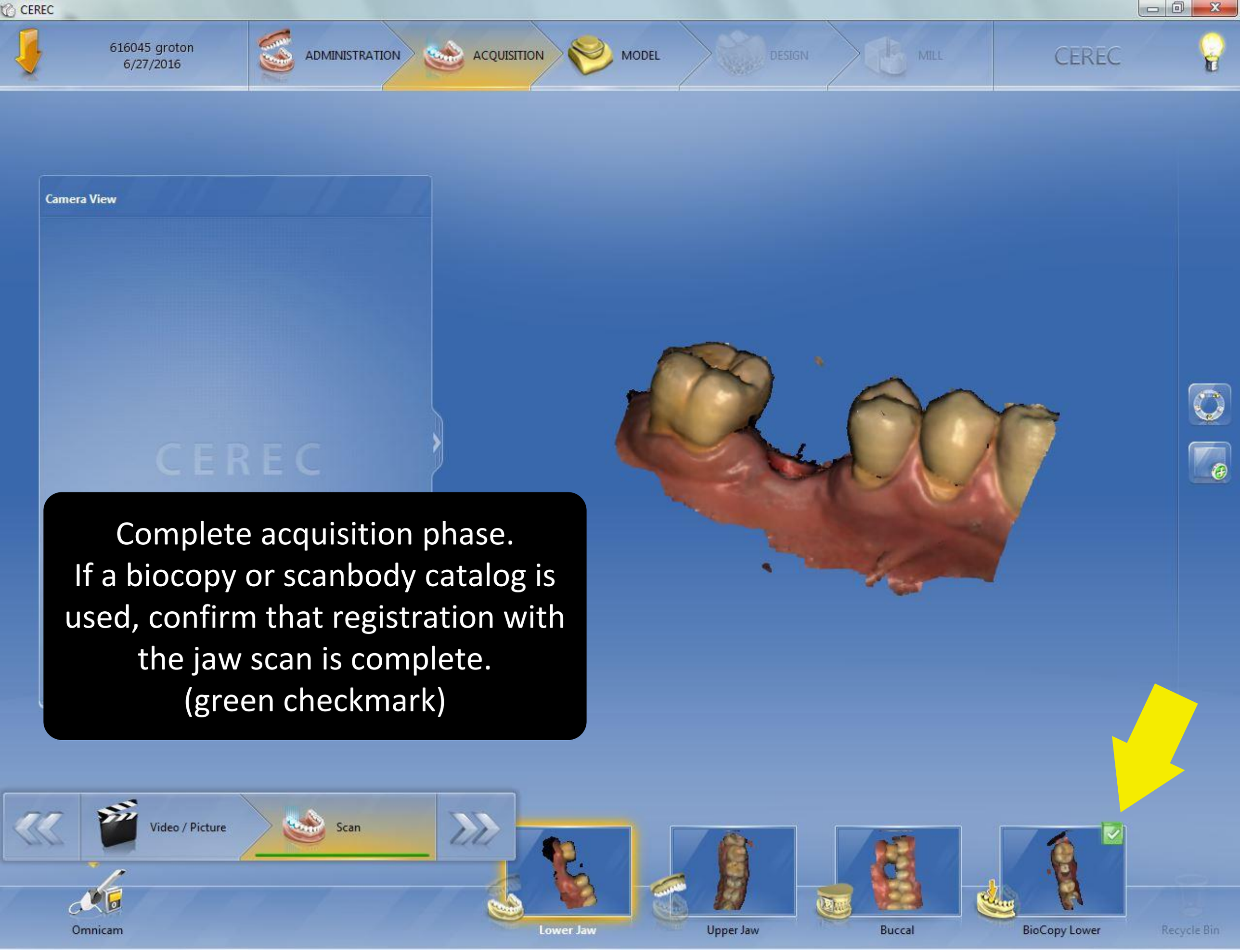
This can only be done by exporting an “.RST file” which is a large file and can only be read by CEREC software. Army and USAF ADLs use this file type for CEREC digital submissions.

Most Area Dental Labs do not have CEREC software. Please check with the lab you are submitting a case to if this is an important feature for you.

Exporting Jaw Scans from CEREC 4.6 SW

Initial Step:
Completing the CEREC Prescription

When anticipating the export of jaw scans to Exocad, there is no required restoration prescription for the initial CEREC screen. Simply skip directly to acquisition.


CEREC
616045 groton
6/27/2016
ADMINISTRATION
ACQUISITION
MODEL
DESIGN
MILL
CEREC
Camera View
CEREC
Complete acquisition phase.
If a biocopy or scanbody catalog is used, confirm that registration with the jaw scan is complete.
(green checkmark)
Video / Picture
Scan
Omnicam
Lower Jaw
Upper Jaw
Buccal
BioCopy Lower
Recycle Bin

CEREC
616045 groton
6/27/2016
ADMINISTRATION
ACQUISITION
MODEL
DESIGN
MILL
CEREC
View Options
Global
Local
Analyzing Tools
Model
Contacts
Color Model
Model Box
Confirm occlusal contact points and intensity are appropriate.
Acquisition
Edit Model
Manual corre-
lation
Buccal Bite
Registration
Set Model Axis
Full Model
30

CEREC

616045 groton
6/27/2016

ADMINISTRATION | ACQUISITION | MODEL | DESIGN | MILL | CEREC

Display Objects

Upper Jaw 100 %

Lower Jaw 100 %

Lower BioCopy 100 %

Trimmed Model

Display opposing jaw to confirm correct position.

Trim Area | Draw Margin | Define Insertion Axis | Preparation Analysis | Design

Full Model

30

616045 groton
6/27/2016
ADMINISTRATION
ACQUISITION
MODEL
DESIGN
MILL
CEREC
Tools
Set Model Axis
Display Objects
Upper Jaw
50 %
Lower Jaw
100 %
Lower BioCopy
100 %
Once you reach model axis, you can export the jaw scans.
Acquisition
Edit Model
Manual corre-lation
Buccal Bite Registration
Set Model Axis
Ok
Cancel

CEREC
616045 groton
6/27/2016
ADMINISTRATION
ACQUISITION
MODEL
DESIGN
MILL
CEREC
Display Objects
Upper Jaw
100 %
Lower Jaw
100 %
Lower BioCopy
100 %
Trimmed Model
If creating an implant restoration in Exocad, image the implant scan body in the Scanbody upper/lower catalog (as appropriate.)
Trim Area
Draw Margin
Define Insertion Axis
Preparation Analysis
Design
Full Model
30

Another view of the scanbody image. Note that proximal contacts are not recorded. The only critical portion of this scan is the scan body and some of the neighboring teeth to register it to the jaw scan.

CEREC

616045 groton
6/27/2016

ADMINISTRATION | ACQUISITION | MODEL | DESIGN | MILL | CEREC

Display Objects

Upper Jaw 100 %

Lower Jaw 100 %

Lower BioCopy 100 %

Trimmed Model

Scanboday image turned off, revealing the jaw scan and the properly imaged proximal contact ares.

Trim Area | Draw Margin | Define Insertion Axis | Preparation Analysis | Design

Full Model

30

CEREC

Start Screen | Save | Save As... | Import | Export | Run Application... | Sirona Connect | License Manager | Configuration | Window Mode | Help | Exit CEREC

