DEDICAM®
DIGITAL CONCEPTS

Design Guide for selected DEDICAM® restorations and attachments with exocad® DentalCAD

November 2023

M-1733-PRT-EN-INT-BHCL-00-112023

biohorizons
camlog

Content

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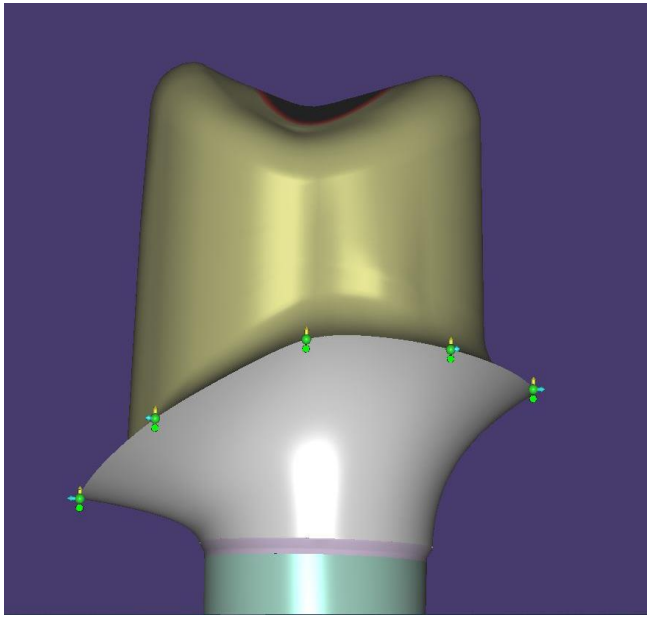
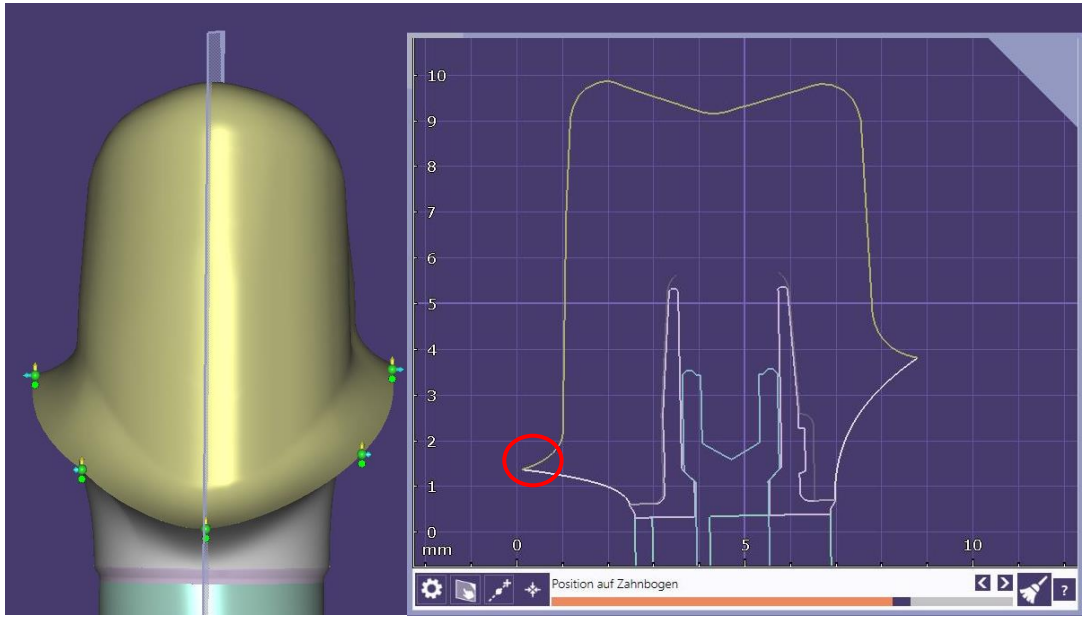
Edge design of thinly tapered margin line on abutments

Edge design of thinly tapered margin line on abutments





Problem:
Thin margin line can negatively influence the milling result (partial chipping at the edges) and leads to redesign and remake of the structure as a possible cause of delivery delays.

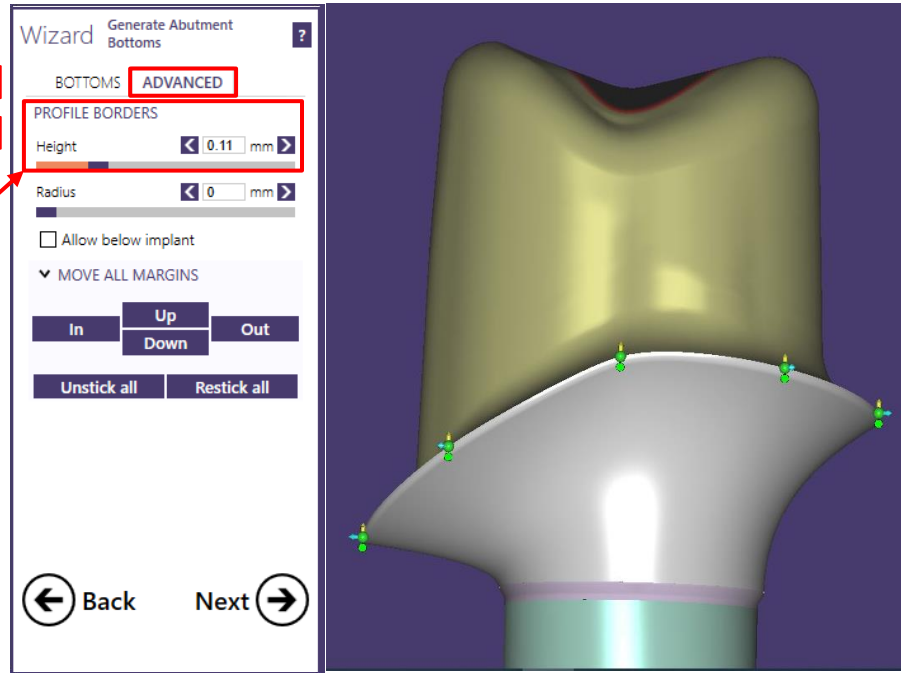
Edge design of thinly tapered margin line on abutments

Note: specific edge reinforcement

Abutment design

1 → Activate Button „Advanced“

2 → Profile borders: Set minimum height 0.1mm (often default height is 0.2mm which may be used as well)

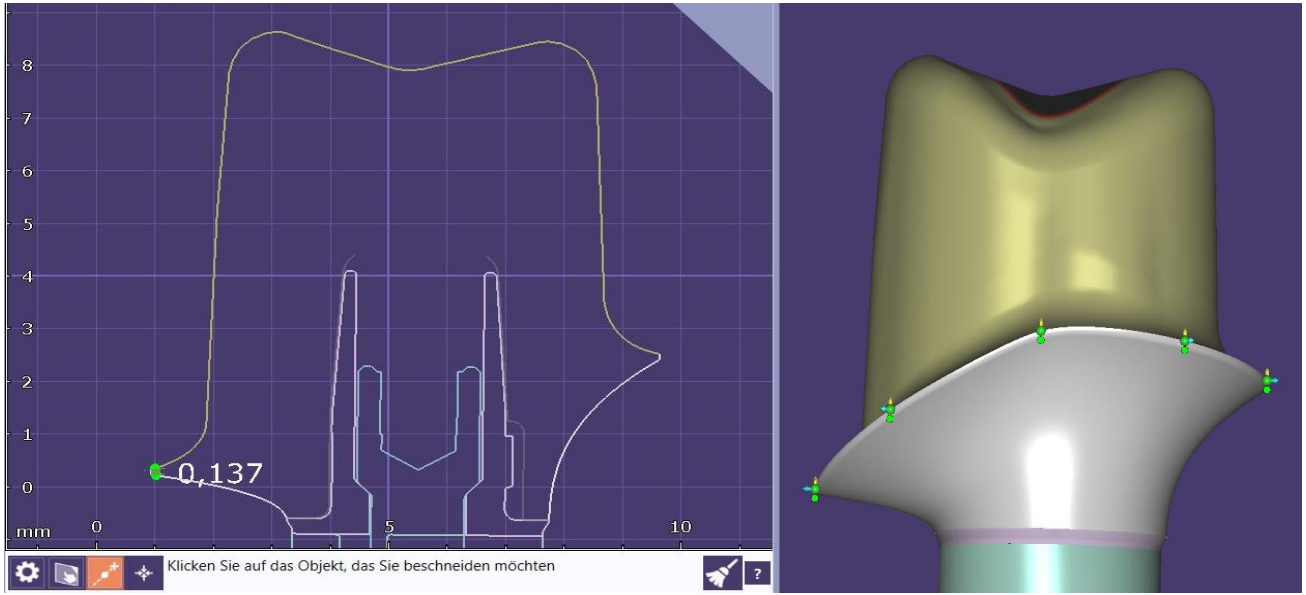


Edge design of thinly tapered margin line on abutments

Note: specific edge reinforcement

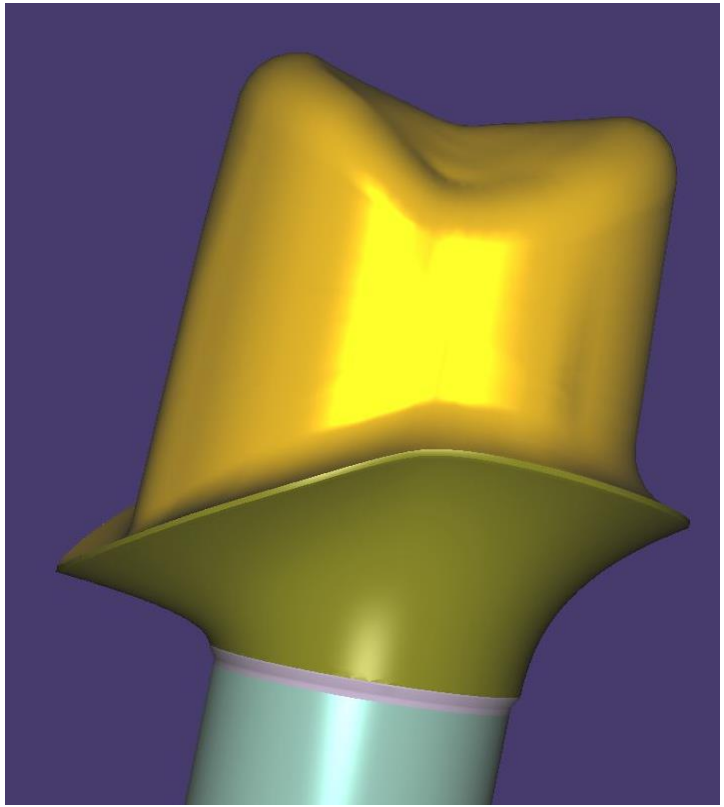
Edge reinforcement in sectional view

- Margin line shows a specific edge reinforcement of approx. 0.1 – 0.2mm and can be milled without loss of cervical contour.

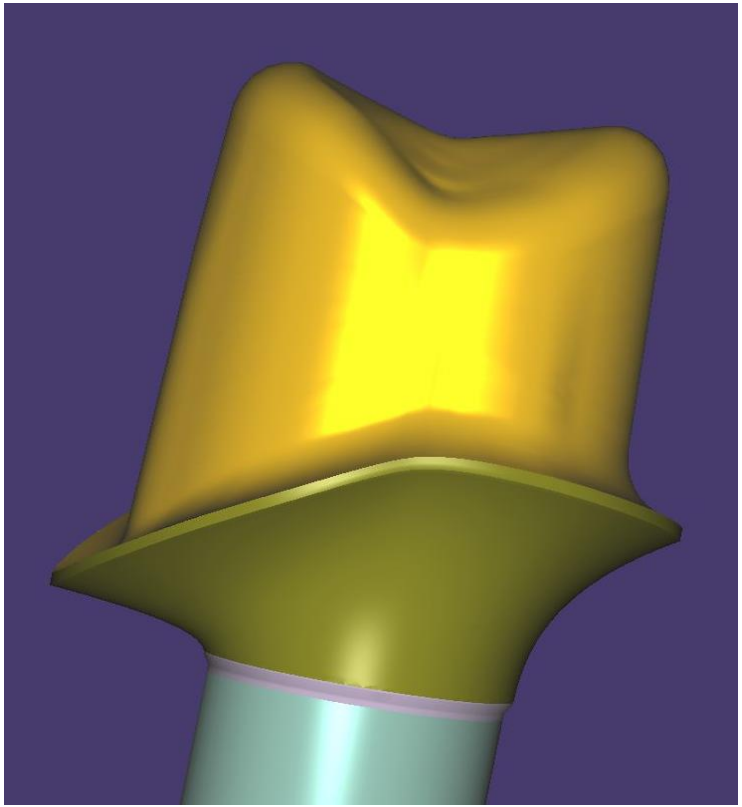


Edge design of thinly tapered margin line on abutments

Edge reinforcement = 0.1mm



Edge reinforcement = 0.2mm

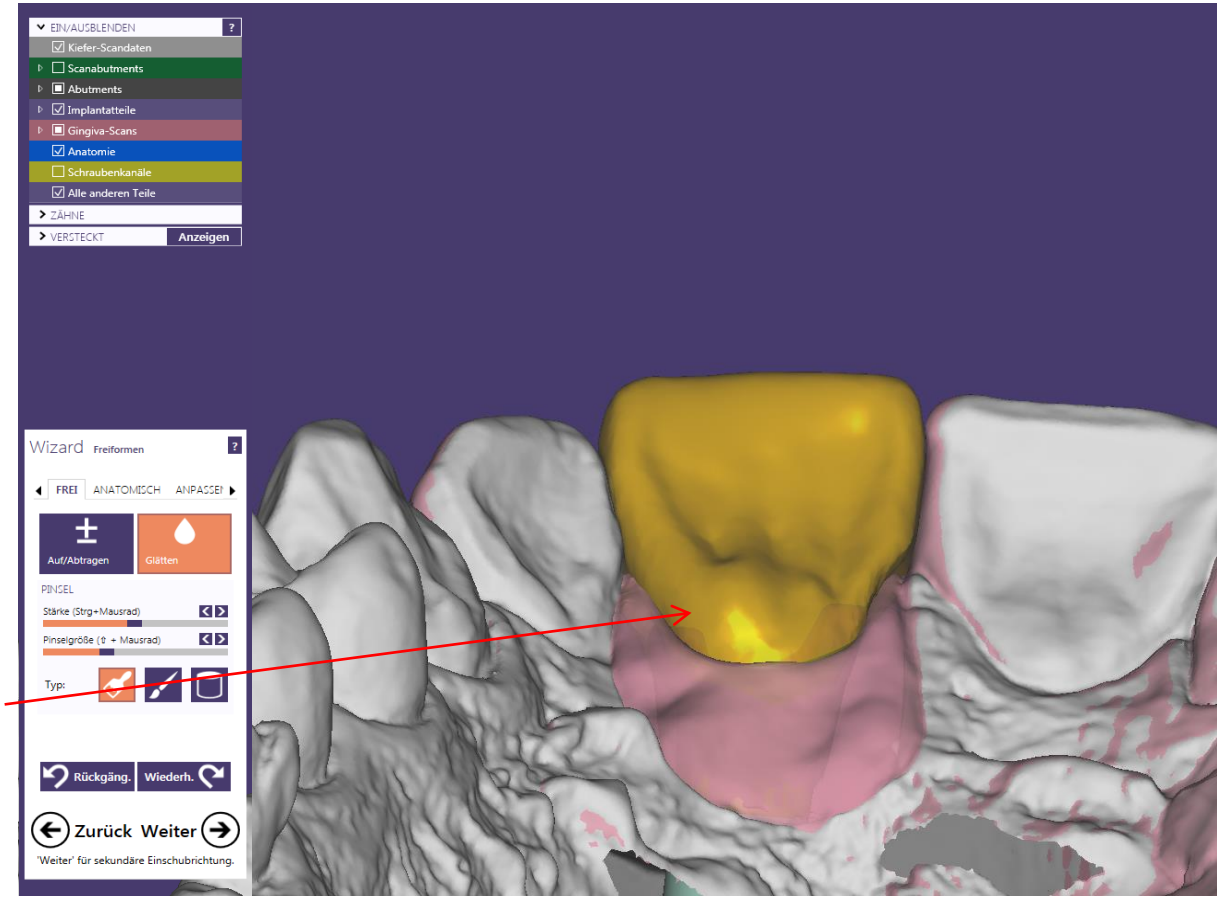


Design of threaded holes M1.4 on one-piece titanium abutments for horizontal screwed crowns, fixed with the “Bredent screw”

Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment:

Note:
Wax up or virtual tooth makes it easier to create individual tooth

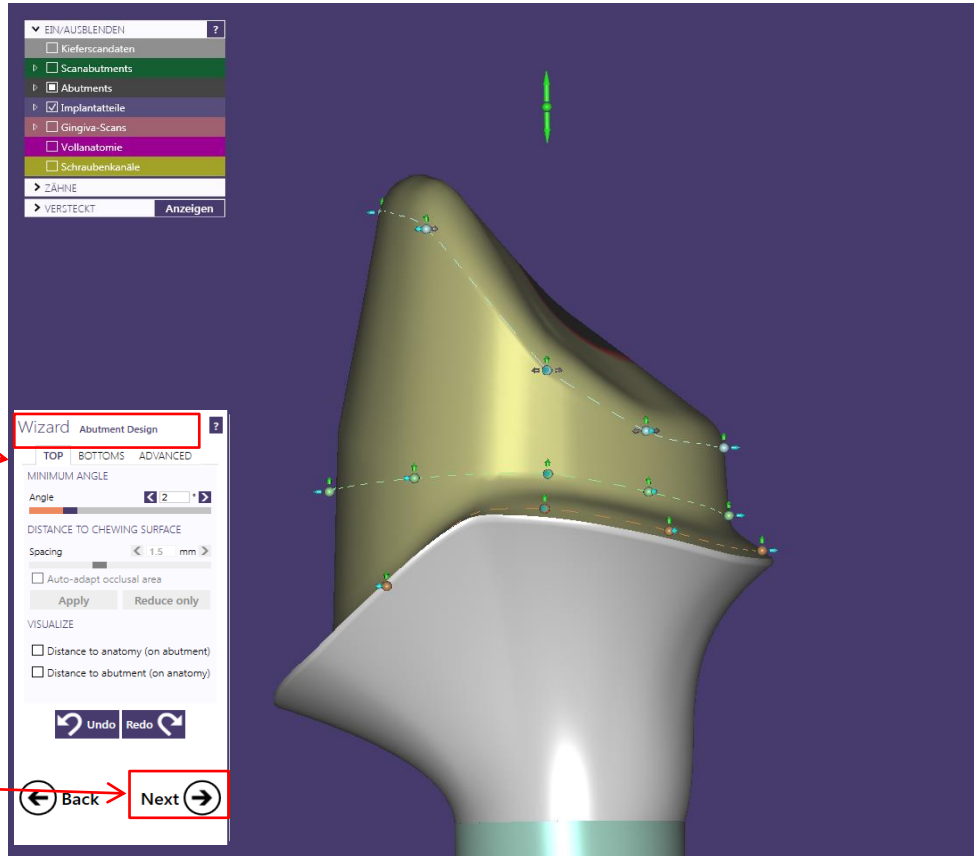


Minimum wall thickness for coping or crown where the threaded hole is planned: **0.9mm**

Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection:

Abutment design finished



Wizard – Abutment Design:

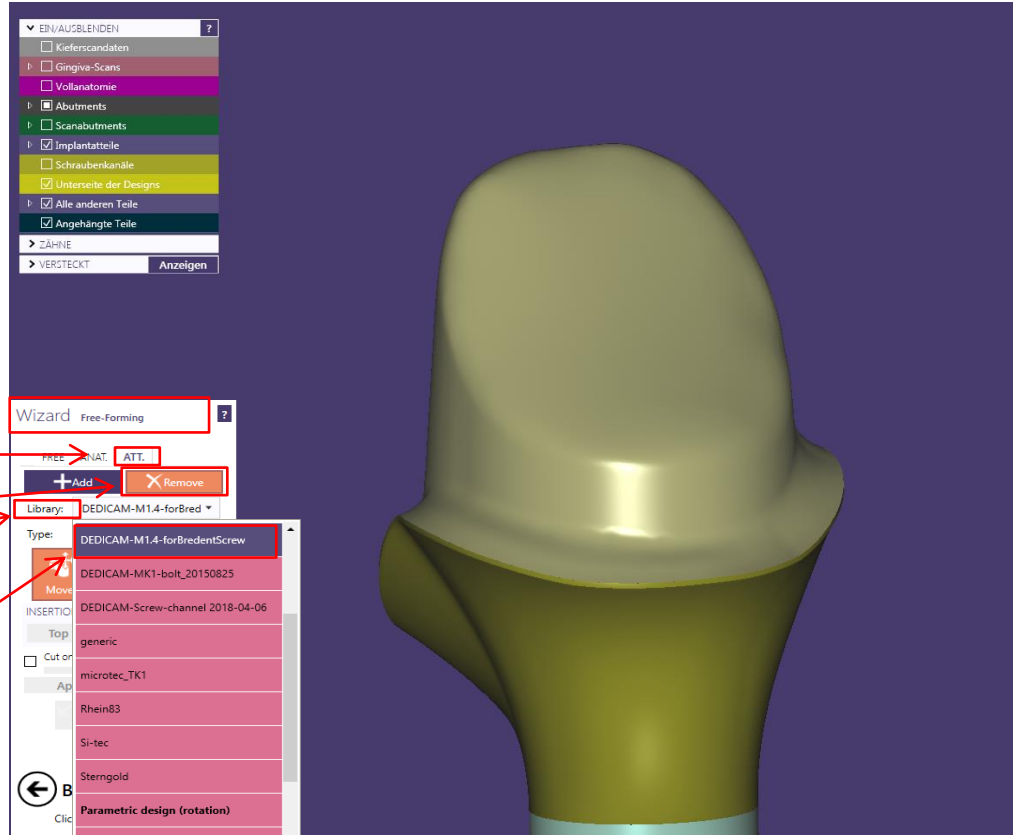
- Top
- Bottoms
- Advanced

Press „Next“

Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection:

Abutment design finished



Wizard – Free-forming: Att.

Check mark „Remove“
Select „Library“

Select attachment:
DEDICAM M1.4 (for Bredent screw)

Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection:

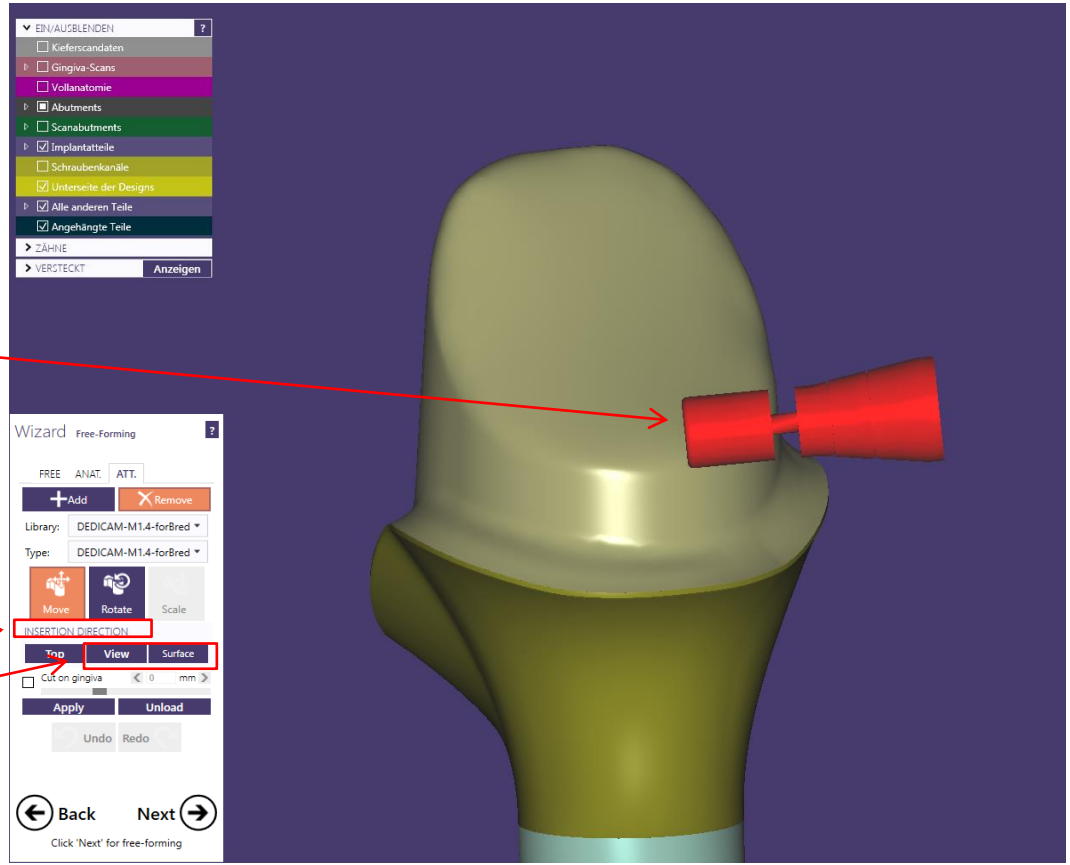
Align attachment position:

View direction on planned horizontal screw connection

Important note:
Attachment is not displayed authentically. This is necessary and offers qualitative advantages

Selected attachment:
DEDICAM M1.4 (for Bredent screw)

Insertion direction
View and Surface



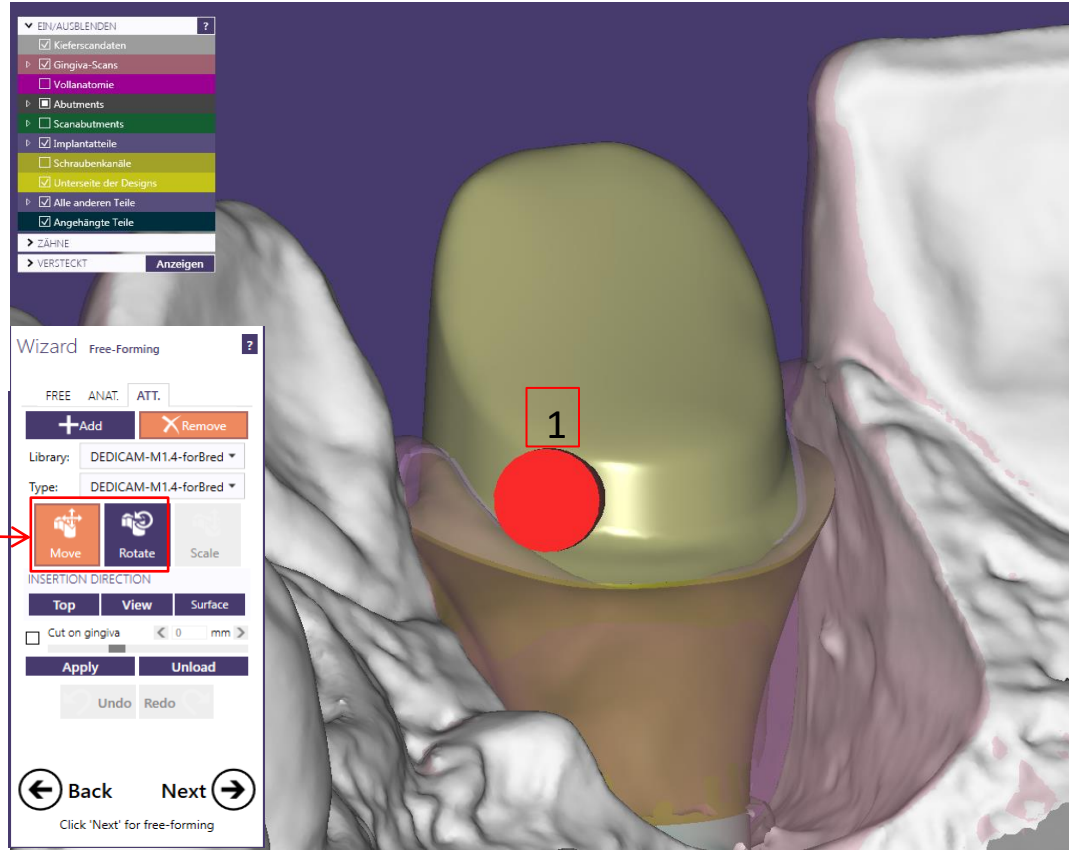
Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection :

Positioning of the attachment:

Check mark

- Move
- Rotate
- Position (1) meets functional and aesthetic aspects



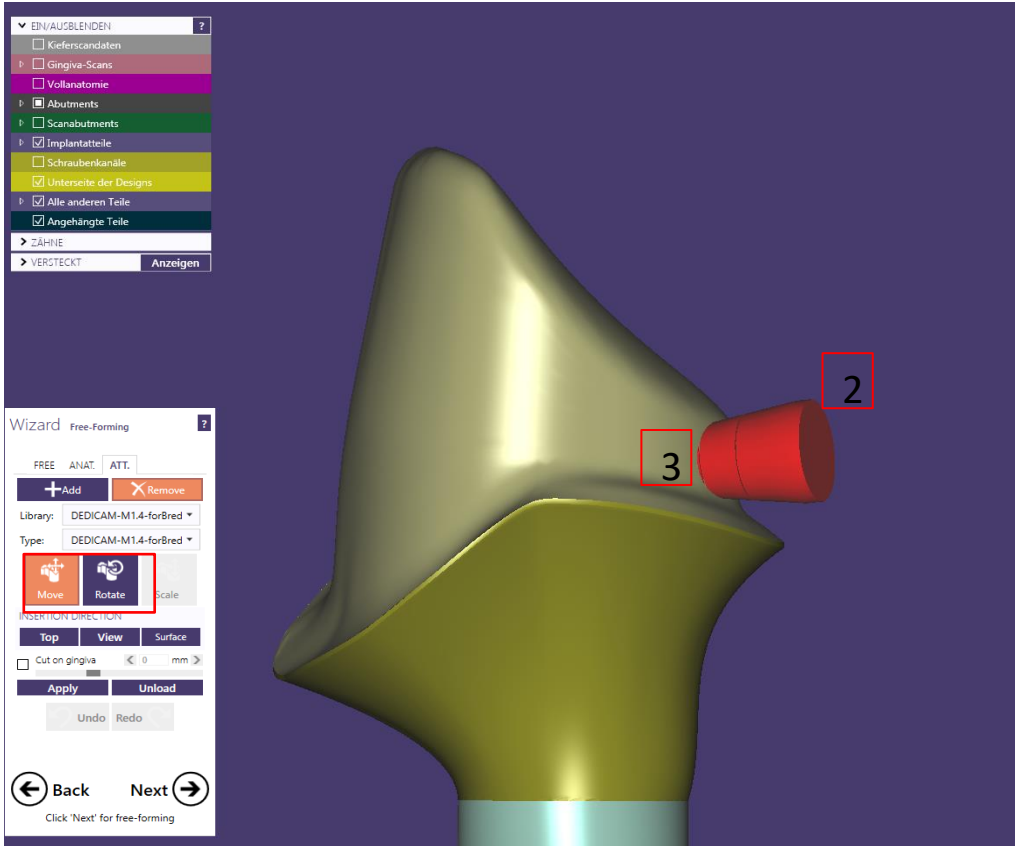
Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection:

Attachment fine adjustment

Pay attention to the groove on the attachment

- Angle (2)
- Depth(3)

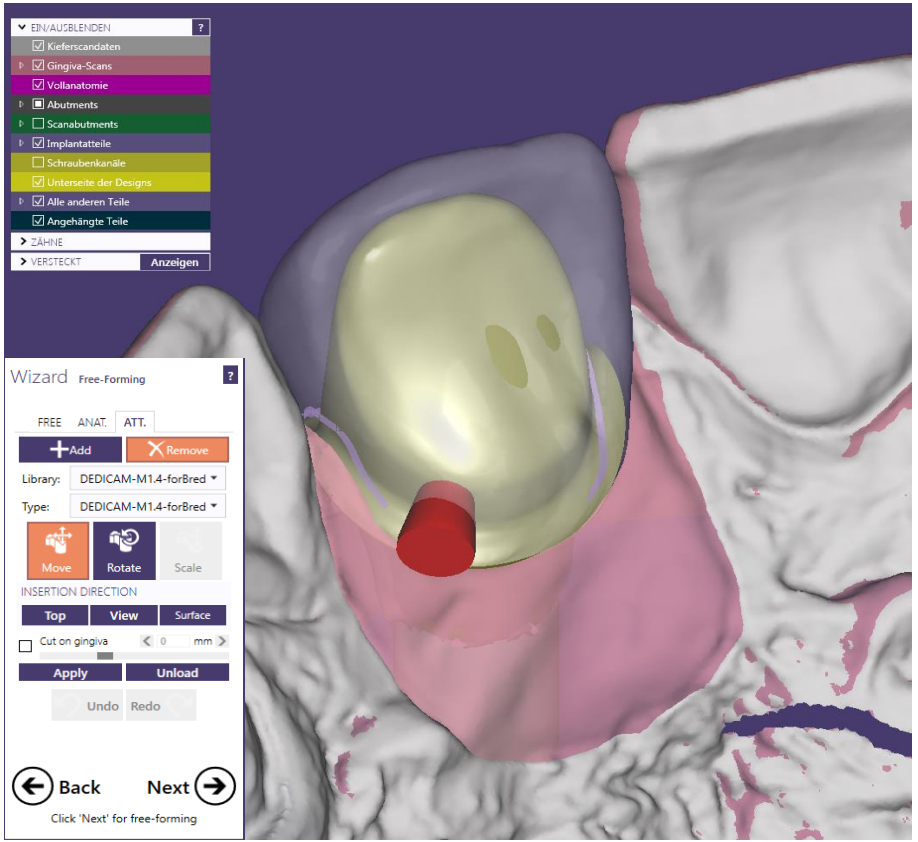


Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection:

Attachment fine adjustment:

View direction on planned horizontal screw connection



Note:
Wax up or virtual tooth makes it easier to create individual tooth.

Design of threaded holes M1.4 on one-piece titanium abutments

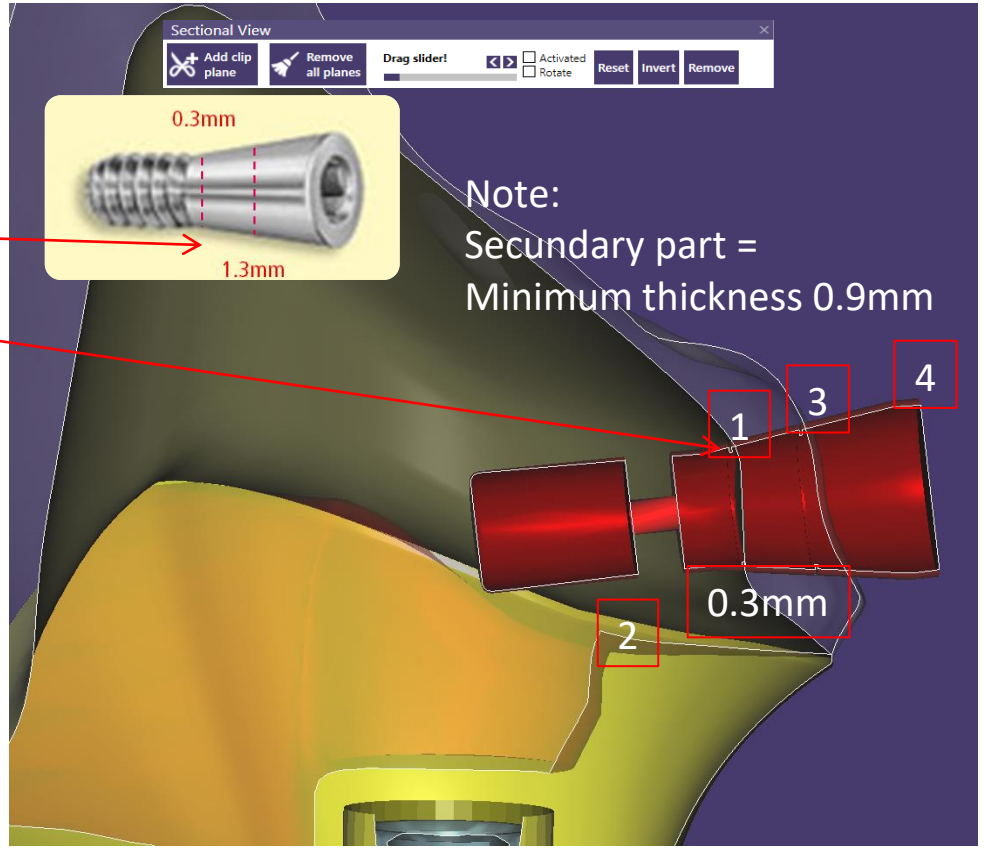
Design abutment and create horizontal screw connection:

DEDICAM Attachment „M1.4 for Bredent Screw“ :

Grooves for the indendent use of Bredent Screw M1.4 (according to IFU)

Grooves on the DEDICAM Attachment:

- Groove must be enclosed from abutment (1)
- Conical part of screw head 0.3mm enclosed from abutment (2)
- Groove as border until the screw might be reduced. max. 1.3mm (3)
- Total length of screw (4)



Design of threaded holes M1.4 on one-piece titanium abutments

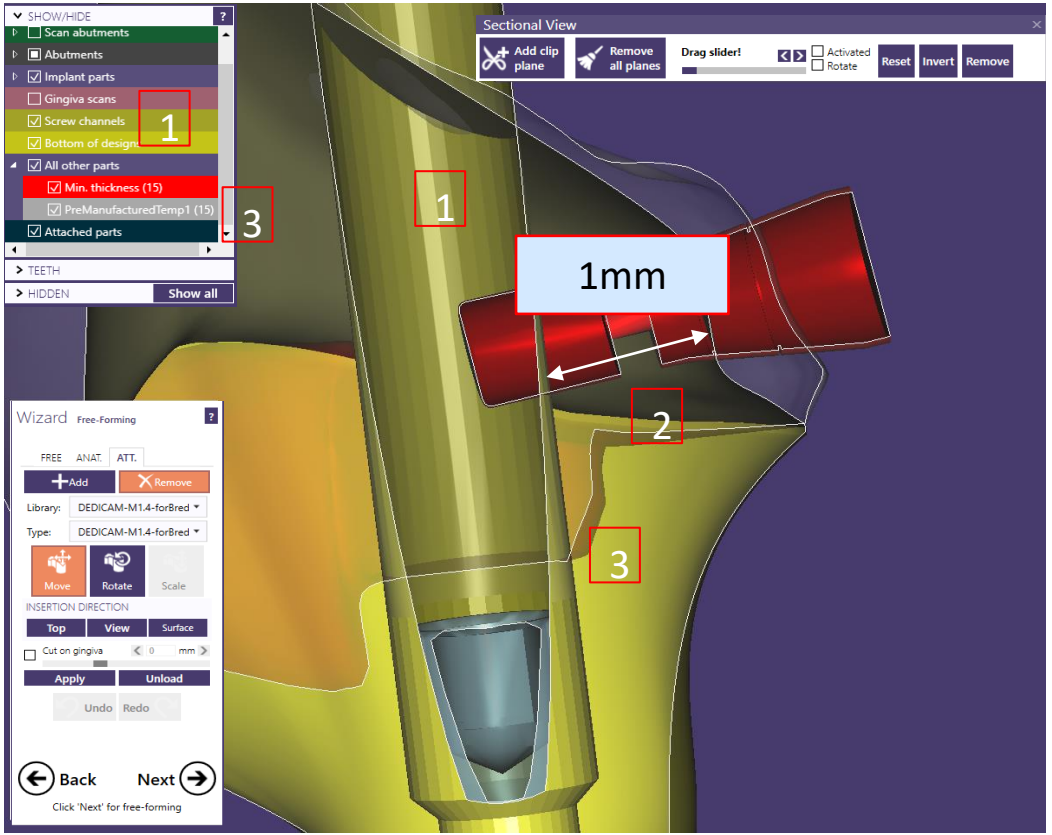
Design abutment and create horizontal screw connection:

Control of correct Positioning from DEDICAM Attachment:

- Show screw channel (1)
- Threaded hole with at least 1mm depth into the abutment (2)
- Show min. thickness and attached parts (3)

Attention: Threaded hole attachment must be placed above abutment min. thickness and abutment screw.

