

Procera® Crown

Introduction

- Available in zirconia or alumina
- Excellent strength with beautiful all-ceramic esthetics
- Biocompatible
- Easy clinical technique, saves chair time
- Freehand CAD coping:
 - eliminates double scanning
 - increased porcelain support
- More than 10 years of clinical documentation
- More than 5,000,000 produced units

Indications

- Use single crowns in any position of the mouth—including the posterior.
- Use the Procera® Crown Alumina (0.4 mm) for cases in the anterior region. It is indicated for incisor, canine, and premolar teeth, and gives increased porcelain space and even greater esthetic possibilities.
- Molar teeth should only receive the regular Procera® Crown Alumina, which has been successfully used for over 10 years in all positions of the mouth.
- For extra strength, Procera® Crown in zirconia is also available.
- For situations where you need to build up the coping for extra porcelain support, you should use the Procera® Crown CAD or Wax-up techniques.

Clinical Procedure

Instrumentation

Procera® needs only your conventional preparation techniques, a moderate chamfer margin and rounded internal line angles.

Nobel Biocare has developed a preparation kit for use with Procera® Crown and Bridge restorations. The shapes are of standard design and can also be found separately from other suppliers.

The kit includes the necessary diamonds for preparation.

Preparation

Each Procera® product uses preparation techniques with which you are already familiar. The preparation is characterized by thinned margins.

In general, you should perform reduction in order to:

- Eliminate sharp line angles and sharp edges.
- Establish tapered axial walls.
- Provide adequate space for the coping and the NobelRondo™ porcelain.

Procera® Crown in the Anterior

- Prepare the tooth with a depth of 0.8 mm to 1.5 mm tooth reduction.
- The preparation is characterized by thinned margins.

Procera® Crown in the Posterior

During preparation for the Procera® Crown in the posterior, be sure to:

- Keep the occlusal surface as even as possible.
- Avoid creating a deep fossa/cavity.
- Prepare the tooth with a depth of 0.8 mm to 1.5 mm tooth reduction.
- Provide sufficient (1.5 mm to 2 mm) occlusal reduction.
- Use a chamfer bur to achieve a 5° to 15° taper during axial wall reduction.
- Eliminate sharp edges, undercuts, slopes, and grooves.

The preparation is characterized by thinned margins.

Impression

Taking an impression

Your ability to accurately capture an impression is critical to correct transfer of information to the laboratory.

- Use your preferred impression material and method.
- Subgingival positioned finish lines open up the possibilities to create a perfect emergence profile with Procera® restorations.
- Therefore, try to make impressions that record a minimum of 0.5 mm below the finish line.
- Verify that the impression is free of voids, inconsistencies, or tears.

Shade Selection

It is essential to accurately document the color of the adjacent teeth according to the Vita range, since it is the pattern used for the veneering porcelain that best suits Procera® restorations.

Thereafter, the easy NobelRondo™ procedure using sample discs provides unlimited possibilities for achieving

customized esthetics, (eg, the hue, chroma and value of the teeth).

For more information see the NobelRondo™ Ceramic Concept and Procedures CD or manual.

Cementation

When you receive your Procera® restoration from the laboratory:

- Check the restoration for damage on the die.
- Seat the Procera® restoration on the tooth/abutment.
- Check the proximal contact.
- Evaluate fit, occlusion, and esthetics prior to connection.
- To save chair time, use conventional crown and bridge cementing instead of bonding.
- Temporary cementation must never be used.
- The internal Procera® surface roughness is similar to that of a porcelain surface after etching and, thus, provides exceptional cementation strength without preparation.
- Consider the translucency of the restoration and adhesive material when cementing in the anterior region.
- Apply selected material in the Procera® Crown. The use of too much cement can make the seating of the restoration difficult.
- Seat the restoration using finger pressure.
- Once the definitive restoration is seated, allow the excess cement to set completely.
- Gently remove any excess cement from the margins.