616045 groton
6/27/2016

ADMINISTRA | ACQUISITION | MODEL | DESIGN | MILL | CEREC

File export option in CEREC Menu

Lower Jaw 100 %

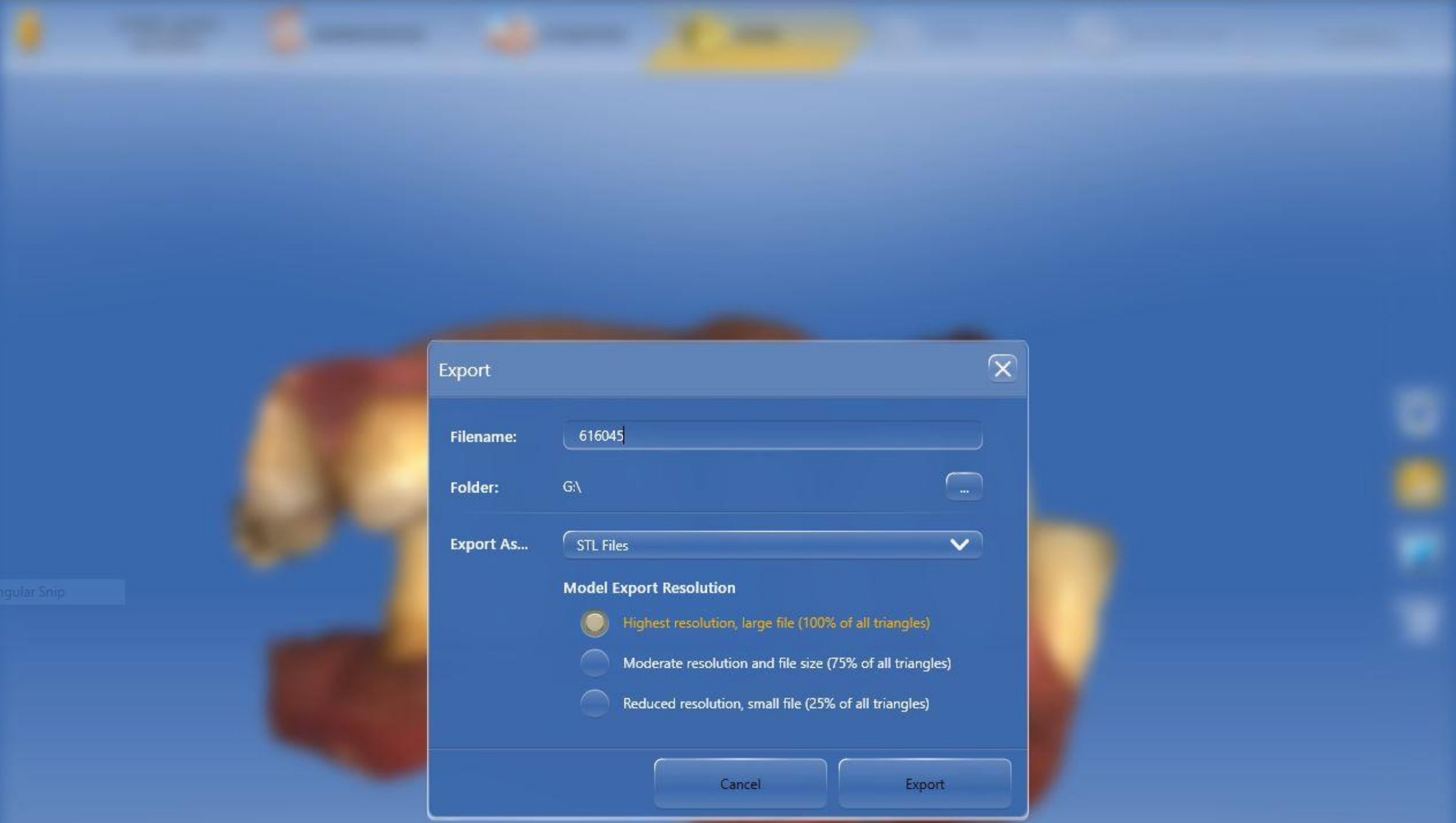
Lower BioCopy 100 %

Trimmed Model

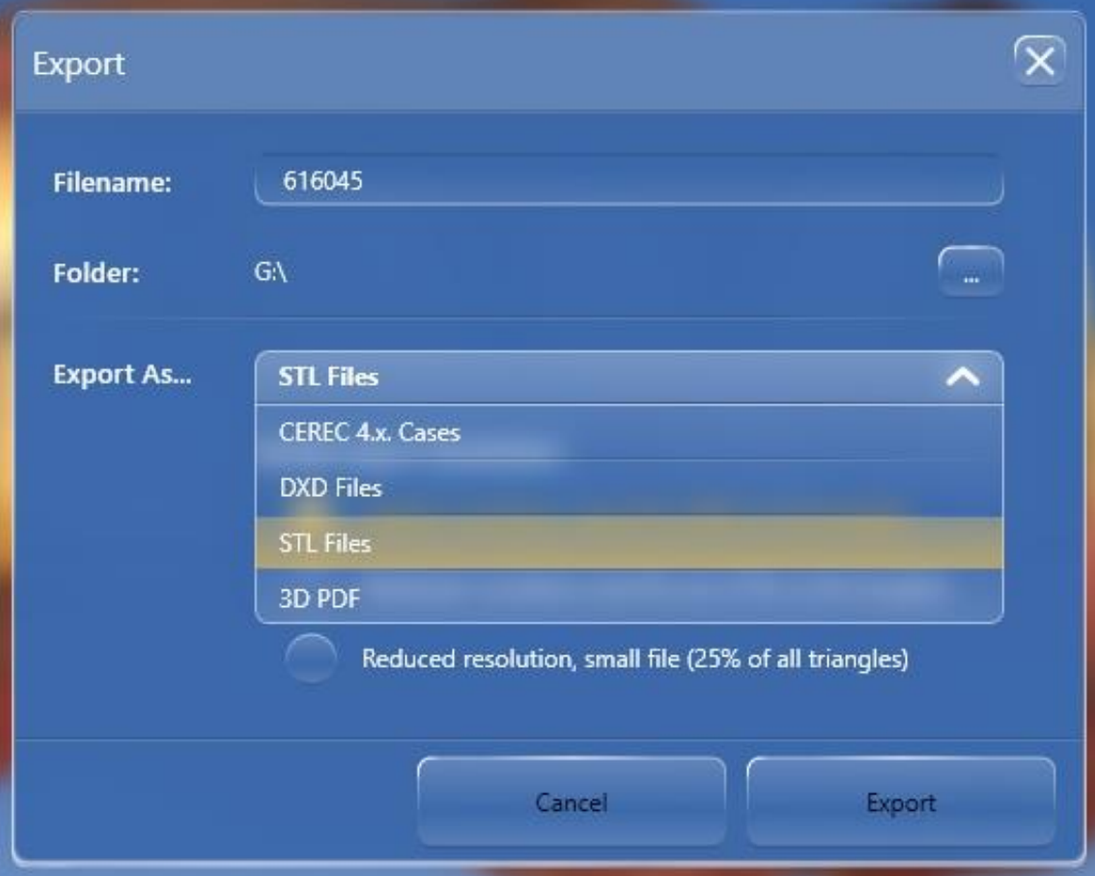
Trim Area | Draw Margin | Define Insertion Axis | Preparation Analysis | Design

Full Model

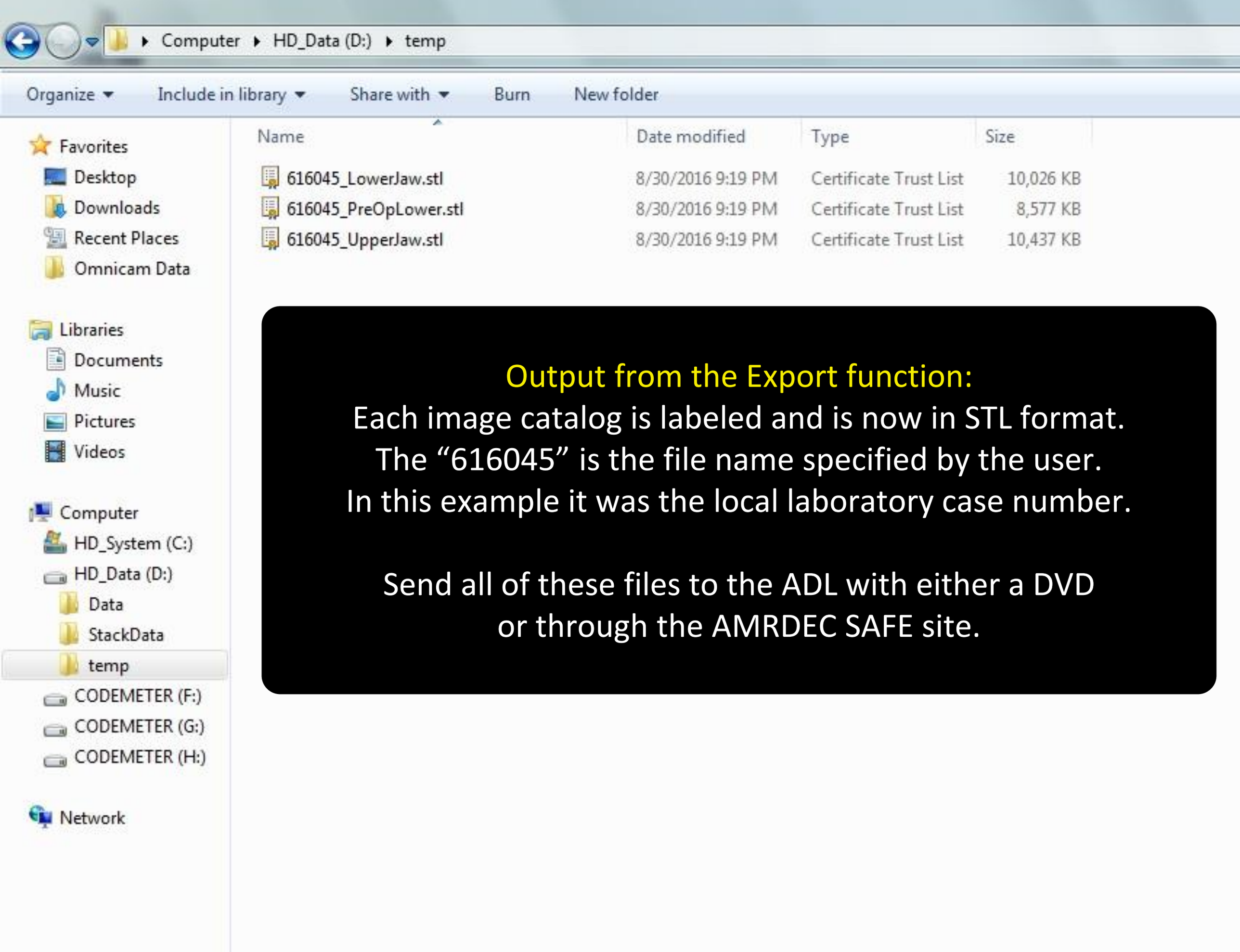
30



You have an option for the quality of the STL export.
Choose the highest resolution.



