Elements of Success
Training Workbook & Resources
Table of Contents

Removable Components ................................................................................................................................................................. 1
Introduction........................................................................................................................................................................................................... 3
Premolar Crown with Buccal Bite .......................................................................................................................................................... 3
Posterior Crown with Selection Area ................................................................................................................................................... 14
Multiple Posterior Crowns .................................................................................................................................................................. 19
Anterior Crown Using Pre-op ................................................................................................................................................................. 23
Posterior Crown Impression .................................................................................................................................................................. 26
Onlay Restoration .................................................................................................................................................................................. 28
Posterior Crown with Bite Registration .............................................................................................................................................. 31
Prep Guidelines & Materials ................................................................................................................................................................. 33
Material Selection .................................................................................................................................................................................. 34
Integration Day & Starter Kit ................................................................................................................................................................. 42
Information Resources ........................................................................................................................................................................... 44
Customer Support Information ............................................................................................................................................................ 45
CDD Program .................................................................................................................................................................................................. 45
CAD/CAM Supplies and Documentation ............................................................................................................................................. 46

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Removable Components

The PlanScan system has a set of removable components.

**Connecting the Thunderbolt™ Adapter**

Properly connecting and disconnecting the scanner prevents damage to your devices.

1. Insert the Thunderbolt adapter into the adapter slot on the side of the laptop. (The adapter should remain attached, even when not in use.)

2. After opening the PlanCAD software, connect the red FireWire connector of the scanner into the white Thunderbolt™ adapter.

The laptop gives an audible signal to confirm that the connection is fully seated.

To remove the scanner, hold the red end with one hand and with the other hand grasp the Thunderbolt adapter. Gently pull apart to disconnect. Leave the white Thunderbolt adapter attached to the computer.

**Disconnecting the Thunderbolt™ Adapter**

If you wish to remove the adapter from the laptop:

1. Disconnect the scanner and exit Romexis to the Windows desktop.

2. Navigate to the Eject Media icon in the lower left corner of the desktop.

3. Click the icon and choose **Eject IEEE 1394 Controller**.

4. Remove the Thunderbolt adapter from the laptop.

Failure to follow this procedure may result in an inoperable scanner. For additional questions or concerns please contact Customer Support at 800.537.6070.
Connecting the Scanning Tip

(If scanning intraorally, disinfect the tip before connecting it to the base. See the User Manual for full instructions or the insert that is inside the scanning tip box.)

1. Grasp the body of the scanner with one hand.
2. Use the other hand to press the scanning tip onto the scanner as shown. A locking click is heard once the tip is fully seated.

Disconnecting the Scanning Tip

1. Grasp the body of the scanner with one hand.
2. With your other hand depress the green button on the underside of the scanner. Gently pull the tip from the scanner.

When the scanner is not in use, place the non-functional protective scanner tip on the scanner. *(Included with the scanner during shipping.)*

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Failure to follow this procedure may result in damage to the scanner and scanning tip.
Introduction

These instructions are intended as an outline to go along with the presenter’s instructions and demonstrations. For complete step-by-step instructions, see the Exercise Workbook and User Manual.

Premolar Crown with Buccal Bite

Tooth #5 (1-4 ISO)

Home

1. On the main screen, click Add Patient and add your name in the patient demographics screen.
2. Complete the options in bold.
3. Click Save Patient at the bottom of the screen.

4. Click CAD/CAM.

5. Under Scan & Design New Restoration click New Scan and Design.

The Setup tab displays. (A User Account Control dialog may appear, choose YES to continue)

Setup

Enter the setup information for this case:

- Tooth 5 (1-4 ISO)
- Crown
- Buccal/Opposing
- Library A
- Empress CAD LT
- Select shade A1
For Your Information

- Hold the scanner close to the tip like a handpiece or overhanded. Rest the neck of the scanner on the adjacent teeth.

- The tip of the scanner should point towards the distal of the preparation.
**Basic Scanning Pattern**

Begin scanning directly over the occlusal surface of the preparation. Move in a gradual, continuous motion toward the mesial neighbor. Transition from the occlusal, cusp, axial wall, to gingival surfaces. The scanner should be held as close to 90° while scanning parallel to the buccal surface.

**Goals**

- 100% of the prep and interproximal contact areas
- 90% of the adjacent teeth
- Good axial data for design
- 2-3 mm gingival tissue on buccal and lingual

**Overview**

1. Click the **Scan** tab.
2. Pick up the scanner.
3. Activate/Deactivate the scanner by clicking the button on the scanner or pressing the **Spacebar** on the keyboard.
4. Scan the model.
5. Click **Generate Model** or press **M** on the keyboard to finish building the virtual model.

**Occlusal scans**

1. Begin scanning directly over the preparation.
2. Keep the scanner parallel to the occlusal table. Move in a gradual, continuous motion toward the mesial neighbor.
3. Be sure to focus on the building model in the software.

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**Note:** You do not need to look at the model during scanning. Keep your eyes on the screen and use the building model and the live view to track your progress and current position.
Buccal scans
1. Use small rotations over the mesial neighbor, transition from occlusal, cusp tip, buccal wall, to gingival.
2. Scan along the buccal surface of the teeth. Rotate the scanner to almost 90° from the occlusal table.
3. Watch as your model builds to see any areas that might require a different rotation or angle.

Distal Tooth
To capture the occlusal data of the distal tooth, transition across the occlusal table until you reach the lingual surface.