If possible threaded hole might not be placed into abutment screw channel.

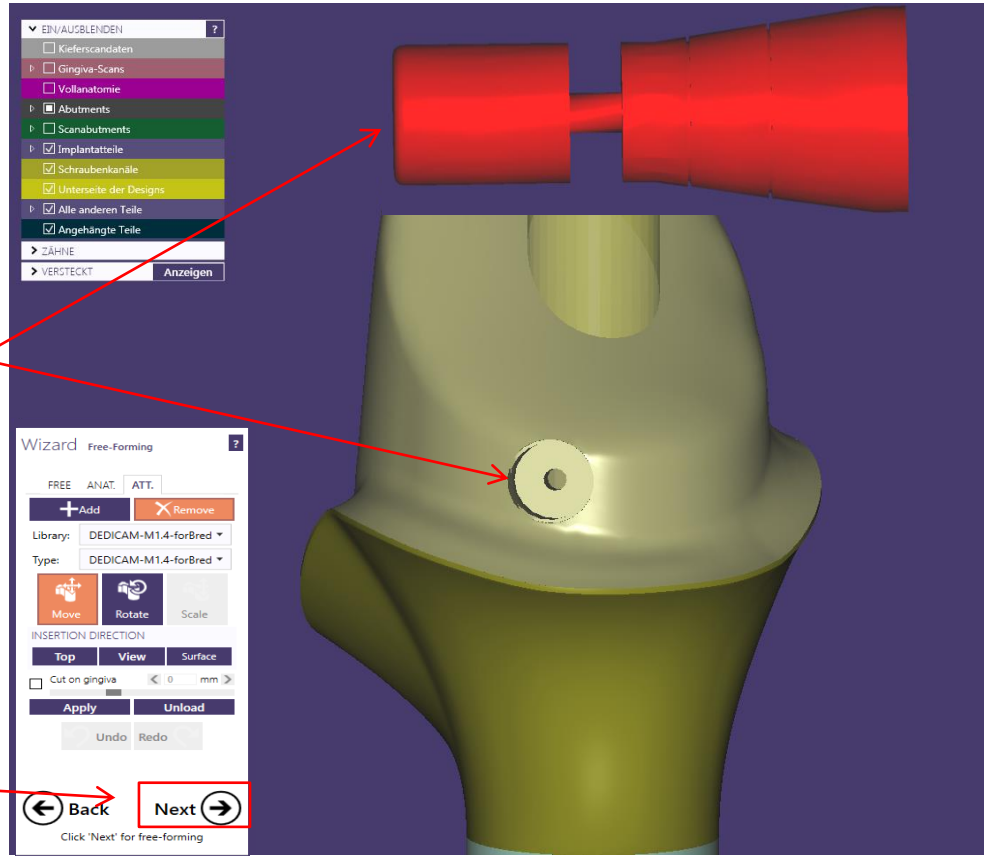


Design of threaded holes M1.4 on one-piece titanium abutments

Design abutment and create horizontal screw connection:

Finish of the DEDICAM horizontal screw connection:

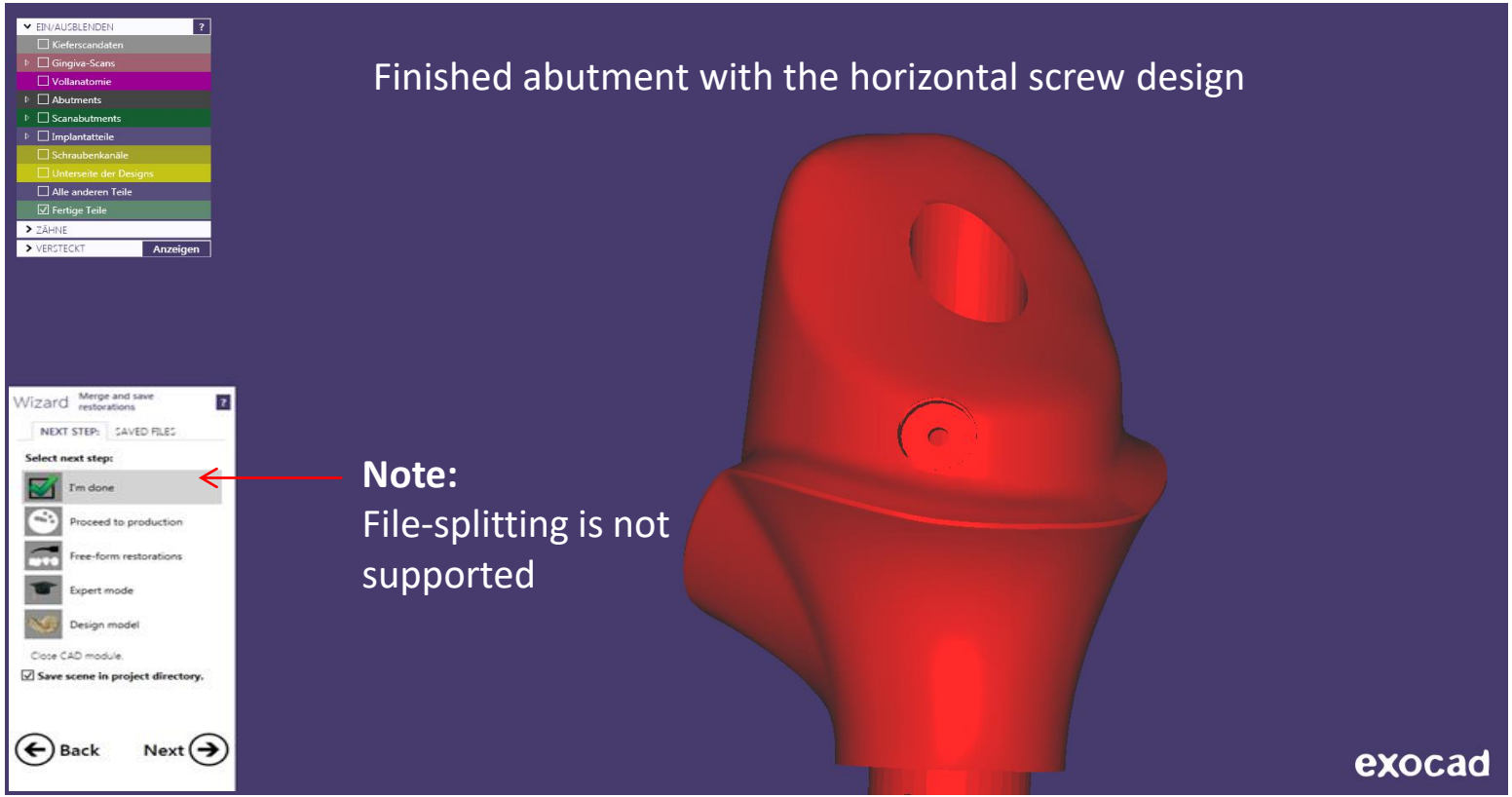
Note:
The screw hole won‘t be shown authentically. This is necessary and has qualitative benefits in the production.
Furthermore it is not possible to produce screw holes in copings or crowns.



Press „Next“

Design of threaded holes M1.4 on one-piece titanium abutments

Abutment with horizontal screw connection for Bredent screw M1.4



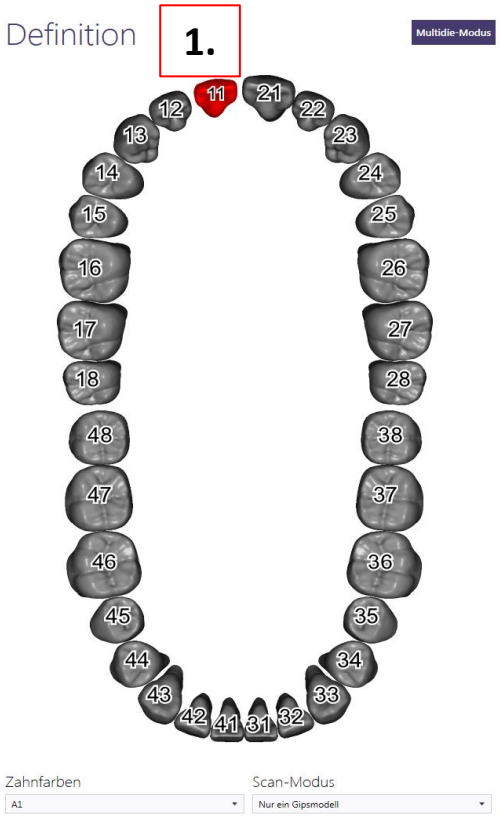
Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Order creation:

1. Select tooth position
2. Select indication

Recommendation:
Select *„Coping“* or *„Offset coping“*



Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Order form:

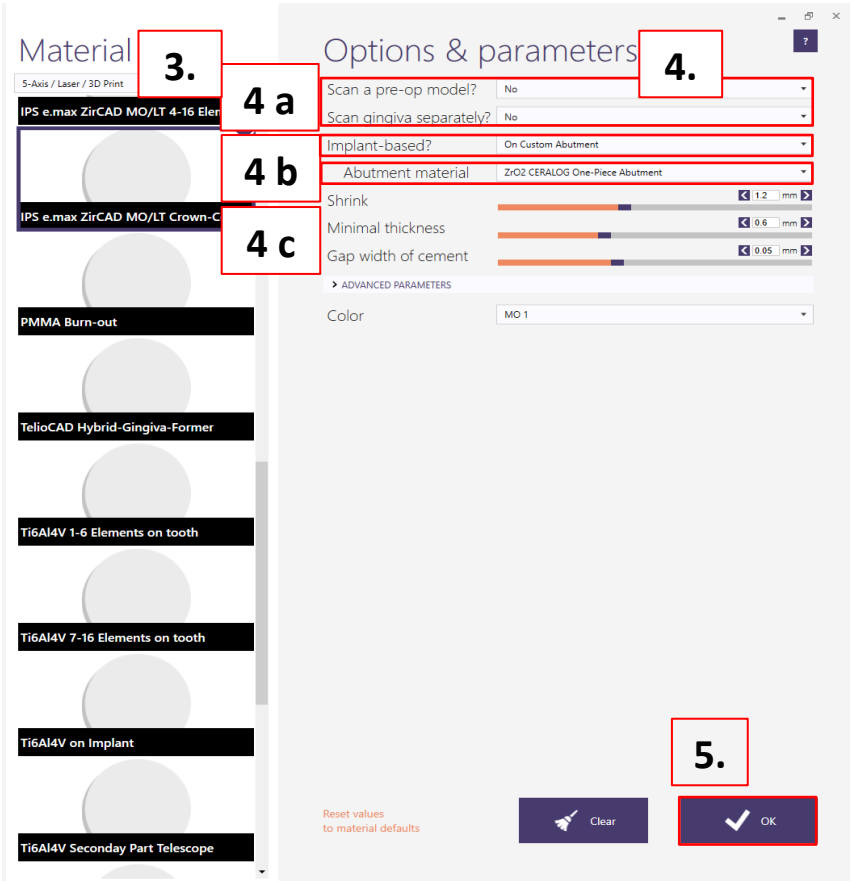
3. Select material for coping or offset-coping
4. *Options & Parameters*

4.a Define type of scan

4.b *Implant-based?: „On Custom Abutment“*

4.c Abutment material: *„ZrO2 CERALOG One-Piece Abutment“*

5. Press *„OK“* to confirm



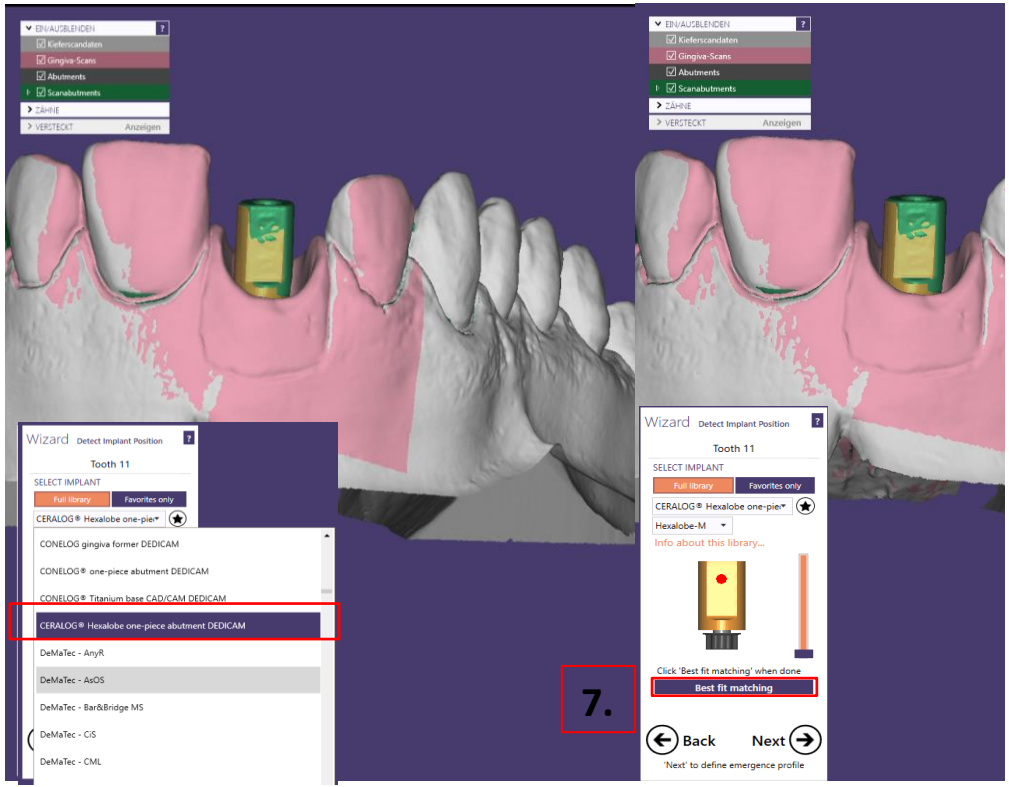
Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Select CAD library:

6. CAD-Library: *„CERALOG® Hexalobe one-piece abutment DEDICAM“*

   Attention: Ensure you took the correct library

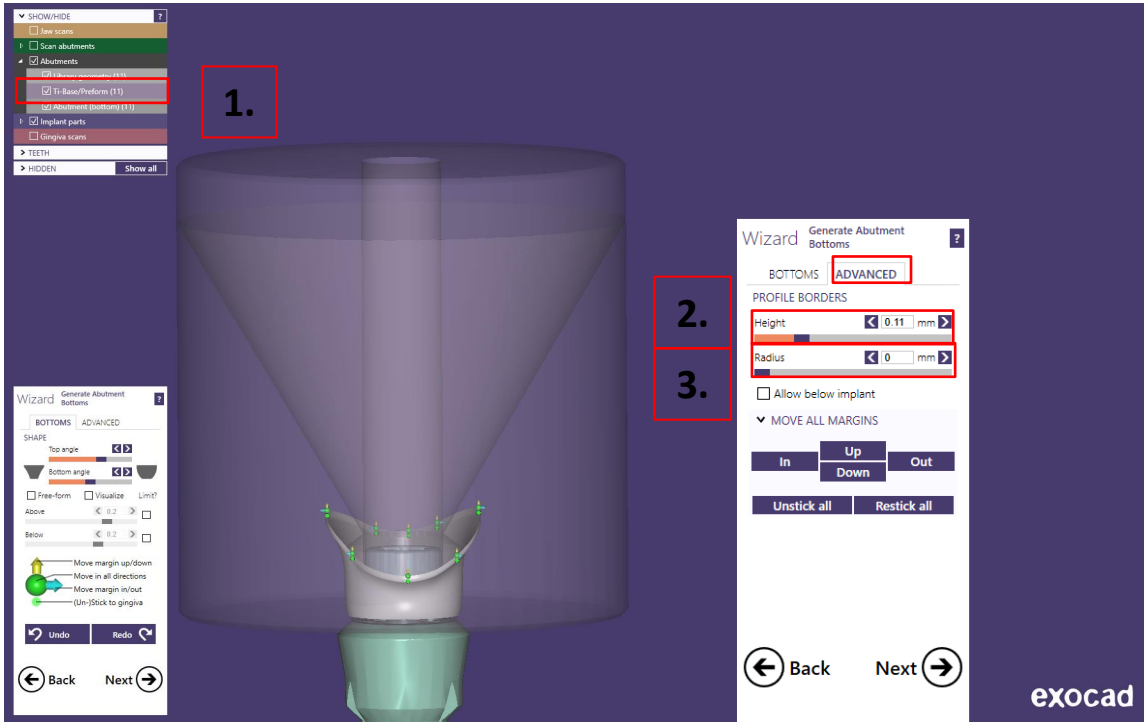
7. Press „Best fit matching“ and confirm with „Next“



Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Wizard Generate Abutment Bottoms:

1. Visualize and respect outer blank limit for design. Hint: Blank size differs from Titanium blank
2. Under „*Advanced*“ set profile borders value „*Height*“ to 0.11mm
3. Set „*Radius*“ always to 0mm (exocad versions provided by AmannGirrbach have mostly 0.2mm on default)

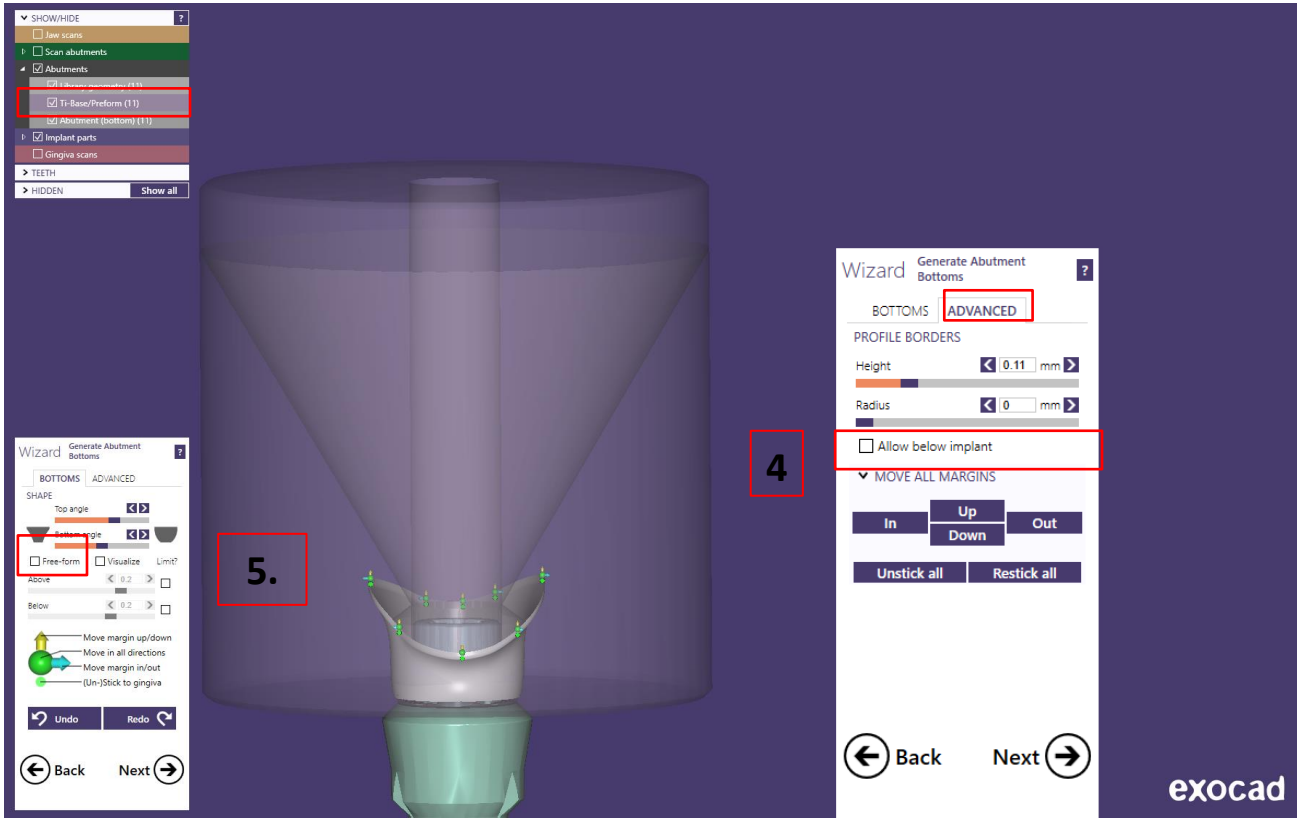


Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Wizard Generate Abutment Bottoms:

4. **Never check mark** „Allow below implant“
5. Check mark „Free-form“ to finalize bottom

Recommendation: Respect outer blank limit – keep blank half transparent during design

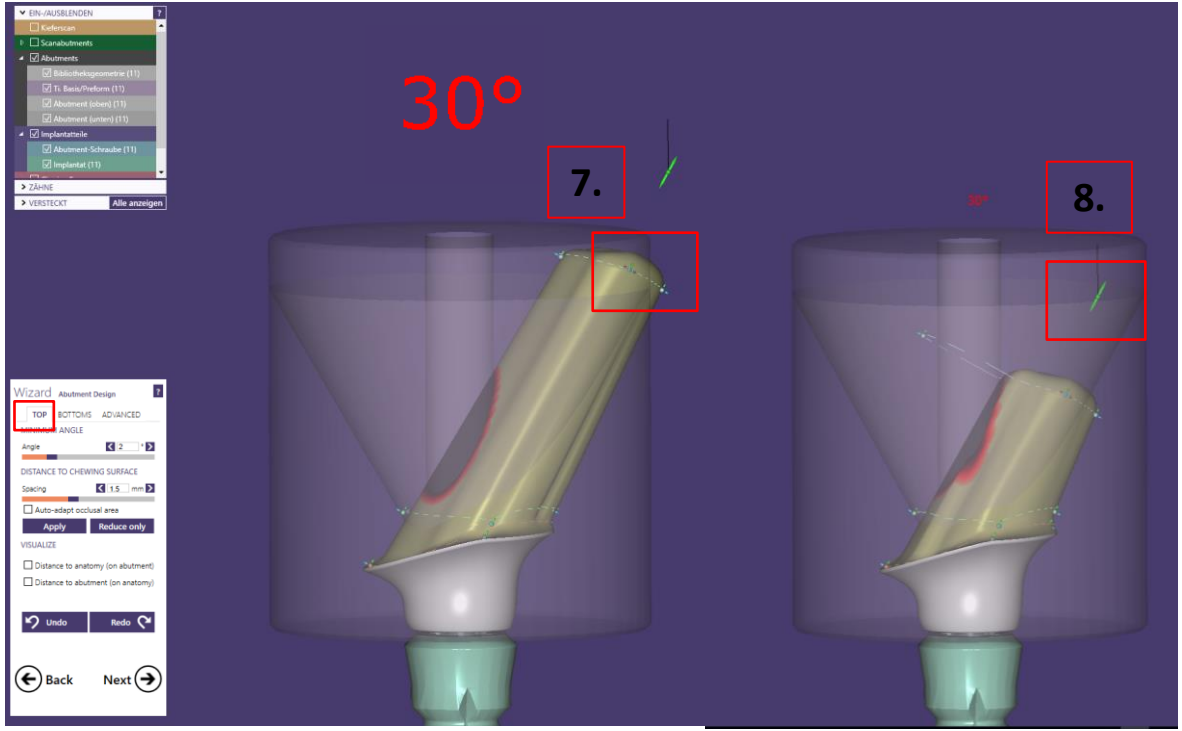


Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Wizard Abutment Design above margin „*TOP*“

6. Abutment design above margin
7. Do not violate outer blank or abutment angulation of 30°
8. Drag „green arrow“ or set another insertion axis to correct

Recommendation: Respect outer blank limit – keep blank half transparent during design

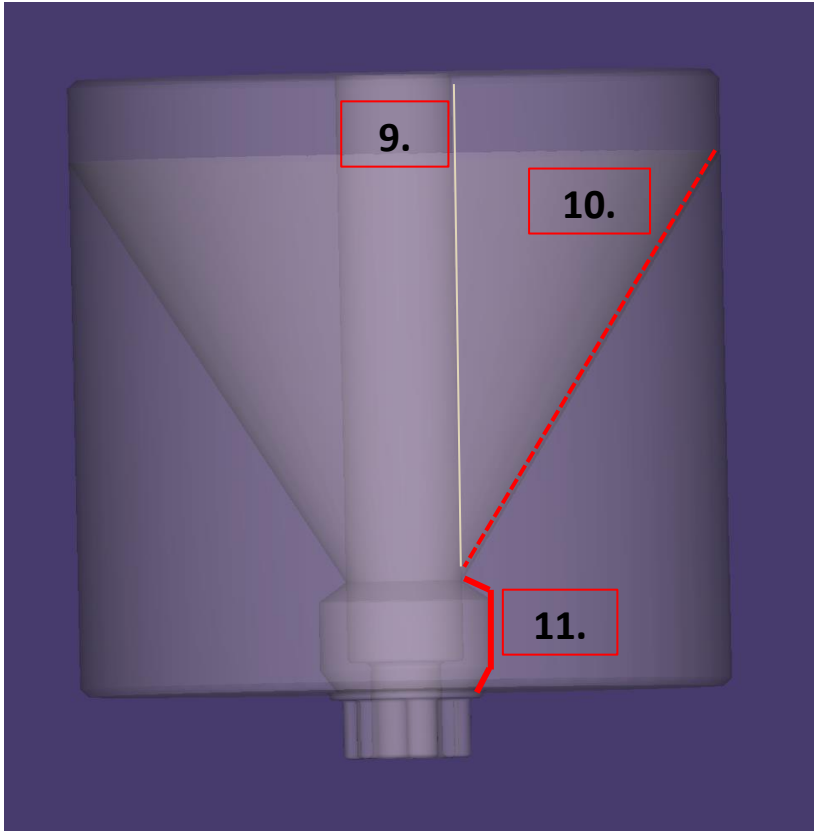


Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Blank visualization informs about maximum outer shell, angulation limit and minimum thickness

9. Screw channel
10. Angulation limit of 30°
11. Minimum thickness around abutment screw

Please note: Designs which do not meet the requirements will be rejected.

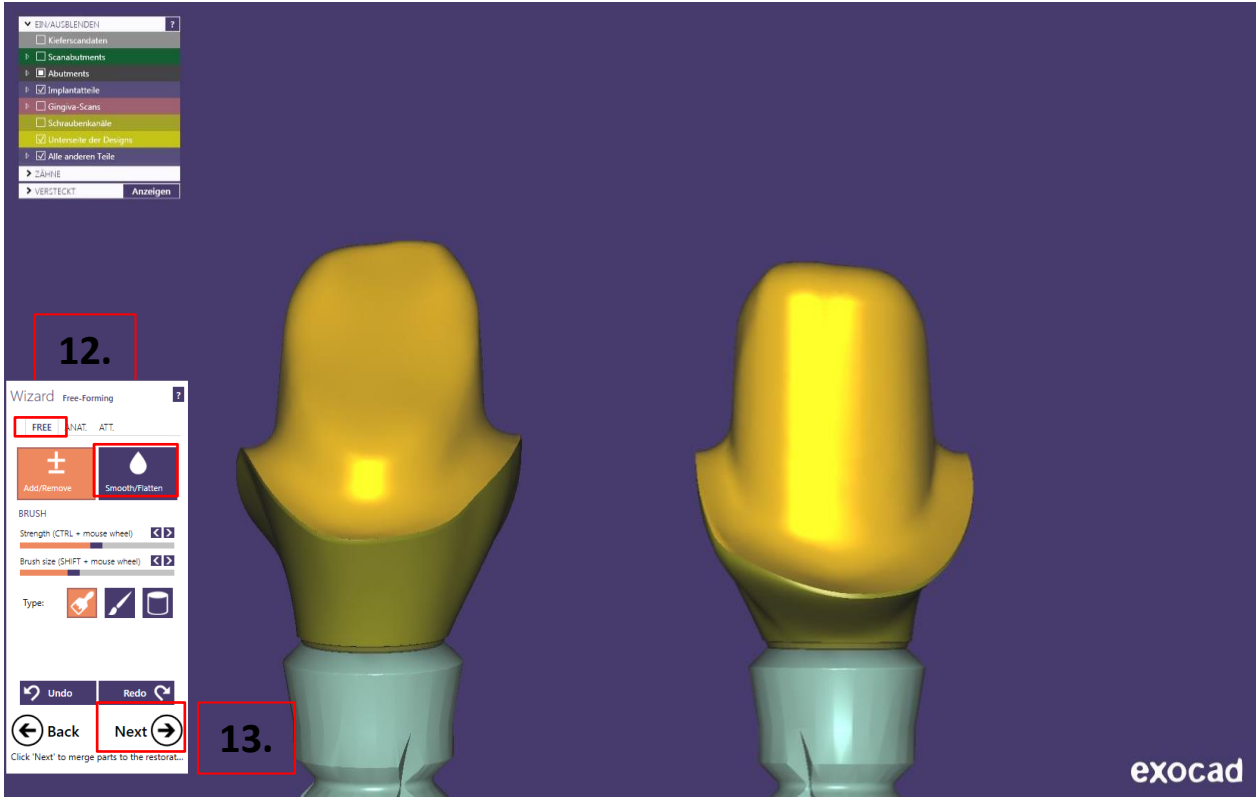


Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Wizard Free-forming:
„Smooth/Flattern“

12. Finalize abutment surface with „*Smooth/Flattern*“
13. Design finalized → Press „Next“

Note: Avoid sharp edges and corners on the abutment



Design of one-piece zirconia abutments for CERALOG® Hexalobe implants

Abutment design: Final design is always saved incl. screw channel

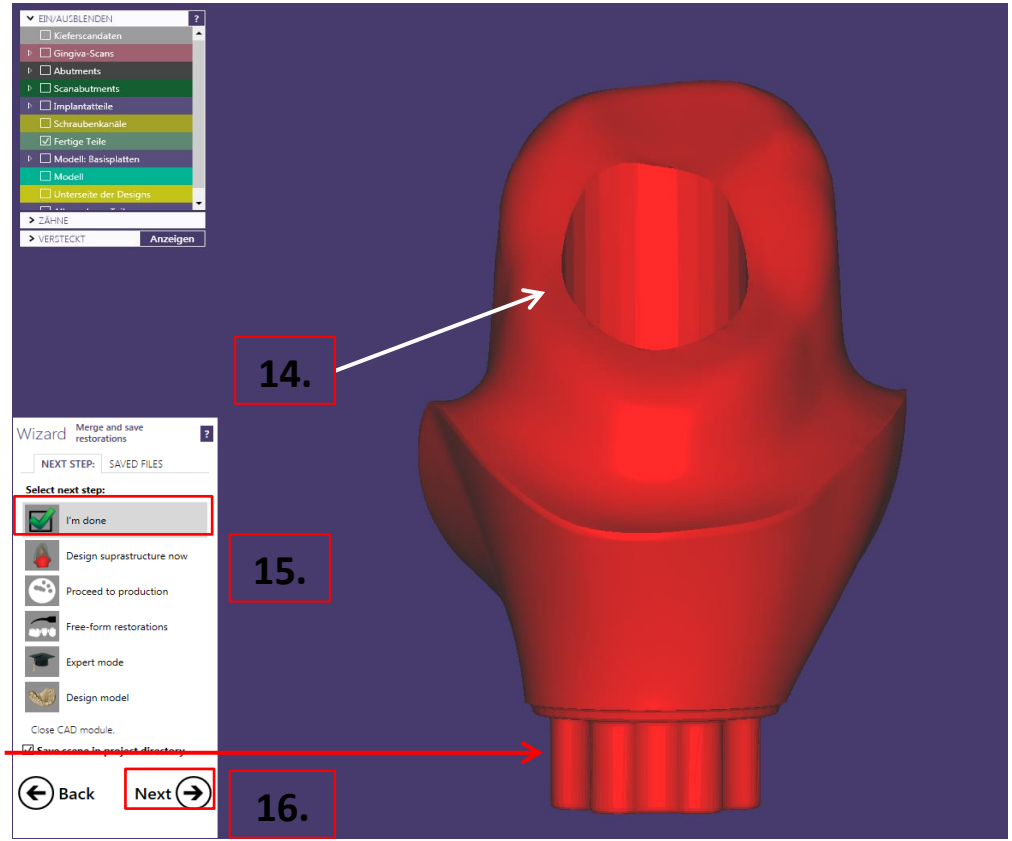
14. Screw channel

Edge rounding on screw channel
Screw channel edges might be slightly adapted on production site if needed to prevent cracks.

15. Design finished

16. Press „*Next*“ and send design incl. *constructioninfo.xml* to Camlog

IMPORTANT
Visualization of the hexalobe-connection is distorted and for safety reasons only millable by Camlog



Adding a MK1 attachment to a bridge or crown block

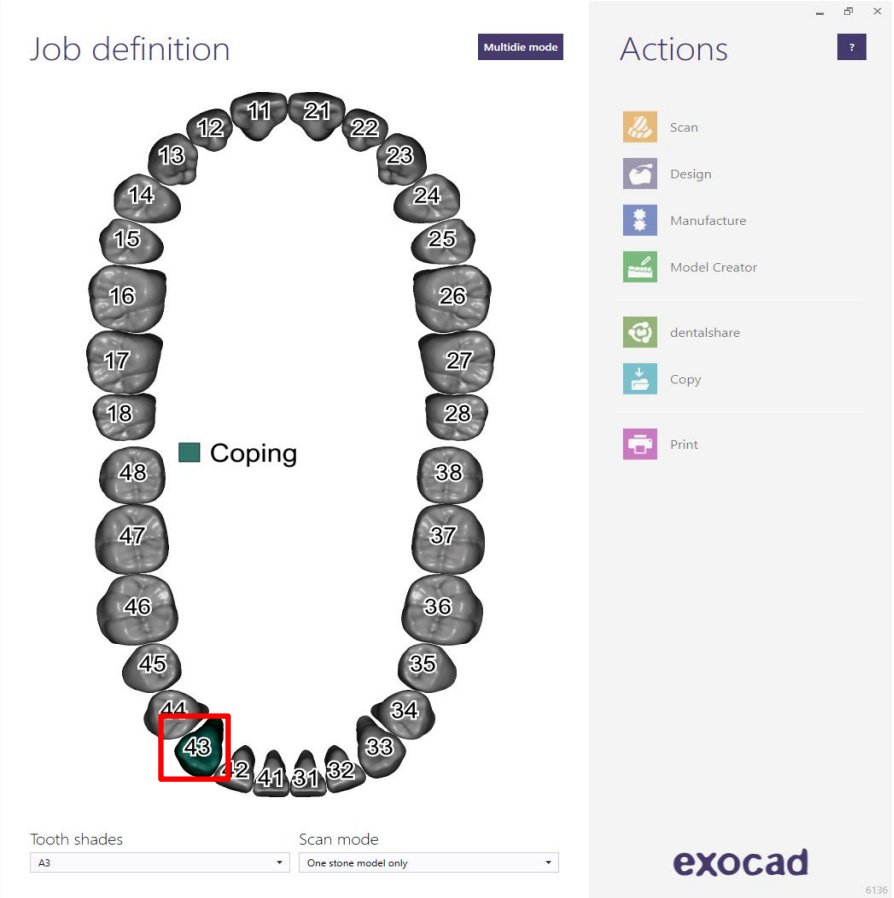
Adding a MK1 attachment to a bridge or crown block

Note:

In order to position attachments to fixed bridges or crown blocks or to cut them by the gingiva. Note the explanations with the example designs when creating the order.

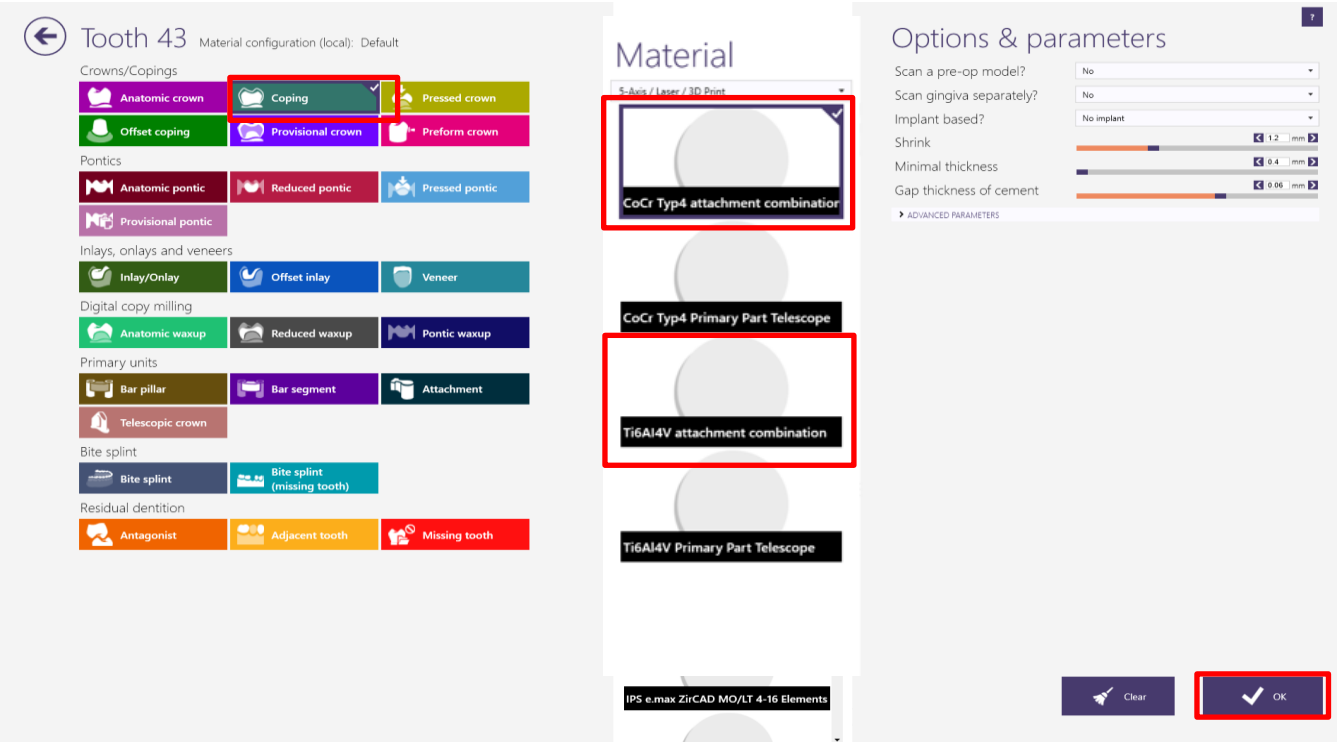
For the design of attachments it is necessary to use the DEDICAM® CAD library.