Export file options include CEREC 4.x Cases (.rst) and Open file format (.stl). If the STL option is not available, then your export license is not installed properly.


Computer ▸ HD_Data (D:) ▸ temp
Organize
Include in library
Share with
Burn
New folder
Favorites
Desktop
Downloads
Recent Places
Omnicam Data
Libraries
Documents
Music
Pictures
Videos
Computer
HD_System (C:)
HD_Data (D:)
Data
StackData
temp
CODEMETER (F:)
CODEMETER (G:)
CODEMETER (H:)
Network
Name
Date modified
Type
Size
616045_LowerJaw.stl
8/30/2016 9:19 PM
Certificate Trust List
10,026 KB
616045_PreOpLower.stl
8/30/2016 9:19 PM
Certificate Trust List
8,577 KB
616045_UpperJaw.stl
8/30/2016 9:19 PM
Certificate Trust List
10,437 KB
Output from the Export function:
Each image catalog is labeled and is now in STL format.
The “616045” is the file name specified by the user.
In this example it was the local laboratory case number.
Send all of these files to the ADL with either a DVD
or through the AMRDEC SAFE site.

Exporting a Designed Restoration from CEREC 4.6 SW

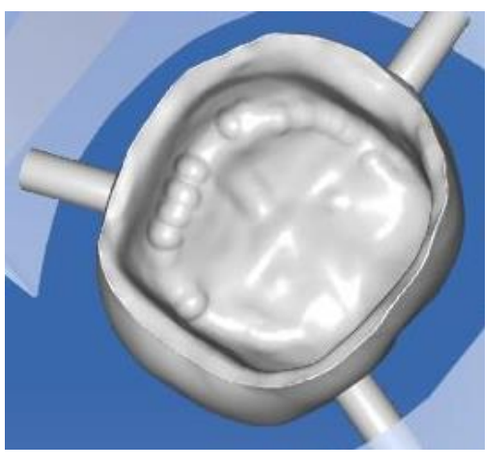
If you are using CEREC to send to the ADL for milling wax, zirconia, or emax on a 5-axis mill…

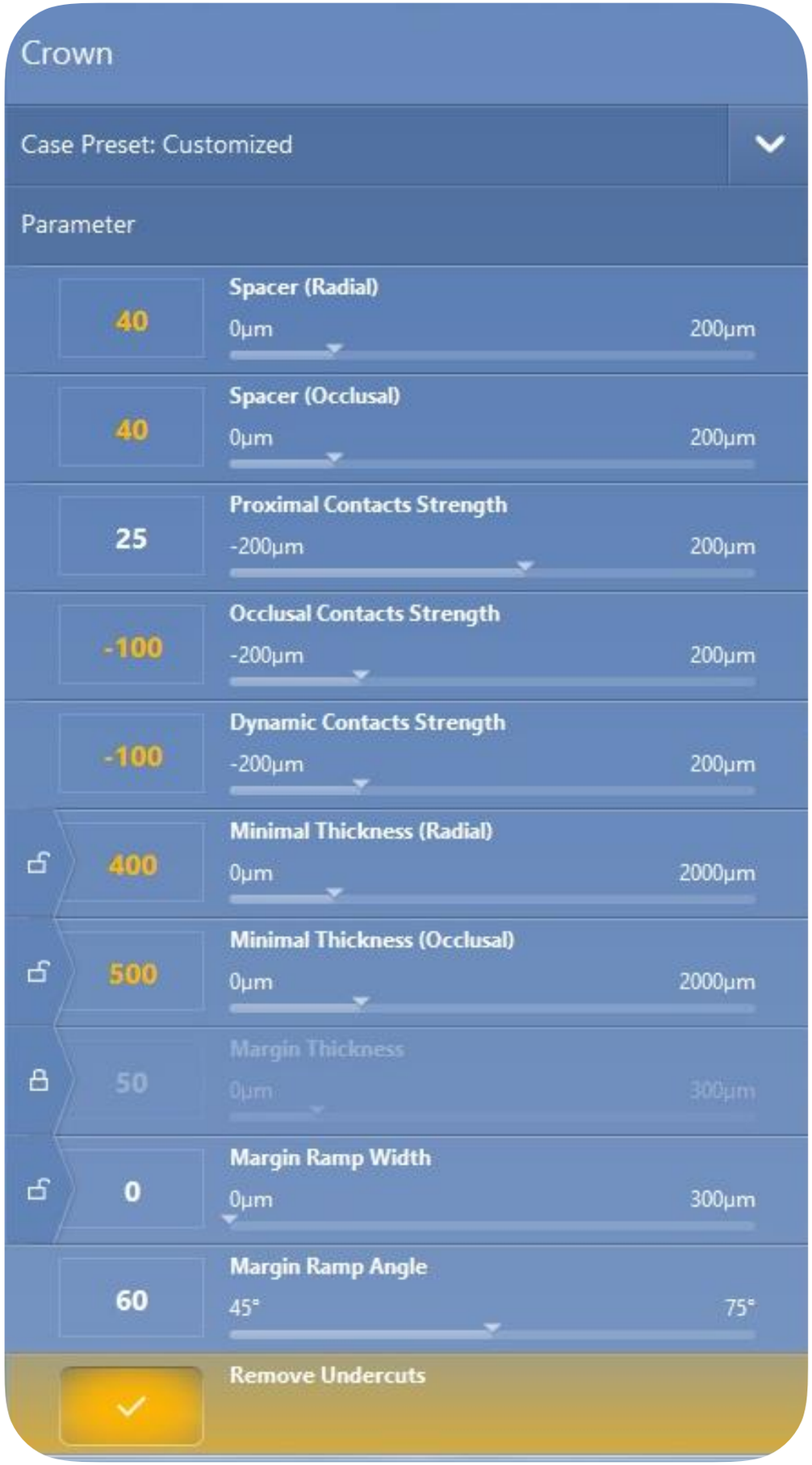
Use these TelioCAD milling parameters.