Lingual scans
1. Scan along the lingual surfaces of the teeth. Rotate the scanner to almost 90° from the occlusal table.
2. Complete the scan pattern at the lingual of the mesial neighbor.
Evaluate the model

1. Click **Generate Model** or press M on the keyboard to finish building the model.

2. Use the mouse to rotate, move and zoom in and out to evaluate the model.

<table>
<thead>
<tr>
<th>Select position pointer on item and click left button to select</th>
<th>Rotate Model press and hold the right button, then drag</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Select" /></td>
<td><img src="image2.png" alt="Rotate" /></td>
</tr>
<tr>
<td><img src="image3.png" alt="Zoom Model" /> rotate the wheel button to change the size of the model on the screen</td>
<td><img src="image4.png" alt="Move Model" /> up/down, left/right: press and hold the wheel button, then drag.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Zoom Model" /> rotate the wheel button to change the size of the model on the screen</td>
<td><img src="image4.png" alt="Move Model" /> up/down, left/right: press and hold the wheel button, then drag.</td>
</tr>
</tbody>
</table>

3. Click **Data Density View**. Dark areas indicate low data. There should be NO dark areas on the margin or axial walls of the preparation or on the contact areas of the neighboring teeth (circled below).

4. Fill in the required missing data.

   Ensure your model has 100% of the preparation, 100% of the interproximal contact area, and at least 90% of the adjacent teeth. Be sure to capture the full cusp tips of the adjacent teeth.

5. Erase any unnecessary data such as extra teeth, tongue, cheek, and cotton rolls.
Buccal Bite and Opposing

The opposing teeth are scanned to acquire bite information for the proposal. The buccal bite is scanned to align the preparation model with the opposing model. Scan all of the teeth that are in opposition to the teeth in the preparation scans.

Note: Many clinical operators scan the Opposing while the patient is being anesthetized.

Scan Opposing

1. Click **Opposing**.
2. Starting with the distal tooth, scan the occlusal data.
3. Transition to the buccal and scan the buccal side of the opposing dentition. Include 2-3 mm of gingival data; do not stop halfway down the tooth. (Cusp tip, axial wall, gingival)

**Goals**

- 100% of the occlusal and buccal surfaces
- 2-3 mm gingival tissue on the buccal surface
- Lingual data not necessary

4. Erase any unnecessary data such as tongue, cheek, and cotton rolls.
Scan Buccal

1. Click Scan Buccal.
2. Close the articulated model gently. If it shifts during the scanning, the alignment may be incorrect.
3. Scan the buccal surfaces of the teeth that were captured in the preparation and opposing models. Ensure some gingival data is captured.

**Goals**

Capture the buccal surface of the dentition in the prep and opposing

2-3 mm gingival data

No rotations necessary

Note: Be sure to verify the status of the buccal alignment.

In most cases, alignment will be done automatically by the software.

A green dot in the Buccal icon indicates a successful alignment.

**NOTES:**
Evaluate and Adjust the Orientation

1. Click the Margin tab.

2. Evaluate and adjust the Orientation using View Controls to change the point of view.
   A. In the Occlusal View, balance the model from buccal to lingual.

   ![Occlusal View Diagram]

   B. In the Distal View, align the buccal cusps of the neighbors.

   ![Distal View Diagram]

   C. In the Buccal View, evaluate marginal ridge alignment.

   ![Buccal View Diagram]

3. Click the Orientation icon to accept the current position.
Mark the Margin

1. Click **Show Features**. Show Features highlights areas of high contour, which helps define the margin.
2. Zoom in on the preparation.
3. Click **Trace** and click on the inside of the green line along the margin.
4. Moving in small increments, click as you move around the preparation.
5. The margin is finished when the original point (blue dot) is clicked to finish the circle.
6. Practice adjusting the margin with both **Move Margin** and **Add Segments**.

Design

1. Click the **Design** tab.

The **Tooth Libraries** screen appears.

2. Click **Apply** to generate the proposal.
3. Click **Incremental Tools** for large adjustments.
4. Click **Freeform Change Tools** for small adjustments.
5. Click **Material Thickness**, the proposal should be blue/green with a yellow margin.
6. Click **Rubber Tooth** and adjust the axial walls, marginal ridges, and embrasures.

7. Click **View Bite Registration** to see the opposing dentition model above the proposal. Click **View Bite Registration** a second time to make the template transparent.

8. Click **View Contacts**.

9. Click **View Bite Registration** again to deactivate the template.

10. Click **Hide Model** to remove the model from view.

11. Rotate the proposal to view the interproximal contacts. Adjust interproximal contacts as needed. The goal is dark blue with a hint of aqua.

12. Deactivate **Hide Model**.

13. Deactivate **View Contacts**.
14. Click **Material Thickness**.

The desired material thickness is based on the block manufacturer’s recommended thickness for your restoration type. The desired material thickness for a crown is 1-1.5 mm along the axial walls (bright green - dark green) and 1.5-2 mm on the occlusal table (dark green - blue).

![Image of material thickness示例](image1.png)

15. Evaluate the margin. The material thickness should be yellow around the margin with no red or orange.

![Good example - yellow margin vs. Poor example - Red or orange along the margin](image2.png)

16. If there is red around the margin, click **Move Margin** to evaluate the margin for accurate placement.

The proposal becomes transparent so that the margin is visible. Do NOT go back to the Margin tab to make the changes or you will lose all of the design work that has been done.

17. Adjust the margin if needed.

18. If the margin is in the correct place, use the **Dropper** tool to add material thickness.

*End of exercise. Do not proceed to the Mill tab.*
**Posterior Crown with Selection Area**

Tooth #30 (4-6 ISO) with bite registration

**Setup**

Enter the setup information for this case:

- Tooth 30 (4-6 ISO)
- Crown
- Buccal/Opposing
- Library A
- e.max HT
- Select shade B1

**Scan Prep**

Scan prep using the basic scan method.

Begin scanning directly over the occlusal surface of the preparation. Move in a gradual, continuous motion toward the mesial neighbor. Transition from the occlusal, cusp, axial wall, to gingival surfaces. The scanner should be held at close to 90° while scanning parallel to the buccal surface.