Adding a MK1 attachment to a bridge or crown block



Example: Blocked copings on tooth 43 + 44 with MK1 distal on tooth 44

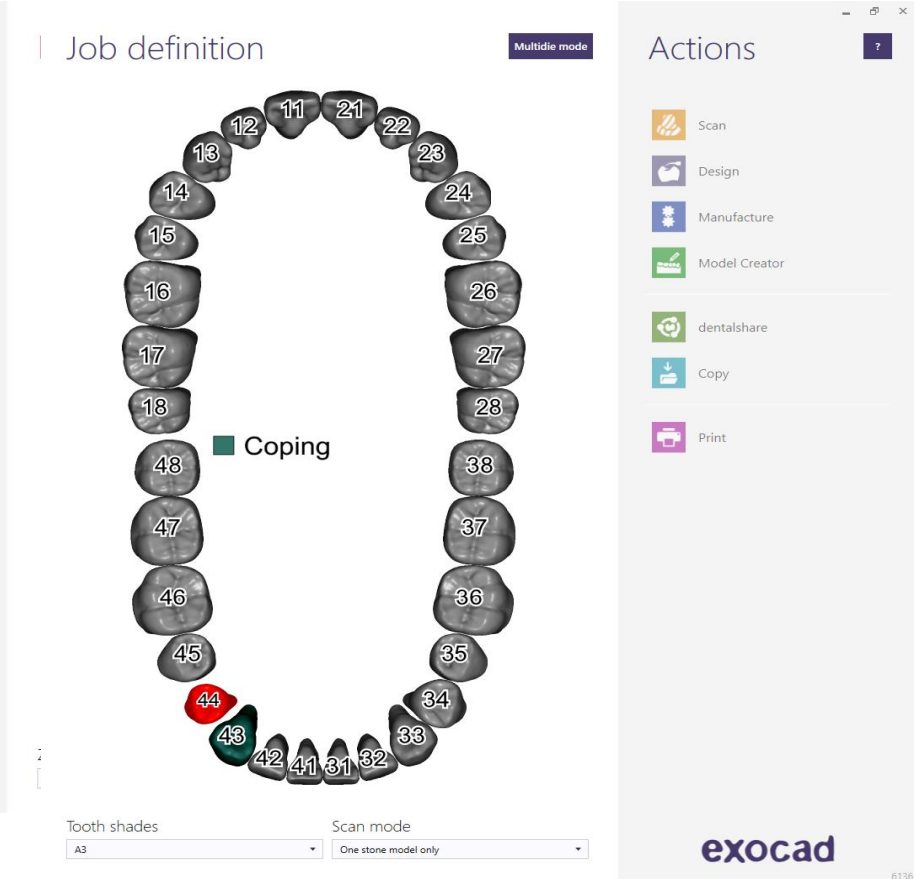
Adding a MK1 attachment to a bridge or crown block



Order creation: Tooth 43

- *Coping*
- Material: *CoCr Typ4 attachment combination*
  or
- *Ti6Al4V attachment combination*
- *OK* to confirm

Adding a MK1 attachment to a bridge or crown block



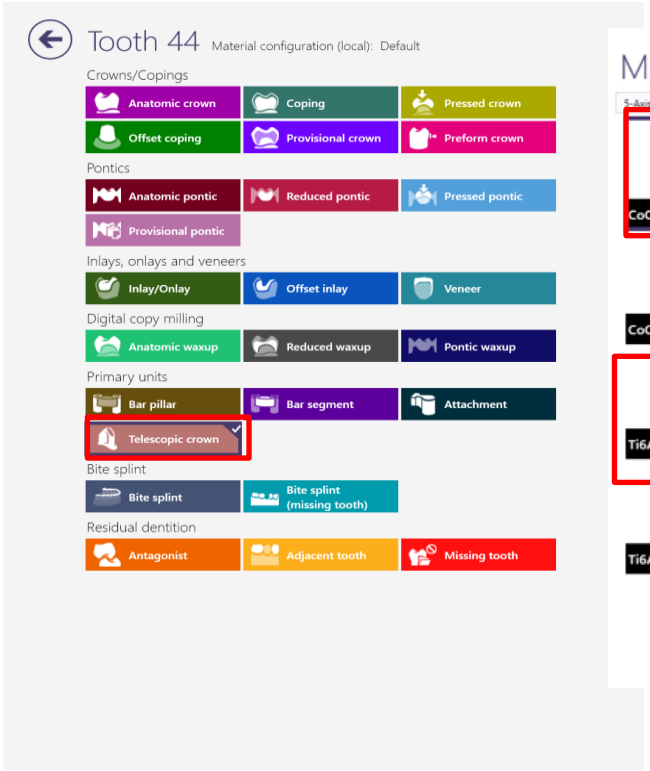
Order creation: Tooth 44

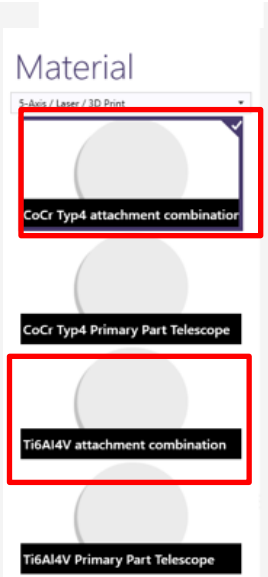
- *Primary telescope*

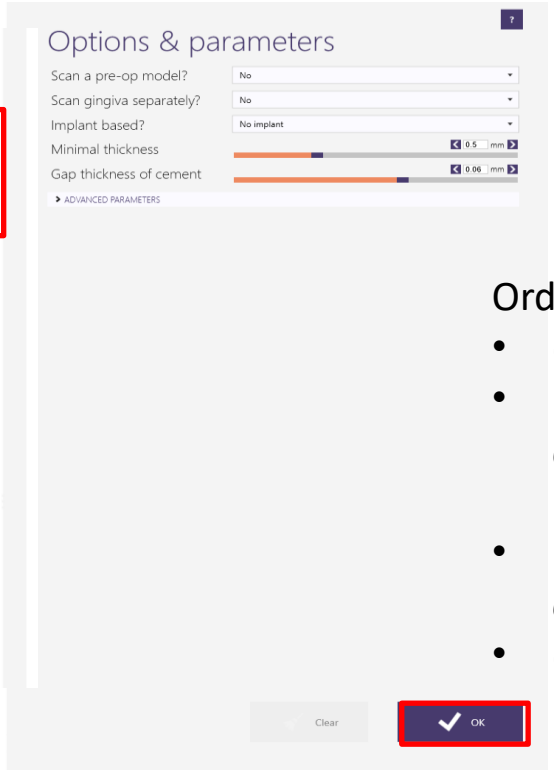
Note:

MK1 Attachment will be placed here

Adding a MK1 attachment to a bridge or crown block







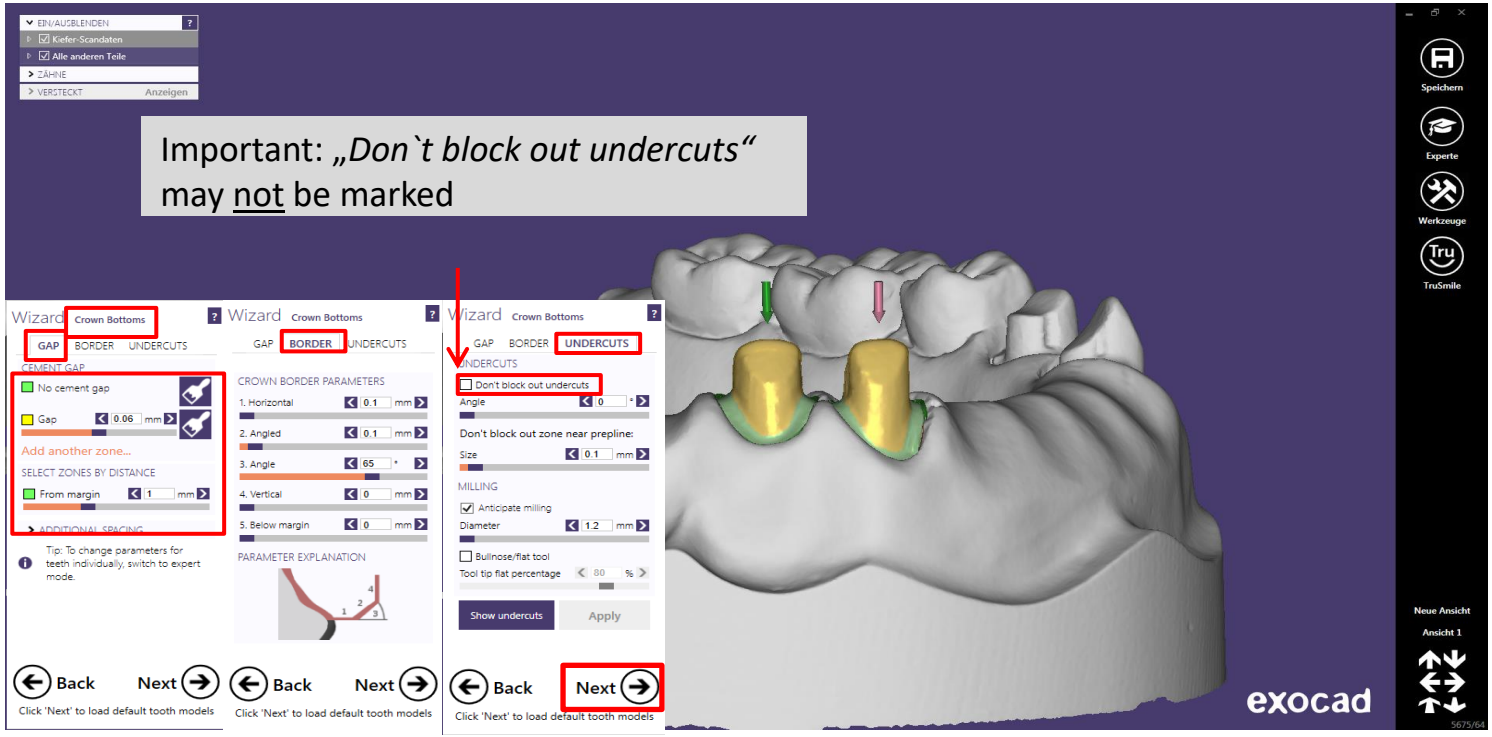
Order creation: Tooth 44

- *Coping*
- Material: *CoCr Typ4 attachment combination*
  or
- *Ti6Al4V attachment combination*
- *OK* to confirm

Adding a MK1 attachment to a bridge or crown block

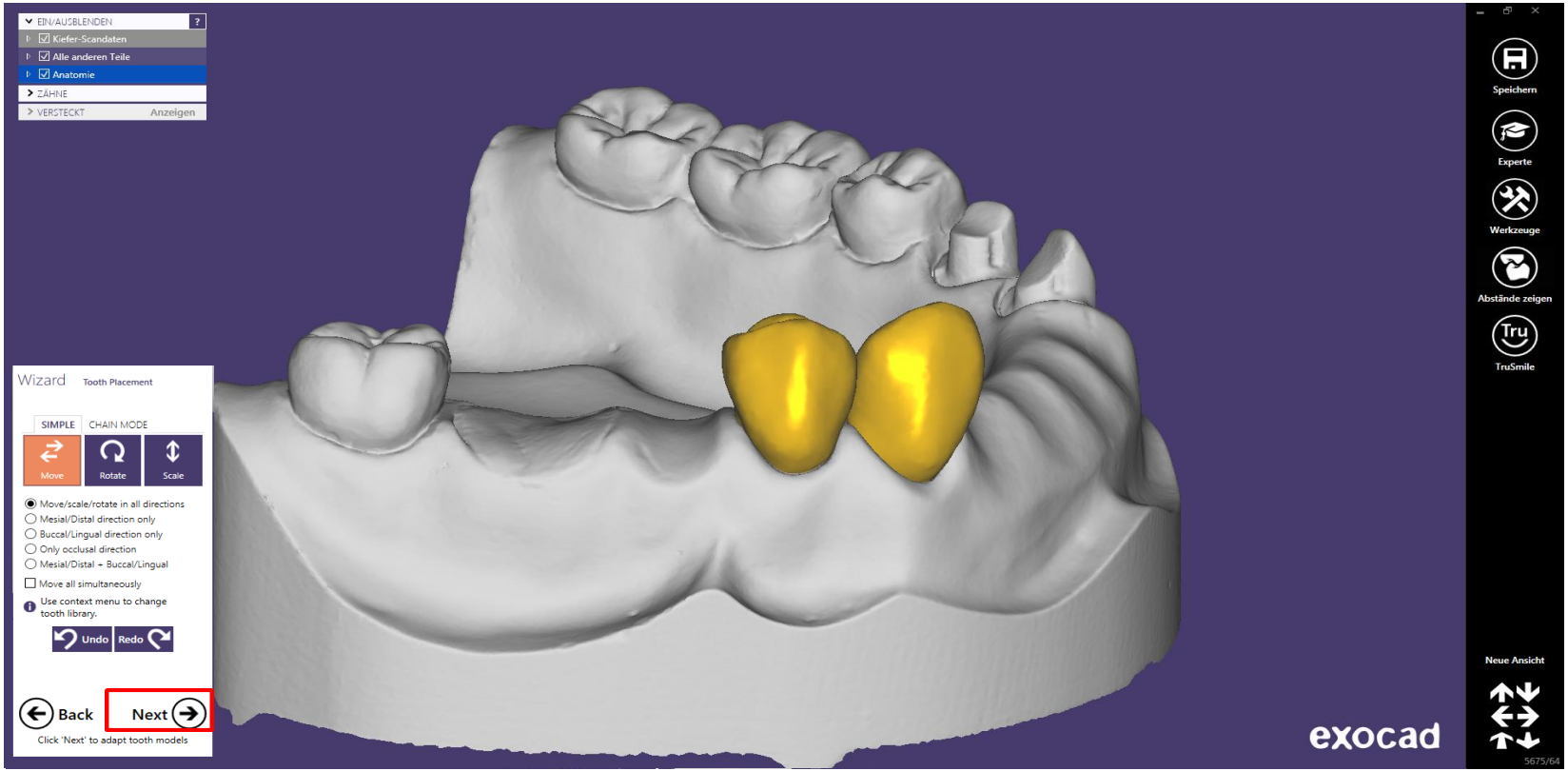
Fitting parameter 43 und 44: check values

Note: Parameter should be identical on all stumps → press “*Next*”



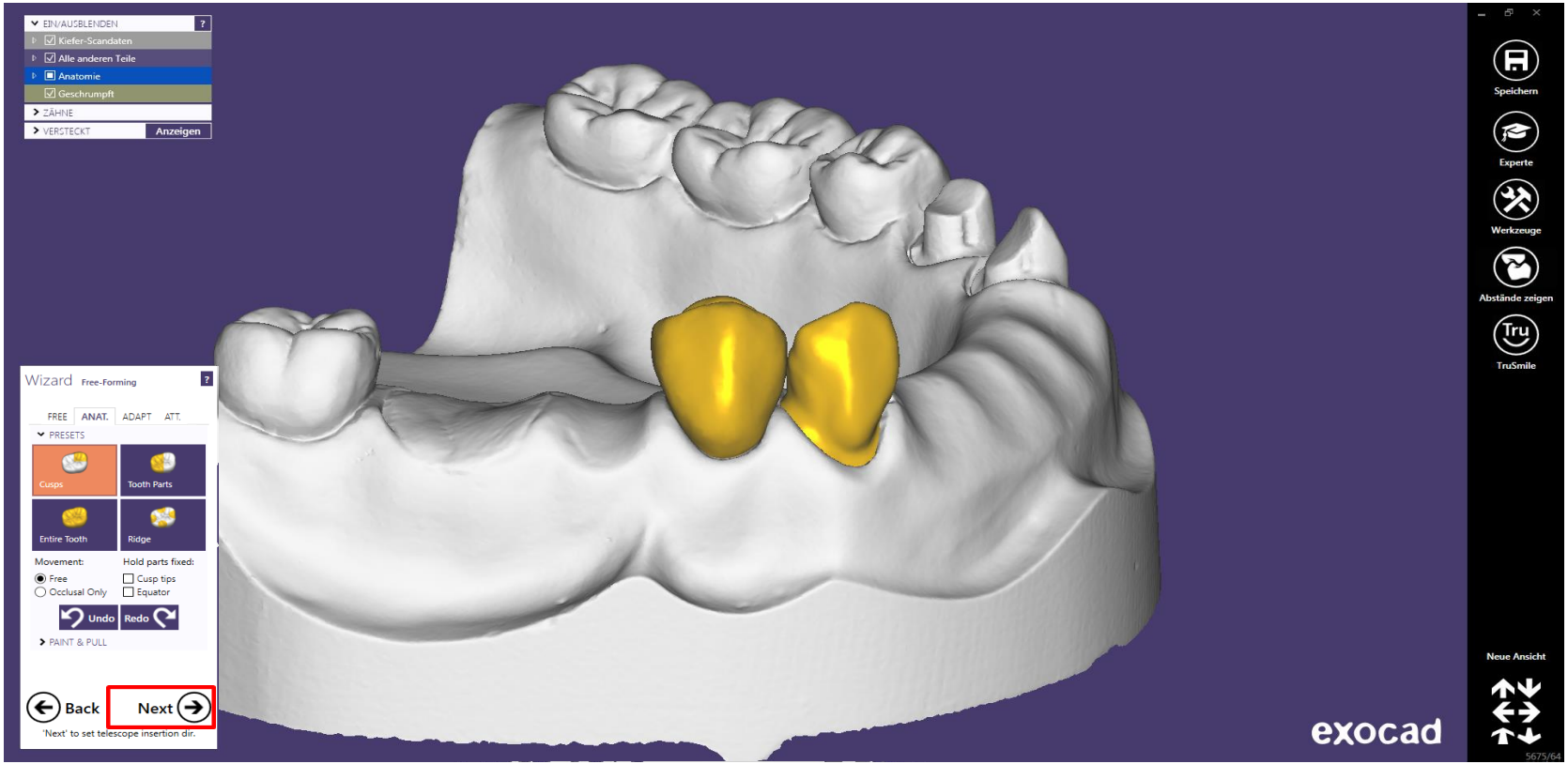
Adding a MK1 attachment to a bridge or crown block

Adapt anatomy design to clinical situation: to reduce full anatomy → press “*Next*”



Adding a MK1 attachment to a bridge or crown block

Reduced anatomy design on tooth 43: for “*Insertion axis telescope*” → press “*Next*”



Adding a MK1 attachment to a bridge or crown block

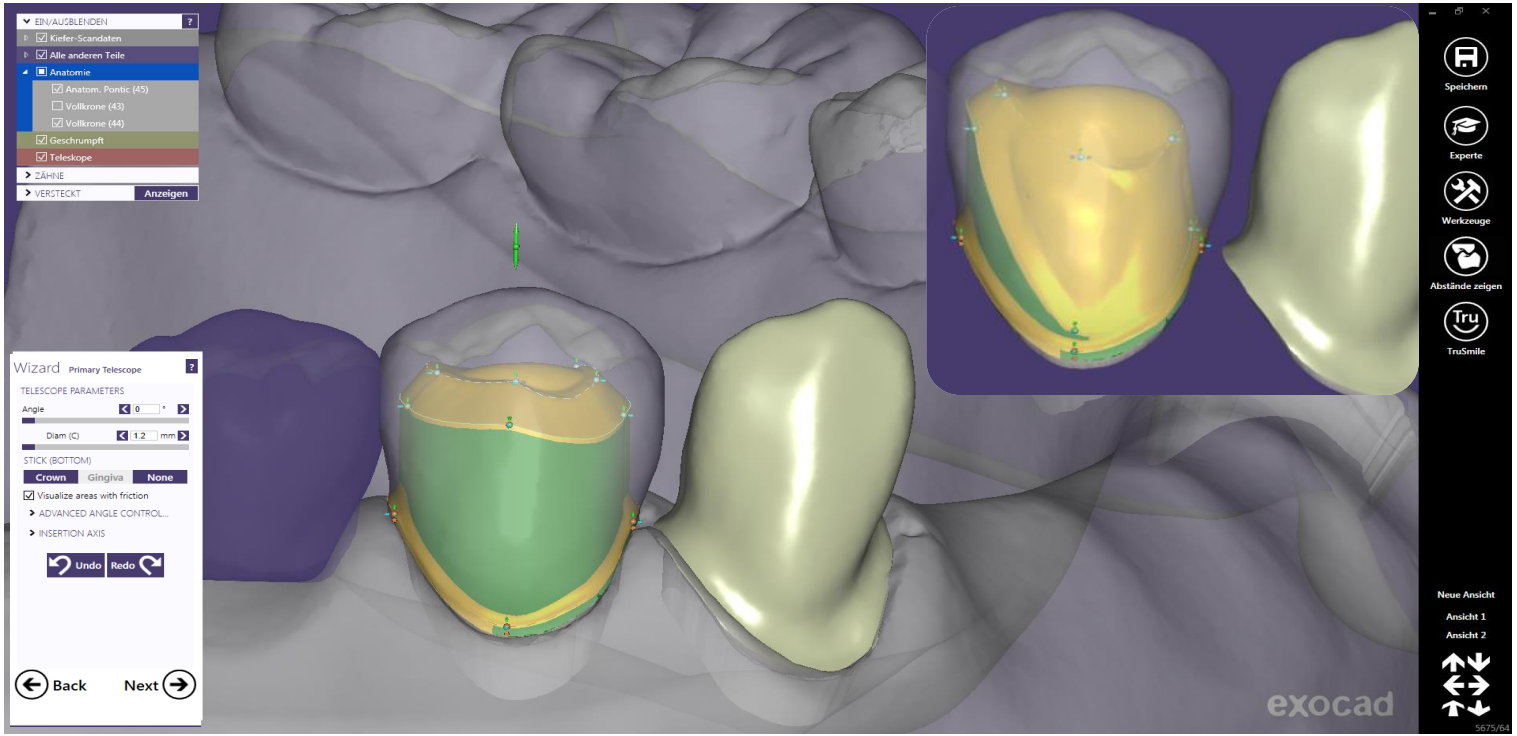
Define telescope insertion axis: View direction = insertion direction

MK1 Attachment follows defined insertion axis

Adding a MK1 attachment to a bridge or crown block

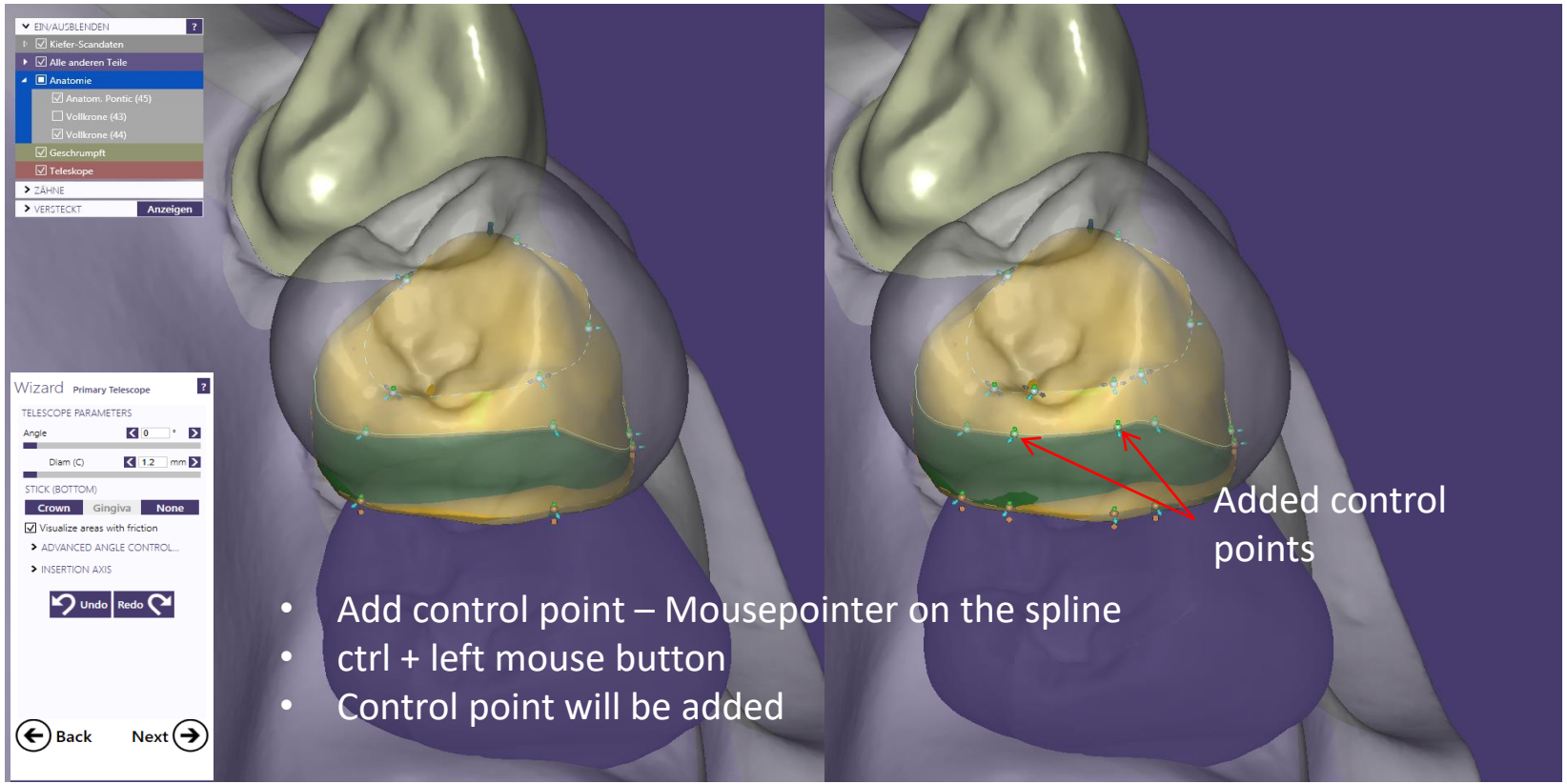
Primary telescope: edit parallel surfaces –

Flat distal surface remaining for MK1 Attachment



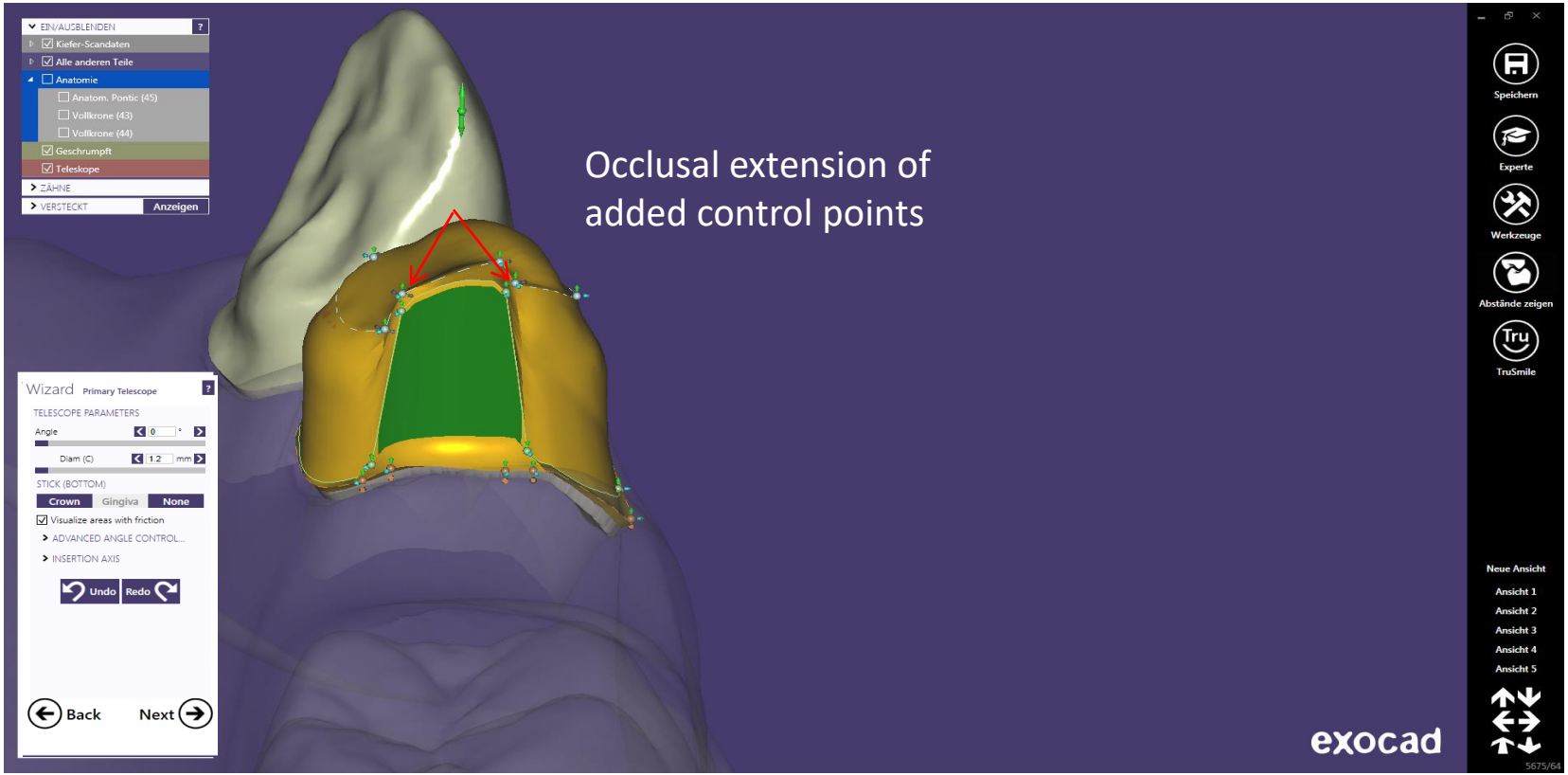
Adding a MK1 attachment to a bridge or crown block

Primary telescope: Add control points to edit distal surface for the MK1 Attachment



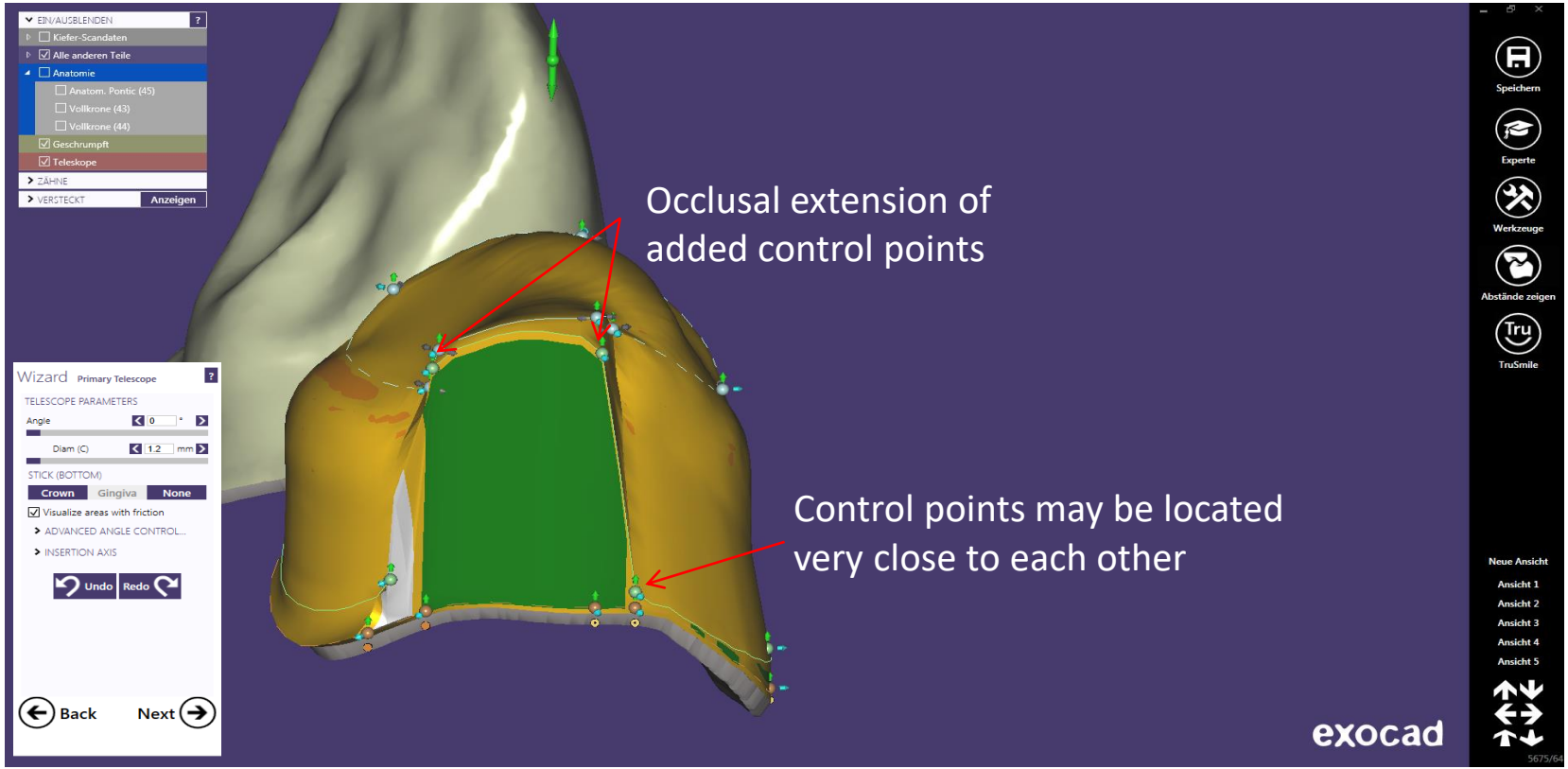
Adding a MK1 attachment to a bridge or crown block

Primary telescope: Add control point to edit distal surface for the MK1 Attachment



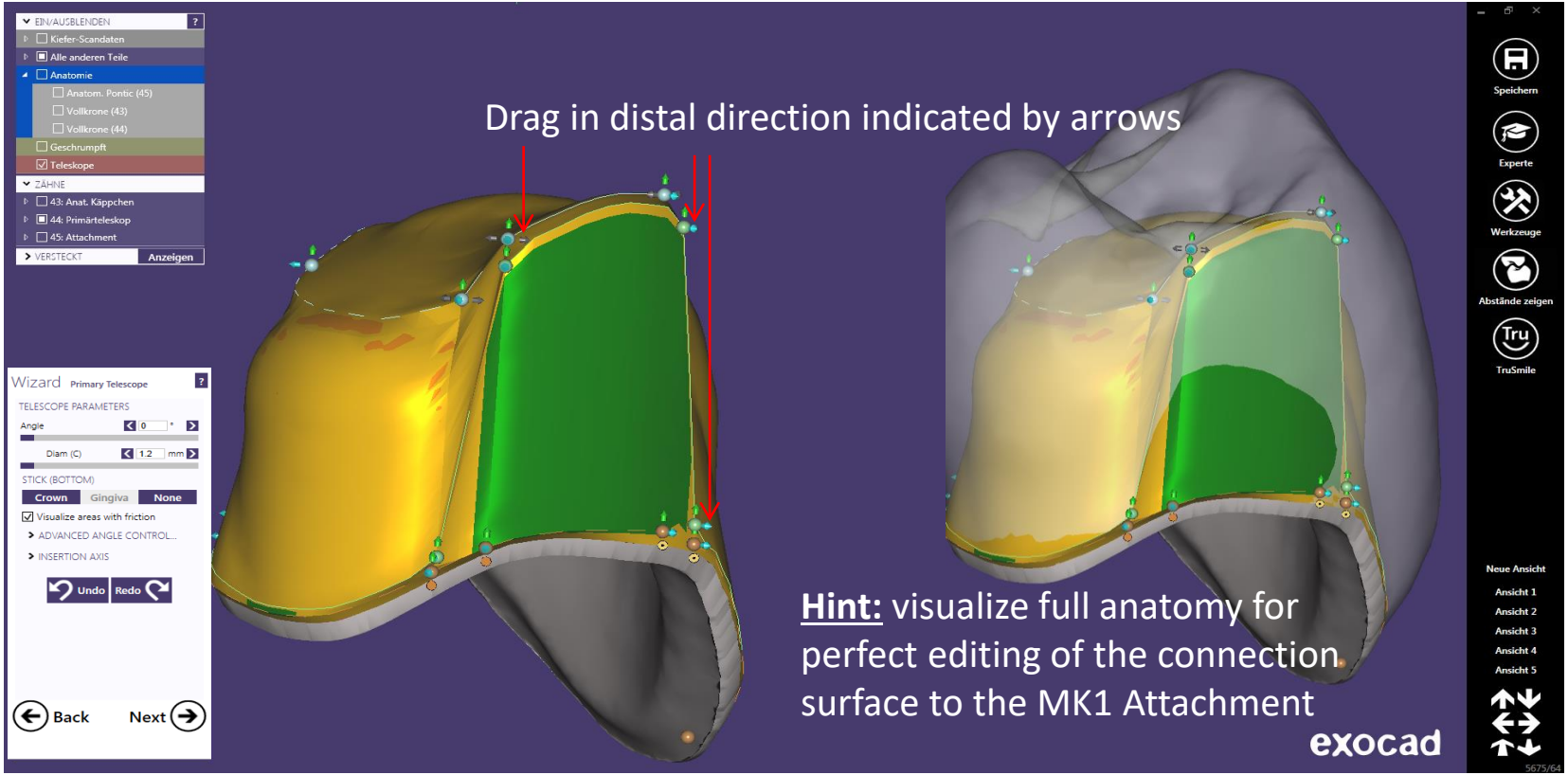
Adding a MK1 attachment to a bridge or crown block

Primary telescope: Add control point to edit distal surface for the MK1 Attachment



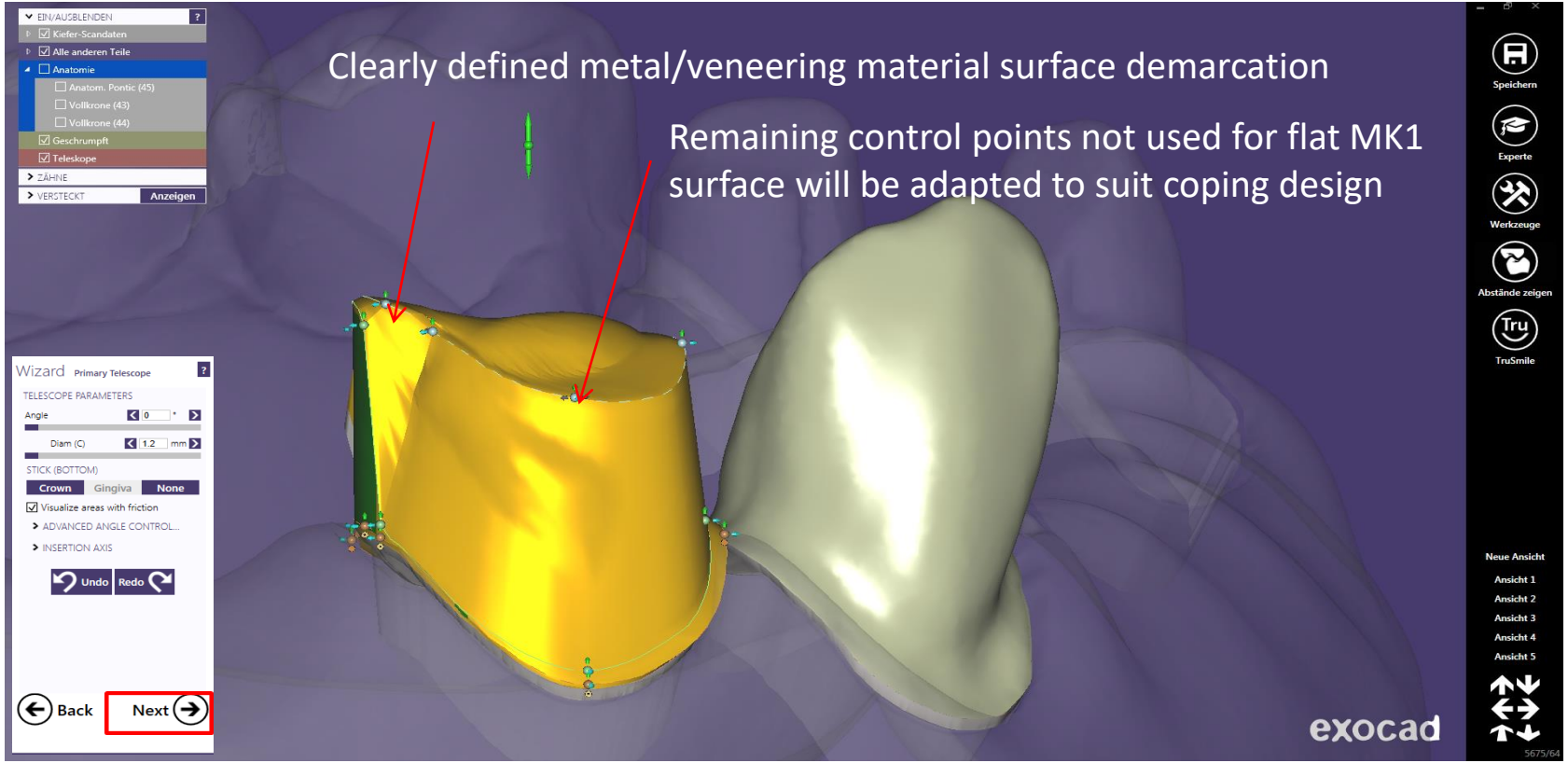
Adding a MK1 attachment to a bridge or crown block