New interactive test – Procera® Crown Clinical Procedure

At the end of each section, this Tutorial includes a series of multiple-choice questions that should help you to determine if you understood its key points. Simply read each question, click on the radial button with the proper answer.

- 1. During instrumentation, which of the following is NOT necessary?**
 - a. Conventional preparation techniques
 - b. A moderate chamfer margin
 - c. Tapered internal line angles
 - d. Rounded internal line angles
- 2. In general, you should perform reduction in order to:**
 - a. Eliminate sharp line angles and sharp edges
 - b. Establish tapered axial walls
 - c. Provide adequate space for the coping and the NobelRondo™ porcelain
 - d. All of the above
- 3. When preparing a Procera® crown in the anterior or posterior, the depth of the tooth reduction should be:**
 - a. 0.5 mm to 1.5 mm
 - b. 0.8 mm to 1.5 mm
 - c. 0.8 mm to 2.0 mm
 - d. 0.5 mm to 2.0 mm
- 4. While taking an impression, try to make impressions that record a minimum of ____ below the finish line.**
 - a. 0.5 mm
 - b. 0.7 mm
 - c. 0.9 mm
 - d. 1.0 mm
- 5. Prior to connection of the Procera® restoration, which of the following steps needs to be completed?**
 - a. Evaluate fit, occlusion, and esthetics
 - b. Evaluate fit, undercuts, and slopes
 - c. Evaluate fit, occlusion, and establish tapered axial walls
 - d. None of the above

Answer Key

1. c. Tapered internal line angles
2. d. All of the above
3. b. 0.8 mm to 1.5 mm
4. a. 0.5 mm
5. a. Evaluate fit, occlusion, and esthetics

Procera® Crown

Laboratory Procedure

Modelling

Follow your standard working procedure to create a working model.

Note that the “Design CAD Coping” function in Procera® Software can be used to build up the coping for extra porcelain support.

When using the wax-up technique to create your Procera® Crown, build up a wax outer layer with:

- Minimum thickness of 0.6 mm.
- Maximum dimensions are 8 mm x 15 mm.

Once fabricated, you will use the model in the scanning phase, as well as in the subsequent fabrication phase.

Sectioning

Ensure the model height is sufficient (approximately 10 mm below the margin) so that scannable dies can be produced.

- Saw relevant parts of the model to form removable units with straight sides.

Die trimming

All dies should be ground and ditched below the margin.

- Create an undercut no deeper than 0.5 mm under the margin.
- The length of the undercut should be a minimum of 1.5 mm to allow the scanner stylus tip to travel more easily on the die.

Die control

Make sure that no undercuts are present above the finish line. If you view undesirable elements (divots, cavities, sharp edges, etc.), block them out with wax to avoid damaging the stylus.

- Die hardener is recommended.
- The use of die spacer is not recommended, as the Procera® process already makes compensation for the cement space.

Scanning

Once you have made a working model of the Procera® Crown, the next step is to scan the model to produce input data for the Procera® CAD application.

Double-click on the scanner to see more details about how to set-up and use the scanner.

Procera® Forte

For Crowns, Bridges, Abutments and Laminates

Remember!

The online step-by-step tutorial in the Procera® Forte application guides you through the complete scanning workflow.

Scanner Set-up

- Powerful magnets ensure that the base sits firmly on the base plate and that the die or jaw holders are firmly positioned on the top plate.
- Procera® Forte is controlled through the scanning software (accessed via the Procera® Software interface).
- When positioning the stylus, always handle the stylus itself. Do not hold the probe.
- Before using Procera® Forte scanner for the first time, plug-in the hardware and install the Procera® Forte scanning software on your PC (see scanner set-up instructions).
- Switch the scanner power on.
- Procera® Software must first be installed on your PC.
- Refer to the system specifications for details of the minimum PC requirements to run the software.