Use small rotations over the mesial proximal tooth, transition from occlusal, cusp tip, axial wall, to gingival.

Scan along the lingual surfaces of the teeth. Rotate the scanner to almost 90° from the occlusal table.

Watch as your model builds to see any areas that might require a different rotation or angle.

**Scan Opposing**

1. Click **Opposing**.
2. Starting with the distal tooth, scan the occlusal data.
3. Transition to the buccal and scan the buccal side of the opposing dentition. Include 2-3 mm of gingival data, do not stop halfway down the tooth. (Cusp tip, axial wall, gingival)

**Goals**

- 100% of the occlusal and buccal surfaces
- 2-3 mm gingival tissue on the buccal surface
- Lingual data not necessary

4. Erase any unnecessary data such as tongue, cheek, and cotton rolls.
**Scan Buccal**

1. Click **Scan Buccal**.

2. Close the articulated model gently. If it shifts during the scanning, the alignment may be incorrect.

3. Scan the buccal surfaces of the teeth that were captured in the preparation and opposing models. Ensure some gingival data is captured.

**Goals**

- Capture the buccal surface of the dentition in the prep and opposing
- 2-3 mm gingival data
- No rotations necessary

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**Margin**

1. Click the **Margin** tab.

2. Evaluate and adjust the Orientation using **View Controls** to rotate the model.
   - A. In the Occlusal View, balance the model from buccal to lingual.
   - B. In the Distal View, align the buccal cusps of the neighbors.

In the Buccal View, evaluate marginal ridge alignment.

3. Click **Orientation** to accept the current position.
In some cases, the adjacent teeth are close enough to the preparation to make the identification of the margin in the interproximal areas difficult. For this exercise, Selection Area is used to isolate the preparation. This is an optional step for full coverage crowns. Selection Area is required for partial restorations and will be discussed more later.

4. Click **Selection Area** on the left side of the screen.

New options appear at the bottom of the screen.

5. Click **Add to Selection**. Left click and hold to draw.

6. Draw a circle around the preparation. Do not include any part of the adjacent teeth.

7. Release the mouse button as you finish the circle. The selected area is highlighted.

8. To add more to the designated area, click **Add to Selection**. Ensure all of the margin is in the highlighted area.
9. Rotate and evaluate the Selection Area. Ensure portions of the adjacent teeth are not in the highlighted area. Click **Remove from Selection** and circle the extra information if needed.

Poor - Selection Area includes part of the adjacent teeth. This is sometimes not noticeable from the occlusal view.

If part of an adjacent tooth is selected, that selection is part of what displays when Hide Model is activated.

This piece of the adjacent tooth can make it difficult to see the margin on that side of the tooth. (Outlined in red above)

Poor - If too much of the gingival tissue is selected, the proposal will be distorted. Selection Area should be close to the size of the final proposal.

10. Click **Margin Tool** on the left. The options on the bottom of the Design Center appear for marking and editing the margin.
11. Click *Hide Model*. Only the designated Selection Area displays. The rest of the model is hidden.

12. Click *Show Features*. Areas with high contours are highlighted. This can help identify the margin.

13. Click *Trace* and mark the margin from the occlusal view. Verify placement by rotating the prep model in different views.

14. Edit the margin if needed.

*Design*

Click the *Design* tab. Follow the CAD/CAM Workflow sheet.

*Mill*

1. Click the *Mill* tab. The proposal turns white and shows the default position for the sprue.

2. Change the location of the sprue on the restoration, if desired, by moving the placement indicator (circled in orange below) along the circle that represents the exterior of the restoration or by clicking one of the arrows.

*End of exercise. Follow the instructors direction for Material Block Size and Milling.*
Multiple Posterior Crowns

Tooth #28 and 29 (4-4 and 4-5 ISO) pre-scanned case

Setup
This case has already been created.

On a multiple restoration case, each tooth requires a restoration type, library, material and shade. Note that the currently selected tooth is orange while the other selected teeth are green.

Margin tab
Since this case has already been scanned, we are going straight to the Margin tab.

1. Click the Margin tab.
2. Click Orientation to activate it.
3. Adjust the Orientation for Tooth 29 (4-5 ISO). The highest tooth number is selected by default.
4. Click Orientation to accept the position for the selected tooth.
5. Click the Tooth 28 (4-4 ISO) tab.
6. Click Orientation to activate it.
7. Adjust the Orientation for Tooth 28 (4-4 ISO).
8. Click Orientation to accept.

Note: The margin for Tooth 29 (4-5 ISO) has already been marked.

9. Click Show Features to activate it. The tab for Tooth 28 (4-4 ISO) should still be selected.
10. Click **Trace**. Mark the margin where it can be seen on the stone model. The mesial side of the preparation is not supragingival and cannot be clearly seen on the stone model.

11. Click **View ICE**.

ICE appears over the model.

12. From the occlusal view, zoom in. Use the ICE view to draw the remainder of the margin directly along the margin of the preparation.

Note: ICE View can only be used on intraoral scans and should only be viewed from the occlusal angle.


14. Evaluate and adjust the margin.
**Design Tab**

1. Click the **Design** tab.

2. Click the **Tooth 29 (4-5 ISO)** tab.

The preview tooth displays as an overly large tooth. It must be resized and repositioned.

3. Press the **Alt** key and the **up or down arrow** on the keyboard until the preview tooth is similar in size to a premolar.

4. Reposition the preview tooth over the center of the prep. Rotate the model to the buccal view to verify positioning.

5. Deselect **Autogenesis**. If Autogenesis is active for the first proposal, it will attempt to make contact with the preparation of the neighboring tooth and become distorted.

6. Click **Apply**.
The proposal is generated.

7. Use the design tools to create a good contour/shape for the first tooth before generating the proposal for the second tooth.

8. Click **Tooth Library**.

9. Click the **Tooth 28 (4-4 ISO)** tab.

The proposal for Tooth 29 disappears from view, but the proposal has not been lost.