Primary telescope: Add Gripper to edit distal surface for the MK1 Attachment



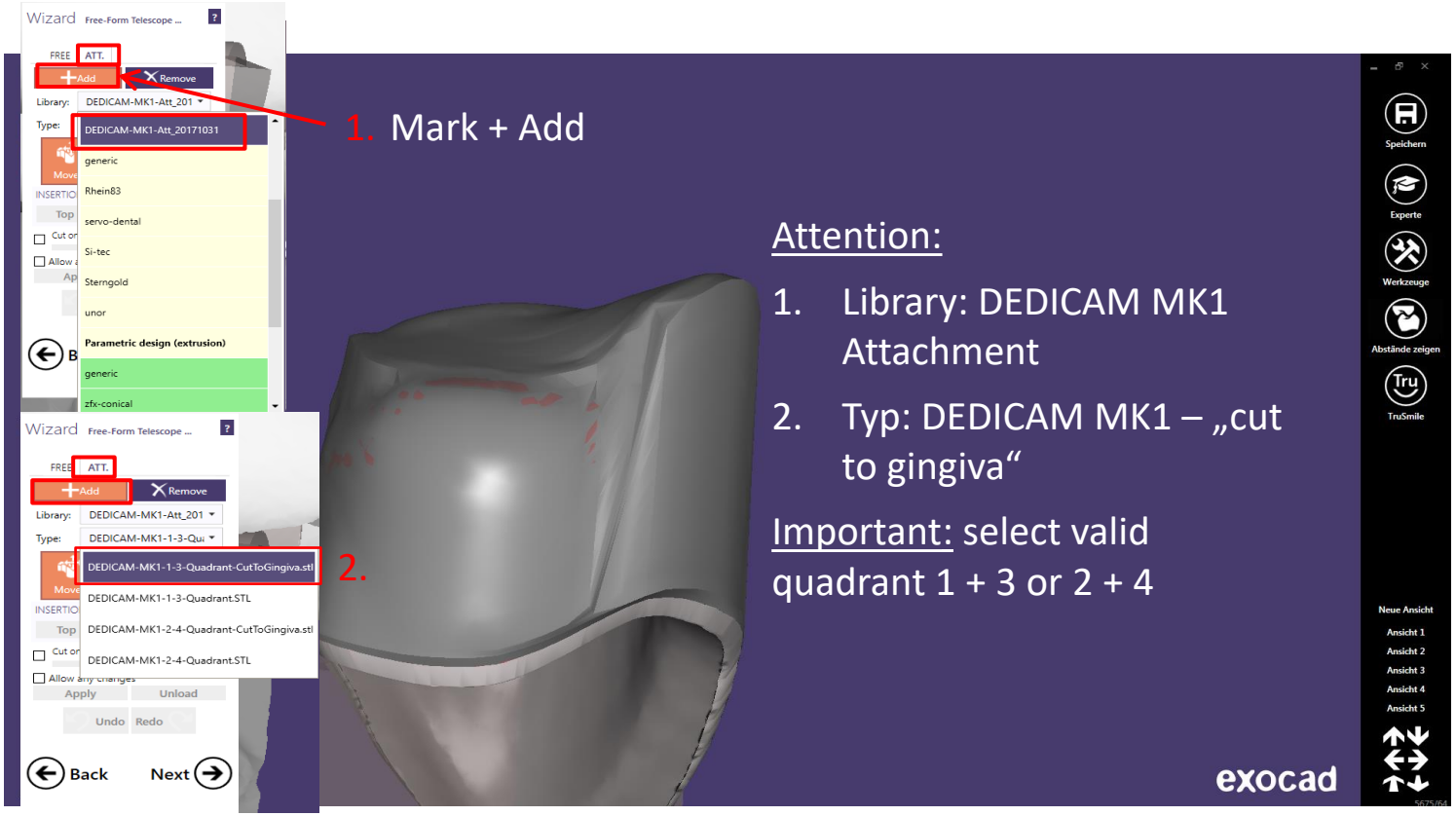
Adding a MK1 attachment to a bridge or crown block

Primary telescope: edit veneering surface → afterwards press “Next”



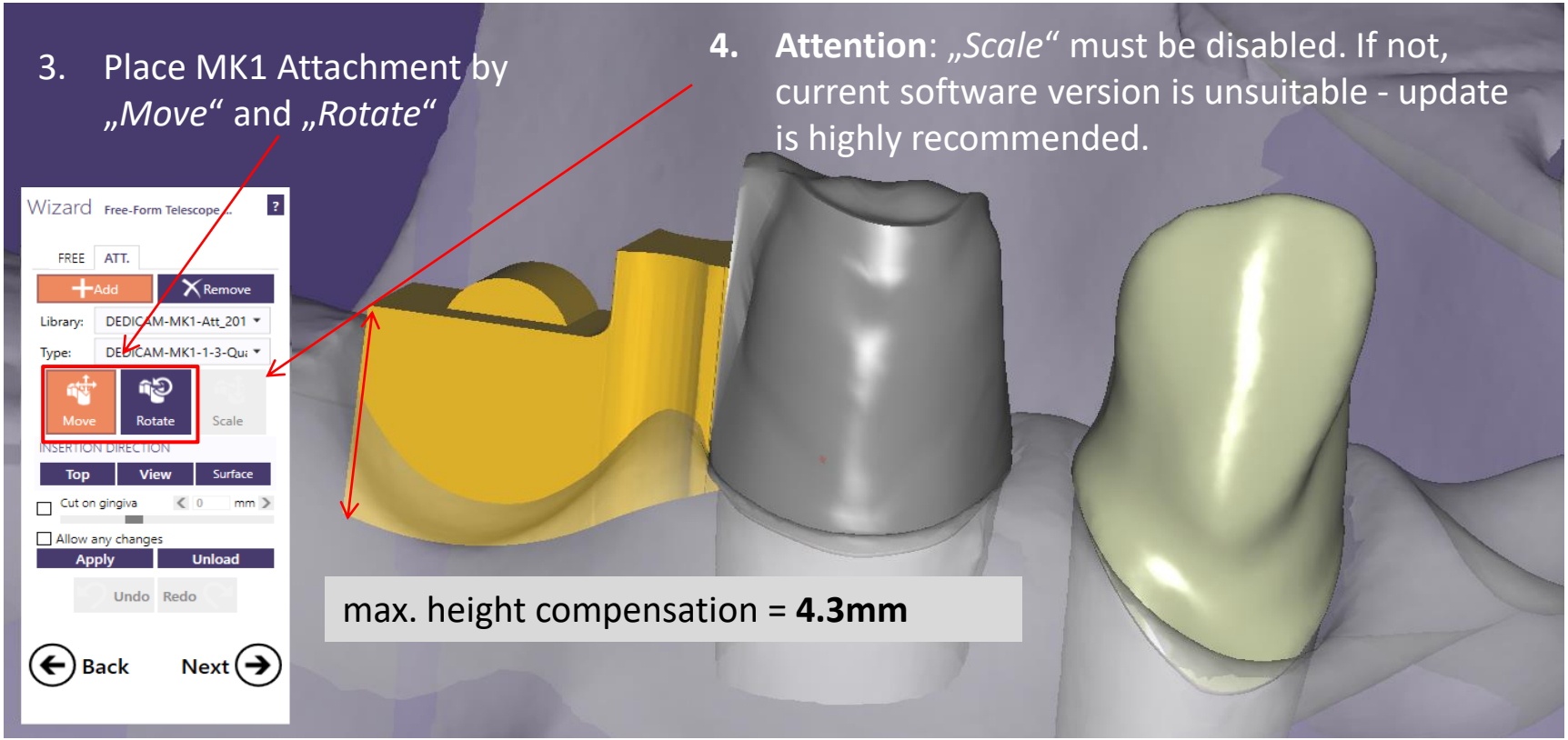
Adding a MK1 attachment to a bridge or crown block

Telescope free-form: Mark DEDICAM MK1 Attachment from the library – select DEDICAM MK1 “cut to gingiva”



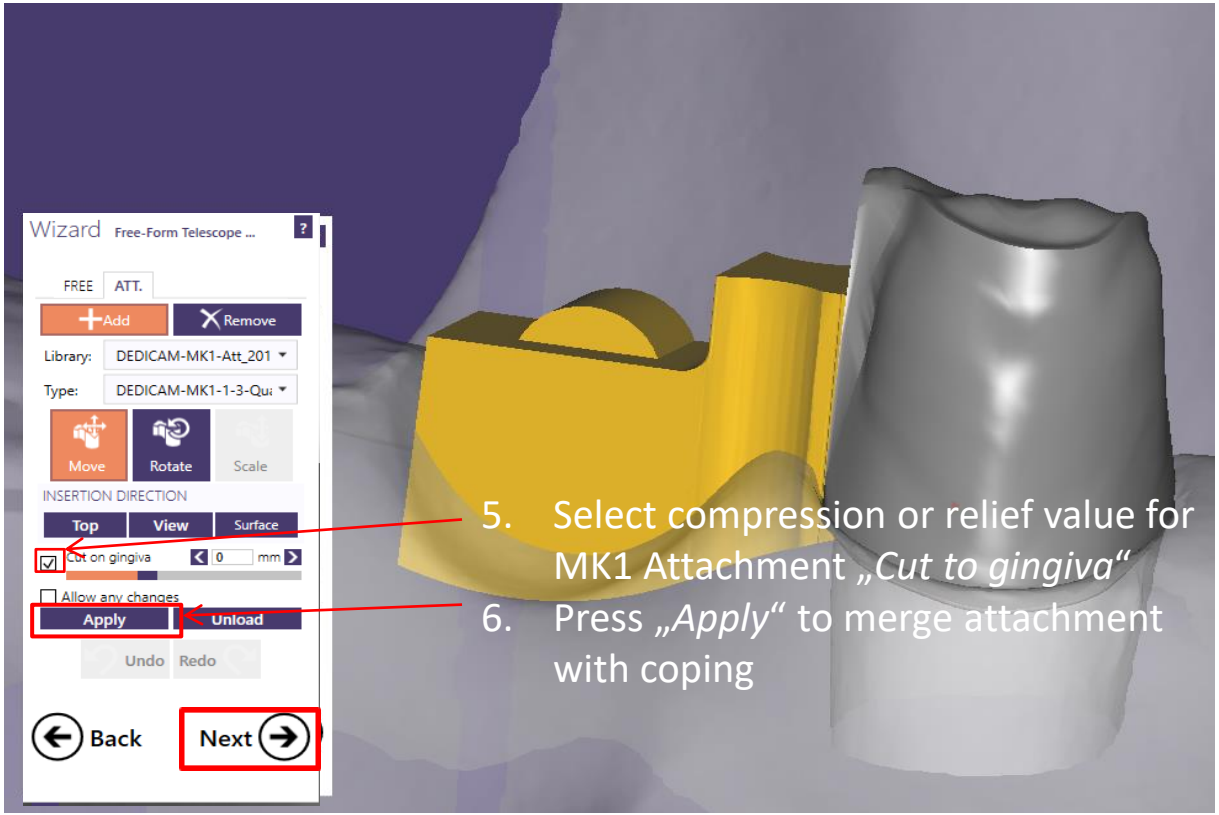
Adding a MK1 attachment to a bridge or crown block

Telescope free-form: Attachment – DEDICAM MK1 “cut on gingiva” positioning



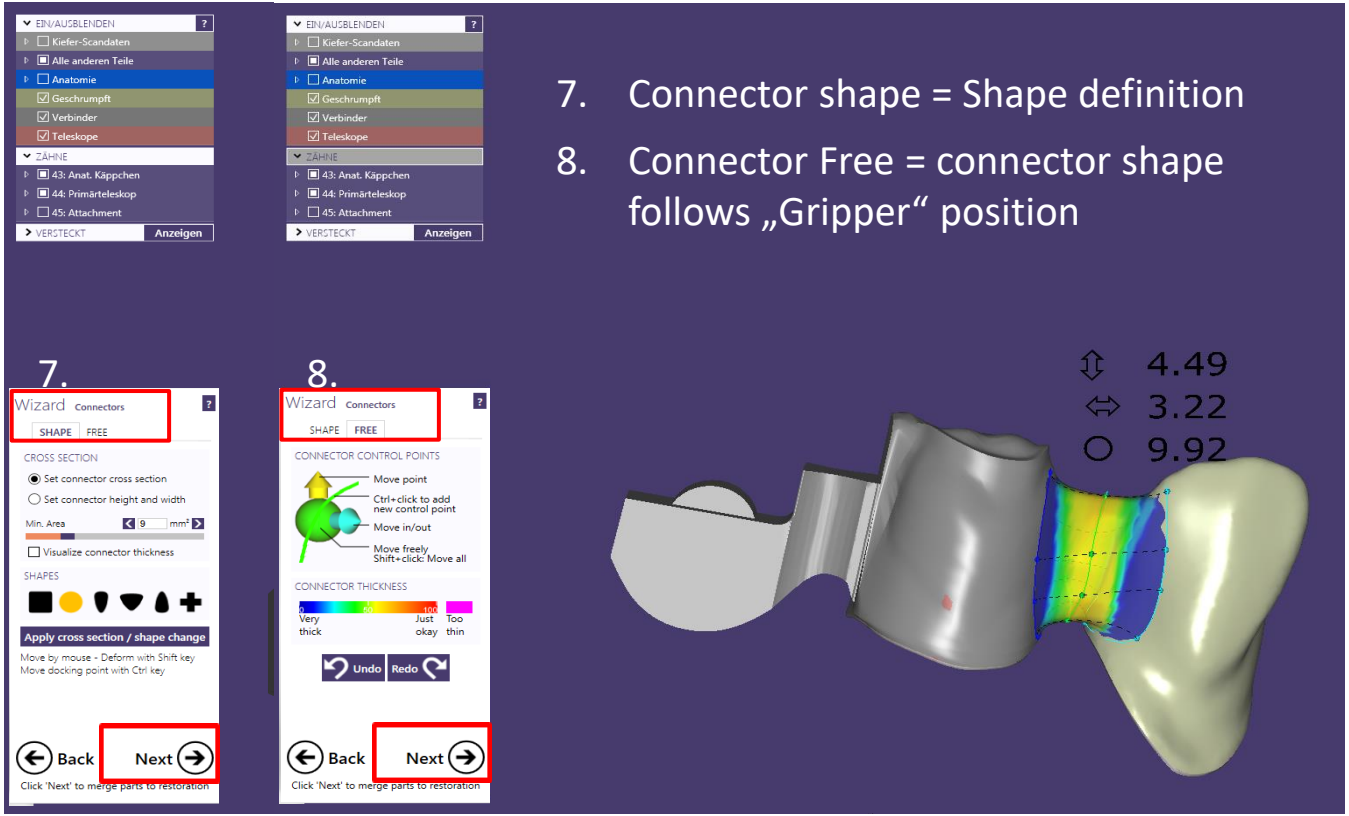
Adding a MK1 attachment to a bridge or crown block

Telescope free-form: Attachment – DEDICAM MK1 “cut on gingiva” adapt to gingiva → press “*Next*”



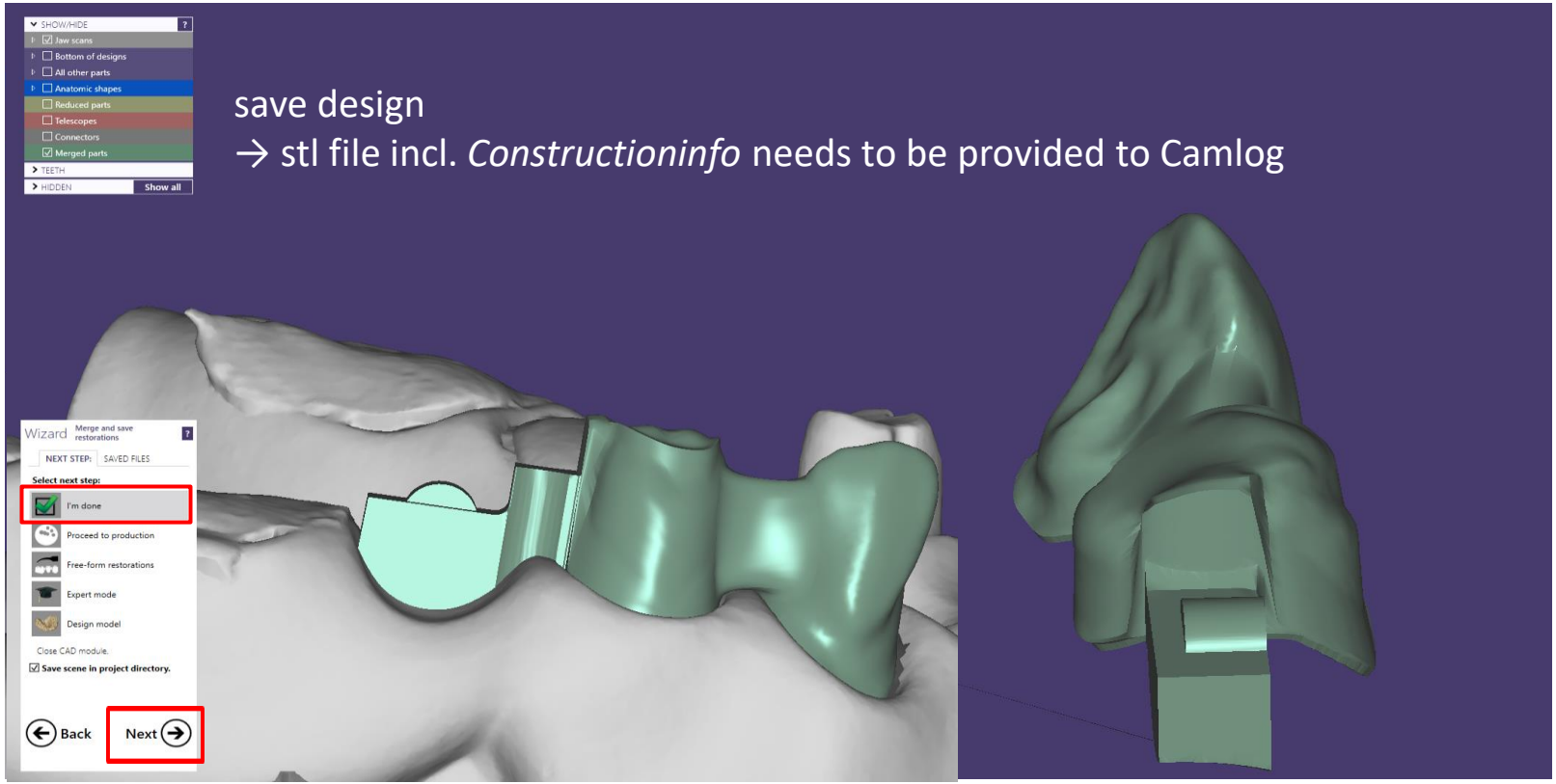
Adding a MK1 attachment to a bridge or crown block

Frame design 43 and 44 blocked through connector → press “*Next*”



Adding a MK1 attachment to a bridge or crown block

Finalize and save the design: minor adjustments possible through free-form tool → press “*Next*”



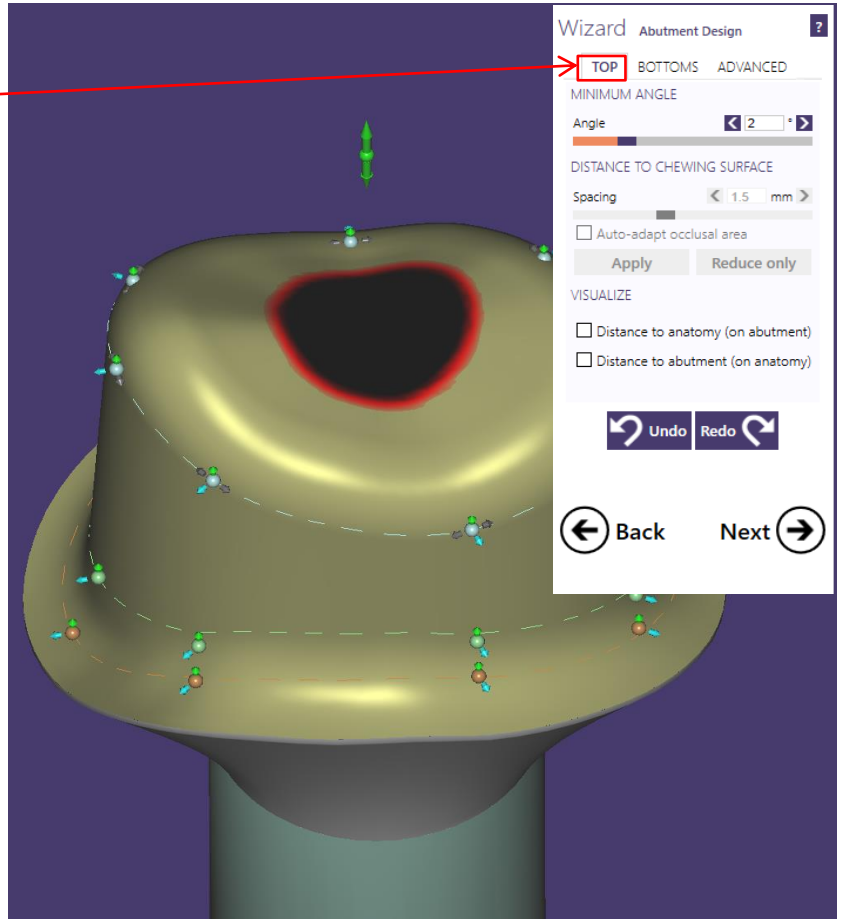
Design of anti-rotation protection on abutments

Design of anti-rotation protection on abutments

Advantage: Efficient and easy to use

1. Go to „TOP“ on Wizard Abutment Design

<u>Note:</u>
Number of Control points is dependend on the abutment design



Design of anti-rotation protection on abutments

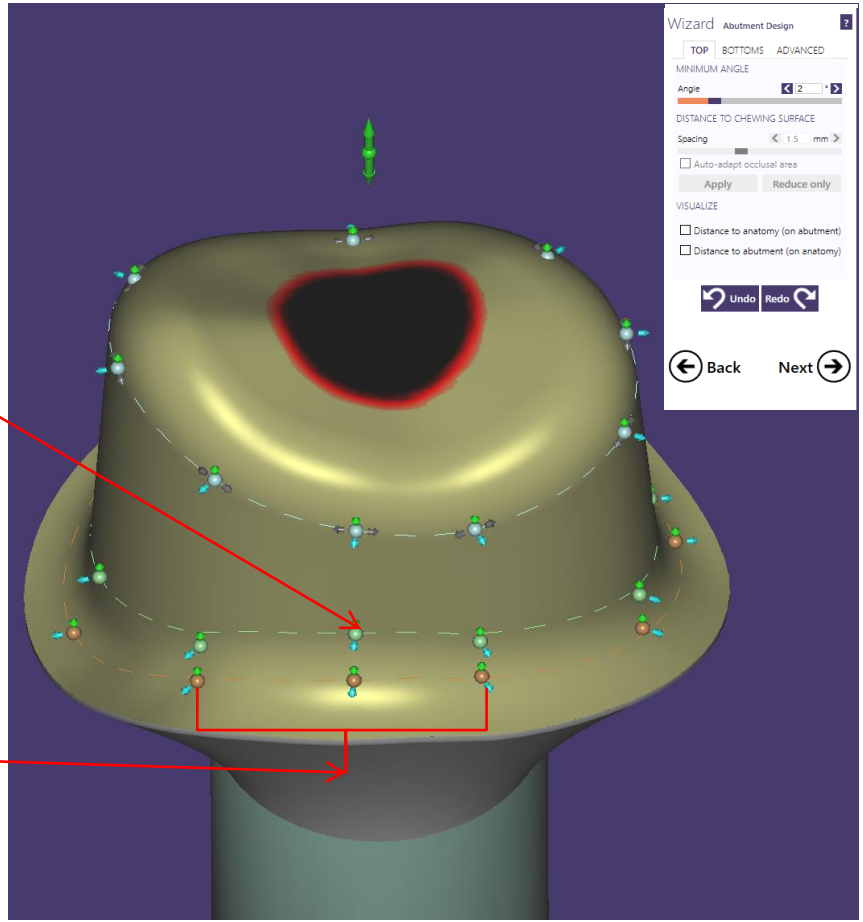
Advantage: Efficient and easy to use

2. Add new control point in the middle of two existing control points

<u>Recommendation:</u>
Add control point on the approximal side

<u>Procedure:</u>
- Ctrl + left mouse button
- New control point added
- Positioning between two existing control points

<u>Note:</u>
Distance between the existing control points is about 2.0 to max. 3.0mm

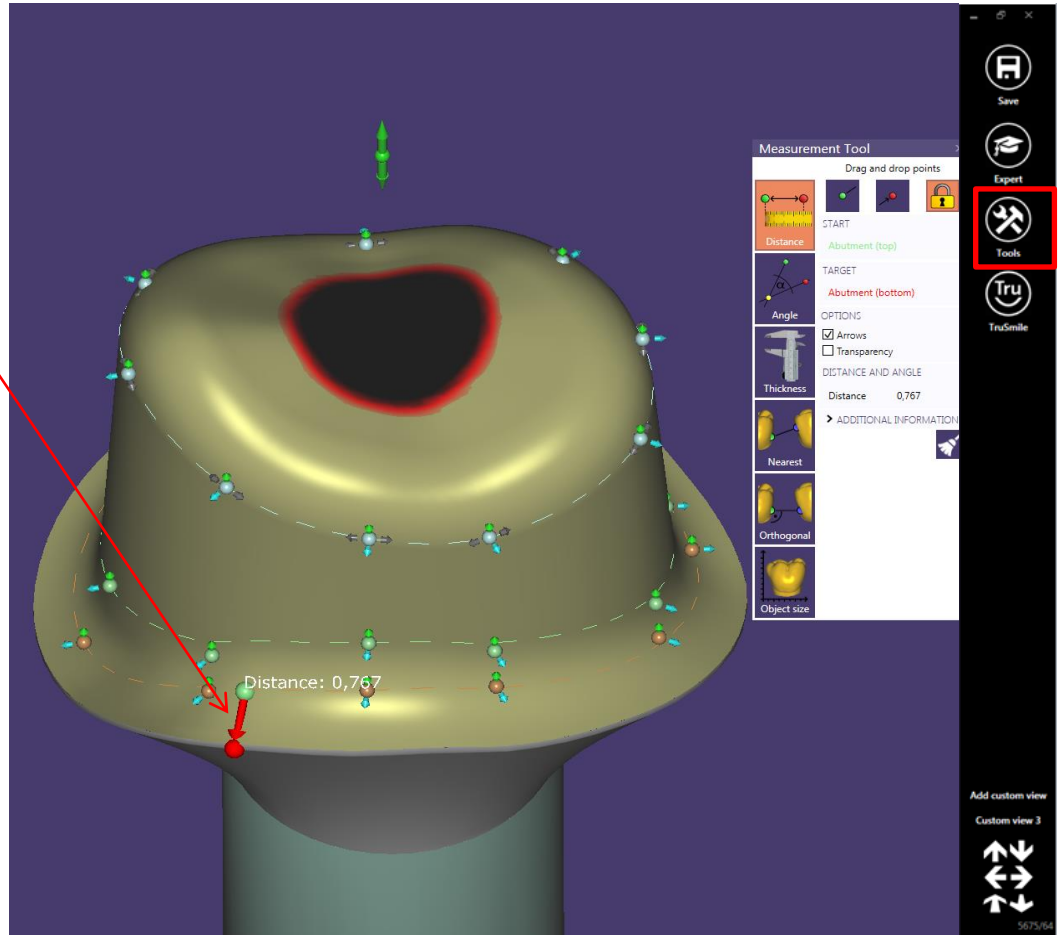


Design of anti-rotation protection on abutments

Advantage: Efficient and easy to use

3. Select from „Tools“ → „Measurement tool“:
   Measure the distance from preparation margin to orange colored spline (Mouspointer – left mouse button)

   <u>Recommendation</u>**:**
   Shoulder width from abutment shoulder: lower control point respectively orange dashed line approx. 0.8mm

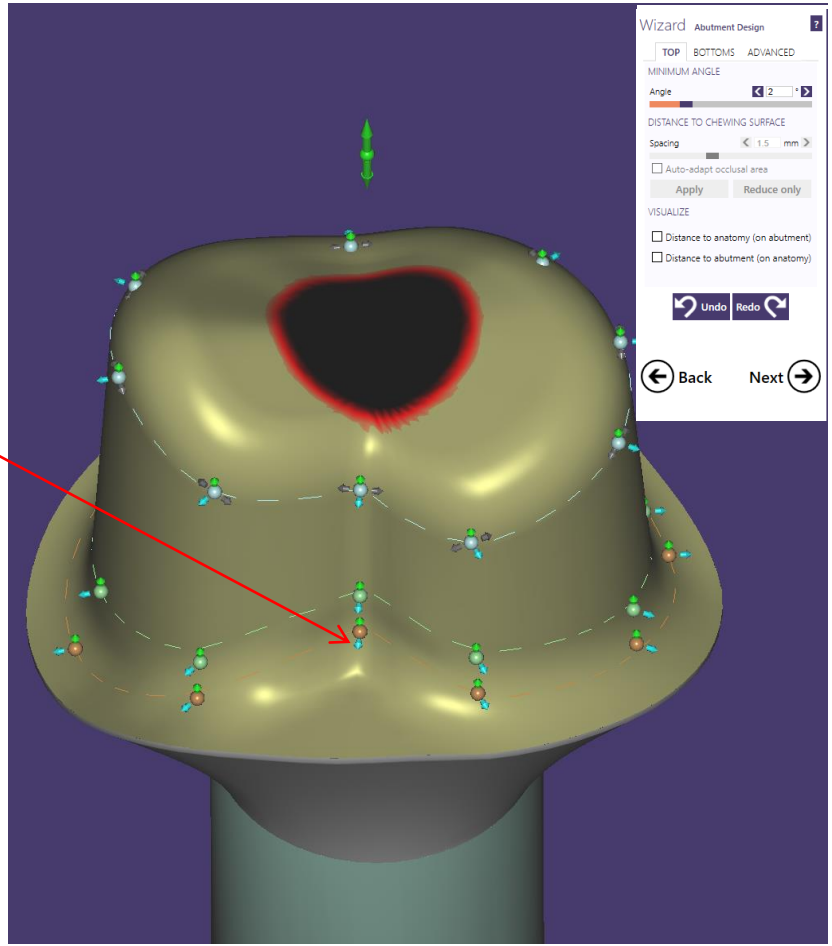


Design of anti-rotation protection on abutments

Advantage: Efficient and easy to use

4. Extend shoulder width to approx. 1.3mm

<u>Procedure:</u>
Drag control point`s blue arrow from approx. 0.8mm to approx. 1.3mm inwards



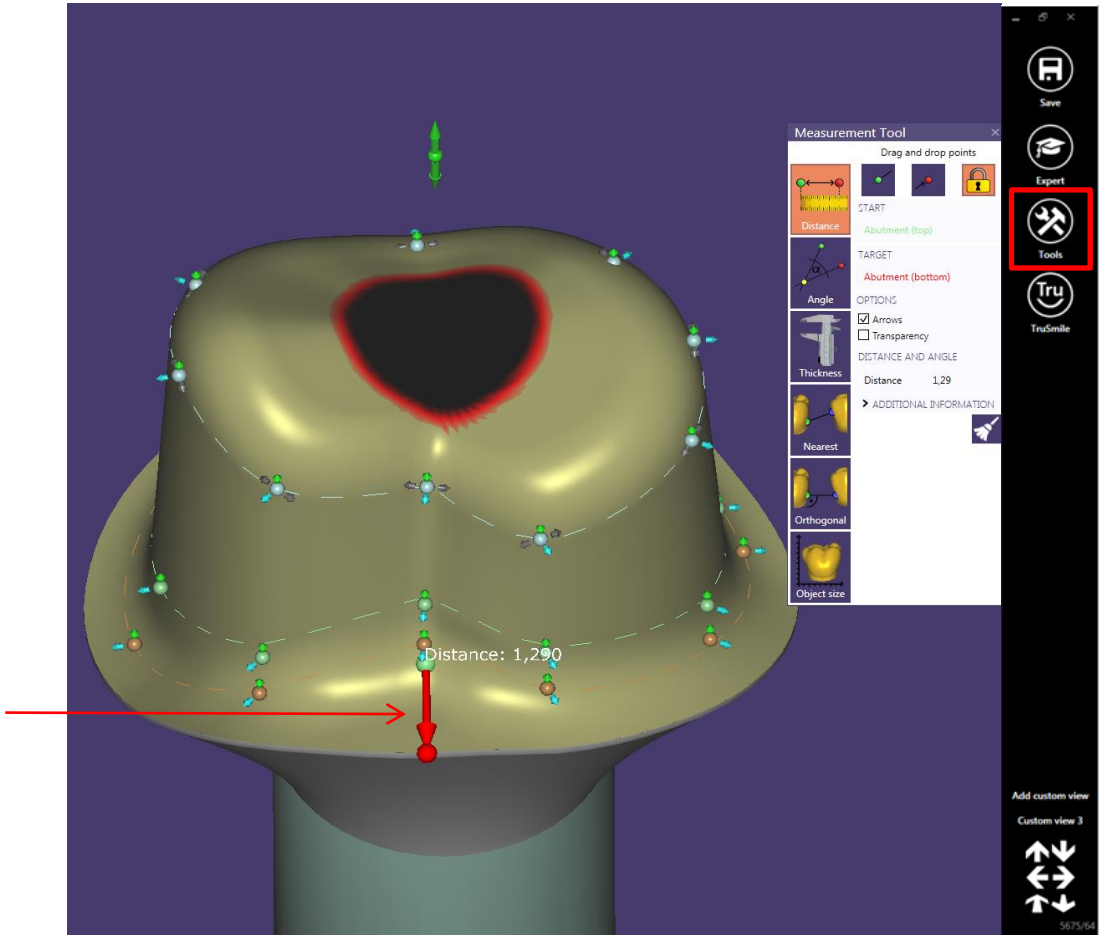
Design of anti-rotation protection on abutments

Advantage: Efficient and easy to use

5. Select from „Tools“ → „Measurement tool“ to proof the shoulder width on anti-rotation

6. Measure the distance from preparation margin to orange colored spline (Mouspointer – left mouse button)

   <u>Recommendation:</u>
   Shoulder width from abutment shoulder as an anti-rotation protection: approx. 1.3mm

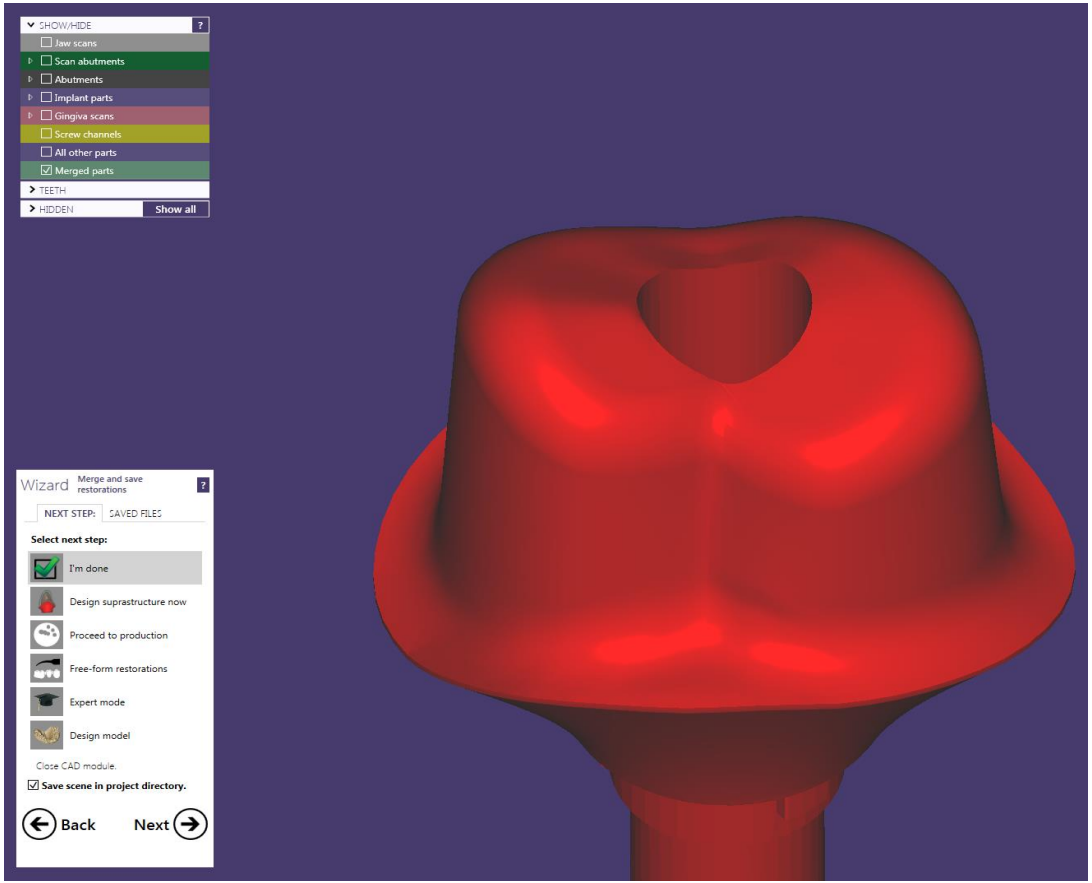


Design of anti-rotation protection on abutments

Option File-Splitting

After finalization of the abutment design, the CAD software offers to design a crown (File-splitting)

Note:
DEDICAM allows file-splitting only for single tooth and bridge restoration up to three units



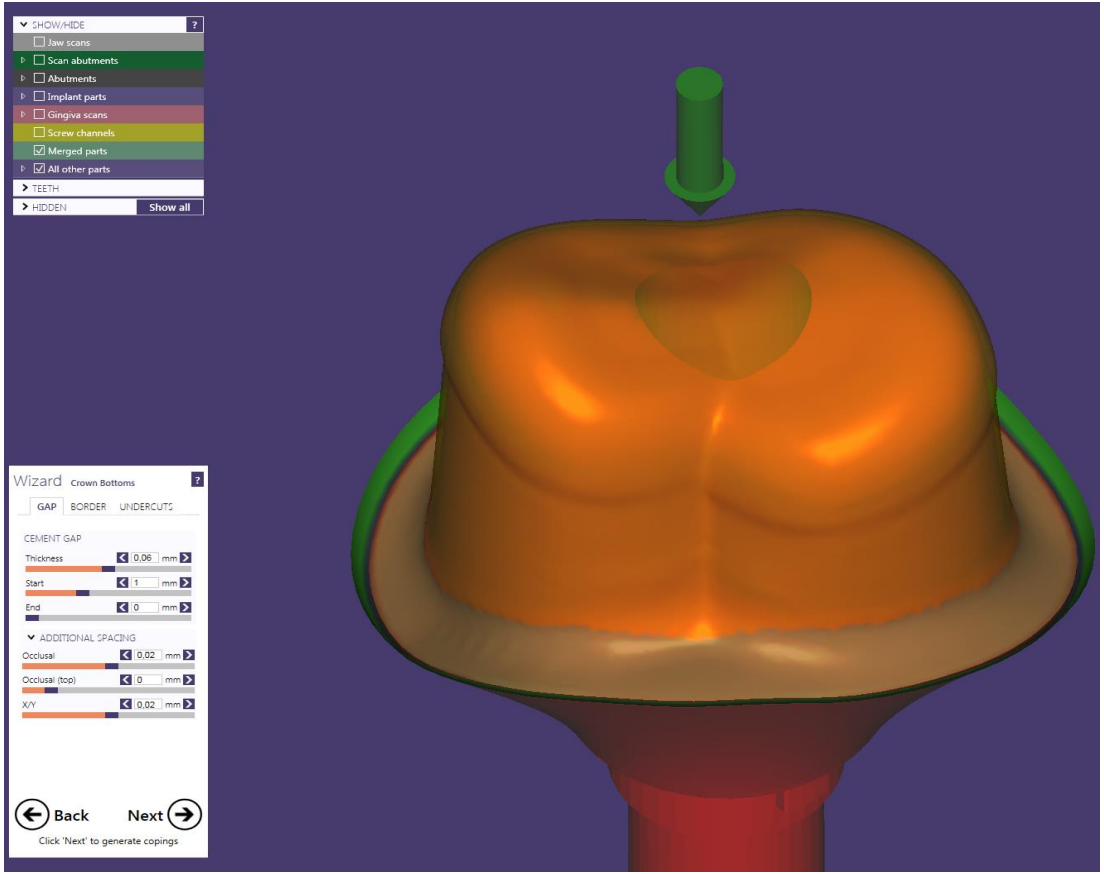
Design of anti-rotation protection on abutments