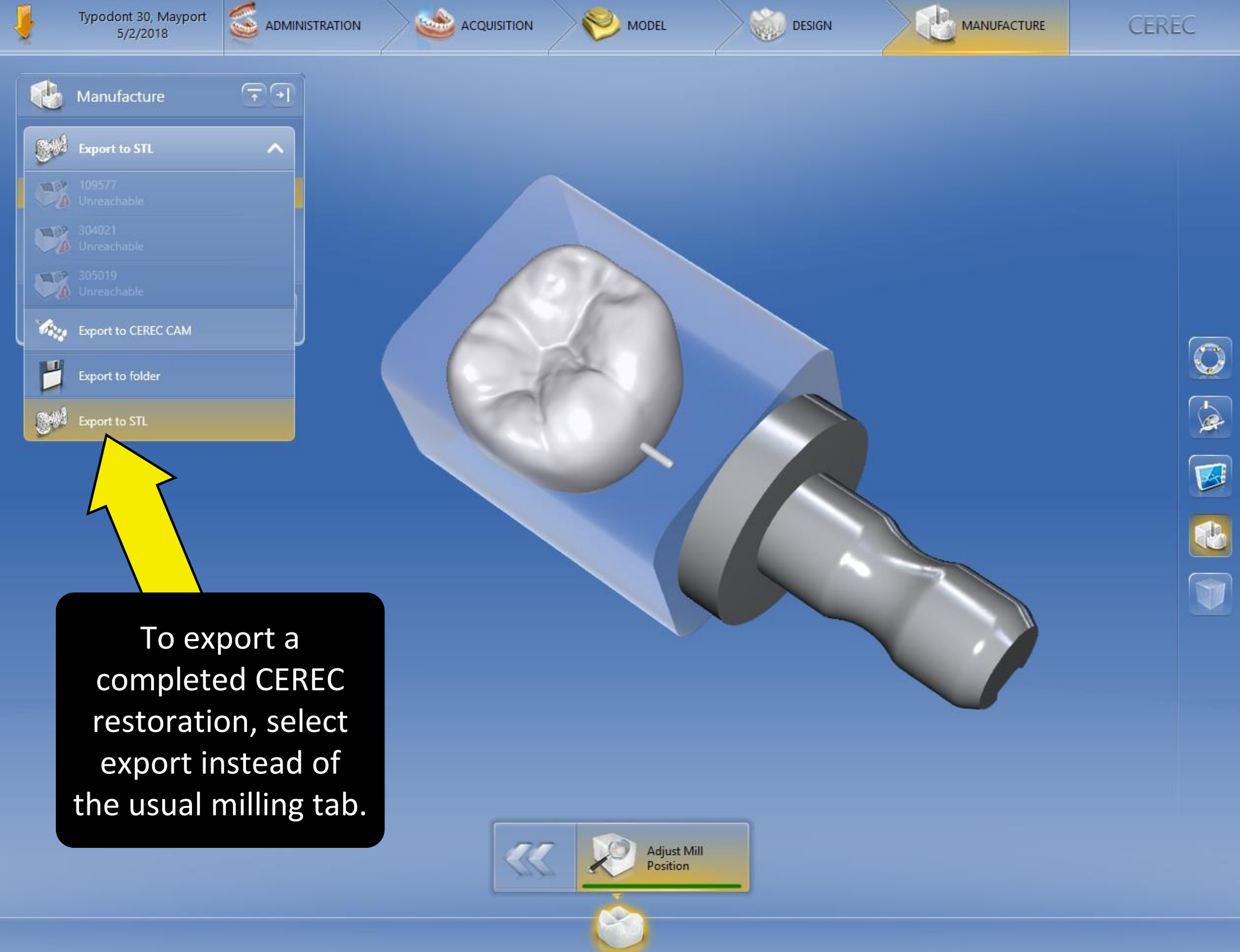
Why?

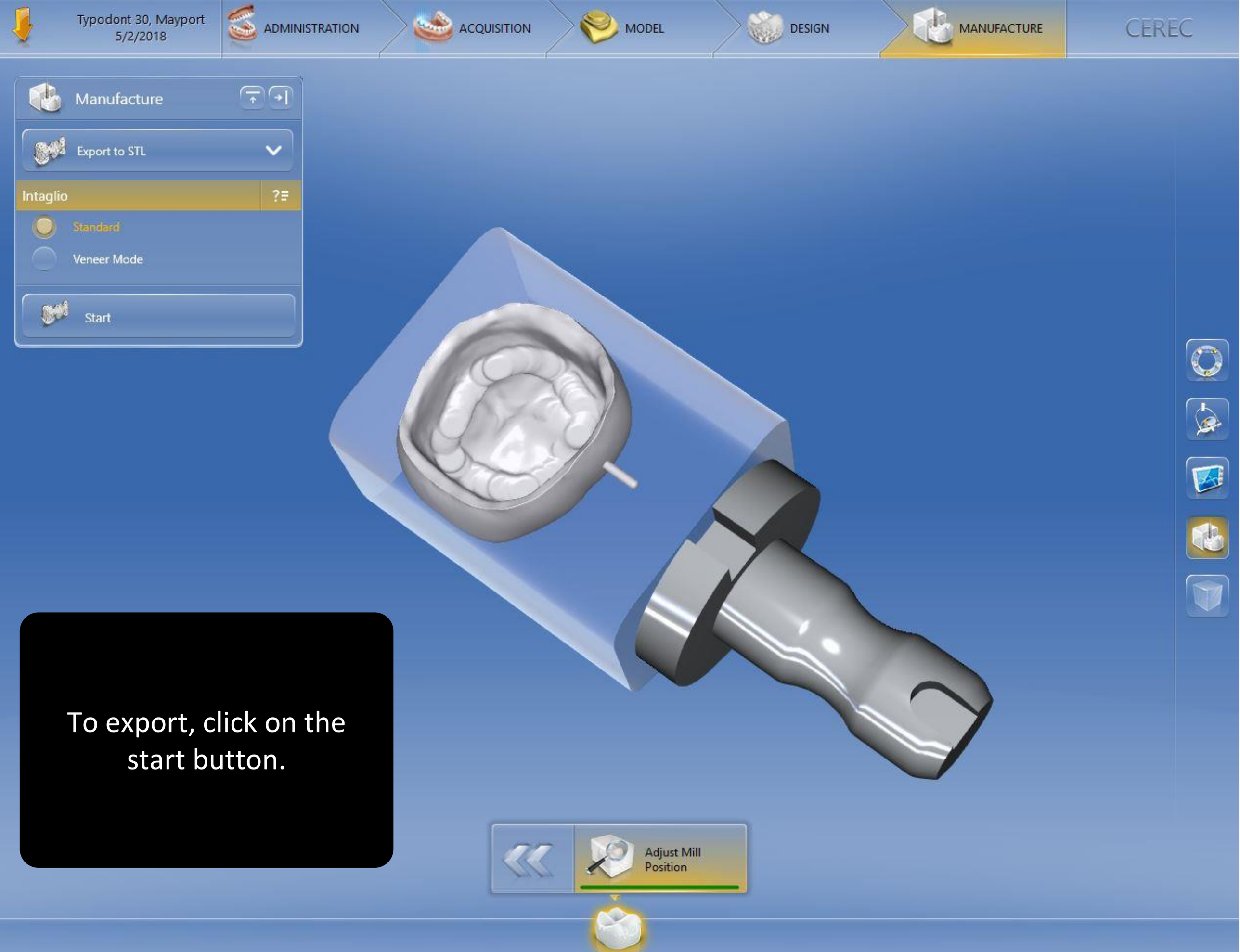
- Because the crown intaglio tool path is best for a 5-axis mill
- Because the occlusal anatomy proposal will be better.