10. Click **Autogenesis** to activate it. Since the first tooth was already generated, Autogenesis will create contact with the first proposal instead of the preparation.

11. Click **Apply**.

The second proposal is generated and both proposals appear.
Follow the design workflow sheet. You can adjust each proposal individually and some tools are available with the ALL tab. Do NOT use Material Thickness on the ALL tab.

<table>
<thead>
<tr>
<th>Manipulate individual proposals without switching tabs</th>
<th>Tools that you CANNOT use with ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rubber Tooth</td>
<td>• Material Thickness</td>
</tr>
<tr>
<td>• Dropper</td>
<td>• Paint Feature</td>
</tr>
<tr>
<td>• Smooth Surface</td>
<td>• Define Feature</td>
</tr>
<tr>
<td></td>
<td>• Contact Refinement</td>
</tr>
<tr>
<td></td>
<td>• Move Feature</td>
</tr>
<tr>
<td></td>
<td>• Move Margin</td>
</tr>
</tbody>
</table>

12. Finish designing both proposals.

*End of exercise. Do not proceed to the mill tab.*

**Anterior Crown Using Pre-op**

Tooth #8 (1-1 ISO)

This case has already been scanned.

**Setup**

On the setup tab, note that the Library is **Pre-op**. No actions are required on this tab.

Note: Select Pre-op as the Library tooth when the patient’s existing dentition or a wax-up is being used as the model for creating the restoration.

**Scan**

1. Click the Scan tab, **Pre-op** is active.
2. Evaluate the Pre-op model.
3. Click **Scan Prep**.
4. Evaluate the prep model. Note that the same amount of data was captured on both models. You need sufficient data on the adjacent teeth to match your preparation model.

Note: There is no bite registration or buccal bite for this case because the Pre-op scans will be used for occlusion. In your office, Time Saver prompts you to copy the data when moving from the Pre-op to Prep scans. This enables you to erase the pre-op tooth and scan in the prep.
Margin

1. Click the Margin tab.
2. Evaluate the Orientation.
   - Are the surface indicators correct? If you accidentally scanned with the wand pointing towards the mesial instead of the distal, the surface indicators will be incorrect. If this happens, rotate the model until the Lingual, Mesial, Distal, and Buccal labels are correct.
   - Are the marginal ridges of the adjacent teeth straight across from mesial to distal? (Orange line used as an illustration below)

3. Click Orientation when you are satisfied with the position of the model
4. Click Show Features.
5. Draw the margin.

6. Click Pre-op Editing.
7. Use the Trace tool to designate the area of the model that you want to use as the Pre-op library surface. Stay away from rough areas and the margin.

8. Use Move Curve and Add Segments to edit the Pre-op if needed.
**Design**

1. Click the **Design** tab.

   Note that the Library at the bottom of the screen now includes Pre-op.

2. Click **Apply**. Autogenesis creates a proposal based on the Pre-op area that you designated.

3. Click **View Pre-op** to see the combination of the pre-op model and the prep model. The speckled area is where the proposal was created from the pre-op designation. The solid area around the margin is where Autogenesis used Library A to fill in any gaps.

4. Click **View Pre-op** a second time to make the pre-op model translucent.

5. Continue designing the proposal. Follow the standard workflow.

6. Click **Ctrl+Alt** to view the proposal in Medusa View. This turns the proposal the same color as the rest of the model, making it easier to evaluate the overall shape. Click **Ctrl** to deactivate Medusa View.

**Mill tab**

1. Click the **Mill** tab.

   For this exercise, we will change the material to an IPS Empress Multiblock.

2. Click **Settings** in the upper right hand corner.

3. Click **Material/Shade Settings**.

4. Click the arrows next to Material and select **IPS Empress CAD Multi**.

5. Click **Save**.
6. Because the IPS Empress Multiblock was selected as the material, the amount of chroma and translucency can be adjusted. Use the Restoration Positioning arrows to move the restoration up or down within the block.

End of exercise. Do not Send to Mill.

Posterior Crown Impression

Tooth #2 (1-7 ISO)

Setup
Enter the setup information for this case. This is a scanning exercise. The case will not be fully designed and milled.

- Tooth 2 (1-7 ISO)
- Crown
- Library A
- Select any material
- Select any shade

Scan
1. Click the Scan tab.

When scanning the impression, ensure the tip of the scanner is pointing towards the distal so that the orientation of the model will be correct. Be careful not to squeeze the impression while scanning or the scans will be distorted. Note that this impression has already been trimmed.
2. Scan the impression. Make small rotations to capture the data on the buccal/lingual walls. 

Note: Hold the scanner perpendicular to the impression, rotate left and right to capture data.

**Goals**

100% of the prep and interproximal contact areas
90% of the adjacent teeth
Good axial data for design
2-3 mm gingival tissue on buccal and lingual

The model is inverted since you scanned an impression. Rotate to view the negative image.

3. Click **Impression Mode** to create a positive version of the model.

4. Click **Data Density View** and evaluate your model. This can be done either before or after activating Impression Mode.
For this exercise, we are not scanning the opposing dentition. In clinical cases, the data needs to be scanned using one of the following methods:

- **Pre-Op** - In Scan Pre-op, scan the preoperative tooth intraorally or take a preoperative impression.
- **Intraoral Bite Registration** - Apply bite registration material and scan intraorally.
- **Model Bite Registration** - Take a bite registration, scan the impression, pour up the impression to create a model, and scan the bite registration on the model.
- **Articulated Model Buccal Bite** - Create an articulated model using both sides of the impression. Use the articulated model to scan the buccal bite.

*End of exercise.*

**Onlay Restoration**

Tooth #3 (1-6 ISO)

This case has already been scanned.