Option File-Splitting

Notes:

- Check parameter e.g.
  - Cement gap
  - Drill diameter

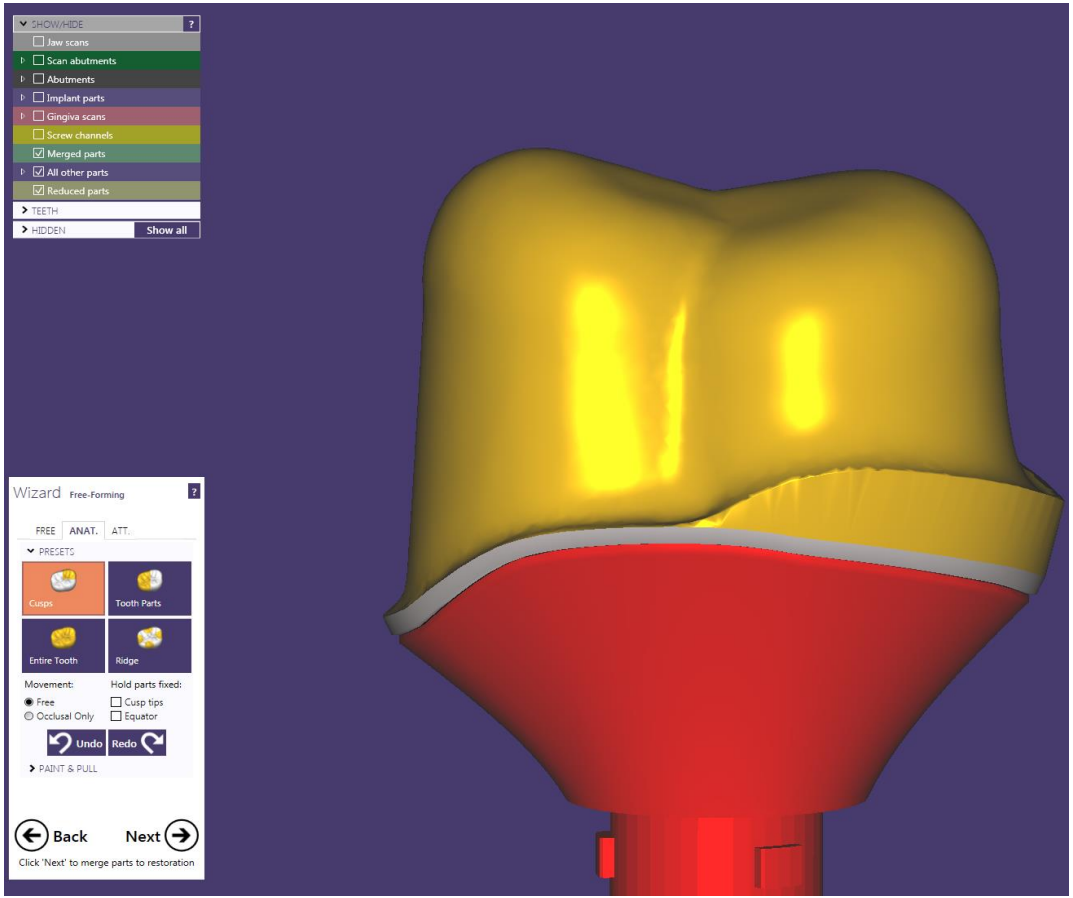
- Check material related drill radius on DEDICAM Software-Parameterchart



Design of anti-rotation protection on abutments

Option File-Splitting

Coping / crown design

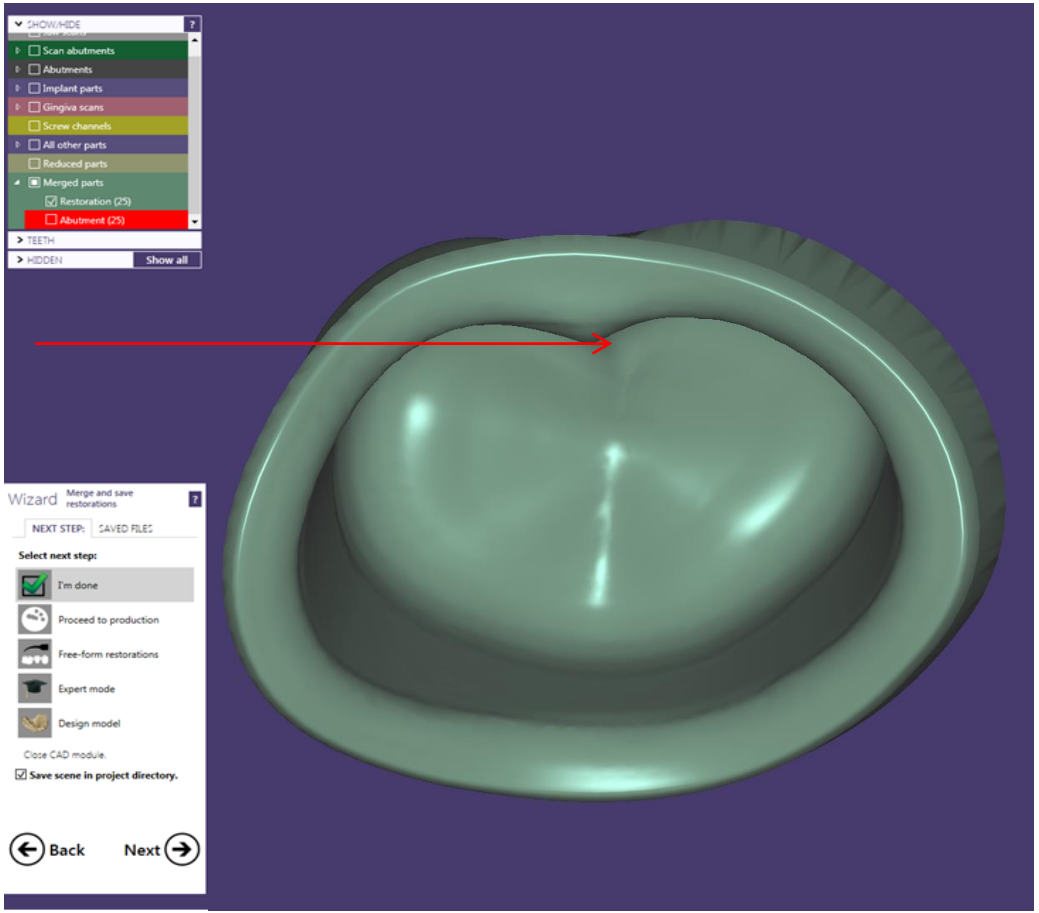


Design of anti-rotation protection on abutments

Advantage: Efficient and easy to use

Suitable anti-rotation of coping / crown follows abutment design
→ Cement gap is even

Note:
The abutment shoulder has no cement gap approx. 1mm from preparation margin.
All other surfaces have approx. 60 to 80 µm cement gap.



Design of anti-rotation protection on abutments

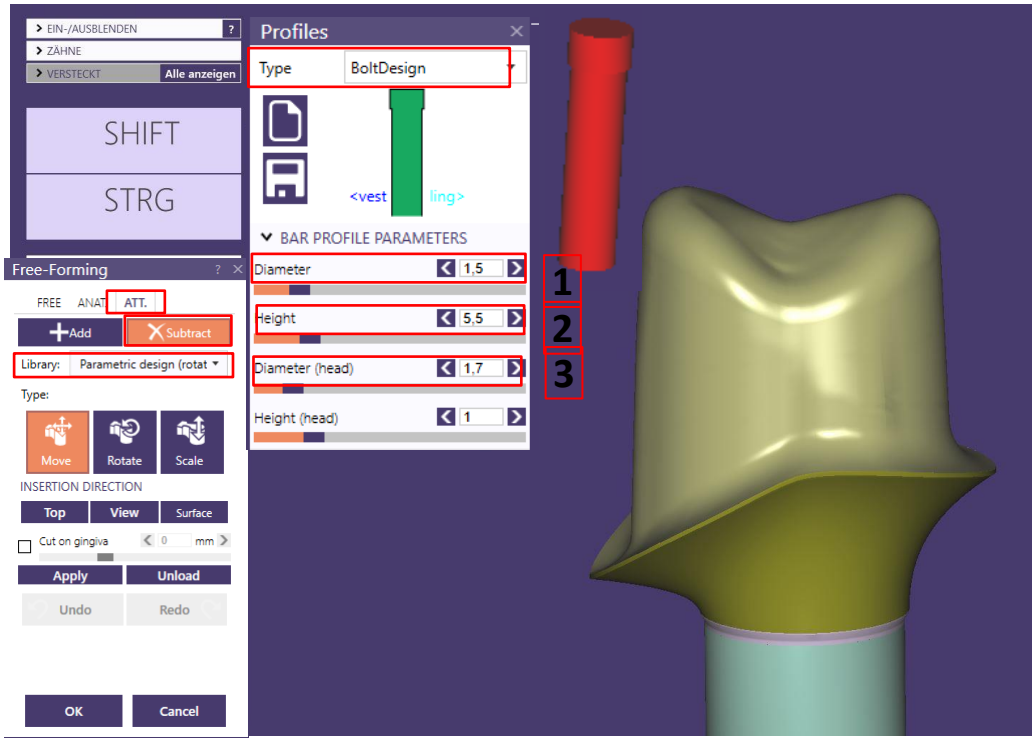
Alternative to the before mentioned anti-rotation protection

After the initial design of the abutment the anti-rotational is installed in the „Free-Forming – Attachments“ mode.
The following selection is available:

- Attachments: Subtract
- Library:
  - → Parametric desig (Rotation)
  - → BoltDesign

Note:

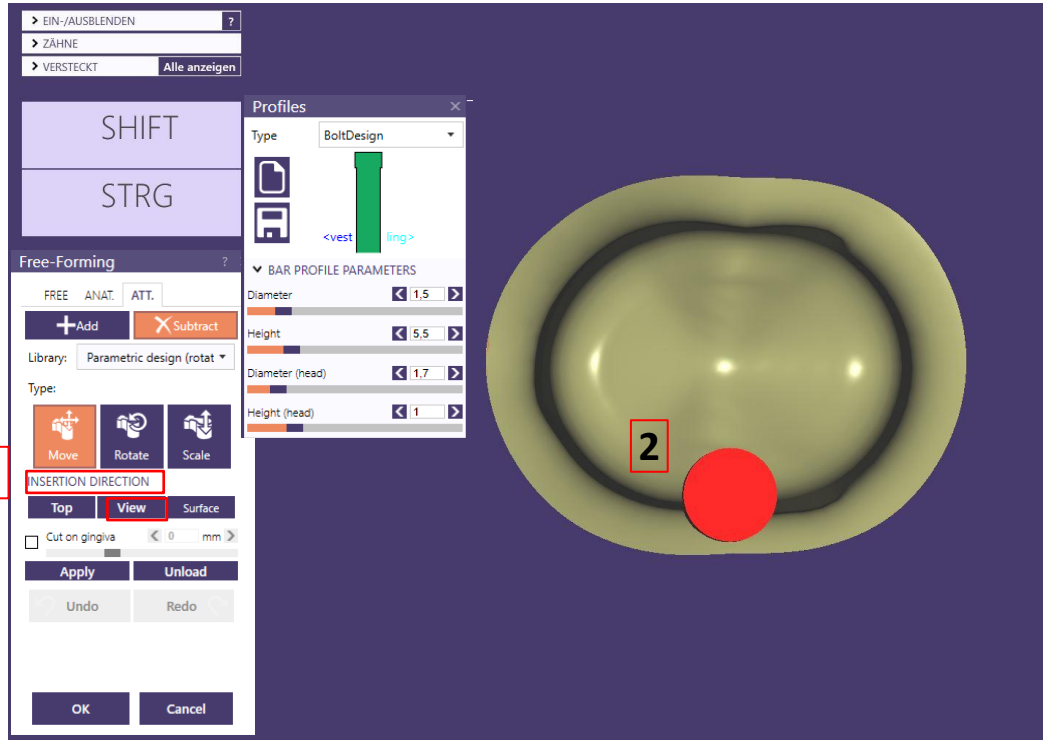
- Parameter adaption required
  - **1** → Diameter: minimum 1.5mm
  - **2** → Height: minimum 5 - 6mm (longer as upper abutment part)
  - **3** → Diameter (Head): reduce e.g. 1.7mm (easier positioning)



Design of anti-rotation protection on abutments

Alternative to the before mentioned anti-rotation protection

- Position the abutment on occlusal view such as lateral abutment flanks are visible to define the insertion direction of the anti-rotational
- Insertion direction **1**
  → View
- Place the attachment on the desired spot **2**



Design of anti-rotation protection on abutments

Alternative to the before mentioned anti-rotation protection

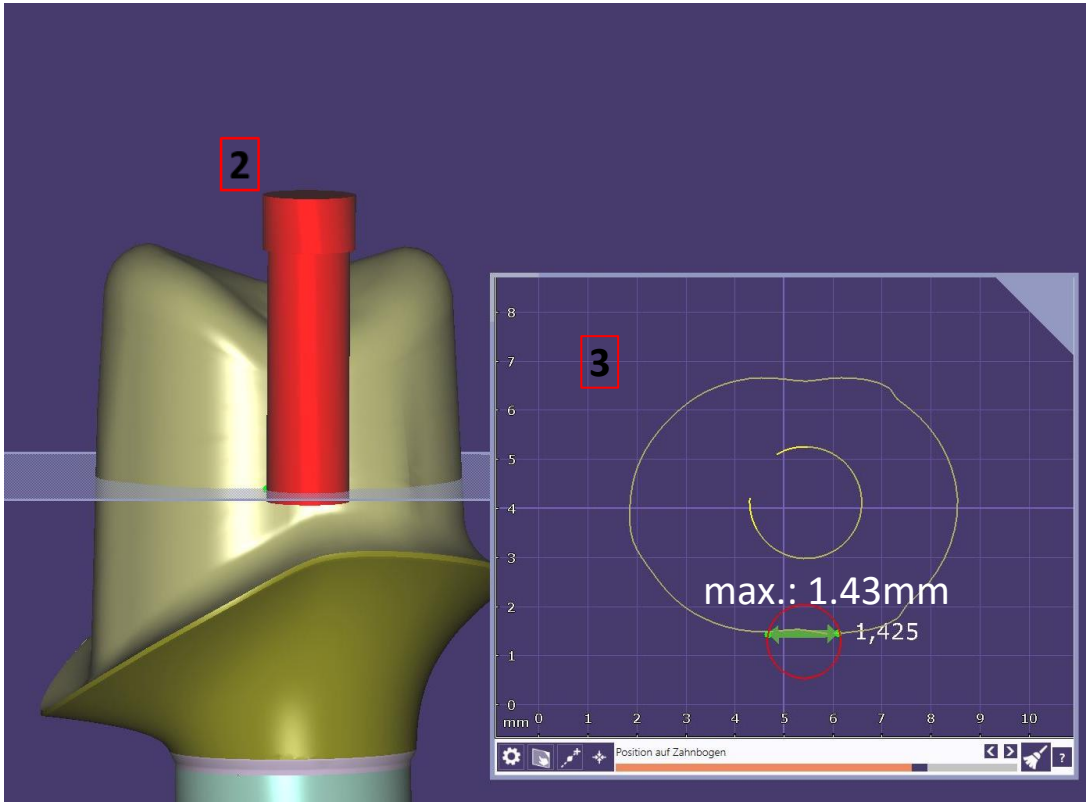
- Place the attachment on the desired spot **2**

- 2D cross section – slightly above the margin: Check correct and millable positioning **3**

Important note:

- Place the attachment (Bolt design ø min. 1.5mm) less than the maximum diameter into the abutment

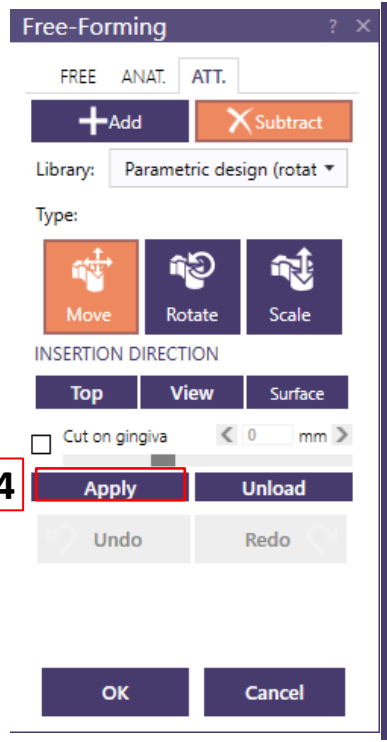
  Diameter = 1.5mm
  maximum diameter on abutment = **1.43mm**

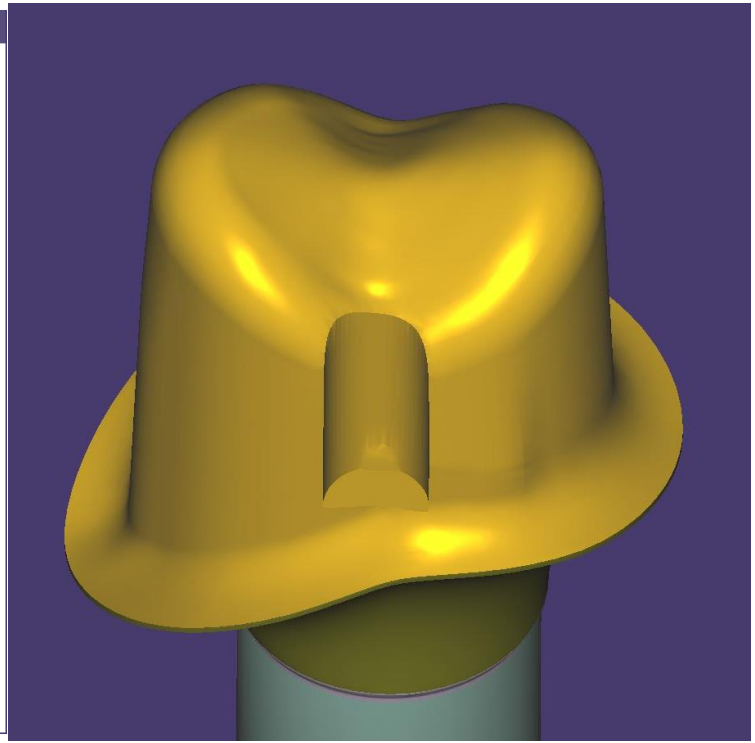


Design of anti-rotation protection on abutments

Alternative to the before mentioned anti-rotation protection

Verify the correct position of the attachment before applying it to the design **4**





Design of anti-rotation protection on abutments

Alternative to the before mentioned anti-rotation protection

After subtraction sharp edges must be smoothened in **„Free-Forming“; „Free-Smooth/Flattern“** 5

→ Activate button „Smooth/Flattern“ 6

Suggestion:

- Put „Strength“ on a low level 7
- Put „Brush size“ on a low level 8
- All sharp edges will be smoothened with this tool

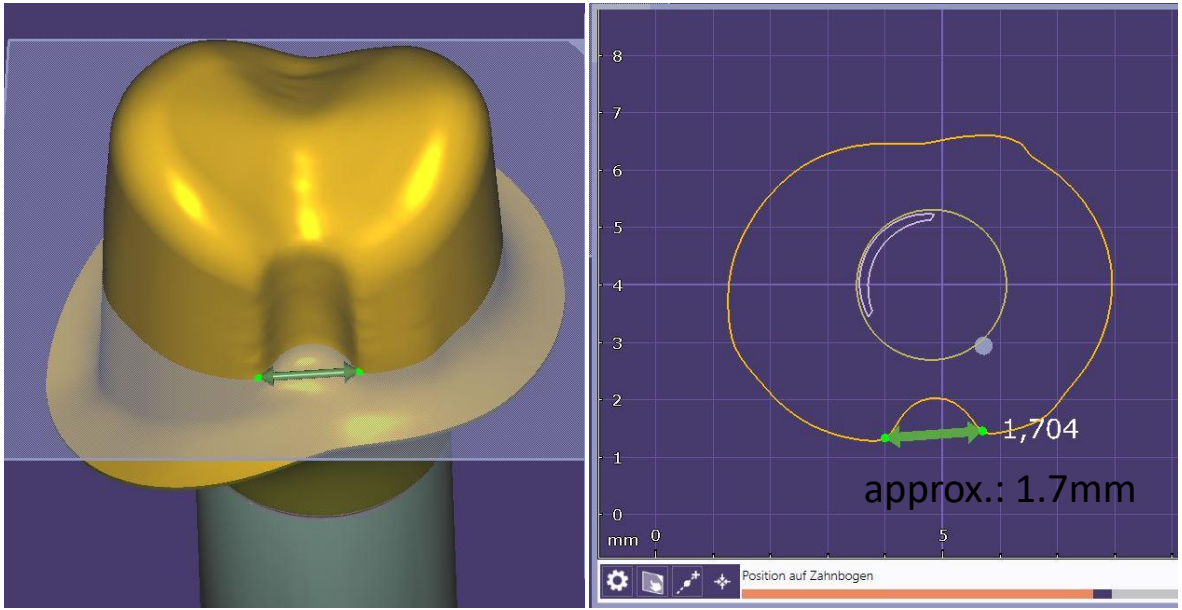
Important note: Due to the drills used in the production the supplied anti-rotation protection on the structure may deviate minimally.

Design of anti-rotation protection on abutments

Alternative to the before mentioned anti-rotation protection

Check the anti-rotational width after smoothing by using 2D cross section again

Width must be **approx. 1.7mm**

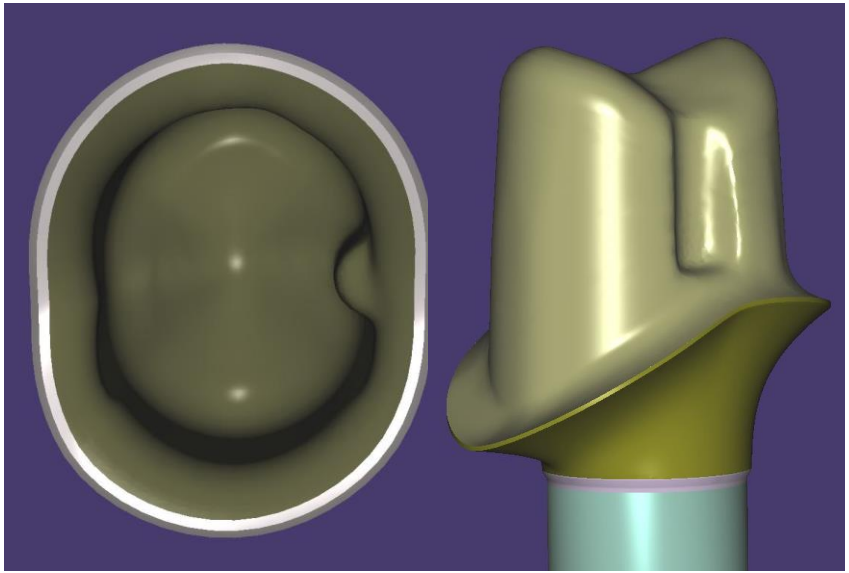


Important note:
Due to the drills used in the production the supplied anti-rotation protection on the structure may deviate minimally.

Design of anti-rotation protection on abutments

This anti-rotational protection is suitable for a precisely fitting coping / crown wether designed in file-splitting or via second design.

Note:
Orders in file-splitting are only processed with anti-rotation protection ensuring that the milling and the fit of the coping / crown can be guaranteed.



Under consideration of the minimum wall thickness this anti-rotational protection is recommened for the following abutment types:

- Meso structures for titanium bases CAD/CAM, for crowns
- One-piece abutments made of titanium
- One-piece abutments for CERALOG Hexalobe implants

Design of screw channels with the aim of an attachment

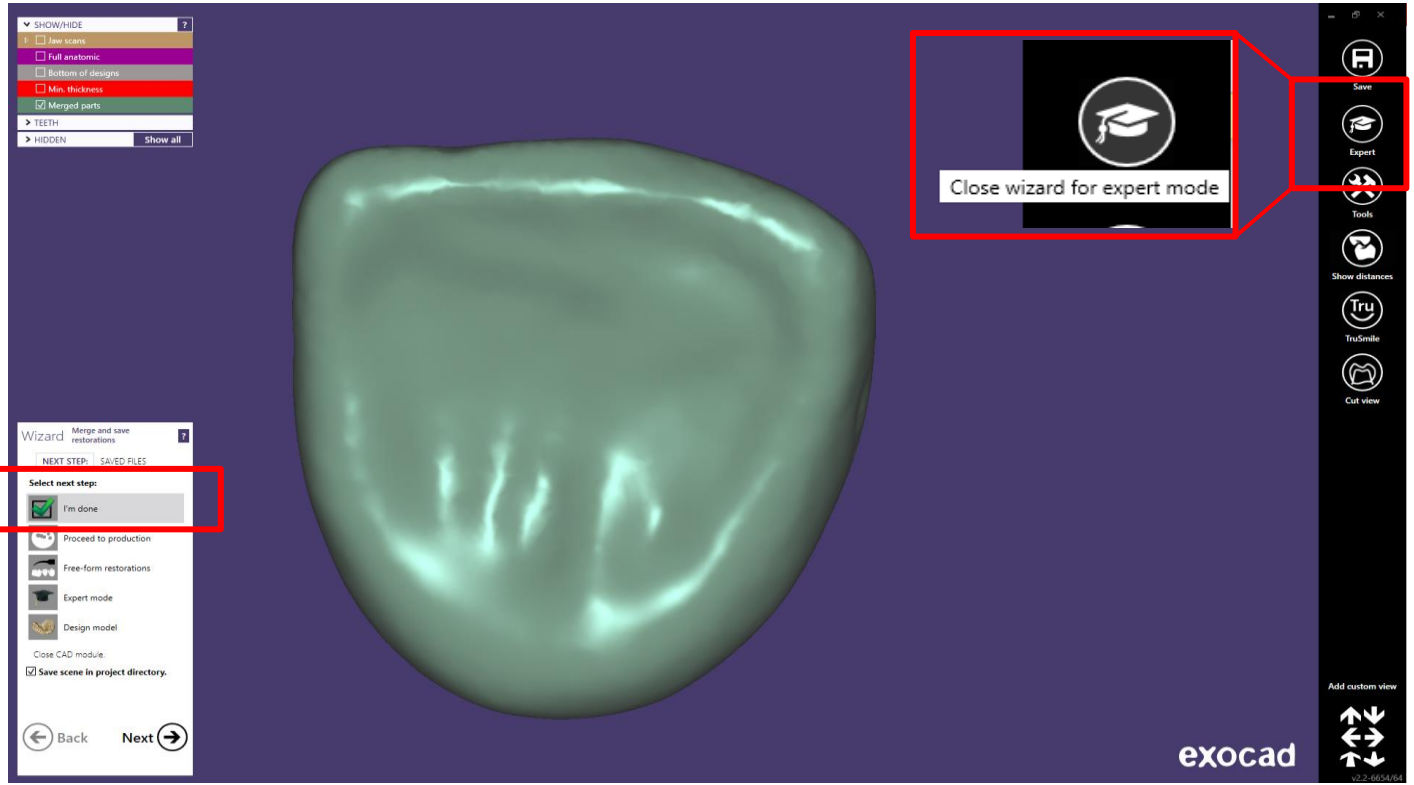
Design of screw channels with the aim of an attachment

Restrictions:

- Implant parts scanned as dies
- Not available for IPS e.max CAD
- Required software version: 2.2 Valletta or higher

Design of screw channels with the aim of an attachment

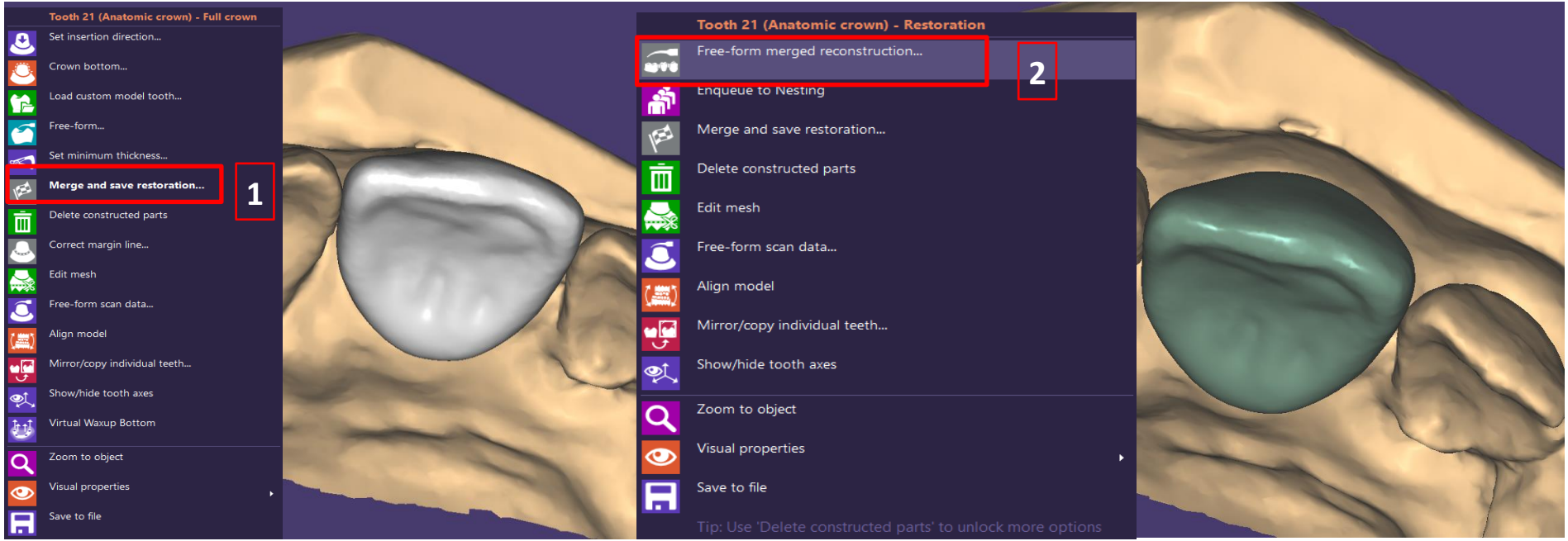
Important: Attachment selection and application must be done at last design step after switching to expert mode!



Design of screw channels with the aim of an attachment

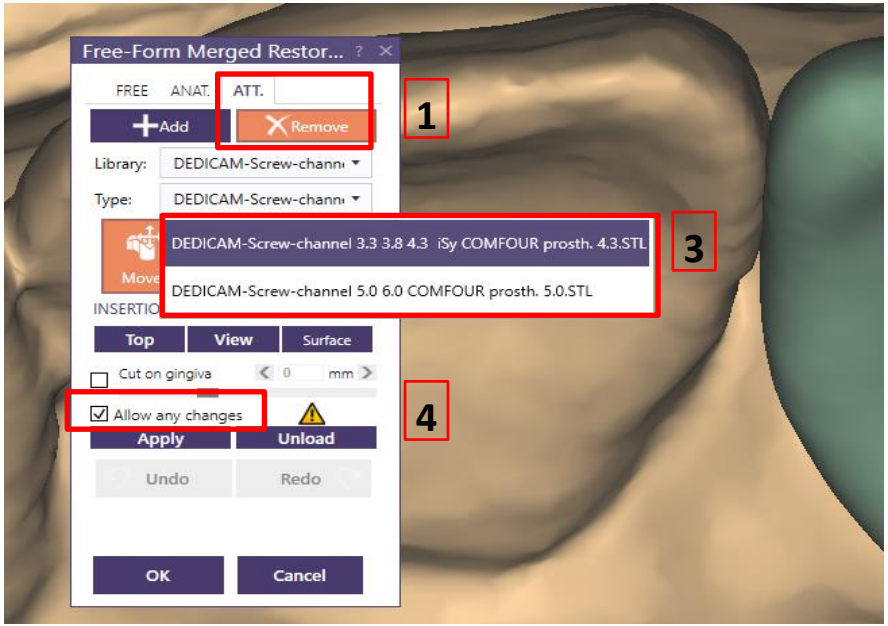
1 After calling up expert mode restoration has to be merged and saved first

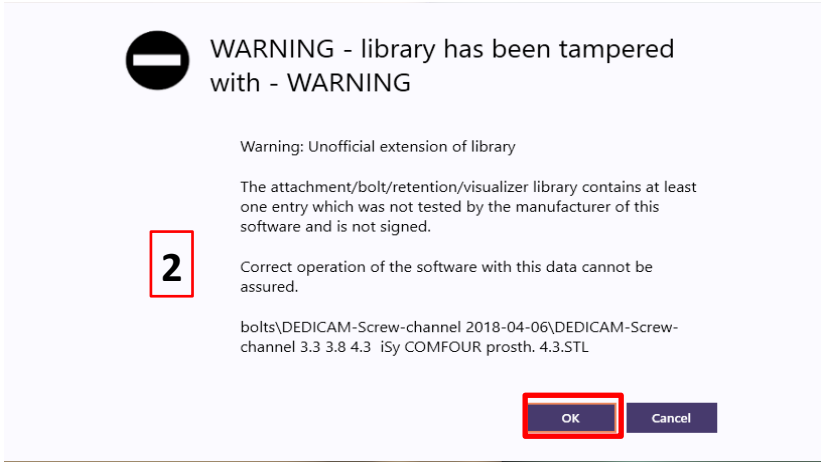
2 Now functionality «Free-form merged reconstruction» is available

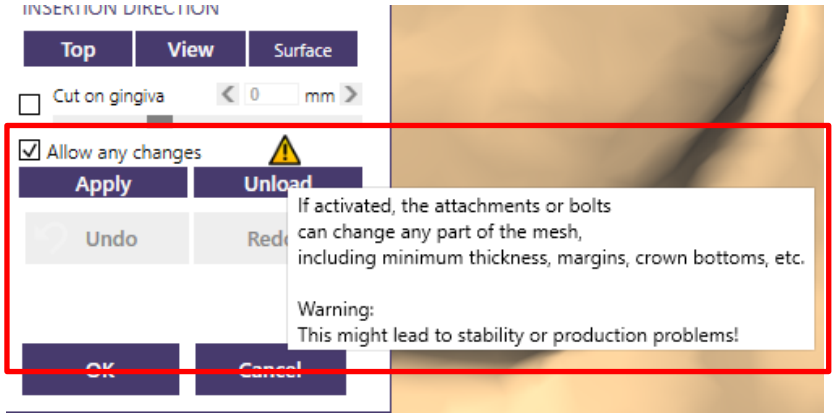


Design of screw channels with the aim of an attachment

1. Select tab «Att.» and «Remove»
2. «OK» to confirm possible warning message
3. Two sizes of screw channels are offered
4. Important: Mark «Allow any changes»



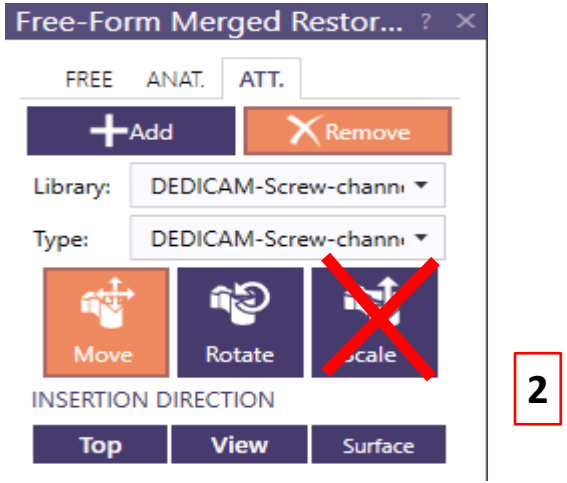




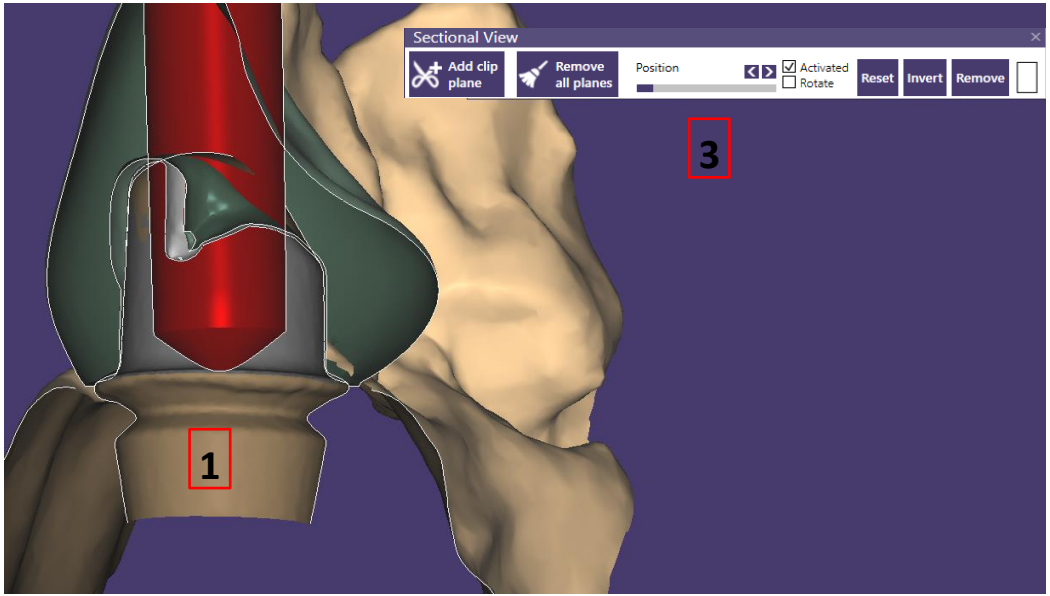
Design of screw channels with the aim of an attachment

1. Aligne the attachment by its tip looking into the cavity
2. Do **not** use «Scale» tool
3. Check attachment to implant axis orientation by sectional tool tool

Important: For trouble-free integration of the screw ensure the attachments axis is aligned with the implant axis



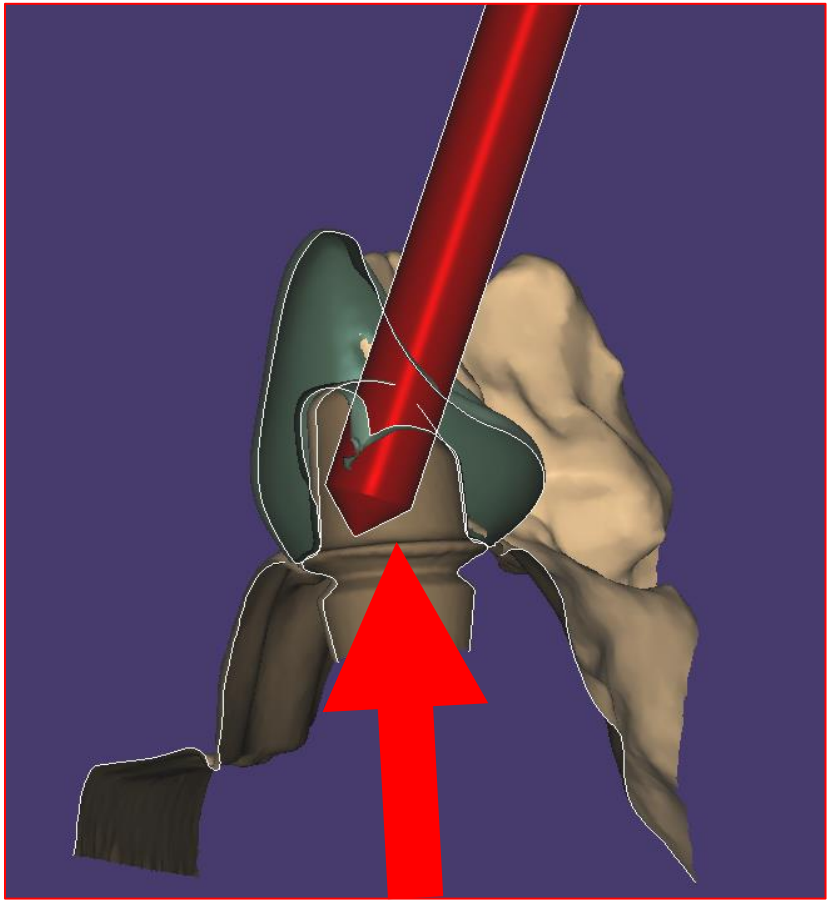
2



Design of screw channels with the aim of an attachment

Divergences between implant axis and screw channel axis may prevent the screw from receiving its thread.