Log in to Procera® System

- Click the Procera® System icon.
- Log in by entering the appropriate username and password and then click ‘Enter’.
- Click the Procera® Forte icon.
- When you are successfully logged in, the Procera® System front-end software will now automatically attempt to connect to Procera® Forte.
- If the scanner is found, the indicator on the toolbar will turn bright green and the scanner’s serial number will be displayed in the title bar.
- Procera® Forte is now ready for use.

Note!

If you want to change scanners from Procera® Forte to Procera® Piccolo or vice-versa, close the scanning application. In the Procera® System interface, open the “Scanner Configuration” menu and select the appropriate scanner.

Initiation

- If the indicator light is orange, the scanner is in the process of booting.

- You will need to wait until it turns bright green. Note that this could take up to 2 minutes.
- If no scanner is found the indicator on the tool bar will remain dark green. If this happens, check that the USB and power are connected and that the power switch is on.
- If there is power to the scanner and the cabling is OK, there is a more serious problem. Refer to the fault-finding section in the Procera® Forte help file.

Calibration Check

- It is recommended that you check your Procera® Forte scanner once a day, but at least once a week.
- Click the “Scanner Check” icon in the Procera® Forte Scanner software.
- Follow the instructions that appear on the screen.

Select Type of Operation

- For Procera® Crowns, select the “Single Preparation” icon from the scanner software toolbar.
- Note that when you are producing a Procera® Crown Wax-up, you will also be required to carry out a scanning of the waxed-up outer layer.
- In this case, when prompted, you will also need to click the “Scan Preparation Wax-up” icon.

Die alignment and centering

- Place the die in the die holder with the facial aspect towards you.
- Center the die in the die holder and tighten the screw, distributing even pressure on the die. Make sure that you cannot move the die in the die holder.
- Place the die holder on the gimbal.
- To align the die in all directions, loosen the black ring on the gimbal.
- Check the alignment for undercuts above the margin to ensure that the stylus can easily travel around the die.
- Improper alignment may create undercuts above the margin.
- Retighten the black ring.
- To center the die, place the gimbal on the base plate of the scanner and loosen the lever. Retighten when satisfied.

Start/Stop Scanning

Follow the online step-by-step tutorial in the Procera®

Forte application concerning the subsequent scanning process.

- Click the “Start scan” icon in the Procera® Forte software toolbar to start scanning.
- The scan starts and a 3-dimensional plot of the scanned model appears on the screen.
- Click the “Stop scan” icon to stop scanning.
- If the scan is aborted, the whole scan must be started again from the beginning.

Complete Scanning

- When the scan is complete, Procera® Forte will automatically stop and the data that has been collected will be displayed on your screen as a solid model.
- The resulting data is deemed unreliable if undercuts (red patches) appear above the margin line.
- The scanned data is saved automatically upon completion of the scan and is now available for import into the Procera® CADDesign application.

Delete Scanning

- If you do not want to import the scanned data into the Procera® CADDesign application, you can delete it using the “Delete Job” icon, or by selecting the “Delete” option from the “File” menu.

Procera® Piccolo

For Crowns, Abutments and Laminates

Remember!

The online step-by-step tutorial in the Procera® Piccolo application guides you through the complete scanning workflow.

Scanner Set-up

- The scanner is controlled through the software interface.
- The probe and turntable are handled manually.
- The lever on the side, releases the turntable so that it can be set to a correct start position.
- Along with the scanner, you have received a box with a holder, a die holder, a calibration gauge and a centering pointer.
- The power switch is located at the back of the scanner.
- Ensure that all cables are connected.
- Clean the probe tip.

Log in to Procera® System

- Click on the Procera® System icon.
- Log in by using the appropriate username, password and press Enter on the keyboard.
- Click on the Procera® Piccolo Icon.
- Procera® System recognizes if a Procera® Piccolo is installed and starts the interface. An icon appears in the working task bar.

Note!

If you want to change scanners from Procera® Forte to Procera® Piccolo or vice versa, close the scanning application. In the Procera® System interface, open the “Scanner Configuration” menu and select the appropriate scanner.