**Setup**

On the setup tab, note that the Restoration Type is Onlay. No actions are required on this tab.

**Scan**

1. Click the **Scan** tab.
2. Evaluate the preparation model. The same basic scan pattern is used for partial restorations.
3. Click **Buccal** to view the previously scanned buccal bite model and evaluate.

**Margin**

1. Click the **Margin** tab.
2. Set the **Orientation** for the onlay. Use the remaining anatomy of the prepped tooth to aid your orientation.
3. Activate **Show Features**.
4. Draw the margin.

Once the margin is drawn, a screen appears. This only appears for inlays and onlays.

**Note:** If this screen doesn't appear, click **Selection Area**.

5. Click **Take Me There** to go to the Selection Area screen.
6. Click **Add to Selection** and circle Tooth 3 (1-6 ISO).

7. Complete the Selection Area and return to the **Margin Tool** screen.

8. Click **Hide Model** to isolate the preparation and to evaluate and adjust the margin.
**Design**

1. Click the **Design** tab.

Autogenesis creates a proposal based on the Selection Area designated.

2. Follow the basic design workflow to design the onlay.

   In some situations, it will be difficult to attain ideal occlusal contact strength and reach minimum material thickness. In the example below, the red material thickness around the margin indicates the margin is too thin.

3. Click **Dropper** and add material thickness. This will result in adequate material thickness strength but a strong contact with the opposing dentition. This can be corrected intraorally.
**Mill**
1. Click the Mill tab.
2. Click Hide Model. The sprue is hidden when the model is visible.
3. Sprue placement options are limited. In this situation, the sprue must be placed on the interproximal contact area.
4. Ensure the total circumference of the sprue is visible.

**Posterior Crown with Bite Registration**

Tooth #30 (4-6 ISO) with bite registration

**Setup**
Enter the setup information for this case:
- Tooth 30 (4-6 ISO)
- Crown
- Bite Registration
- Library A
- e.max HT
- Select shade B1

**Scan**
1. Scan prep using the basic scan method.

Begin scanning directly over the occlusal surface of the preparation. Move in a gradual, continuous motion toward the mesial neighbor. Transition from the occlusal, cusp, axial wall, to gingival surfaces. The scanner should be held at close to 90° while scanning parallel to the buccal surface.

Use small rotations over the mesial proximal neighbor, transition from occlusal, cusp tip, axial wall, to gingival.

Scan along the lingual surface of the teeth. Rotate the scanner to almost 90° from the occlusal table.

Watch as your model builds to see any areas that might require a different rotation or angle.

*End of exercise. Do not Send to Mill.*
2. Erase any unnecessary data such as tongue, cheek, and cotton rolls.

3. Apply bite registration material.
   - Apply enough material vertically and horizontally
   - Do not smooth with fingers
   - Evaluate model and trim material away from adjacent teeth

4. Scan the bite registration and evaluate model for sufficient data.
   **Goals**
   - 100% occlusal data
   - No lingual or buccal data necessary

5. Click **Bite Selection**.

6. Paint the area of the opposing dentition within the bite registration material.

Proceed with the normal Margin tab and Design tab workflow.
Prep Guidelines & Materials

Prep Guidelines

- Tapered Sides

Prep Guidelines

- Tapered Sides
- Rounded Internal Angles

Prep Guidelines

- Tapered Sides
- Rounded Internal Angles
- Equi/Supra Gingival Margins
Material Selection

Prep Guidelines

TREAT
- Tapered Sides
- Rounded Internal Angles
- Equi/Supra Gingival Margins
- Adequate Reduction
- Tissue Management

AVOID
• A copy is provided for each practice in your blue take away bag and included in the User Manual.
• Electronic versions are available online.
Block Size Selection

- Materials come in a variety of sizes.
- The size of the designed restoration and sprue position will determine the available size to mill.

IPS Empress CAD by Ivoclar Vivadent

**Beautiful Esthetics**
IPS Empress CAD offers over 100 combinations of block size, shades, and translucencies.

**Multi Shade & Translucency**
- Cut back and layer esthetics in a monolithic block
- Multiple translucencies create the most natural looking, esthetic restoration
- Control incisal translucency and gingival color

**High Translucency**
- Excellent chameleon effect
- Blends easily with existing tooth structure
- Inlays virtually “disappear”
- 20% more translucent than the Low Translucency Block

**Low Translucency**
- Higher value
- “Block out” capability. Higher opacity level
Efficient
IPS Empress CAD offers the option to simply mill and polish for maximum efficiency or glaze fire for up to a 50% increase in strength*.

*Clinician's Report – October 2009, Volume 2 Issue 10

Multi
- A1, A2, A3, A3.5, B1
- BL1, BL3

HT (High Translucency)
- A1, A2, A3, A3.5, B1, B2, B3, C2, D3

LT (Low Translucency)
- A1, A2, A3, A3.5, B1, B2, B3, C2, D3
- BL1, BL2, BL3, BL4

Beautiful Esthetics
IPS e.max CAD offers a wide range of shades, sizes, and translucencies to allow the dental professional to provide beautiful esthetics and the durability to ensure clinical success for all indications.

The Highlights
- True-to-nature shade behavior for highly esthetic solutions
- Versatile use and comprehensive range of indications
- Lifelike esthetics, irrespective of the shade of the preparation
Benefits

• Durable restorations due to the high strength
• Adhesive, self-adhesive or conventional cementation depending on the indication

New Materials

• C16
  - Ideal for longer dentition and large restorations
• B32
  - Up to three-unit bridges up to the second premolar as the abutment tooth

IPS e.max CAD
by Ivoclar Vivadent

HT (High Translucency)
- A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
- BL1, BL2, BL3, BL4

LT (Low Translucency)
- A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
- BL1, BL2, BL3, BL4

C16 & B32 Blocks
- A1, A2, A3, A3.5, B1, B2, C1, C2, D2
- BL1

IPS e.max CAD Impulse
by Ivoclar Vivadent

Value blocks – various brightness values
The Value blocks feature different brightness values: 1 is the lowest and 3 the highest.