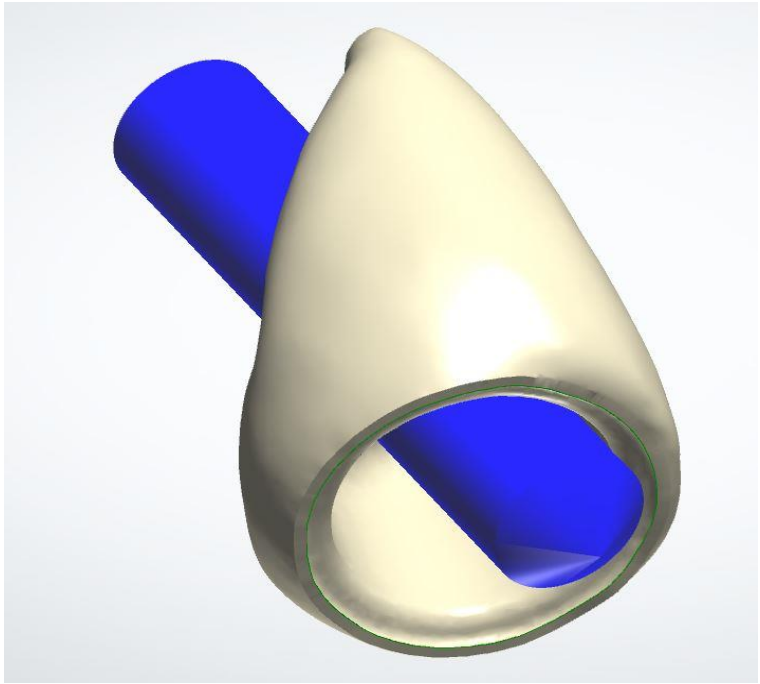
Camlog will not carry out any verification about functionality prior and post to manufacturing.

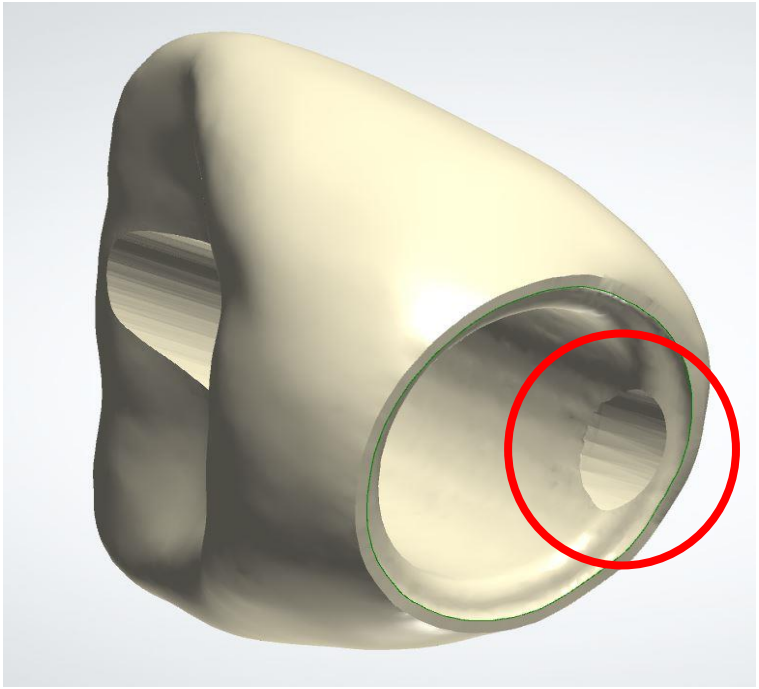


Design of screw channels with the aim of an attachment

Attention: Attachment should not touch crown margin!

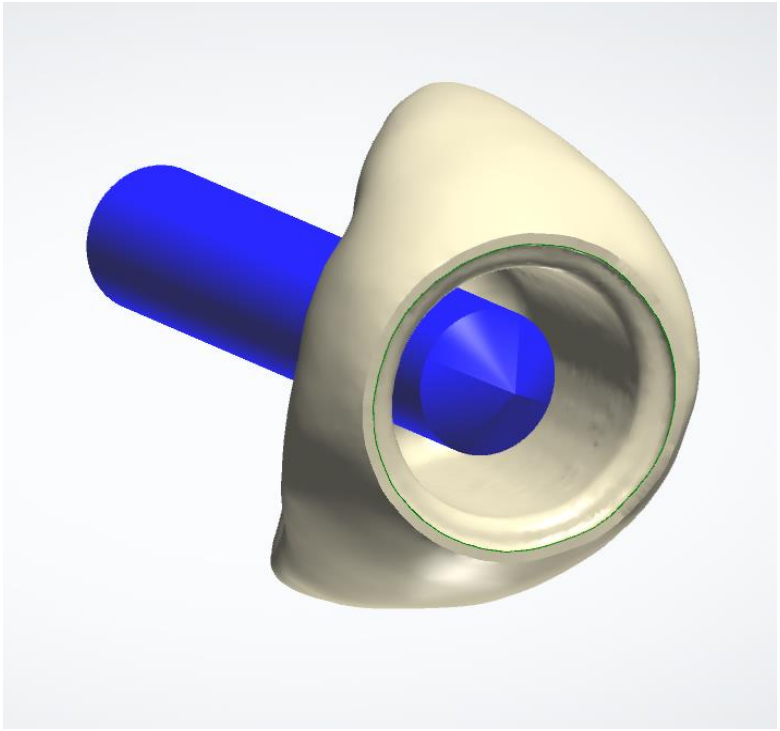
If necessary adapt attachment length and / or axis

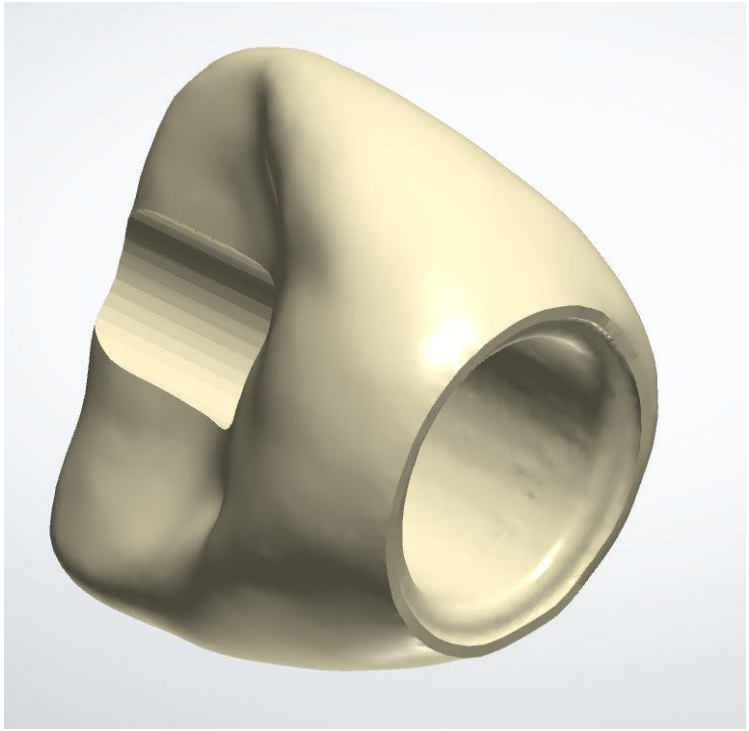




Design of screw channels with the aim of an attachment

Correctly placed attachment to create a screw channel



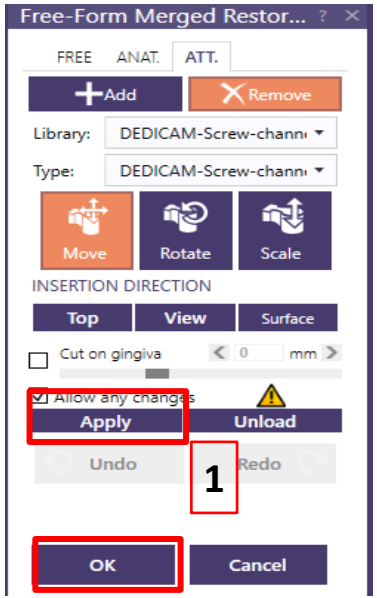


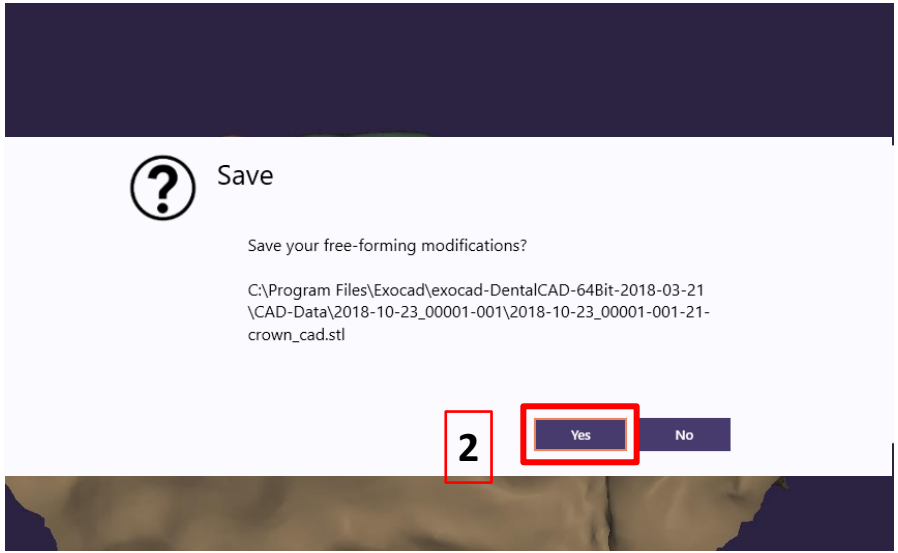
Design of screw channels with the aim of an attachment

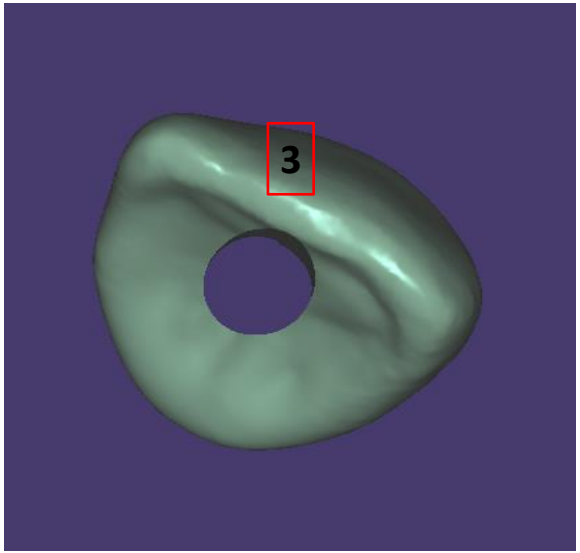
1 To apply correct placed attachment press «Apply» and «OK»

2 Confirm free-form changes again

3 Added crew channel on final restoration

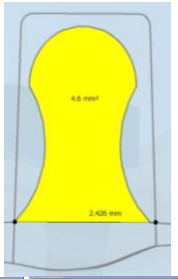




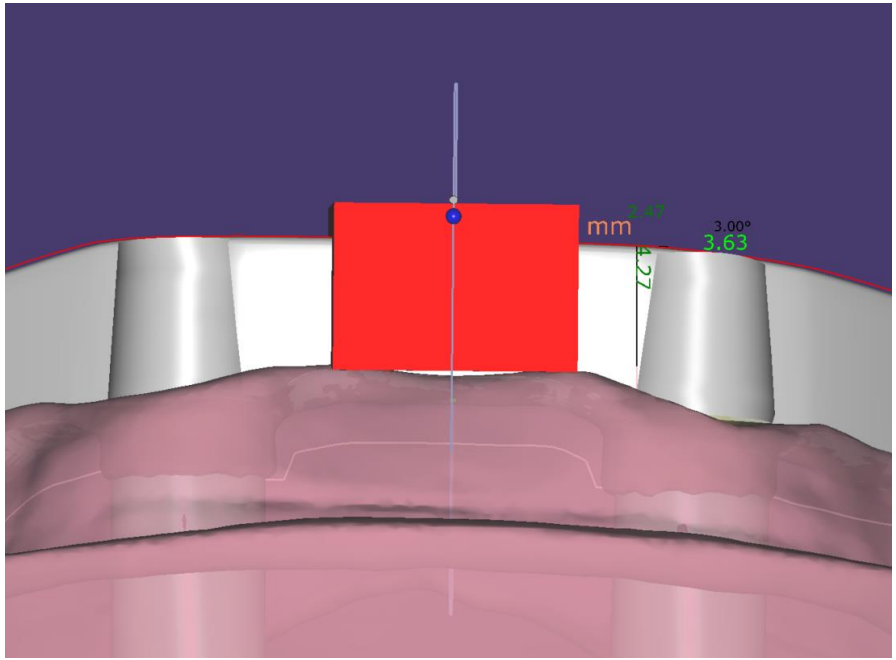


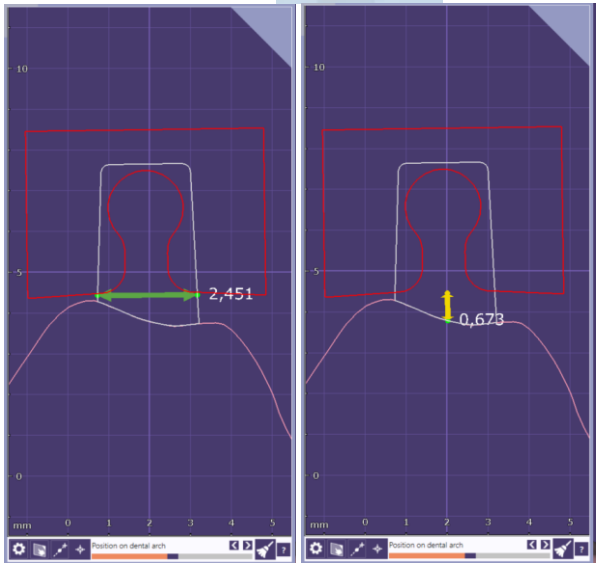
Recommendation on cross-section designs for bars

Recommendation on cross-section designs for bars



Note:
Preci-Horix cross-section 4.6mm²
plus cross section below Preci-Horix geometry



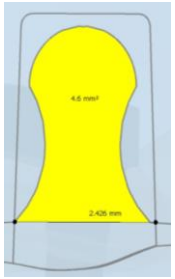


Measure of bar heigth and width below Preci-Horix geometry

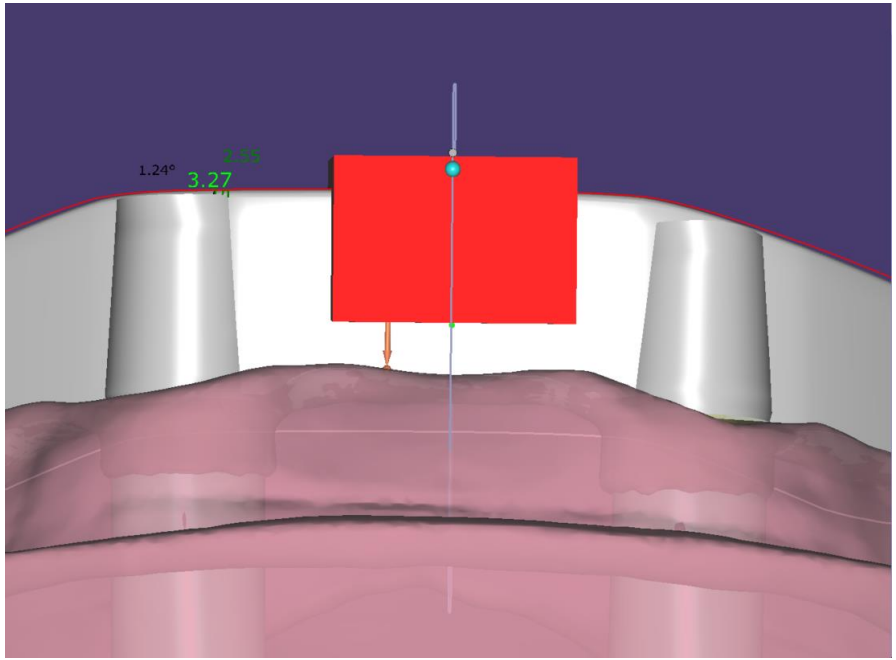
e.g.
2.45 x 0.67 = 1.64mm²
Preci-Horix + 4.60mm²
Total = 6.24mm²

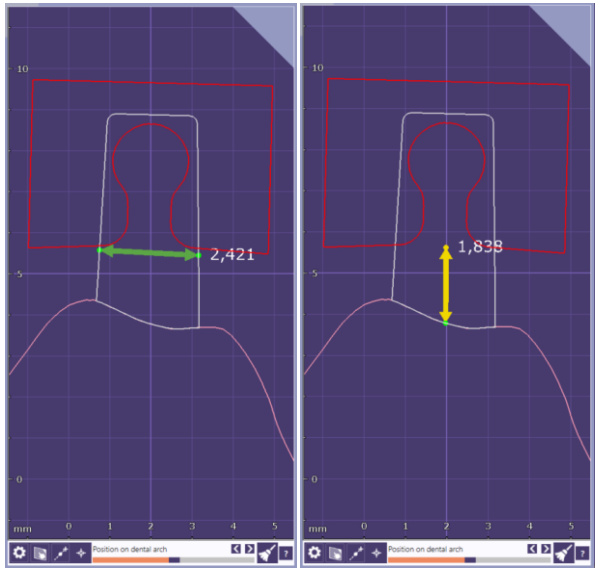
For bars with cross-section-reducing attachments (Preci-Horix), it should be noted that the reduced bar cross-section must be compensated by a larger width or height.

Recommendation on cross-section designs for bars



Note:
Preci-Horix cross-section 4.6mm²
plus cross section below
Preci-Horix geometry



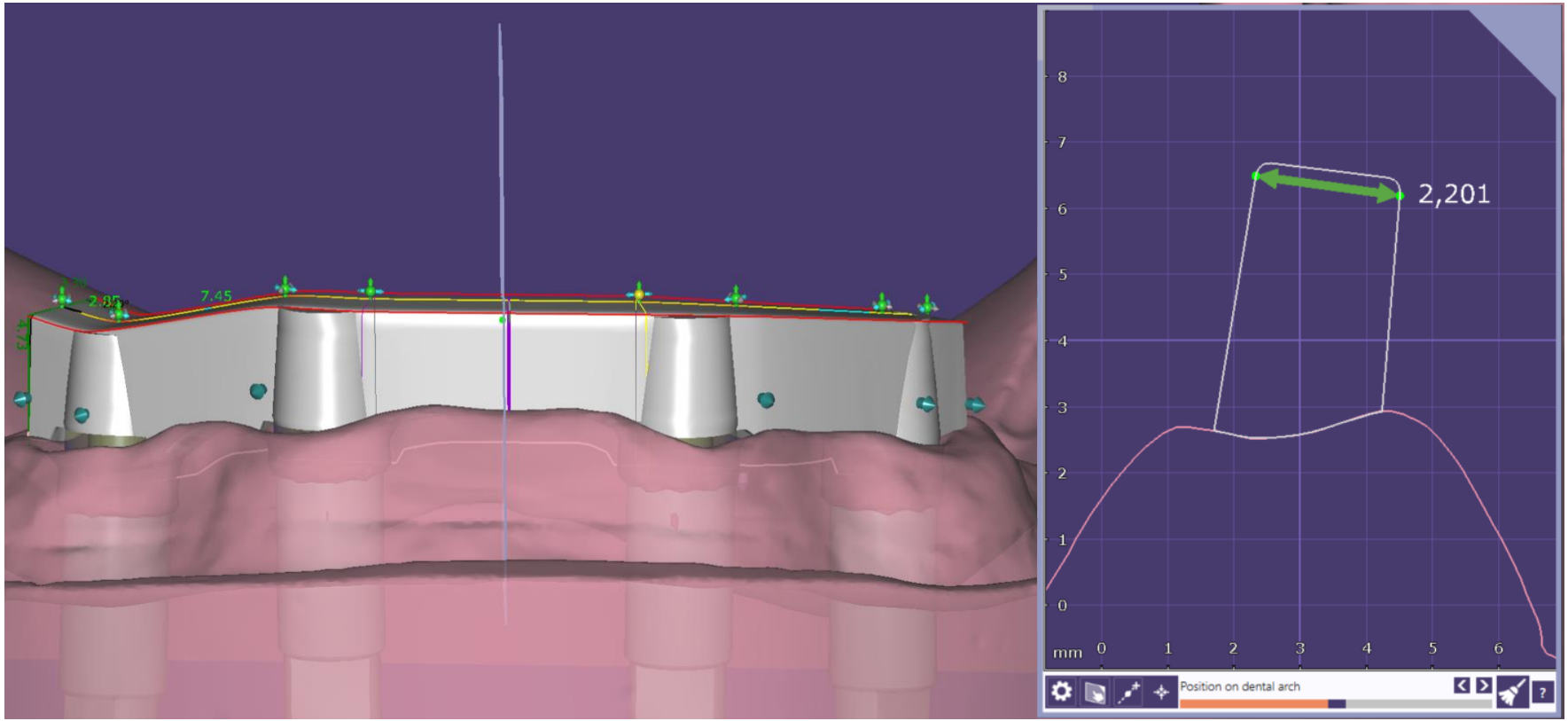


Measure of bar heigth and width below Preci-Horix geometry

e.g.
2.42 x 1.84 = 4.45mm²
Preci-Horix + 4.60mm²
Total = 9.05mm²

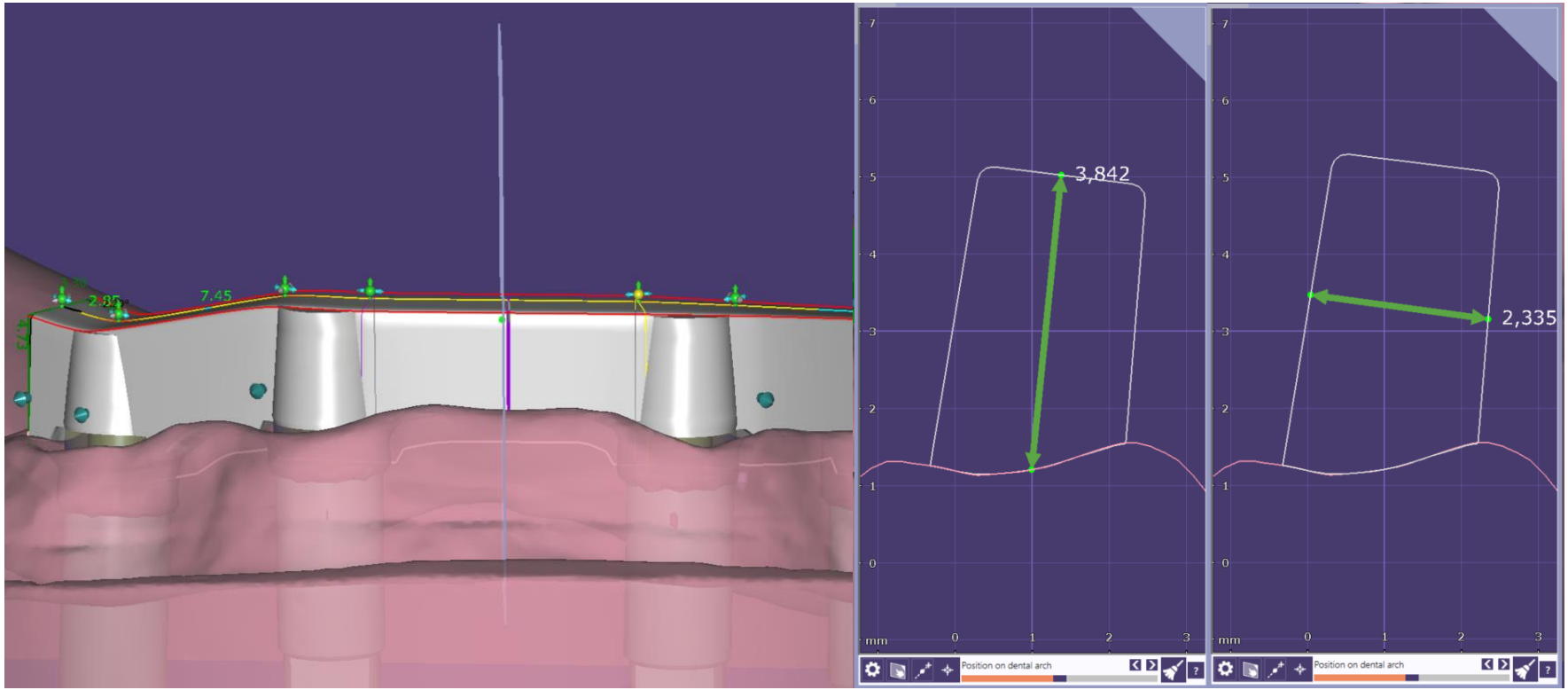
For bars with cross-section-reducing attachments (Preci-Horix), it should be noted that the reduced bar cross-section must be compensated by a larger width or height.

Recommendation on cross-section designs for bars



Recommended bar width of min. 2.2mm ensures manufacturing of suprastructures

Recommendation on cross-section designs for bars



It is recommended not to go below a cross-section of approx. 8 to 9mm².

Note: The cross-section is smaller on bars for prefabricated bar matrices (Micro/Macro Dolder).

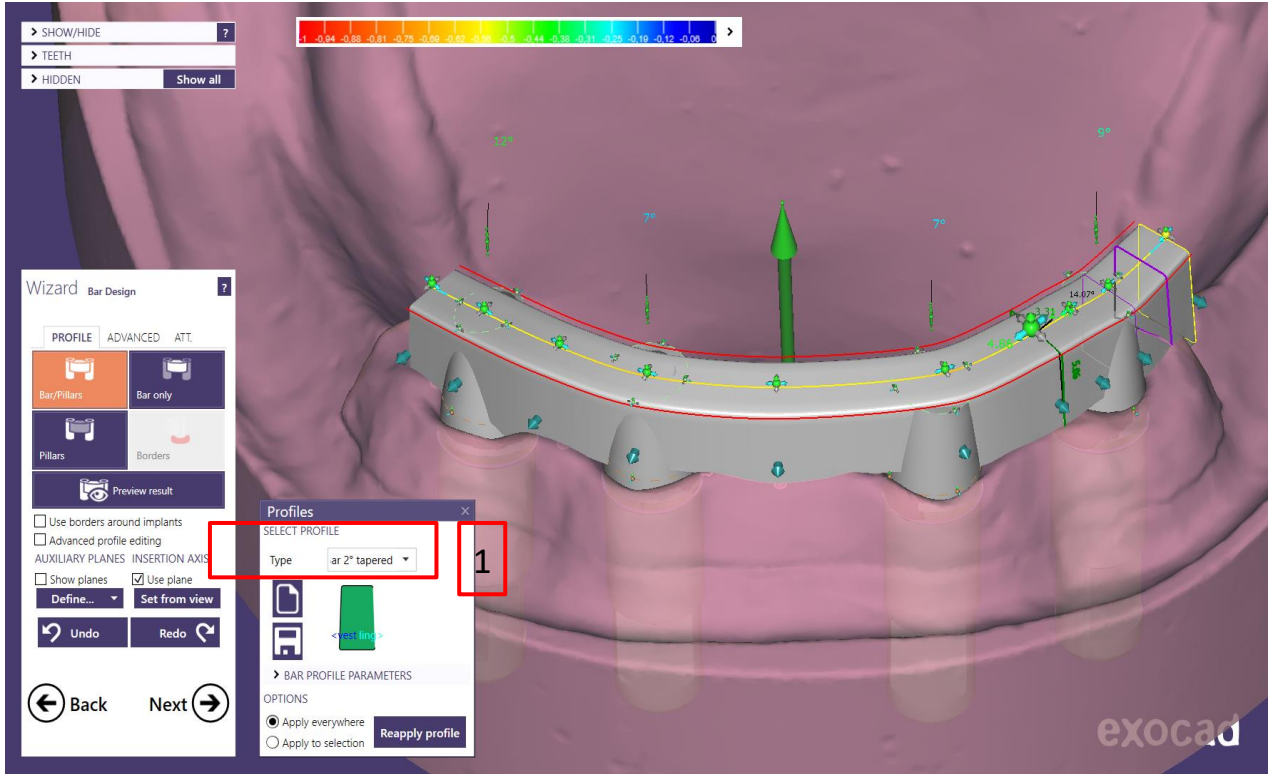
Adding a MK1 cantilever attachment to a bar

Adding a MK1 cantilever attachment to a bar

Bar type: DEDICAM
Primary Bar 2° tapered [1]

Cantilever bar width: min. 2.8mm

Note:
It is the recommendation of the MK1 attachment manufacturer to use a 2° tapered bar type.

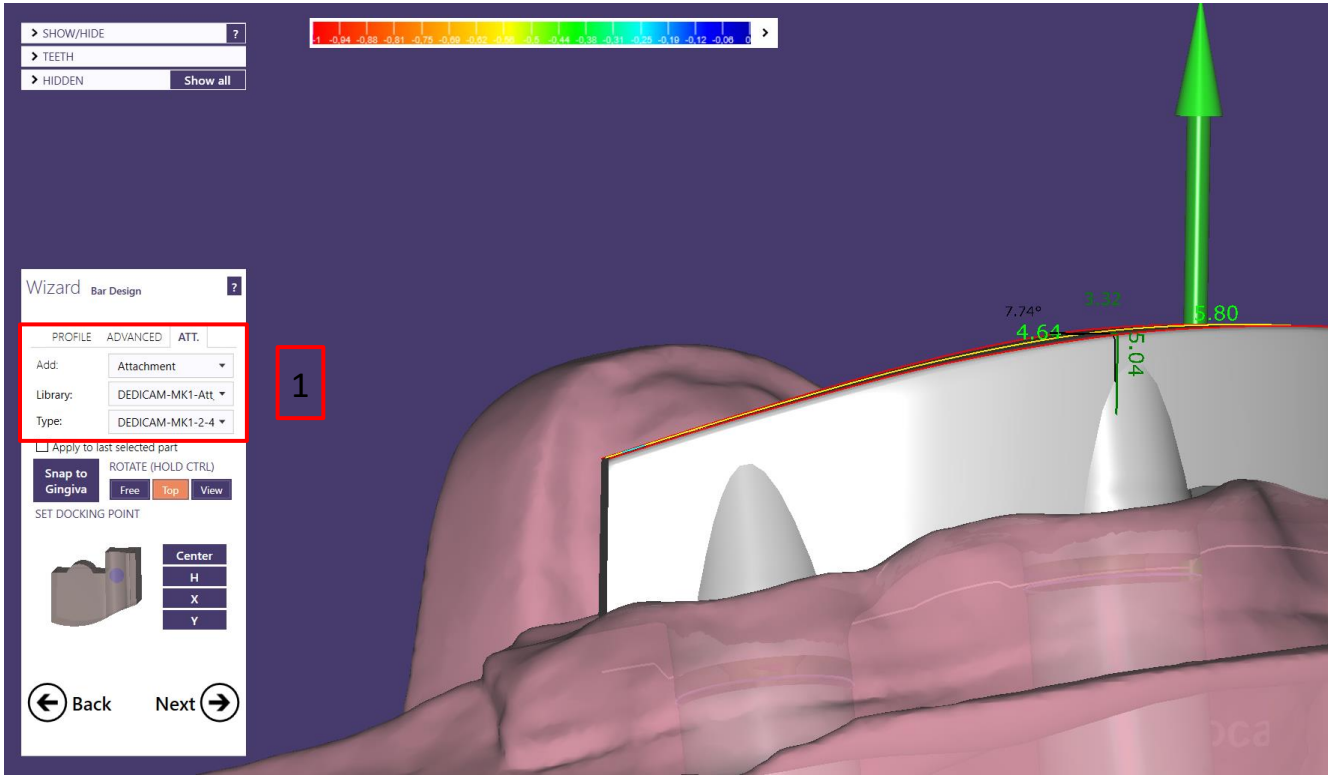


Adding a MK1 cantilever attachment to a bar

Select DEDICAM MK1 attachment according its placing region 1. +.3. Q. or 2.+ .4. Q. 1

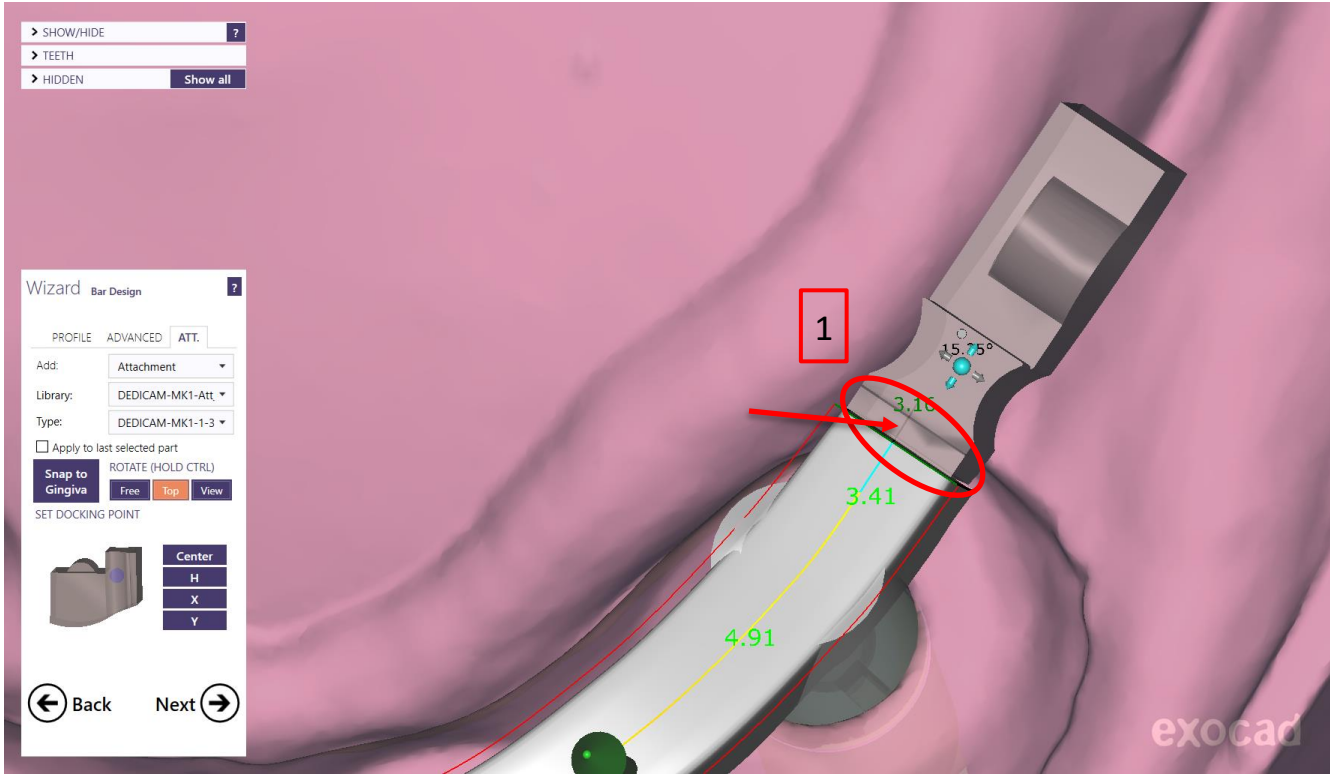
Note:

In case the attachment shall be cut to the gingiva, select MK1 attachment with „cut-to-gingiva“ naming.