Initiation and Calibration

- After the Procera® Piccolo is switched on, a calibration must be carried out before the first scan.
- This is automatically detected by the software.
- A message will appear in the middle of the screen.
- Click on “Calibrate” and follow the instructions on the screen.

Note!

To ensure continuous precision in the scans, regularly check Procera® Piccolo against the gauge.

Select Type of Operation

- For Procera® Crowns, select the “Scan single coping” icon from the scanner software toolbar. Note that when you are producing a Procera® Crown Wax-up, you will also be required to carry out a scanning of the waxed-up outer layer.
- In this case, when prompted, you will also need to click the “Wax-up crown” icon.

Die Alignment

- Place the die in the die holder with the facial aspect towards you and the screws to the right.
- Center the die in the die holder and tighten the screws, distributing even pressure on the die. Make sure that you cannot move the die in the die holder.
- To align the die in all directions, push the upper part of the die holder.
- To tilt the upper part of the die holder, push using both hands and thumbs.
- Check the alignment for undercuts above the margin and balance the margin level.

- Improper alignment may create undercuts above the margin.

Centering

- Position the turntable at 270° (marked on the turntable and scanner base).
- Carefully put the die holder on the edge of the turntable.
- Place the die holder with the facial aspect of the die towards you.
- Slide the die holder into the center without hitting the probe tip.

Centering Anterior Dies

- Center the die on the highest point by using the centering pointer.

Centering Posterior Dies

- Balance the level of the occlusal table and avoid undercuts.
- Center in the middle of the die by using the centering pointer.

Centering Steep Occlusal Angles/Deep Occlusal Cavities

- Steep occlusal angles cannot be read if the probe tip does not stay in contact with the die.
- During rotation, the probe tip may pick up a limited part and this can affect the fit of the coping or make production impossible.
- For mandibular premolars, tilt the die more to the lingual and center closer to the highest point. The misreading will be covered from the opposite direction.
- For molars, block out deep occlusal cavities with wax.
- Keep the probe tip in contact with the die to ensure that no sharp edges will appear on the scanned image.

Start/Stop Scanning

Follow the online step-by-step tutorial in the Procera® Piccolo application concerning the subsequent scanning process.

- Click the “Start scan” icon in the Procera® Piccolo software toolbar to start scanning.
- The scan starts and a 3-dimensional plot of the scanned model appears on the screen.
- Click the “Stop scan” icon to stop scanning.
- If the scan is aborted, the whole scan must be

started again from the beginning.

Complete Scanning

- When the scan is complete, Procera® Piccolo will automatically stop and the data that has been collected will be displayed on your screen as a solid model.
- The resulting data is deemed unreliable if undercuts (red patches) appear above the margin line.
- The scanned data is saved automatically upon completion of the scan and is now available for import into the Procera® CADDesign application.

Delete Scanning

- If you do not want to import the scanned data into the Procera® CADDesign application, you can delete it using the delete icon, or by selecting the “Delete” option from the “File” menu.

Procera® Software

Procera® Software is used to:

- Create a production order.
- Process the scanning data in a CAD environment.
- Dispatch an order for production.

Create an Order

- Whilst scanning is ongoing, click the “Order Manager” icon on the left-hand side of the Procera® Software screen.
- To create an order, follow the online step-by-step tutorial in the Procera® Software Order Manager application.
- To gain a general reference overview of the Order Manager application, you can also click on Help in the application’s main menu.

CAD Design application

- After creating a new order in the Order Manager, click the Procera® CADDesign application icon on the left-hand side of the Procera® Software window to finalize the design after scanning.
- Depending on your chosen lab technique, there are three design guides included in the Procera® Software CADDesign application to support the production of Procera® Crown:
 - Design Coping – choose from standard coping designs.
 - Design CAD Coping – modify the thickness and shape of the coping for increased porcelain

support.

- Design Wax-up – adapt the design of the coping using a double scanning technique.

- Click on the appropriate link to open the relevant CADDesign tutorial page.