Opal blocks – lifelike opalescence effect
- The Opal blocks exhibit a decreasing opalescence and increasing brightness value from 1 to 2.
- The Opal blocks can be used as an “enamel replacement” material.
- Aesthetic and minimally invasive restorations – thin veneers in particular.
IPS e.max CAD Impulse  
**by Ivoclar Vivadent**

**Advantages**
- Lithium disilicate glass-ceramic (LS2) with a strength of 360 MPa
- Opal blocks for highly esthetic, minimally invasive veneers with a minimum thickness of 0.4 mm
- Value blocks for lifelike brightness value in crowns

Telio CAD  
**by Ivoclar Vivadent**

**Strength and Endurance**
- Long term temporary bridge material (12 mo.).
- Flexural strength of 130 MPa

**Esthetic**
Polyacrylate material technology allows for beautiful esthetic results simply by polishing or with the option to apply stains and glaze for a customized appearance.

**Shades**
- A1, A2, A3, A3.5, B1
- BL3

Lava Ultimate  
**by 3M**

**Nano Technology**
- High flexural strength (200 MPa) adds durability to posterior restoration
- Excellent wear resistance
- Brilliant and long-lasting polish
- Excellent stain resistance for color stability

**Shades**
- A1, A2, A3, A3.5, B1, C2, D2
- BL
**Paradigm MZ100**

*by 3M*

**Versatile and Easy**
- Enamel-like wear characteristics are superior to that of ceramic blocks
- Easy to finish and polish
- Easy to repair intraorally

**Shades**
- A1, A2, A3, A3.5, B3
- Enamel

---

**Zirlux FC2**

*by Zahn Dental*

**Advantages of Full Contour Zirconia**
- Flexural strength of 1100 MPa
- Simple stain and glaze technique
- High translucency pre-shaded zirconia
- Predictable aesthetic outcome
- Excellent alternative to PFM’s
- Low wear on opposing dentition

---

**Burn out Block (BOB)**

*by E4D Technologies*

**Advantages**
- Ideal for the lost wax technique allowing the optimal design of the restoration to be used for lost-wax casting or pressing techniques for additional material and restoration utilization

---
Options to think about...

- Choose the best option for your patient
- Call your manufacturer representative for more details
- View manufacturer websites for more specific indications and uses

Remember to always follow the manufacturer instructions provided with each type of material.

For additional information regarding the content in this presentation. Please contact the manufacturer for the product in question.
Integration Day & Starter Kit

Integration Day

- Day starts at 7:30am and ends 3pm
- 3 Pre-prepared, Single Unit, Posteriors (premolar, molar)
- Schedule:
  - Patients at 8am, 10am, and 1pm
    - Allow 3 hours for the first appointment that may overlap the second
    - 2 hour appointments are needed for the second and third patients
  - Lunch and Learn
    - MRI maintenance
    - DDx Setup
    - Discuss how to continue with your education
- No other patients scheduled
- Focused on those who attended the Elements of Success course in Texas

Premier - Starter Kit

1. Diamond Twist Paste Kit
2. Translucent Sample
3. Sample Prep Burs
4. Milling Tools Sample Pack
- 2 Ellipsoidal
- 2 Conical
- 2 Tapered
5. Sample Knit Pak Cord

Ivoclar - Starter Kit

Telio CAD:
- 4 Telio CAD Blocks
- Telio CS Link Transparent
- Telio CS Descandeaz 1g
- OptaPh Test Pack

IPS e.max CAD:
- 4 e.max CAD Blocks
- 2 e.max Shades
- 1 e.max Stain
- 1 e.max Glass Paste
- 1 e.max Glass Liquid
- 1 e.max Crystallization Tray

IPS Empress CAD:
- 4 IPS Empress CAD Blocks
- 2 Empress Shades
- 1 Empress Stain
- 1 Empress Glaze
- 1 Empress Glass Liquid

Misc. items:
- 2 Multilink Primers
- 1 Monobond Plus
- 1 Ceramic Etching Gel
- 1 Multilink Autocure Trans
- 1 OptaStick
- 1 Optamelane Promo Pack
- 1 Optrastick
- 1 Optrafine Promo Pack
- Cementation Navigation-DVD
3M - Starter Kit

Lava Ultimate:
- 542 LT C14 Blocks
- 542 HT C14 Blocks

Misc. Items:
- 1 Reliance Ultimate Adhesive (A1)
- 1 Scotchbond Universal Adhesive
- 1 3M ESPE Retraction Capsule
- 1 CoJet Sand Blast Coating Agent
- 1 Lava Ultimate Guide

Contact your local representative today:
- Order blocks in shade values for upcoming patients
- Order mill tools
- 1 sleeve of each: Ellipsoidal and Tapered
- Stains and shades for characterization
- Spray Glaze and speed tray for e.max (depending on order)
- High Level Disinfection (choose one):
  - Deionized Water and Cidex Plus
  - Distilled Water and MaxiCide Plus
- Lens tissues (KimWipes)
- Lab handpiece and Finishing Kit
- Sand blaster (if using Lava Ultimate)
- Prep Kits (recommended, not required)

What’s Next?
Information Resources

There are many resources available for gathering information. The Learning Tools page on our website ([www.e4d.com/learning_tools](http://www.e4d.com/learning_tools)) includes:

- Documentation available for download. Printed copies are available for $25 each and can be ordered by emailing educationgroup@e4d.com.
- Chairside Chats (recorded webinars)
- Link to 3C Learning Library (links to cadcamcan.com - ability to search content by subject)

Please note that cadcamcan.com is a separate site. To post on their forums, you will need to Create an Account on the cadcamcan.com website. The registration invitation code is PlanScan (case sensitive).