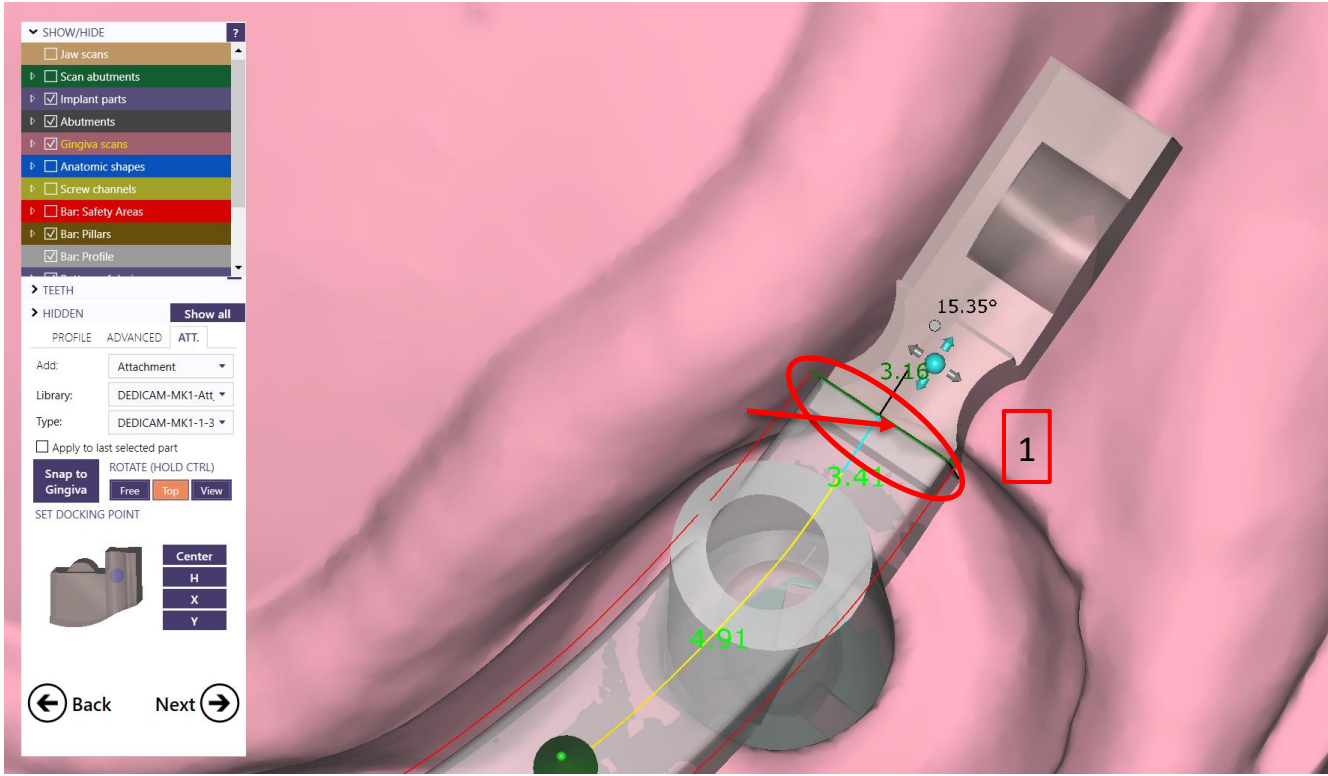
Adding a MK1 cantilever attachment to a bar

Push the MK1 attachment into the bar profile. 1



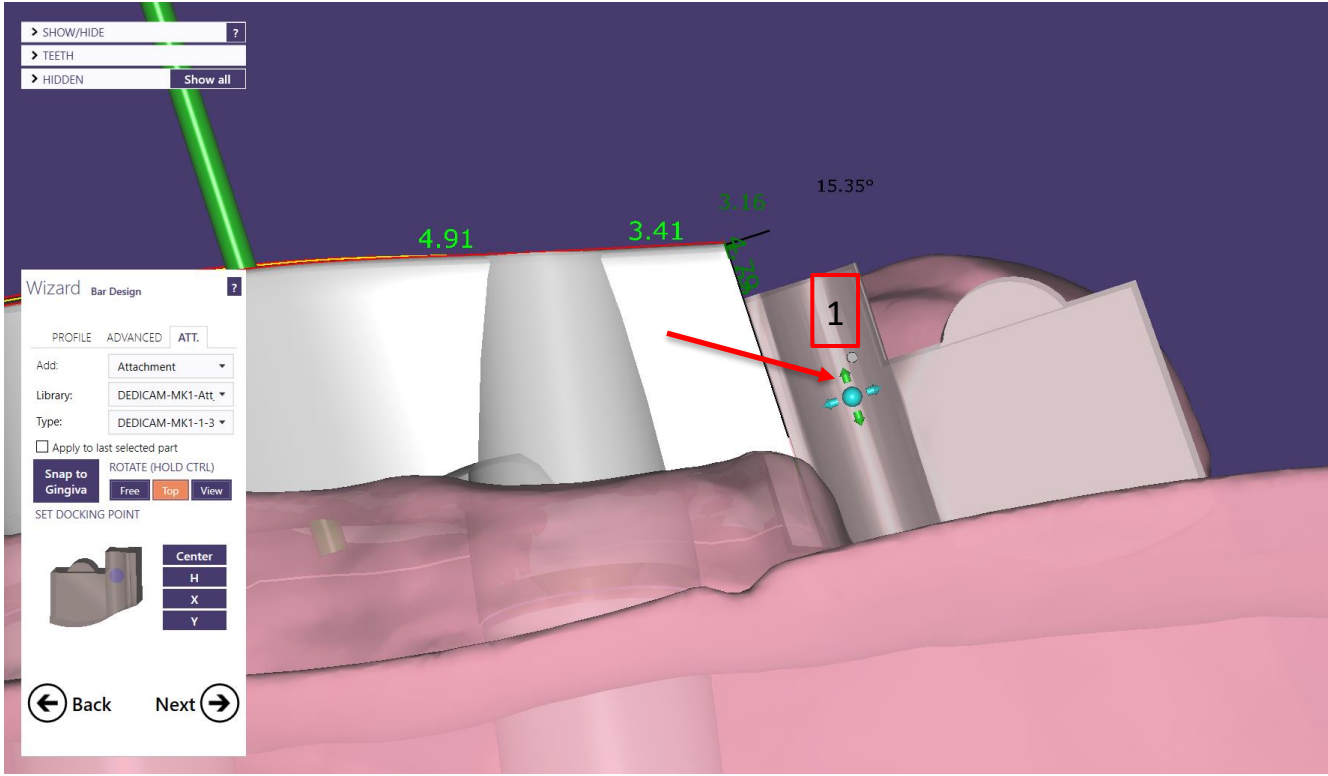
Adding a MK1 cantilever attachment to a bar

Do not push the MK1 attachment further into the bar profile than the marked line indicates. 1



Adding a MK1 cantilever attachment to a bar

Change to side view for positioning of the MK1 attachment in terms of height.
Therefore, use the green arrow. 1

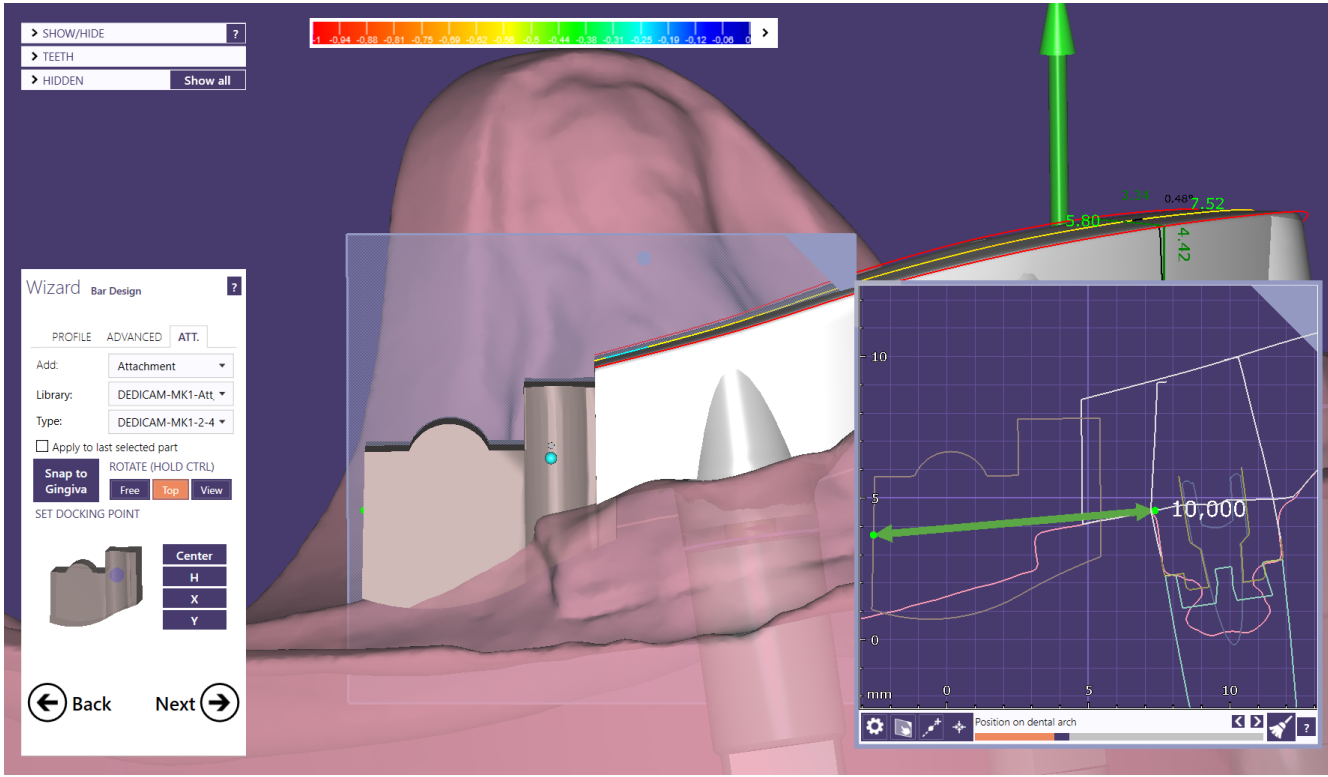


Adding a MK1 cantilever attachment to a bar

Attention:

According to the IFU, the maximum extension of the bar including attachment is 10mm measured from the outer diameter of the implant.

Use the 2D cross section to verify the length.

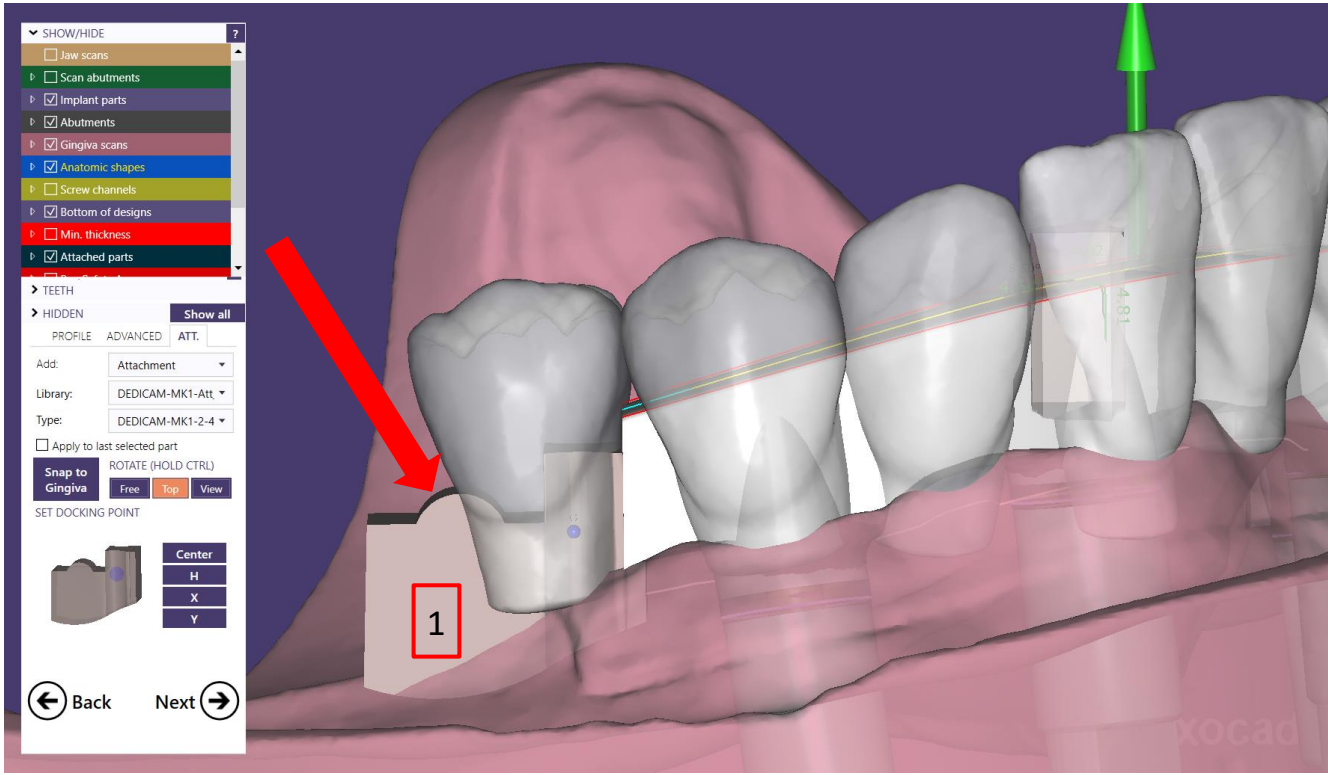


Adding a MK1 cantilever attachment to a bar

The ideal solution is to place the functional part of the MK1 attachment in the interdental space of the denture teeth. 1

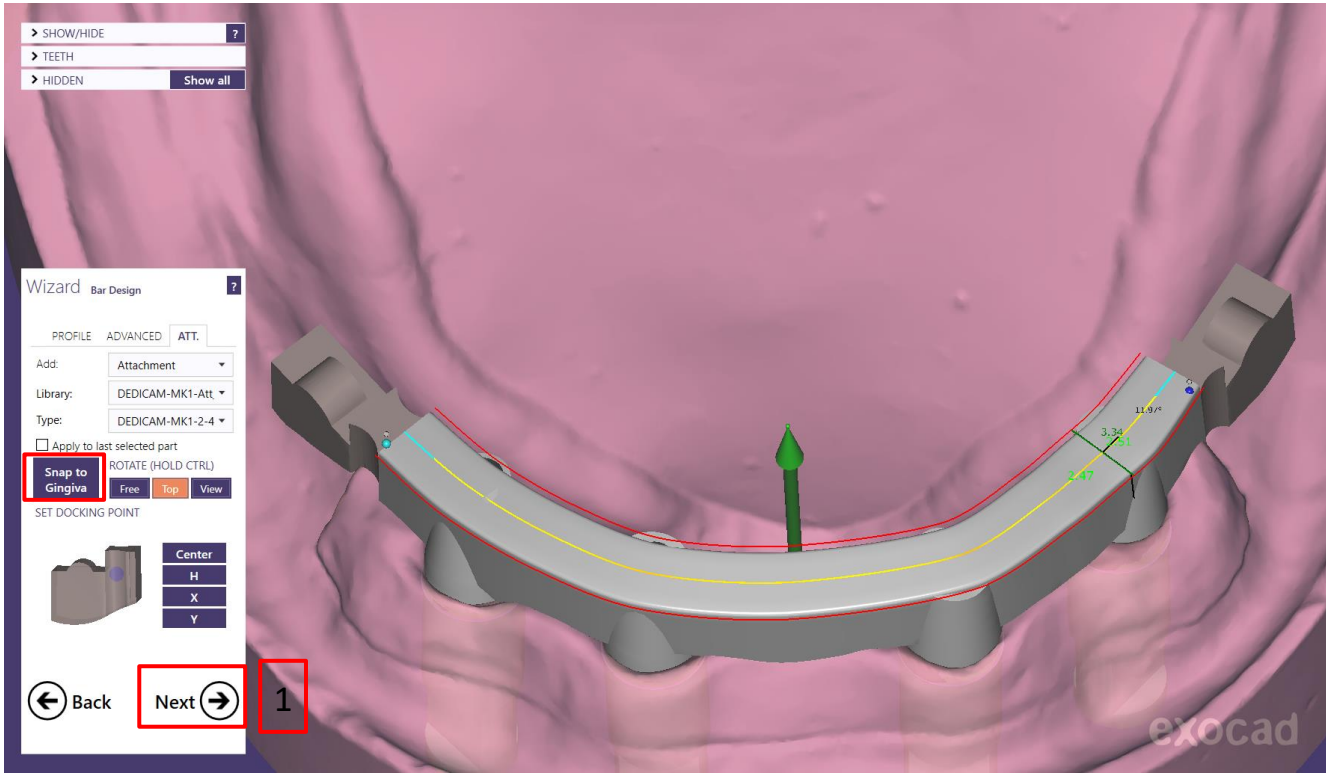
Note:

In order to ensure operability by the patient it is recommended to place the functional part of the MK1 attachment not further distal than the 2nd premolar.



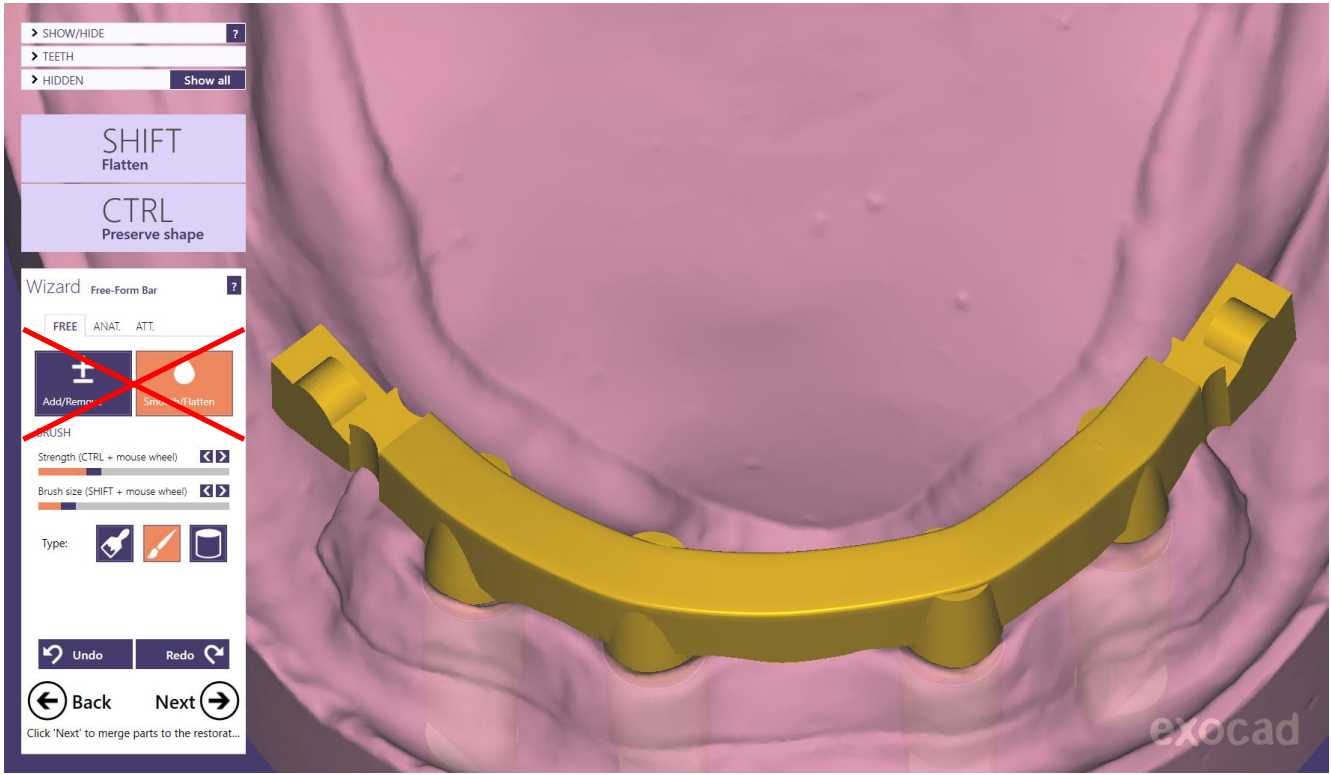
Adding a MK1 cantilever attachment to a bar

After final positioning of the MK1 attachments activate the button „Snap to Gingiva“ and apply by clicking „Next➔“ 1



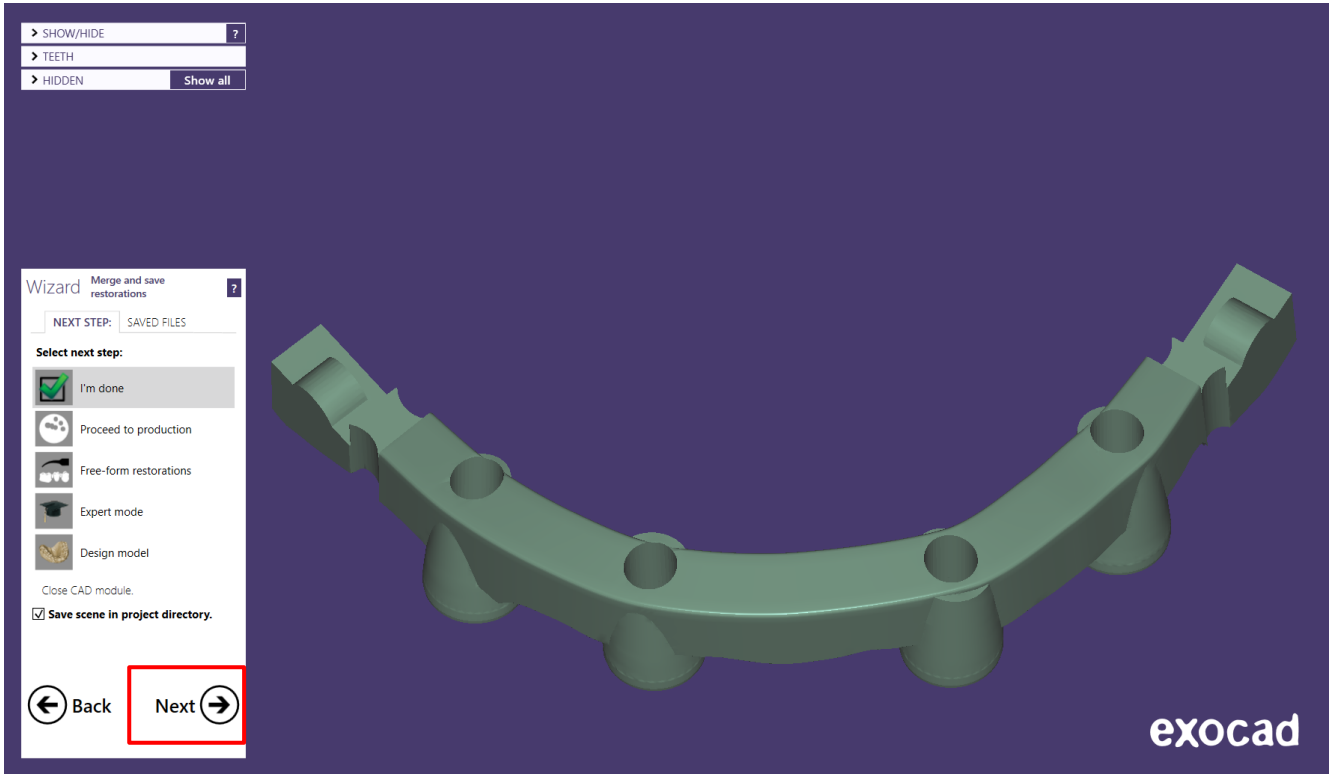
Adding a MK1 cantilever attachment to a bar

Do not use any other tools from the „Free-Form Bar“ to finalize the bar design.



Adding a MK1 cantilever attachment to a bar

Send the design via Dentalshare or our eService to Camlog.



Design of a primary part of a telescopic crown

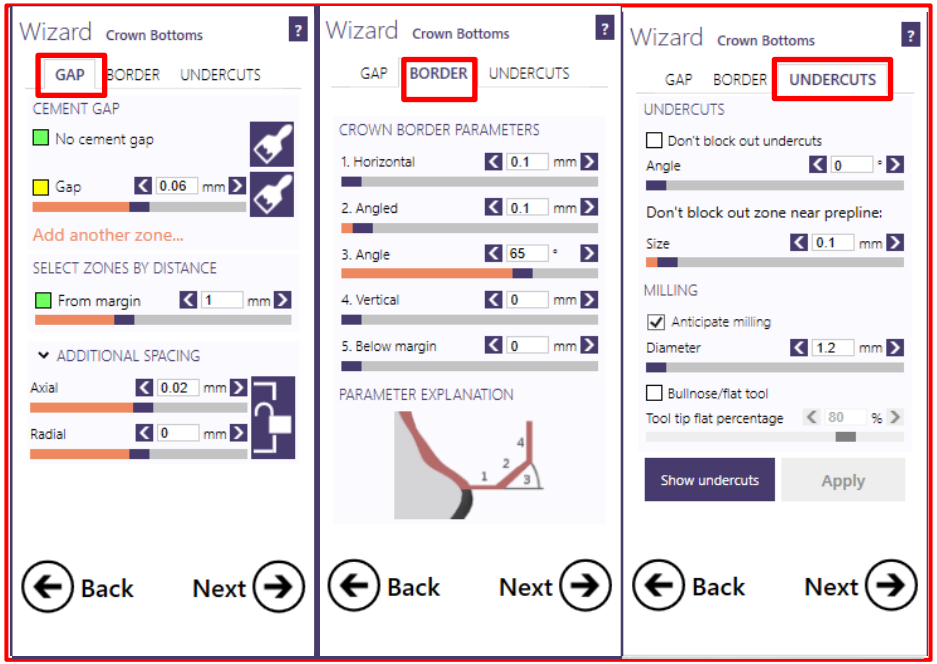
Design of a primary part of a telescopic crown

Stump parameter, internal fit for primary components

Gap		Undercuts		Milling	
Cement Gap	0.06	Angle	0.00	Anticipate milling → check mark	
		Size	0.10	Diameter	1.2

Additional spacing	
Axial	0.02
Radial	0.00

Border	
Horizontal	0.10
Angled	0.10
Angel	65°
Vertical	0.00
Below margin	0.00



Design of a primary part of a telescopic crown

Stump parameter, internal fit for primary components

- CoCr Typ4 Primary Part Telescope
- Ti6Al4V Primary Part Telescope

Angle: 0.00° - 6.00°

- Value can be changed: telescope = 0° / double crown 2 – 6° (Note: use same value per jaw)

Minimum thickness: 0.50mm

- Value should not be changed if possible in order to ensure that there is enough material thickness even after corrections.

Border: H: 0.1mm; A: 0.1mm; A: 65°; V: 0.0mm

- For accuracy of fit use optimised CAD parameter.

Milling: Ø 1.2mm

- „Anticipate milling“ → check mark
  Diameter 1.2mm

Design of a primary part of a telescopic crown

Order creation

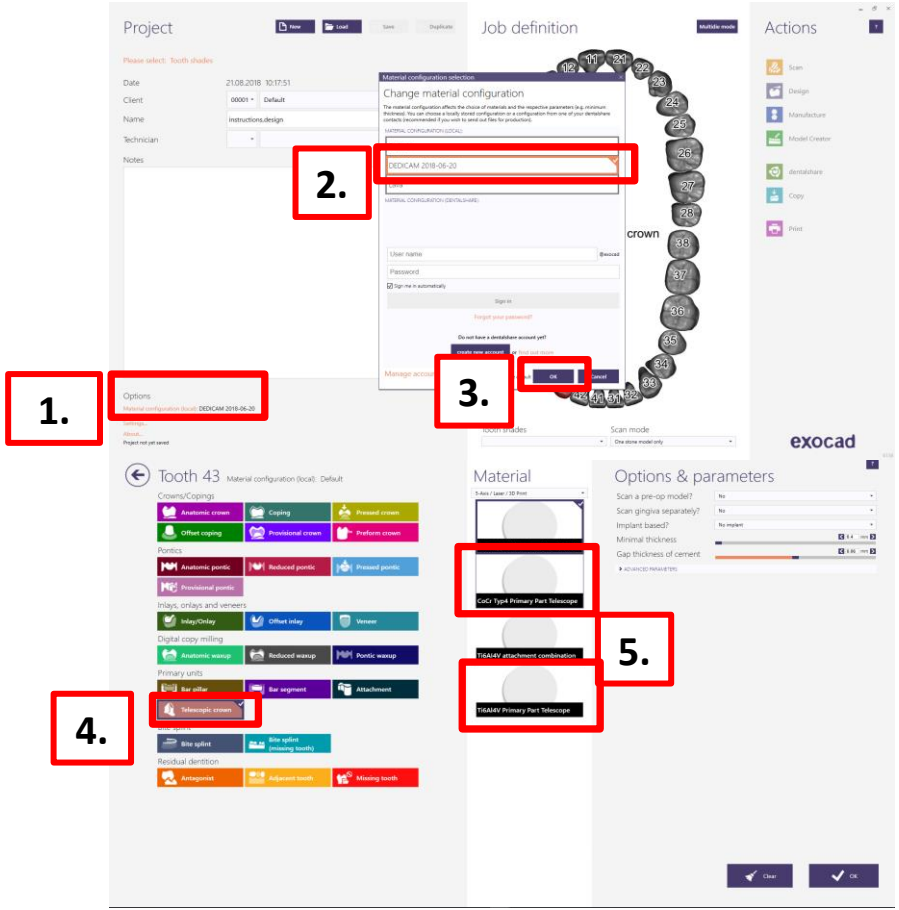
Select **1.** Material configuration (local)

2. DEDICAM 2018-06-20 or higher and

click „OK“ **3.** to confirm

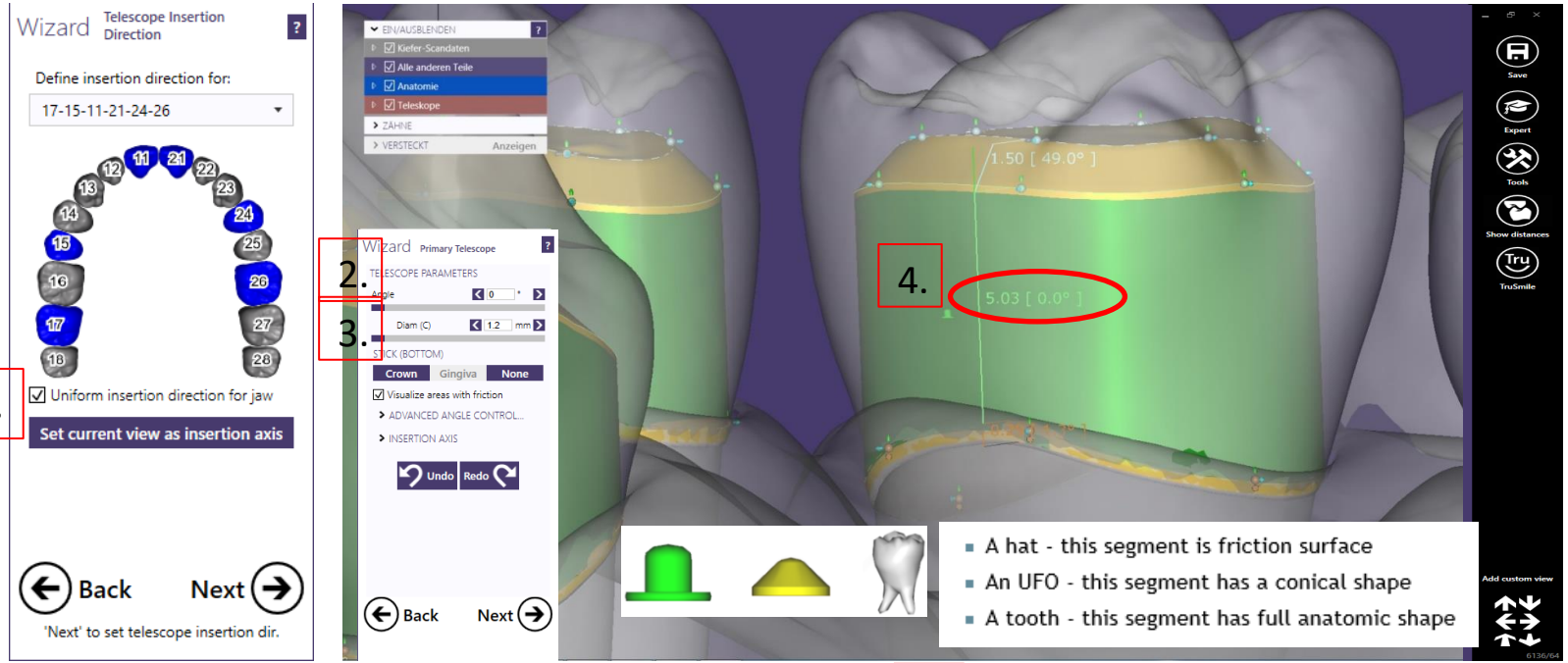
4. Indication „Telescope crown“

5. Material „CoCr Typ4 Primary Part Telescope“ or „Ti6Al4V Primary Part Telescope“



Design of a primary part of a telescopic crown

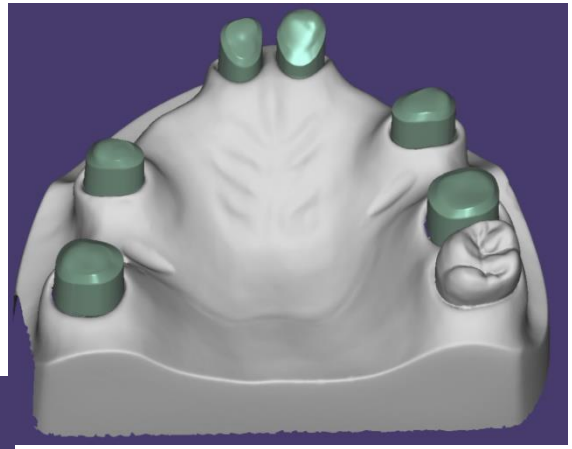
Design primary components as follows:



1. Select „Uniform insertion direction for jaw“
2. Telescope angle = 0° or double crown angle 2-6°
3. Ø bur = 1.2mm
4. Height function surface = Height ~5.0mm 
5. abutment shoulder = epi- or supragingival

Design of a primary part of a telescopic crown

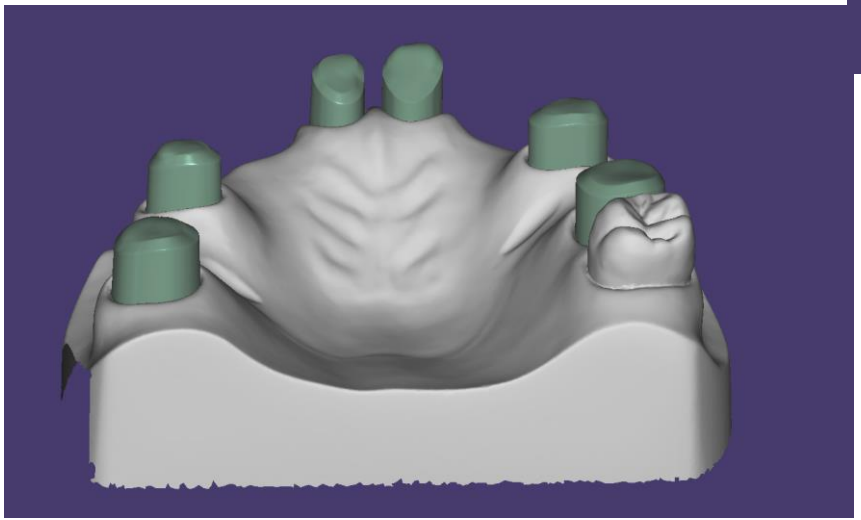
Finish of the primary components design



Right quadrant = primary telescope

Left quadrant = primary double crown 2°

Note: parallel and conical walled telescopes must never be mixed.



Attaching a Preci-Vertix® with interlock and circumference to crowns and bridges

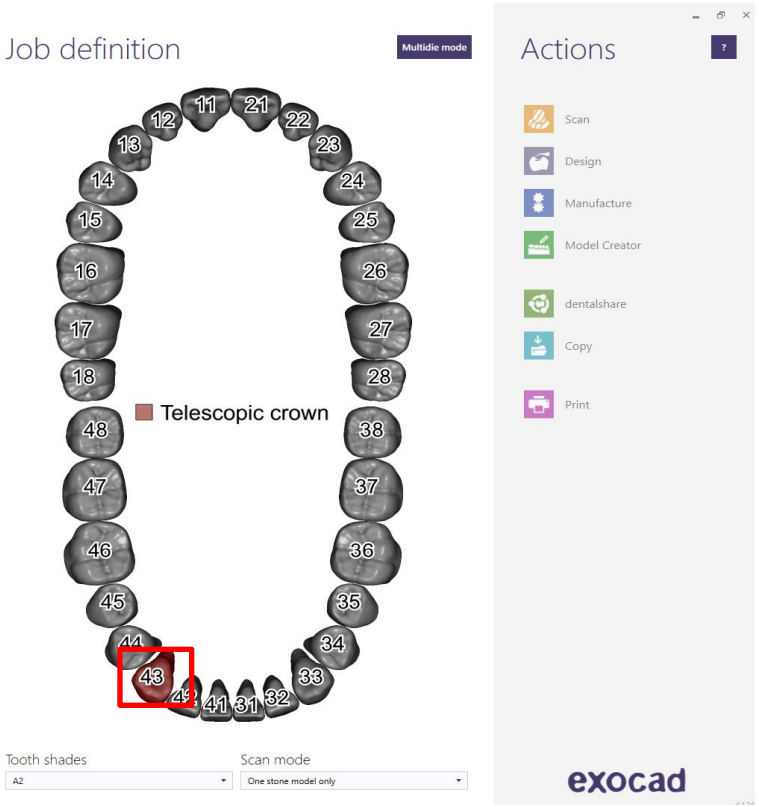
Attaching a Preci-Vertix® with interlock and circumference

Note:

In order to position attachments to fixed bridges or crown blocks or to cut them by the gingiva. Note the explanations with the example designs when creating the order.

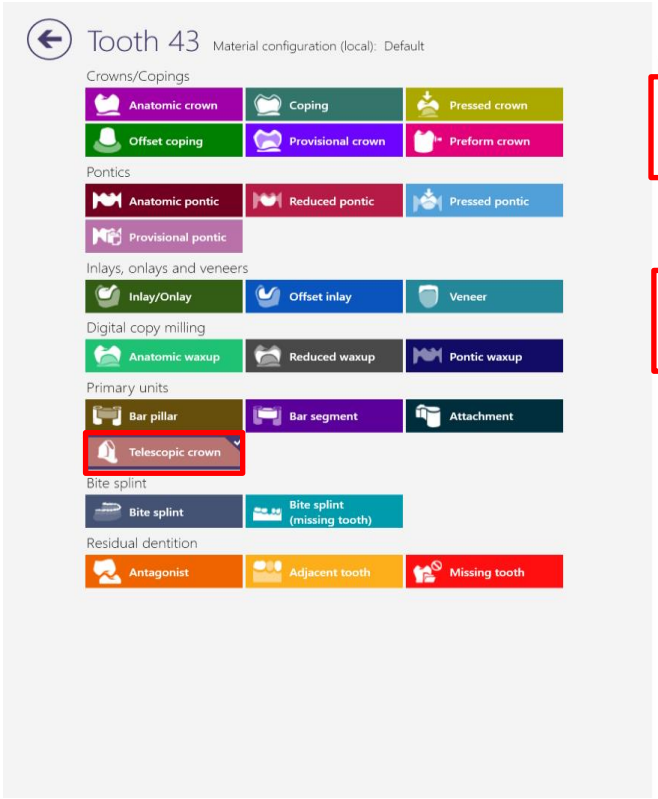
For the design of attachments it is necessary to use the DEDICAM® CAD library.