VS



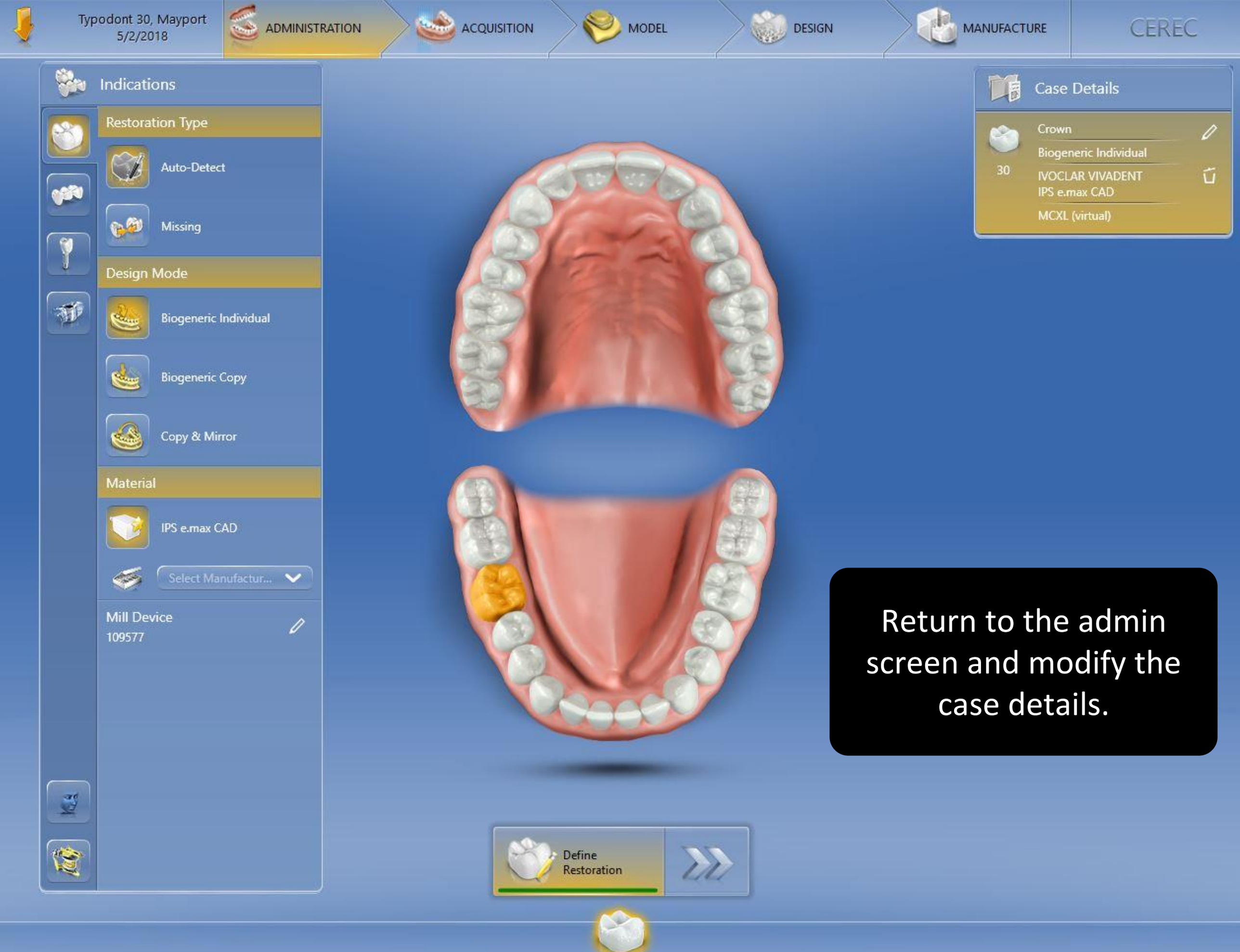


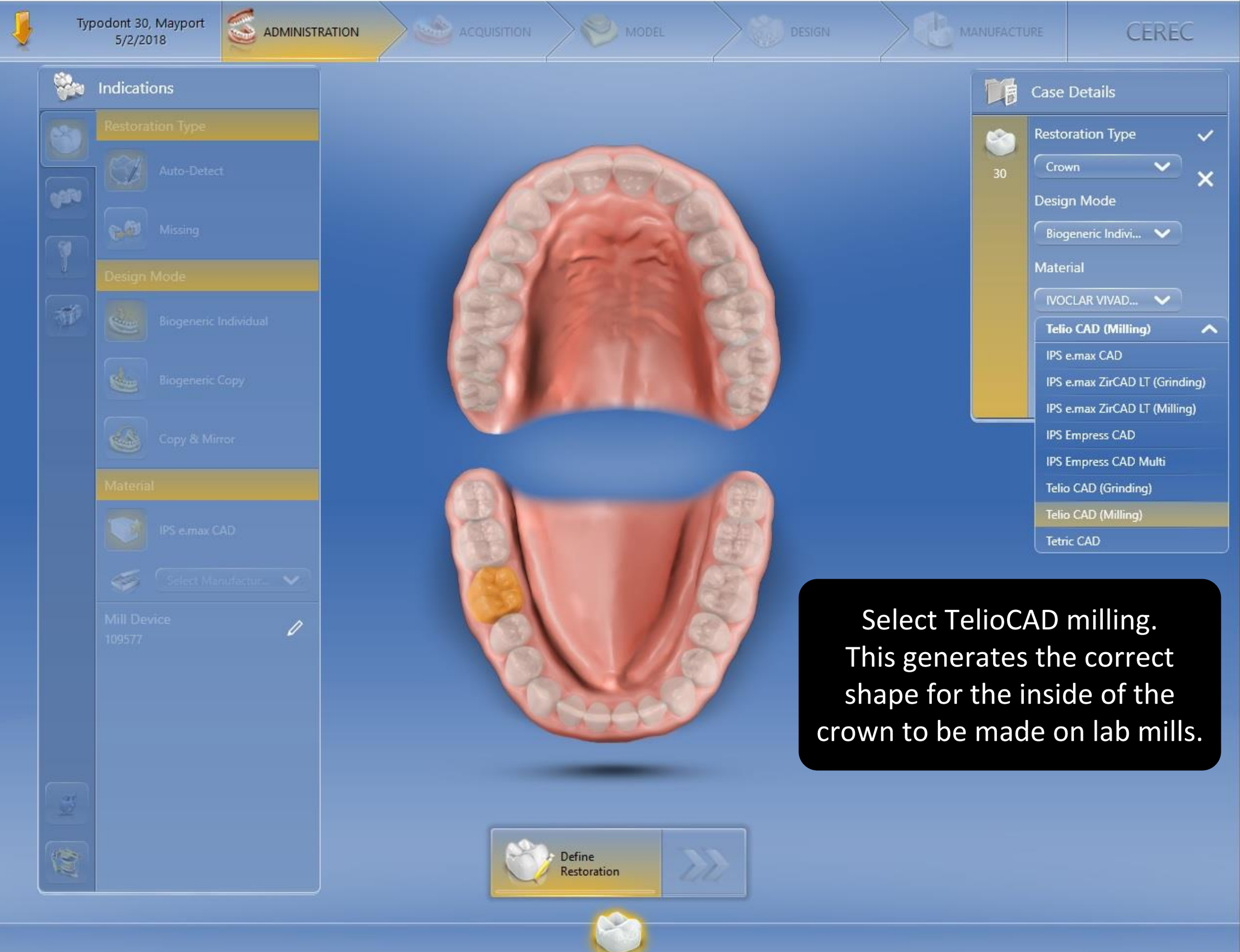

Typodont 30, Mayport
5/2/2018
ADMINISTRATION
ACQUISITION
MODEL
DESIGN
MANUFACTURE
CEREC
Manufacture
Export to STL
109577
Unreachable
304021
Unreachable
305019
Unreachable
Export to CEREC CAM
Export to folder
Export to STL
To export a completed CEREC restoration, select export instead of the usual milling tab.
Adjust Mill Position



To export, click on the start button.

Before exporting, confirm the inside of the restoration is suitable for milling on lab mills. Flat spots indicate the wrong material was selected for the original prescription.


Typodont 30, Mayport
5/2/2018
ADMINISTRATION
ACQUISITION
MODEL
DESIGN
MANUFACTURE
CEREC
Indications
Restoration Type
Auto-Detect
Missing
Design Mode
Biogeneric Individual
Biogeneric Copy
Copy & Mirror
Material
IPS e.max CAD
Select Manufactur...
Mill Device
109577
Case Details
Crown
Biogeneric Individual
30
IVOCLAR VIVADENT
IPS e.max CAD
MCXL (virtual)
Define
Restoration
Return to the admin screen and modify the case details.



Select TelioCAD milling.
This generates the correct shape for the inside of the crown to be made on lab mills.

Typodont 30, Mayport
5/2/2018

ADMINISTRATION | ACQUISITION | MODEL | DESIGN | MANUFACTURE | CEREC

Indications

Restoration Type

- Auto-Detect
- Missing

Design Mode

- Biogeneric Individual
- Biogeneric Copy
- Copy & Mirror

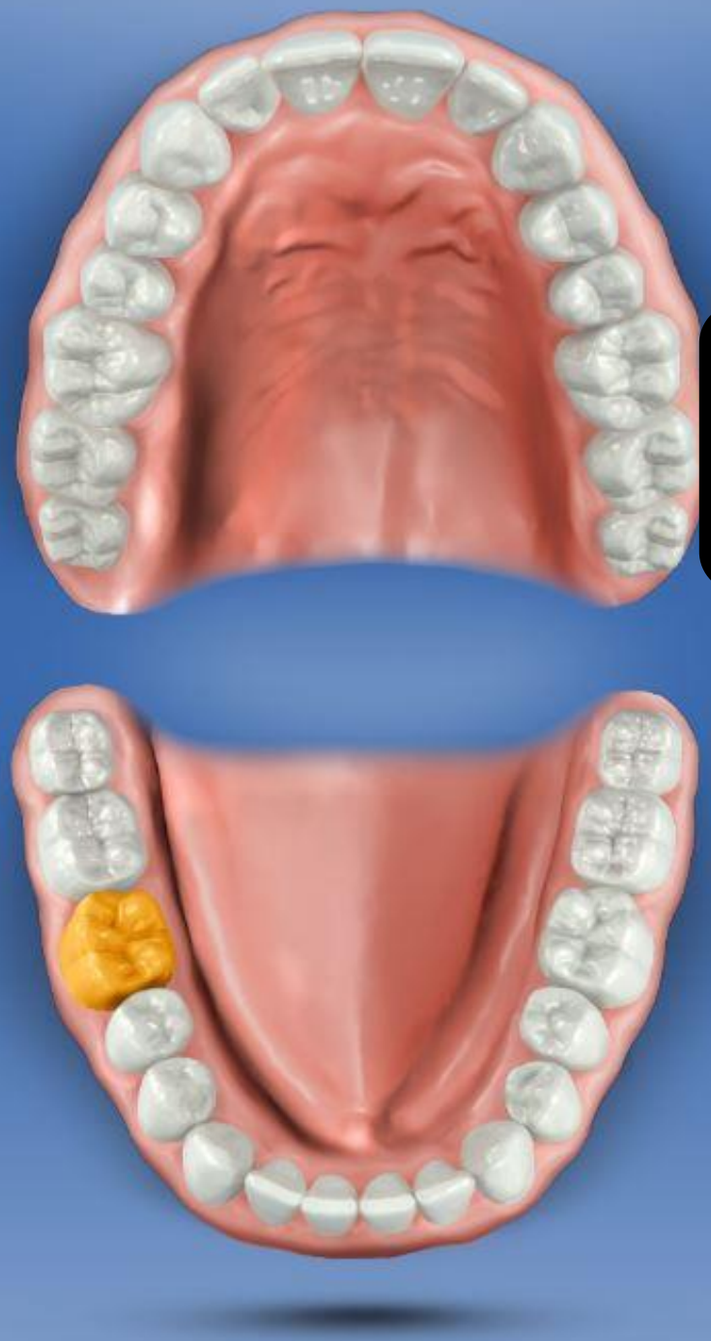
Material

- IPS e.max CAD
- Select Manufactur...