- Training Videos

Newsletters, Chairside Chat, update information, and more is usually communicated via email. When you create your ECO Member account in class, you are automatically added to our email list. You may unsubscribe at any time.

E4D.com Registration

To register, go to [www.e4d.com/register](http://www.e4d.com/register). This is usually done while you are at the Elements class in Dallas.

1. **Doctor** is the default selection. If you are not a dentist, click **Team Member**. It is important that you fill out your information under the correct tab.

2. Fill out the information. The fields are different for Dentists and Team Members.

3. At the bottom of the registration are several checkboxes. You can edit these at a later date if needed.

   - Weekly Video Tutorials
   - Send me Product Updates
   - Dentist Finder (on the Dentist registration only)
   - CDD Registration (on the Team Member registration only)

4. Click **Submit**.

Sign in to the website as a customer with the login you created in class. The Member Resources page includes:

- Create/Edit your Dentist Finder information - Dentist Finder is a tool on the website that enables the general public and potential patients in your area to locate you.
- Resources page - Download Patient Marketing materials
Customer Support Information

PlanScan system support
E4D Customer Support
1.800.537.6070
866.361.1333 corporate phone
972.234.3557 corporate fax

customersupport@e4d.com
7am-7pm Central Time Mon-Thurs
7am-6pm Central Time Friday

CDD Program

The self-paced CAD/CAM Dental Designer Program (CDD) provides motivated operators with the opportunity to gain professional recognition and establish credibility in proficiency with the latest dental CAD/CAM technology.

Home Study Elements

Registering for the CDD is normally done when you register for the website. If you need to sign up after registering, go to e4d.com/training-course-301/ and scroll to the Register option at the bottom of the page.

Email CDD@e4d.com at the completion of each step.

• Learn about the program via online resources.
• Scan and design several cases using the Elements model provided in class or using your own models (must fit the exercise criteria)
• Complete 20 CAD/CAM restorations and fill out the Doctor Signoff Form (included online) as you complete them. Email the completed form to CDD@e4d.com or fax it to 972-234.3557 Attn: Education Department.
• Take Before and After pictures of 4 E4D restorations. Email the photos and bite wing x-rays of the seated restorations to CDD@e4d.com. Please combine these attachments into one email if possible.
• Satisfactory completion of a Final Design Case.
• Satisfactory completion of the Final Exam.

How to register a new team member

Register the new team member on the E4D website at www.e4d.com/register and ensure they check the CDD checkbox at the bottom. If they have already created a username and password for e4d.com, then they can go to e4d.com/training-course-301/ and scroll to the Register option at the bottom of the page.
### CAD/CAM Supplies and Documentation

The materials listed below are all items used at Planmeca University. They are grouped by item type. For new documentation, go to www.e4d.com/resources and use the Customer Log In to see customer documentation.

#### Documentation

<table>
<thead>
<tr>
<th>Name</th>
<th>Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Manual</td>
<td>E4D Technologies</td>
</tr>
<tr>
<td>Milling Center Quick Reference</td>
<td>E4D Technologies</td>
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#### Infection Control

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<tbody>
<tr>
<td>Alcohol Prep Pads</td>
<td>Schein</td>
<td>1048298</td>
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<tr>
<td>MaxiCide Plus w/ Activator</td>
<td>Schein</td>
<td>102-5796 (Qt)</td>
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<td></td>
<td></td>
<td>102-2865 (Gallon)</td>
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<tr>
<td>MetriTest Strips</td>
<td>Schein</td>
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<td>Distilled Water</td>
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<td>Gloves</td>
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<td>X-Small: 5654510</td>
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<td></td>
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<td></td>
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<td></td>
<td>X-Large: 5651575</td>
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<td>Allrap Cover Film 4x6 Clear</td>
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#### Preparation Design

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<tr>
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<td>2013581</td>
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<td>Two Striper Inlay/Onlay Kit</td>
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#### Impression and Model Materials

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<tr>
<td>Earth Stone - Quick Set Stone</td>
<td>Schein</td>
<td>9662932</td>
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<tr>
<td>Orban 1/2 Perio Blade for trimming bite registration</td>
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#### Scanning

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<tr>
<td>Scanning Tips (Pack of 3)</td>
<td>Schein</td>
<td>6314915</td>
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<td>Optical Wipes - Kimwipes</td>
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<td>Ergotron Cart (smaller)</td>
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<tr>
<td>Enovate Cart (larger)</td>
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## Milling Center

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<td>Coolant</td>
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<td>Defoaming Solution</td>
<td>Schein</td>
<td>6318999</td>
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<td>Two Striper E4D Mill Diamonds (Burs)</td>
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<tr>
<td>Conical</td>
<td>Schein Premier</td>
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<tr>
<td>Ellipsoidal</td>
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<tr>
<td>Tapered</td>
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<tr>
<td>Assorted</td>
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## Restoration Finishing

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<td>Two Striper Finishing Kit</td>
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## Articulating Paper

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<tr>
<td>Accufilm I Single Sided Red Articulating Paper</td>
<td>Schein</td>
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## Clinical materials and accessories (cements, adhesives, stains & glaze, etc.)