Dispatch an Order

- Once you have designed your Procera® Crown, use the Procera® Software Order Manager to dispatch the order to the Nobel Biocare production facility.
- Click the “Order Manager” icon on the left-hand side of the Procera® Software screen.
- To dispatch an order, follow the online step-by-step tutorial in the Procera® Software Order Manager application.
- To gain a general reference overview of the Order Manager application, you can also click on Help in the application’s main menu.

Concluding Procedure

After delivery of the Procera® Crown from the Nobel Biocare production facility:

Use diamond impregnated finishing tools to make minor adaptations to the finish line or margin.

- **Caution!** To avoid micro cracks, Procera® Crowns should only be ground when wet. Do not apply excess pressure.
- After adjustments, sandblast Procera® Crown using two to four bars of pressure utilizing aluminum oxide:
 - 110 μm – 250 μm for zirconia crowns.
 - 50 μm – 110 μm for alumina crowns.
 - at an approximate distance of 10 mm.
- Apply appropriate NobelRondo™ porcelain (see the NobelRondo™ Ceramic Concept and Procedures CD or manual).
- Then clean in an ultrasonic bath before sending the finished product to the clinic.

New interactive test – Procera® Crown Laboratory Procedure

Procera® Forte Users

At the end of each section, this Tutorial includes a series of multiple-choice questions that should help you to determine if you understood its key points. Simply read each question, click on the radial button with the proper answer.

- 1. When using the wax-up technique to create your Procera® Crown, build a wax outer layer with:**
 - a. Minimum thickness of 0.6 mm
 - b. Maximum dimensions of 8 mm x 15 mm
 - c. Both A and B
 - d. Neither A nor B
- 2. When you are successfully logged in, the Procera® System front-end software will automatically attempt to connect to Procera® Forte. If the scanner is found, the indicator light will turn _____ and the scanner's serial number will be displayed in the title bar.**
 - a. Bright yellow
 - b. Bright green
 - c. Bright red
 - d. Bright orange
- 3. After scanning is complete, the resulting data is deemed unreliable if the following appear above the margin line:**
 - a. Angles
 - b. Undercuts
 - c. Sharp edges
 - d. None of the above
- 4. Sufficient model height so scannable dies can be produced is:**
 - a. 5 mm below the margin
 - b. 6 mm below the margin
 - c. 8 mm below the margin
 - d. 10 mm below the margin
- 5. Procera® software is used to:**
 - a. Create a production order
 - b. Process the scanning data in a CAD Environment
 - c. Dispatch an order for production
 - d. All of the above

Answer Key

1. c. Both A and B
2. b. Bright green
3. b. Undercuts
4. d. 10 mm below the margin
5. d. All of the above

New interactive test – Procera® Crown Laboratory Procedure

Procera® Piccolo Users

At the end of each section, this Tutorial includes a series of multiple-choice questions that should help you to determine if you understood its key points. Simply read each question, click on the radial button with the proper answer.

1. After the Procera® Piccolo is switched on, which of the following checks must you perform before your first scan?
 - a. Centering
 - b. Die alignment
 - c. Calibration
 - d. All of the above
2. If deep occlusal cavities are present in the die, they should be _____ for ideal scanning.
 - a. Blocked out with wax
 - b. Constructed by extending the undercut below the finish line
 - c. Covered in type-4 stone
 - d. None of the above
3. To avoid micro cracks, Procera® Crowns should only be ground when _____.
 - a. Dry
 - b. Wet
 - c. Neither A nor B
 - d. Both A or B
4. When centering the die on the scanner, position the turntable at:
 - a. 360°
 - b. 180°
 - c. 270°
 - d. None of the above
5. To align the die in all directions, push the _____ part of the die holder.
 - a. Upper
 - b. Lower
 - c. Middle
 - d. Right

Answer Key

1. c. Calibration
2. a. Blocked out with wax
3. b. Wet
4. c. 270°
5. a. Upper