Mill Device
109577

Case Details

Crown
Biogeneric Individual
30
IVOCLAR VIVADENT
Telio CAD (Milling)
MCXL (virtual)



Completed Prescription.
Jump back to manufacturing.

Define Restoration

Notice the inside of the restoration has flat spots and had not changed. You need to make the CEREC software re-calculate the internal aspect.

Crown

Case Preset: Customized

Parameter

50	**Spacer (Radial)** 0µm 200µm
50	**Spacer (Occlusal)** 0µm 200µm
25	**Proximal Contacts Strength** -200µm 200µm
25	**Occlusal Contacts Strength** -200µm 200µm
25	**Dynamic Contacts Strength** -200µm 200µm
800	Minimal Thickness (Radial) 0µm 2000µm
1500	Minimal Thickness (Occlusal) 0µm 2000µm
50	Margin Thickness 0µm 300µm
0	**Margin Ramp Width** 0µm 300µm
60	**Margin Ramp Angle** 45° 75°
	Remove Undercuts

Return to design and select parameters. Change the cement spacer to make CEREC re-think the internal shape. Click OK.

Restoration Para-meters

Ok

Cancel

Typodont 30, Mayport
5/2/2018

ADMINISTRATION | ACQUISITION | MODEL | DESIGN | MANUFACTURE | CEREC

Manufacture

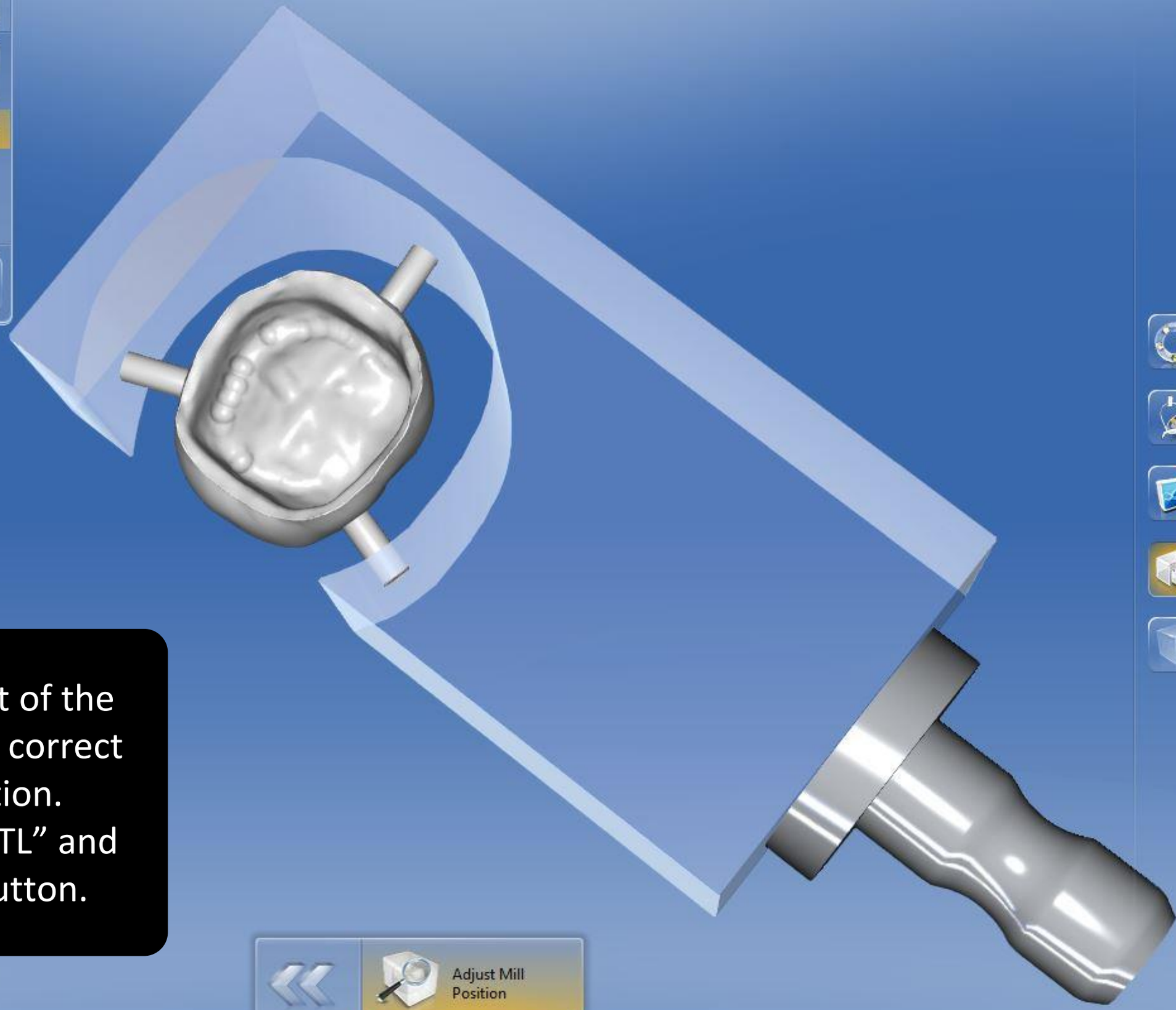
Export to STL

Intaglio

Standard

Veneer Mode

Start



Adjust Mill Position

The internal aspect of the crown now has the correct drill compensation.
Select “export to STL” and press the start button.

Export job element...

This PC › CODEMETER (F:)

Search CODEMETER (F:)

Organize | New folder

- This PC
- 3D Objects
- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- Windows (C:)
- Local Disk (D:)
- DVD RW Drive
- CODEMETER (F
- USB Drive (G:)

Name	Date modified	Type	Size

No items match your search.

File name: 1218001

Save as type: STL Files (*.stl)

Hide Folders

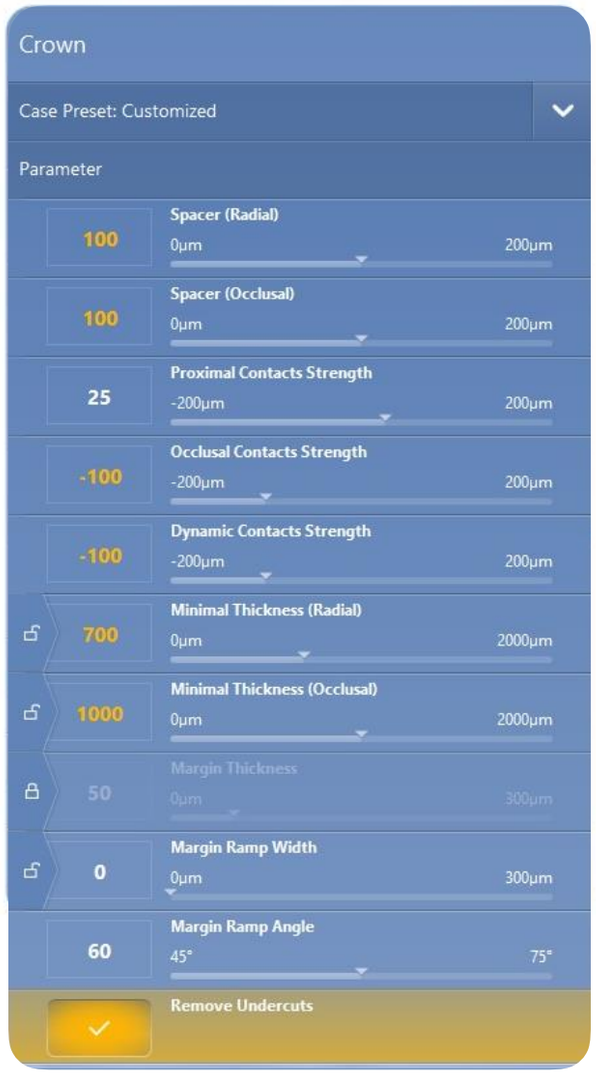
Save | Cancel

The file is ready to submit to the lab for milling. Please name the file with your local lab case number.