<table>
<thead>
<tr>
<th>Company</th>
<th>Contact</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivoclar Vivadent</td>
<td><strong>Rebecca Spillman, MS</strong></td>
<td>716.691.2248 phone</td>
<td><a href="mailto:rebecca.spillman@ivoclarvivadent.com">rebecca.spillman@ivoclarvivadent.com</a></td>
</tr>
<tr>
<td>3M ESPE</td>
<td><strong>Bill McGlynn</strong></td>
<td>651.733.9078 phone</td>
<td><a href="mailto:bfmclynn@mmm.com">bfmclynn@mmm.com</a></td>
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<table>
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<th>Company</th>
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</thead>
<tbody>
<tr>
<td>Premier Dental Products Company</td>
<td><strong>John Bonner</strong></td>
<td>610.239.6022</td>
<td><a href="mailto:jbonner@premusa.com">jbonner@premusa.com</a></td>
</tr>
<tr>
<td>Ivoclar Vivadent</td>
<td>Rebecca Spillman</td>
<td>716.691.2248</td>
<td><a href="mailto:rebecca.spillman@ivoclarvivadent.com">rebecca.spillman@ivoclarvivadent.com</a></td>
</tr>
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</table>
## Block Recommendation Chart

*Manufacturer Specifications for Materials*

<table>
<thead>
<tr>
<th>Restoration Type</th>
<th>Anterior Full Crown</th>
<th>Anterior Veneer</th>
<th>Posterior Full Crown</th>
<th>Inlay/Onlay</th>
<th>Implant</th>
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<td><strong>IPS e.max CAD Impulse</strong></td>
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<tr>
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<td>✓</td>
<td>⚠️</td>
<td></td>
<td>✓</td>
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- ⚠️ Primary Indication
- ✓ Secondary Indication
- ⚠️ With manufacturer caution

FOR CAST OR PRESSED INDICATIONS ONLY

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IPS e.max CAD
Characterization Process

1. Preparing the restoration
   - Object Fix: Flow (shown) will be used to affix the restoration to the firing pin for characterization and firing. Object Fix - Putty can also be used.

2. Characterization of IPS e.max
   - Crystal Glaze Liquid
   - Crystal Glaze
   - Shade 1 (gingival shading)
   - Sunset (occlusal shading)
   - Incisal (enhance cusps, translucency)
   - White (fluorosis, cusps and ridges)
   - Mahogany (occlusal pit)

3. Oven program and firing
   - Crystallization Tray: After characterization place the restoration onto the crystallization tray for firing. Note there is an additional Speed Crystallization Tray for IPS e.max

Program Information
- P1 - IPS e.max
- P2 - Corrective firing
- P3 - Speed crys. spray
- P4 - Empress

Characterization Process
- E4D TECHNOLOGIES
- Crystal Glaze Liquid
  - Shade 1
    - Sunset (occlusal shading)
    - Incisal (enhance cusps, translucency)
    - White (fluorosis, cusps and ridges)
    - Mahogany (occlusal pit)

Object Fix
- Putty can also be used for affixing the restoration to the firing pin.
Scanning Technique
Goals & Patterns

Preparation
100% of the prep and interproximal contact areas
90% of the adjacent teeth
Good axial data for design
2-3 mm gingival tissue on buccal and lingual

Interproximal
To achieve 100% of the interproximal contact area, a slight rotation of the scanner will be needed
Rest the scanner on the proximal dentition and perpendicular to the arch

Opposing
100% of the cusps
2-3 mm gingival tissue on the buccal side
Lingual and gingival data not necessary

Buccal Bite
Capture the buccal surface of the dentition in the prep and opposing
2-3 mm gingival tissue
No rotations necessary

Impressions
100% of the prep and interproximal contact areas
90% of the adjacent teeth
Good axial data for design
2-3 mm gingival tissue on buccal and lingual

Note: Information on scanning Bite Registration material can be found in the User Manual
SCAN

Buccal Bite Scanning

Scan Prep
100% of Prep and contacts

- Click Data Density View to evaluate for low data
- Use the Eraser tool to remove excess scan data

Scan Opposing
100% Occlusal and 2mm of buccal gingival data

Scan Buccal
Capture all teeth associated in Prep & Opposing scans

Verify buccal alignment, and re-align if needed

Orientation
Automatically active; use the View Circle to position model

Occlusal - Buccal/Lingual tip
Distal - Align buccal cusps
Buccal - Marginal ridges

Trace Margin
From the occlusal view, mark the margin on the shoulder

Click Show Features as an aid to highlight high contour areas
Use Move Margin to adjust placement
Use Add Segments to redraw a portion

Orientation Guide
After deactivating all tools, use the green Preview Tooth to verify orientation.

Margin Marking Guide
ICE mode can be used in margin detection; remember stone mode is priority

MARGIN

DESIGN

Tooth Libraries
Autogenesis™ ON - Click APPLY
Autogenesis OFF - Resize, Reposition, Re-Apply

Incremental Tools
Large adjustments to tooth position - Fitting the proposal in its space

Freeform Change Tools
Small adjustments to contour - Fine tuning the design

Material Thickness
Occlusal table - 1.5 to 2 mm (Dark Green/Blue)
Axial walls - 1.0 to 1.5 mm (Green)
Margins - Yellow

Rubber Tooth
1st - Axial Walls
2nd - Marginal Ridges (Occlusal Table if needed)
3rd - Embrasures

Adjusting the Bite
Activate View Bite Registration (click twice) then activate View Contacts to evaluate. Use Contact Refinement (small circles) to adjust to White, Brown, Black.

Adjusting Interproximal Contacts
Turn OFF View Bite Registration and activate Hide Model. Rotate to the mesial and distal to evaluate interproximal contacts. Return to Freeform Change Tools, use Smooth Surface to adjust to Light Green/Aqua surrounded by Dark Blue.

Recheck Material Thickness & Check Margins
Verify that design changes have not affected the appropriate material thickness for milling.

Margins should be Yellow. If Red/Orange, verify margin placement with Move Margin. Use Dropper as needed to add material.

MILL

Sprue Position
Away from margins, contacts, and occlusion. Initial position is the fastest milling time. Verify the end of the sprue is round.

Mill Sim
Check the internal fit of your restoration before milling.

Block Size Selection
Available block sizes depend on sprue position and the material selected.

Congratulations!

QUESTIONS ABOUT DESIGN? Contact Support @ 800.537.6070

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