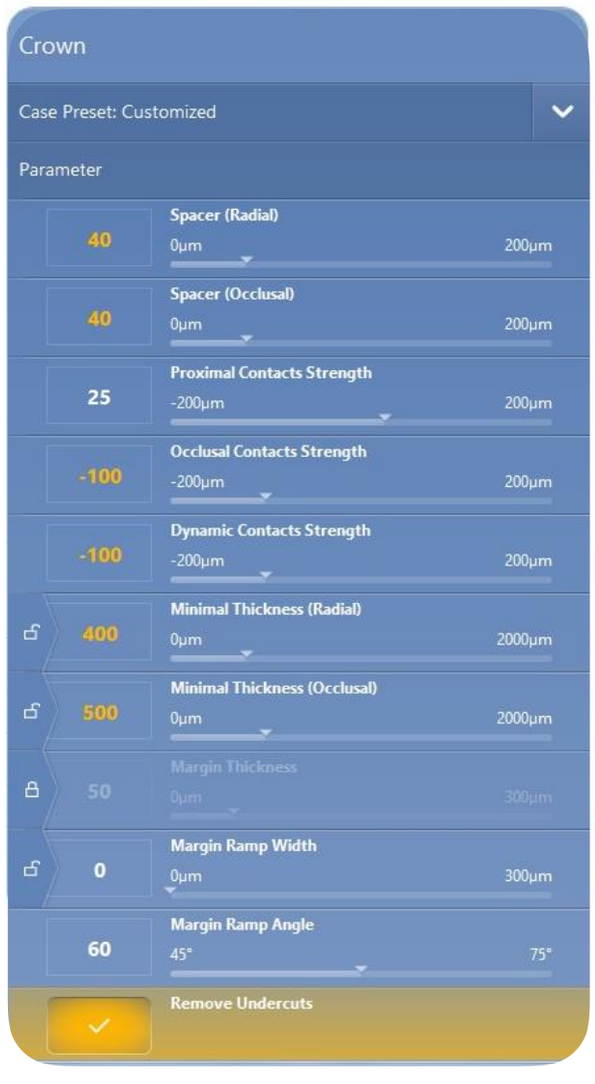
Exporting case...

CEREC Prescription and Parameters by Material/Milling Machine

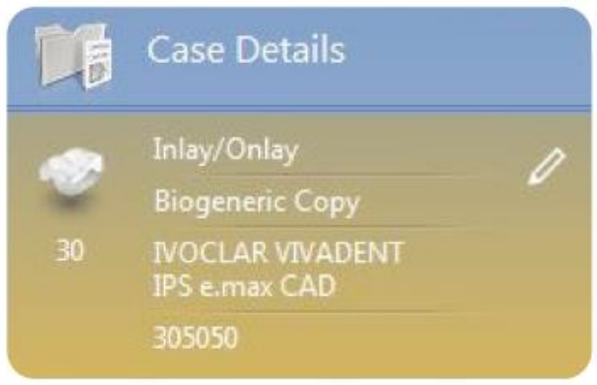
Glass Ceramic Crown MCXL

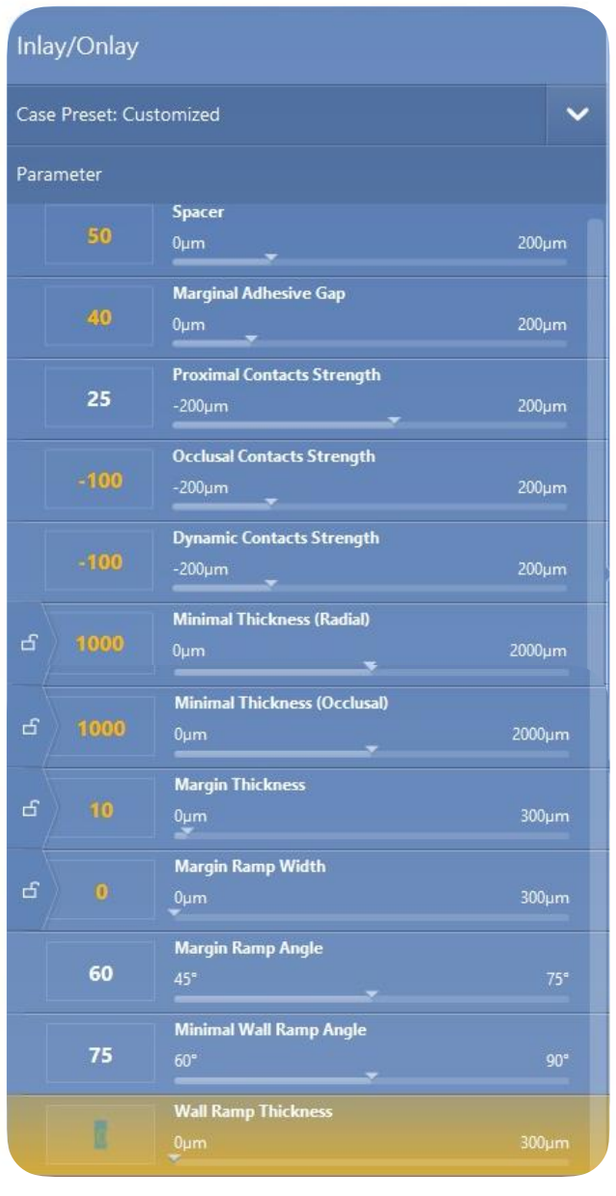


Wax Pattern, Zirconia or Strategy Milling Lab Crown

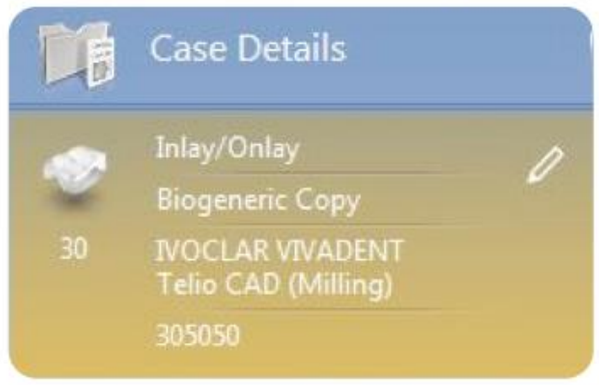


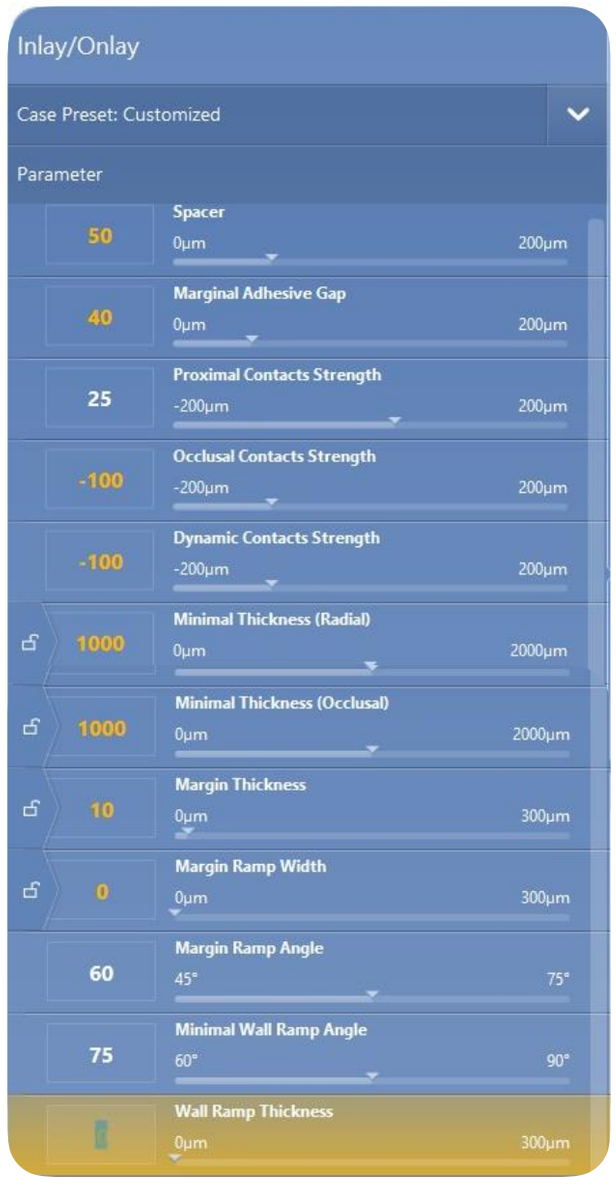
Glass Ceramic Inlay/Onlay MCXL





Gold Inlay/Onlay Strategy Milling





Sending Files with the AMRDEC File Transfer Portal

Fully-Digital Products

1

Requires AMRDEC

2

Small enough to email STL

3

Requires AMRDEC

AMRDEC File Transfer Portal

Can be used to send large files (up to 2 GB) into OR out of the DoD Network.

Either the sender or the recipient must have a military email address. Both can also be military.

Files can be sent directly from an Omnicam (connected to WiFi) to the ADL using this portal.

It is safe for sending PII but if you are sending from non-DOD computers it should be PII free.

Notes on AMRDEC File Submission

If you want to submit the file from your DoD computer,
Burn a DVD from your Omnicam.

San Diego ADL email address:

usn.san-diego.navmedcensanca.mbx.nmcsd-adl-cadcam-submission@mail.mil

Norfolk ADL email address

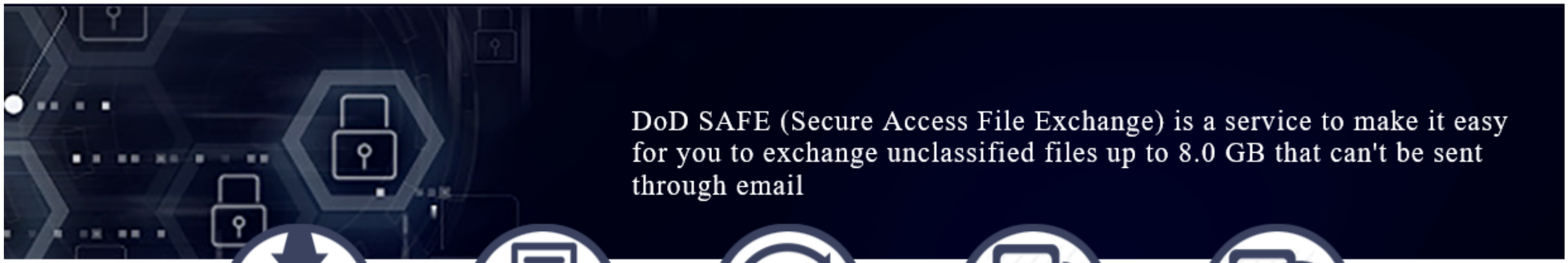
usn.hampton-roads.navhospporsva.mbx.bhcnorfolktriad-adl@mail.mil
@mail.mil

Please include your DD2322 as an attached file
in your AMRDEC file submission.

https://safe.apps.mil/

DoD SAFE

Logged on as user: *LISH.JAMES.CARBERY MORROW*



Drop-off

Drop-off (*upload*) a file for someone else.

Request a Drop-off

Ask another person to send you some files.

Pick-Up

Pick-up (*download*) a file dropped-off for you.

Outbox

View drop-offs and files you have sent.

Help

How to use DoD SAFE and information about this service.

Please note: Non-DoD Personal Identity Verification (PIV) certificates or External Certificate Authority (ECA) are not currently supported. Users should select their SIGNATURE certificate issued through the DoD Email Certificate Authority (CA) or select the AUTHENTICATION PIV certificate issued by the DoD Identifier (ID) Certifcate Authority (CA) in order to connect.

Users outside of DoD may notice lengthy download and upload times depending on their bandwidth availability, but DISA will work to continually improve the experience for all users.

DoD SAFE

Logged on as user: *LISH.JAMES.CARBERY MORROW*

Home | Drop-Off | Request a Drop-Off

PLEASE NOTE

NO CLASSIFIED INFORMATION IS ALLOWE

Any files containing PII/PHI must be encrypted pr

Uploaded files are scanned for viruses.

This web page will allow you to drop-off (upload) c
the information you enter below and instructions fo

From:

LISH.JAMES.CARBERY MORROW <james.c.lish.mil@mail.mil> USN

To:

Short note to the Recipients:

1000 / 1000 left

☐ **Encrypt every file (REQUIRED FOR PII/PHI)**

☑ **Send me an email when each recipient picks up the files**

Click to Add Files or Drag Them Here

Add Recipients

Add One | Add Many

Name:

Email:

Add | Add & Close

Complete this section. Email can be civilian email address if recipient is military email.

This web page will allow you to drop-off (upload) one or more files for anyone (either a DoD user or others). The recipient will receive an automated email containing the information you enter below and instructions for downloading the file.

From:

LISH.JAMES.CARBERY MORROW <james.c.lish.mil@mail.mil> USN

To:

James Lish <james.c.lish.mil@mail.mil>

Short note to the Recipients:

1000 / 1000 left

☐ **Encrypt every file (REQUIRED FOR PII/PHI)**
☑ **Send me an email when each recipient picks up the files**

Click to Add Files or Drag Them Here

	Filename	Size	Description
1:	HALLIGAN Surg Guide.stl	15.1 MB	Surgical guide file
2:	Printed Models.pdf	119.6 KB	Lab RX

15.3 MB / 4096 MB

Drop-off Files

Select the STL file(s) and include the DD 2322 Lab Rx to send to the ADL.

This web page will allow you to drop-off (upload) one or more files for anyone (either a DoD user or others). The recipient will receive an automated email containing the information you enter below and instructions for downloading the file.

From:

LISH.JAMES.CARBERY MORROW <james.

To:

James Lish <james.c.lish.mil@mail.mil>

Short note to the Recipients:

Encryption Passphrase

This passphrase will not be sent to the recipients.
You need to do this yourself.

Passphrase:

And again:

OK

very file (REQUIRED FOR PII/PHI)
an email when each recipient picks up the files

To encrypt every file for PII/PHI this box will apprear when you click the check box.

Email this passphrase also to the ADL's email.

Click to Add Files or Drag Them H

	Filename	Size	Description
1:	HALLIGAN Surg Guide.stl	15.1 MB	Surgical gui
2:	Printed Models.pdf	119.6 KB	Lab RX

15.3 MB / 4096 MB

Drop-off Files

Drop-Off Completed

Your files have been sent successfully.

Filename	Size	SHA-256 Checksum	Description
HALLIGAN Surg Guide.stl	15.1 MB	F36E2EAB73D24E0012456F1753590C518AAB23D24CB2FBFC1C796C16DE81C85C	Surgical guide file
Printed Models.pdf	119.6 KB	EB5BB7C424E051A90FB6610BD6A8382CBED54D88CD1A74E18162228477C39522	Lab RX

2 files

From:

LISH.JAMES.CARBERY MORROW <james.c.lish.mil@mail.mil> USN on 2019-10-03 11:14 UTC

To:

James Lish <james.c.lish.mil@mail.mil>

Comments:

Success!

This is an automated message sent to you by the DoD SAFE service.

LISH.JAMES.CARBERY MORROW <james.c.lish.mil@mail.mil <mailto:%6a%61%6d%65%73%2e%63%2e%6c%69%73%68%2e%6d%69%6c%40%6d%61%69%6c%2e%6d%69%6c> > has dropped off 2 files for you.

IF YOU TRUST THE SENDER and are expecting to receive a file from them, you may choose to retrieve the drop-off by clicking the following link (or copying and pasting it into your web browser):

https://safe.apps.mil/pickup.php?claimID=h7DK6cXzSbqg2fcC&recipCode=t7D97r

You will be required to enter the claim passcode, which is:
2S6ieheBqAQxfCWq

You have 7 days to retri drop-off; after that the link above will expire.

Full information about the dr

Claim ID: h7DK6cXzSbqg2fcC
Recipient Code: t7D97r
Claim Passcode: 2S6ieheBqAQxfC
Date of Drop-off: 2019-10-03 11:14:44

Copy and Paste this link to verify you are the sender.

Copy and Paste this password to receive the files.

Specialty Leader Contact Information

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andrew.r.knofczynski.mil@mail.mil
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Camp Pendleton, Prosthodontist (Advanced Digital Dentistry Specialty Leader)

LCDR James Lish
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NH Beaufort, Prosthodontist (Assistant Advanced Digital Dentistry Specialty Leader)

CDR Gain Liu
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NH Rota, Prosthhodontist (Dental Laboratory Specialty Leader)