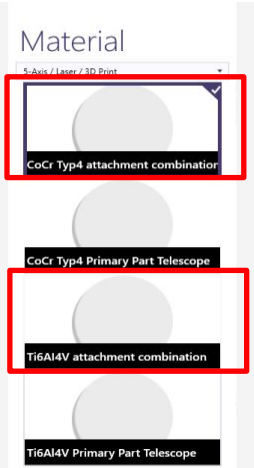
Attaching a Preci-Vertix® with interlock and circumference

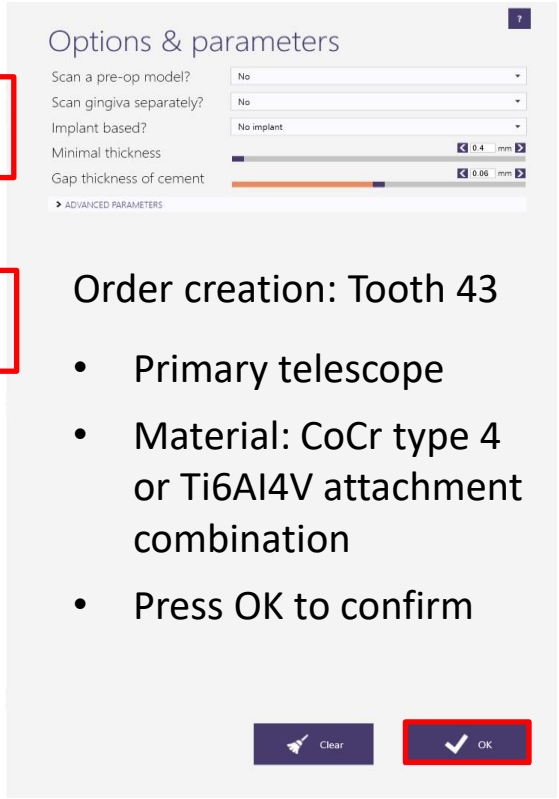


Example: Copings blocked on tooth 43 + 44 with a Preci-Vertix distal to 44 and an Interlock between 43 + 44

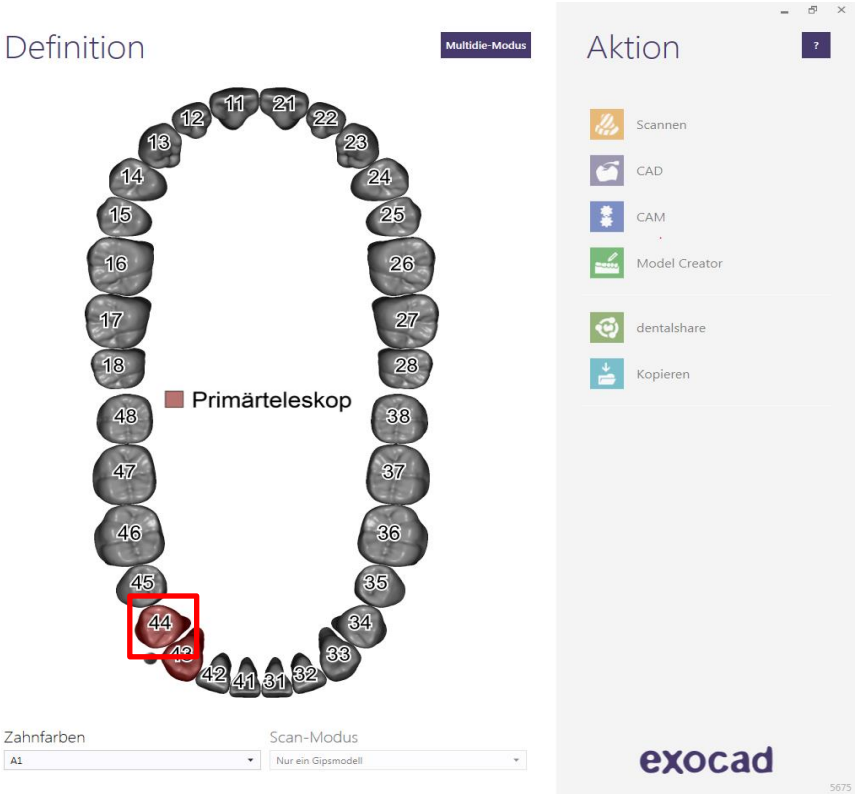
Attaching a Preci-Vertix® with interlock and circumference







Attaching a Preci-Vertix® with interlock and circumference



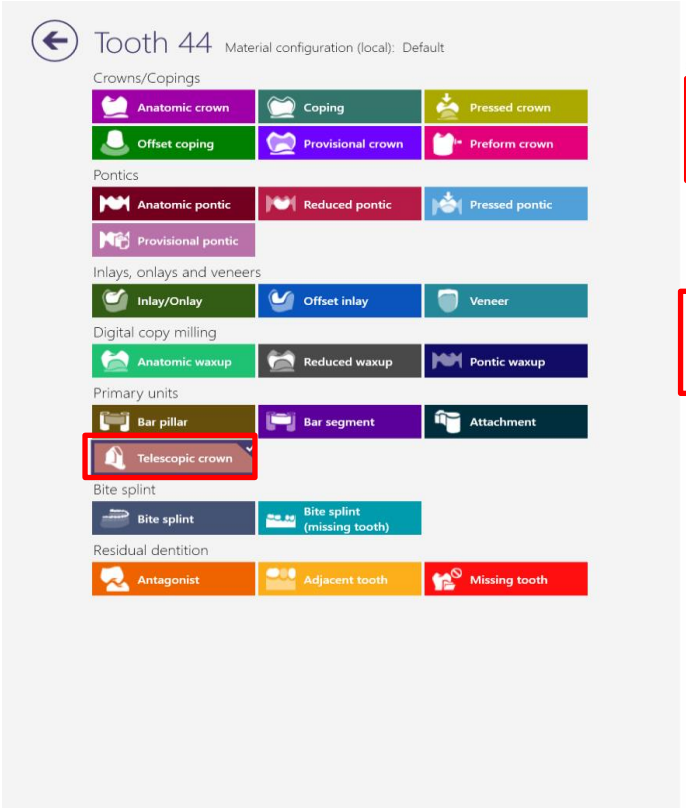
Order creation: Tooth 44

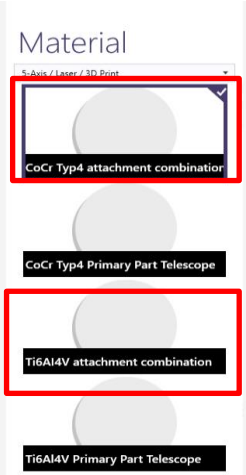
- Primary telescope

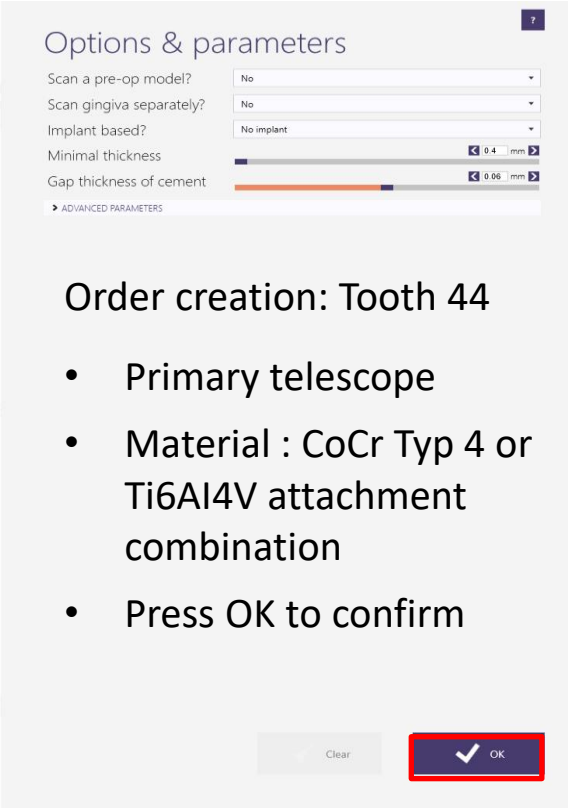
Note:

Preci-Vertix attachment and Interlock will be placed here.

Attaching a Preci-Vertix® with interlock and circumference







Order creation: Tooth 44

- Primary telescope
- Material : CoCr Typ 4 or Ti6Al4V attachment combination
- Press OK to confirm

Attaching a Preci-Vertix® with interlock and circumference

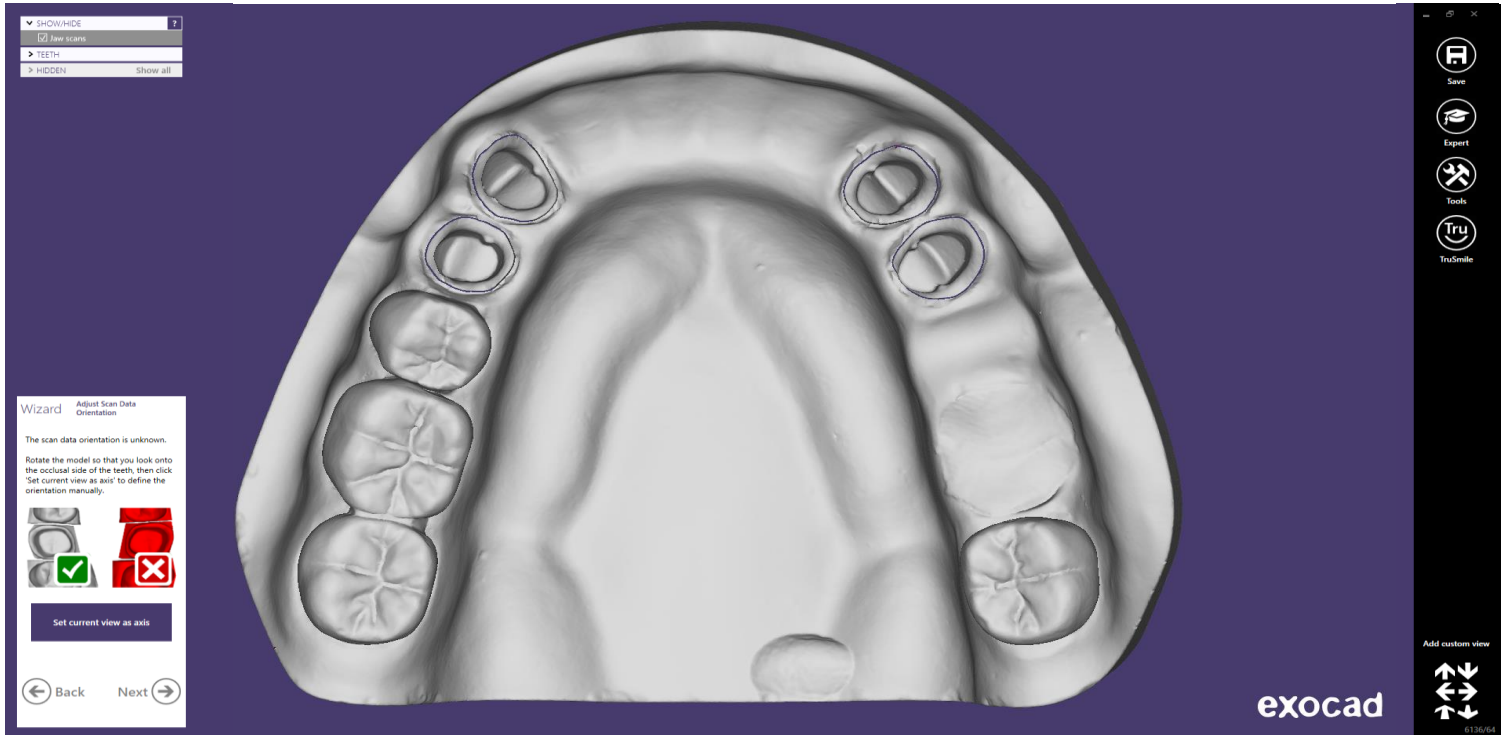
Order creation: Tooth 43 + 44

- Block selected teeth

Attaching a Preci-Vertix® with interlock and circumference

Scan orientation: View direction = Insertion direction

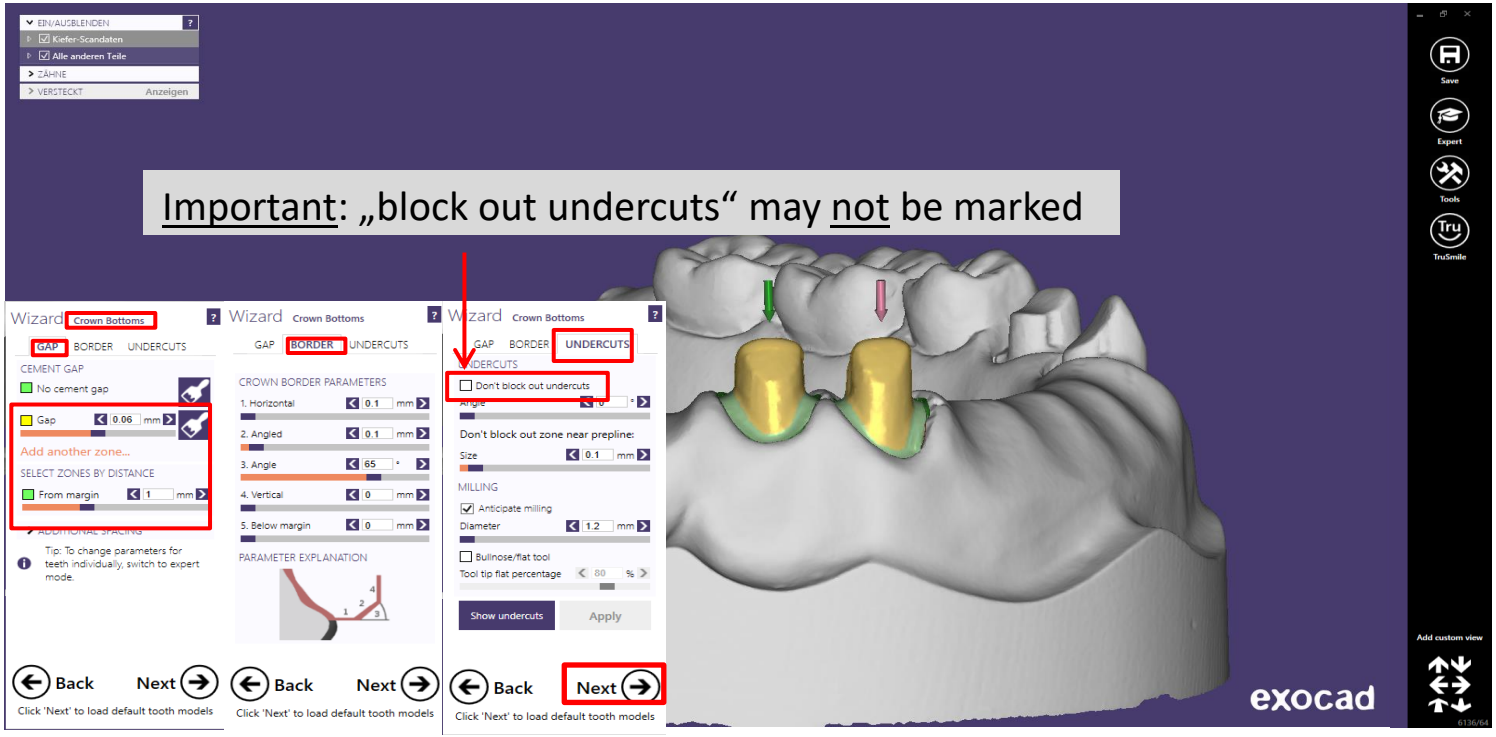
Direction followed by Preci-Vertix circumference and Interlock



Attaching a Preci-Vertix® with interlock and circumference

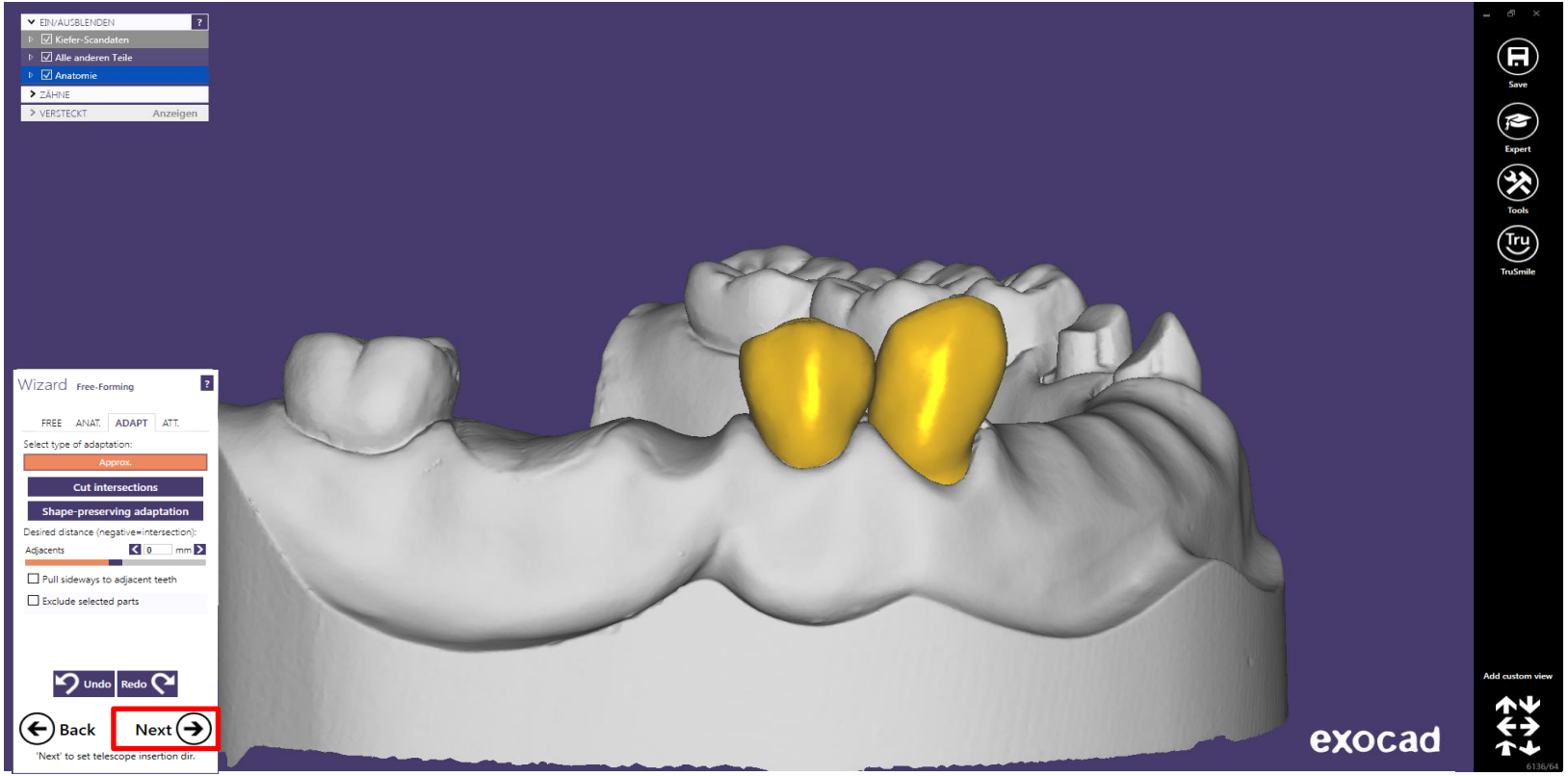
Fitting parameter 43 und 44: check values

Note: Parameter should be identical on all stumps → press “Next”



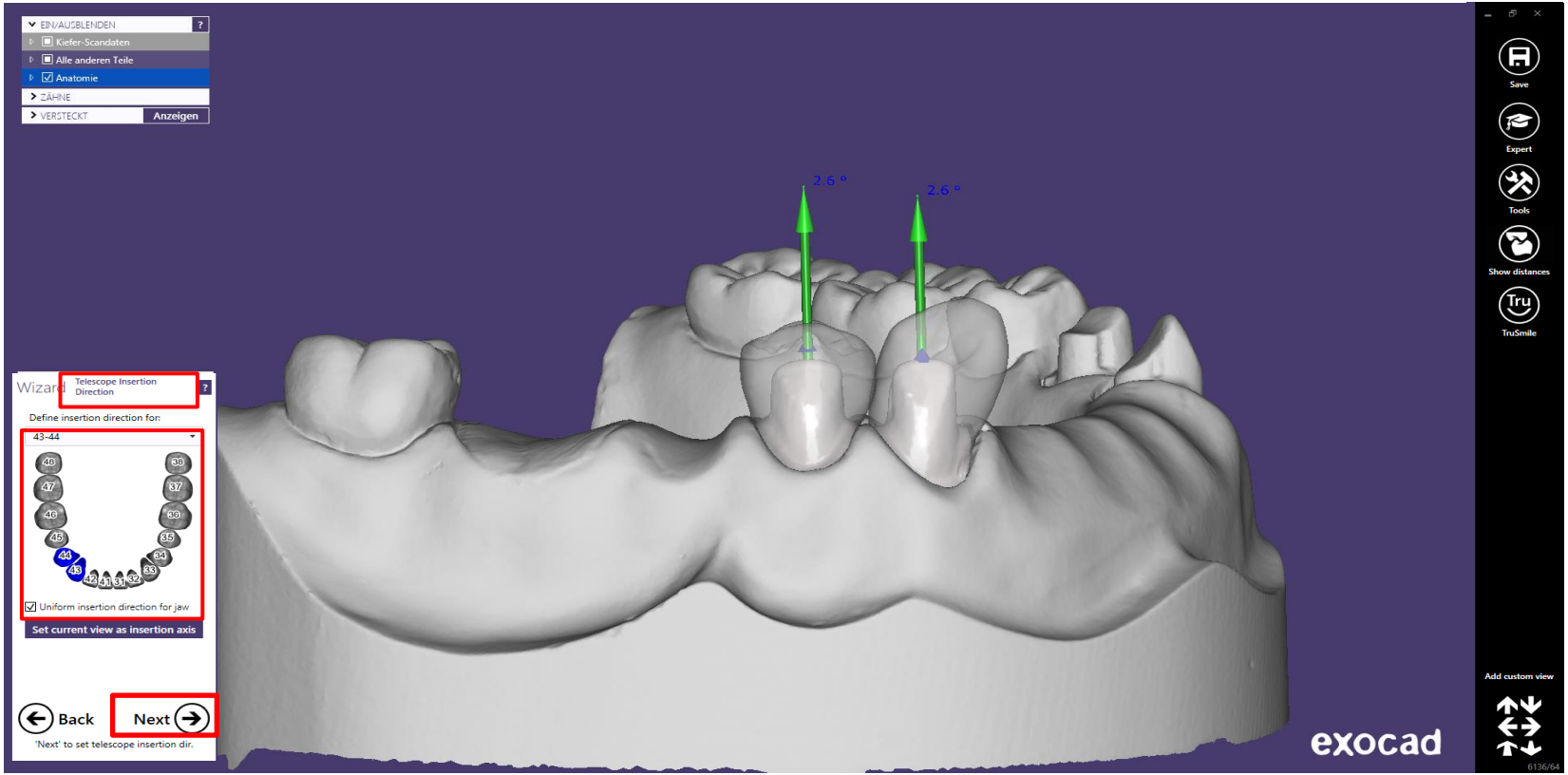
Attaching a Preci-Vertix® with interlock and circumference

Adapt anatomy design to clinical situation → press “Next”



Attaching a Preci-Vertix® with interlock and circumference

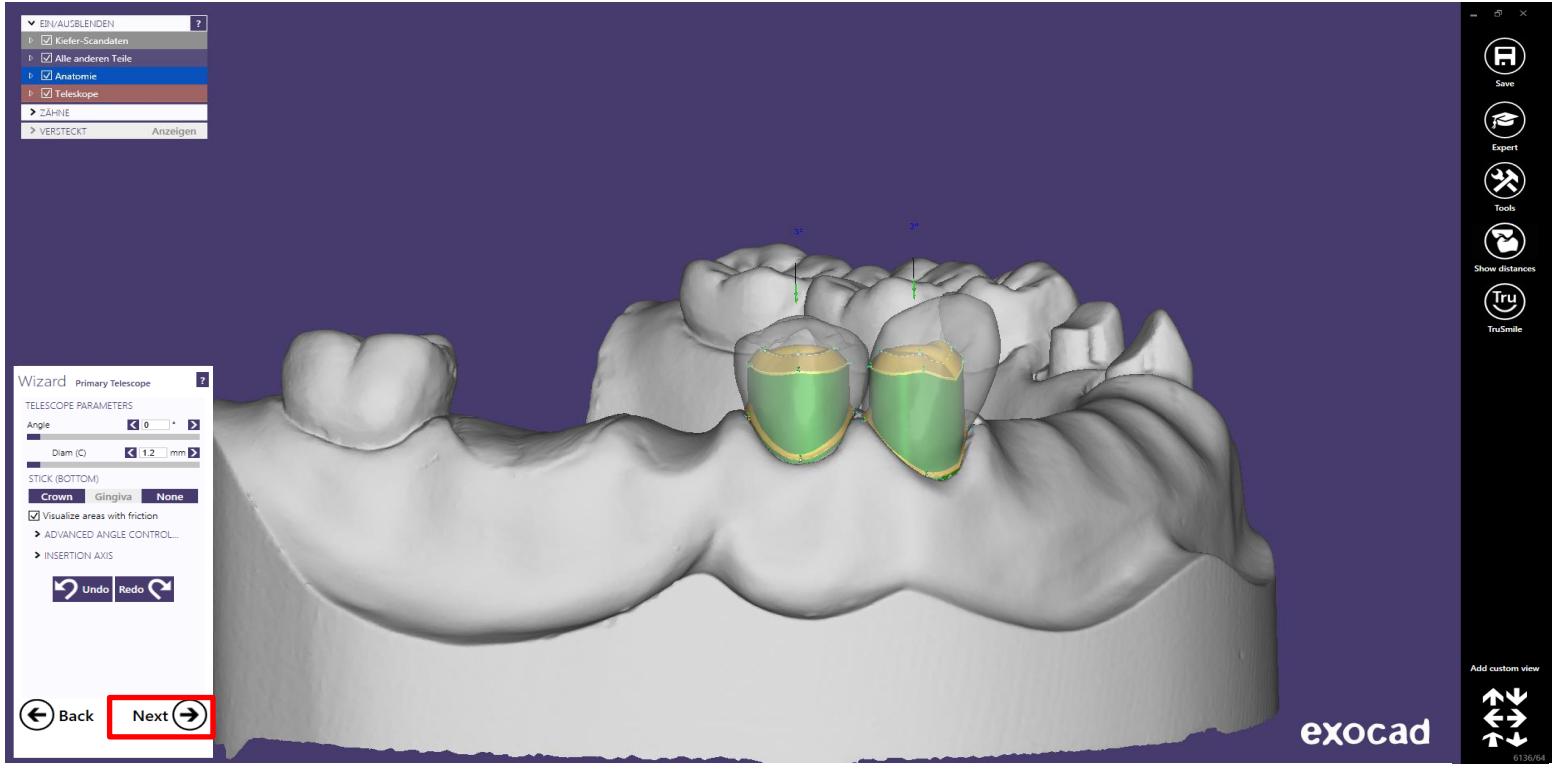
Telescope insertion direction 43 and 44 → press “Next”



Attaching a Preci-Vertix® with interlock and circumference

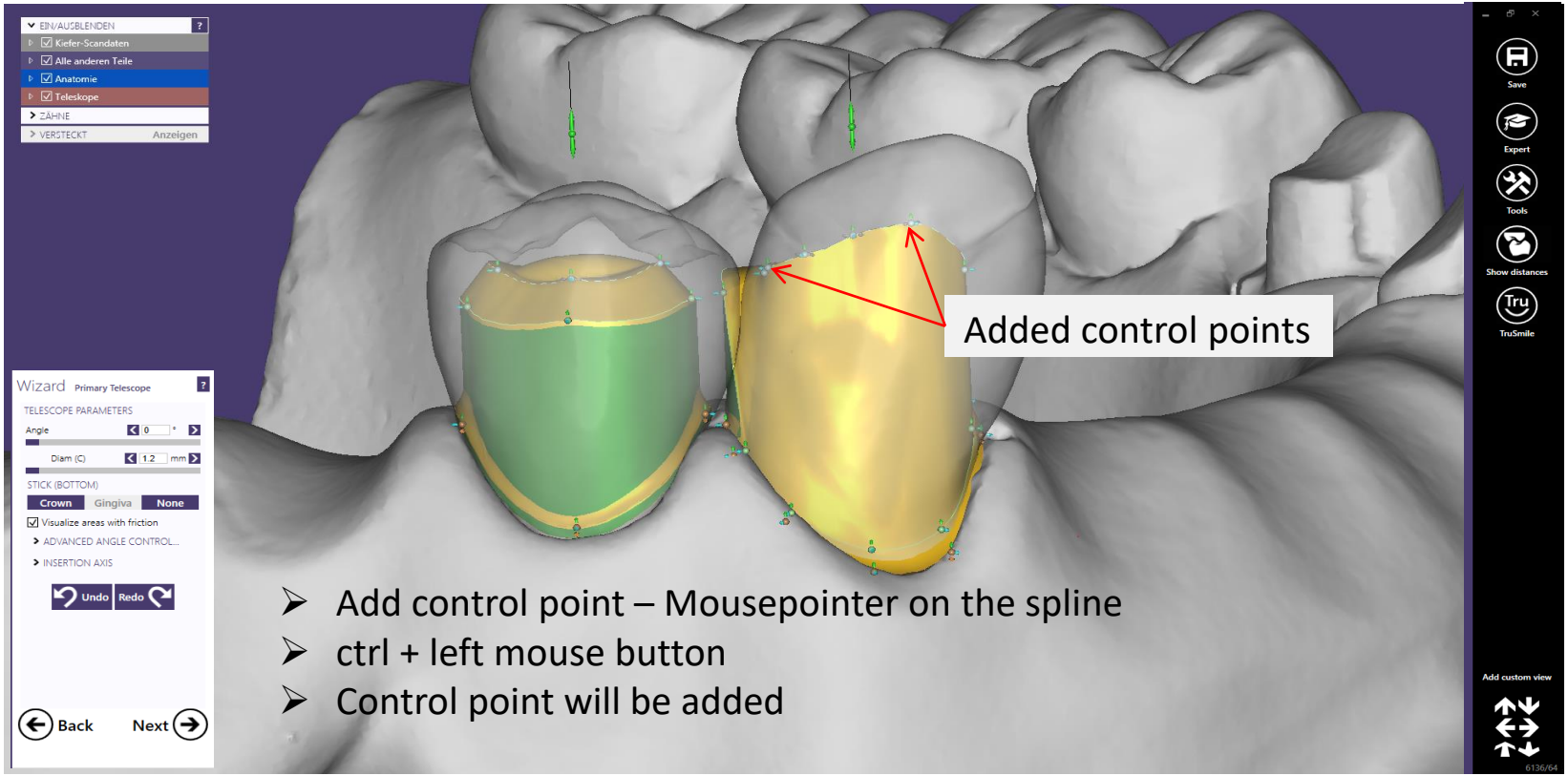
Full anatomy design 43 + 44 will be reduced to primary crowns: further “Telescope” design

→ press “Next”



Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: edit parallel surfaces – modification as coping. Add control point if needed.

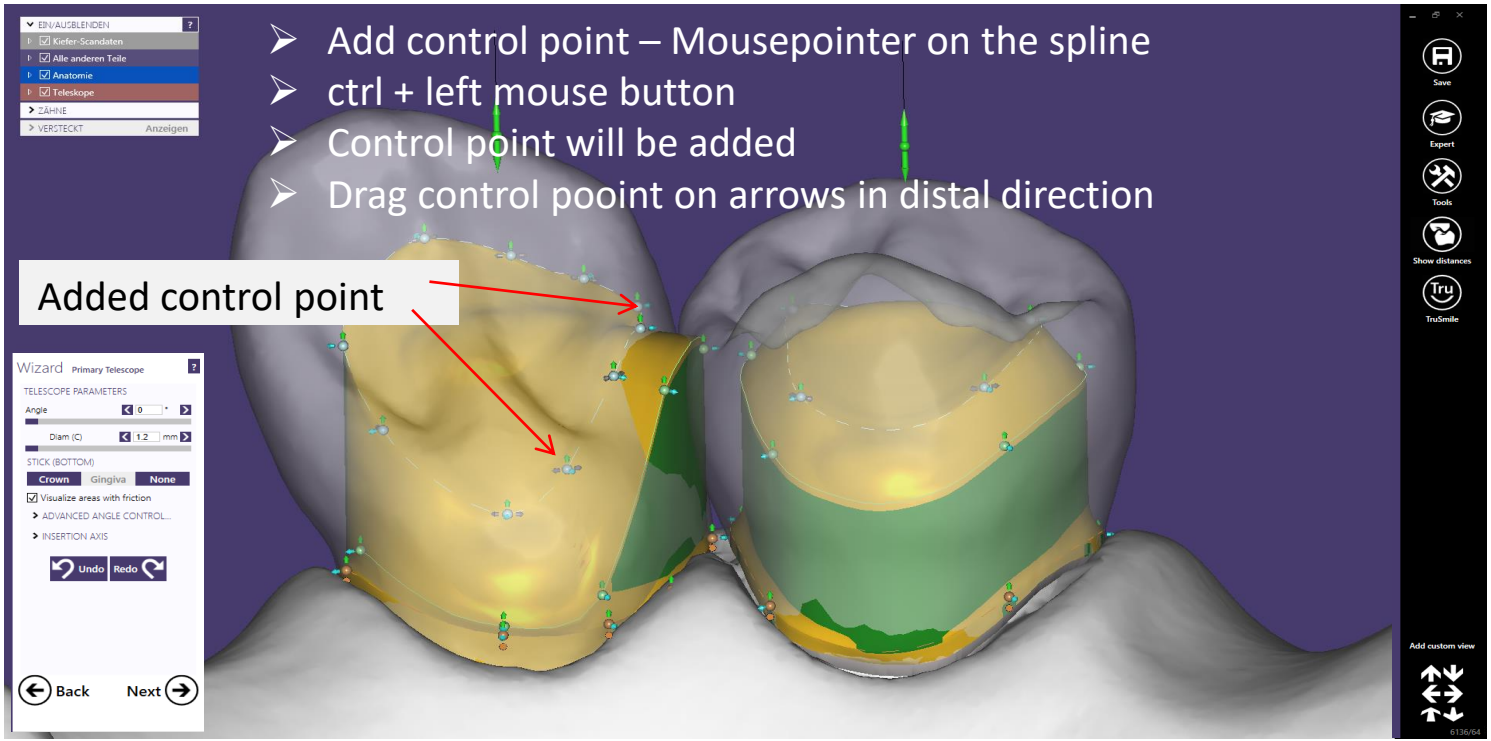


- Add control point – Mousepointer on the spline
- ctrl + left mouse button
- Control point will be added

Attaching a Preci-Vertix® with interlock and circumference

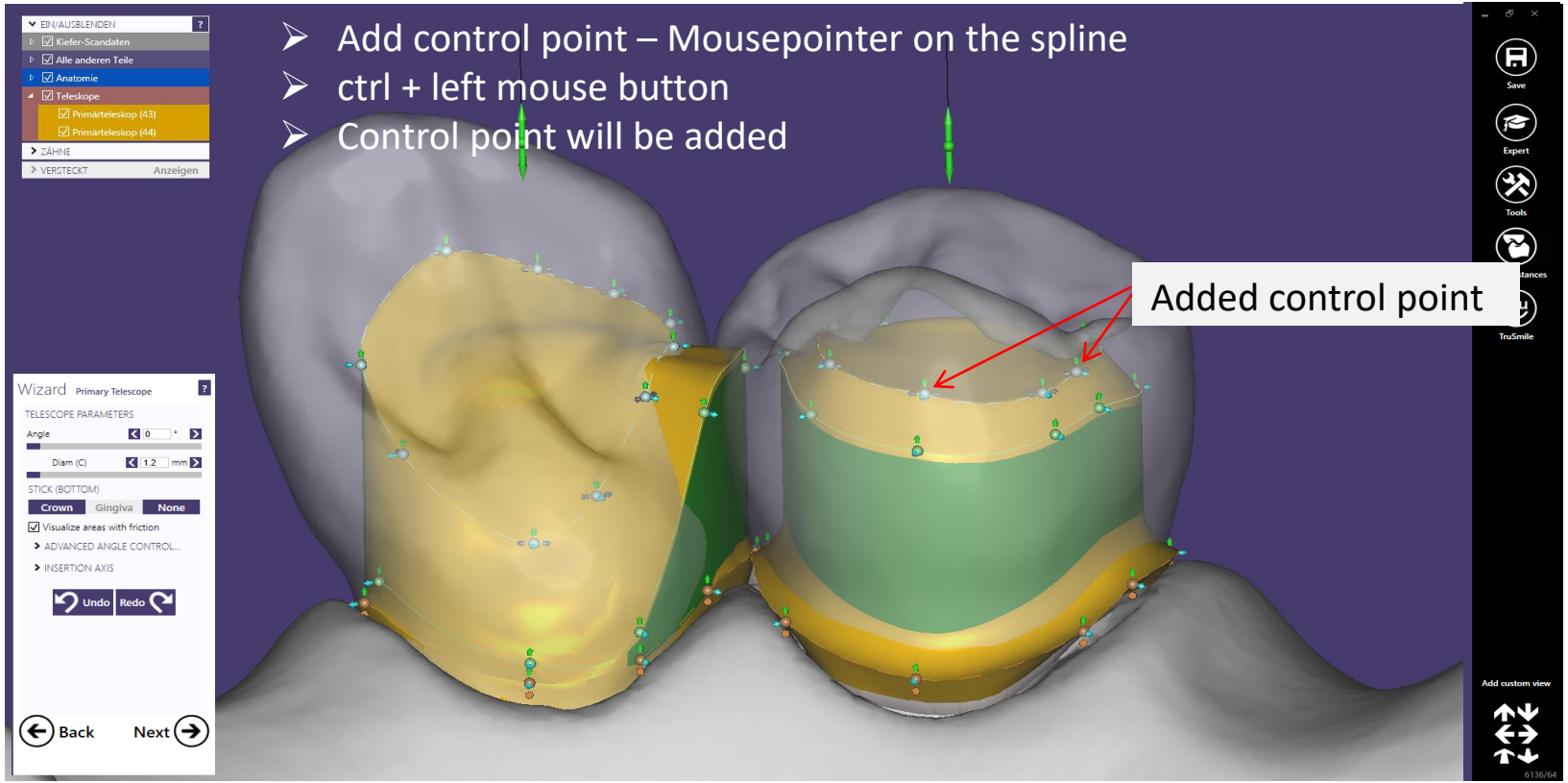
Primary telescope: edit parallel surfaces – modification as coping. Add ”Gripper” if needed.

– Narrow interdental space between 43 and 44



Attaching a Preci-Vertix® with interlock and circumference

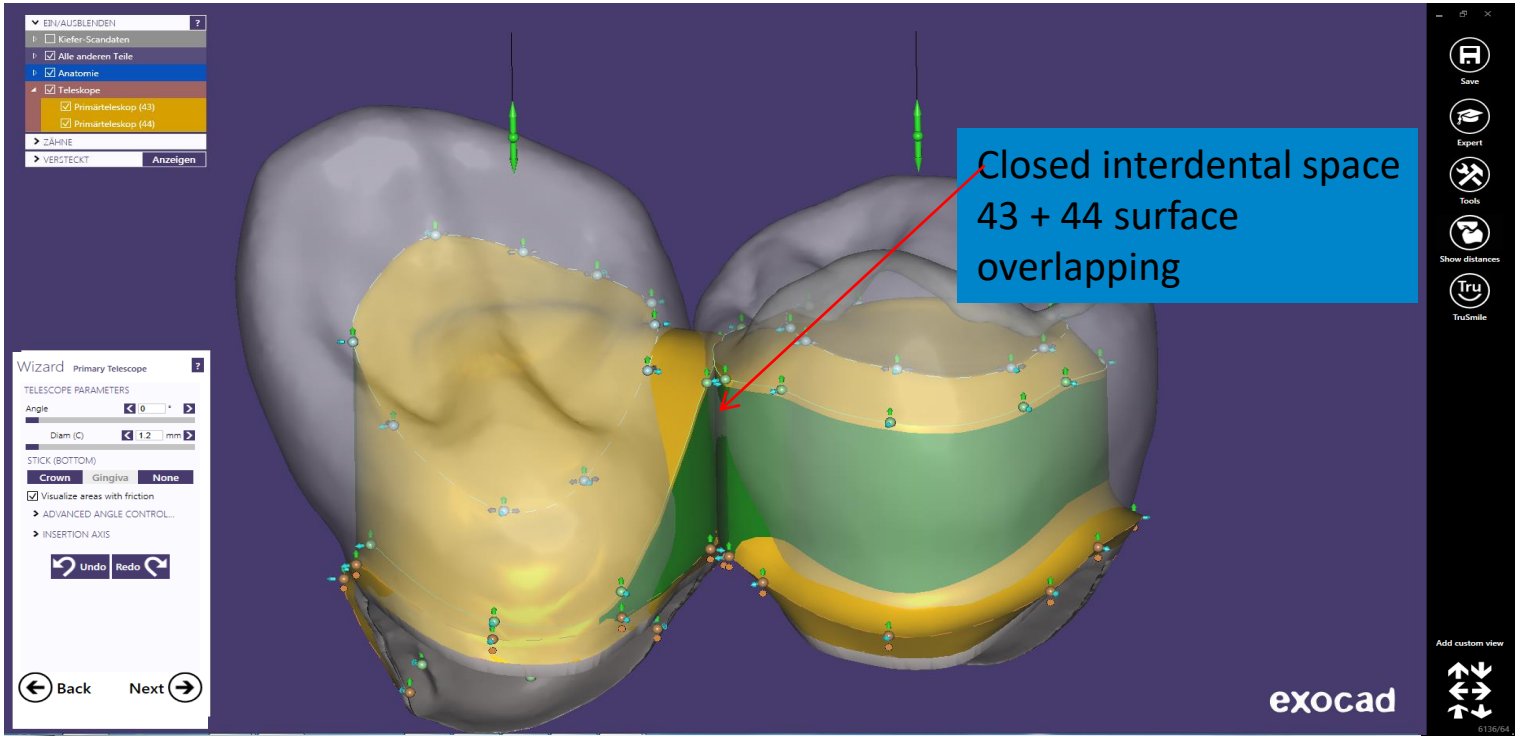
Primary telescope: palatinal surface preparation for shoulder



Attaching a Preci-Vertix® with interlock and circumference

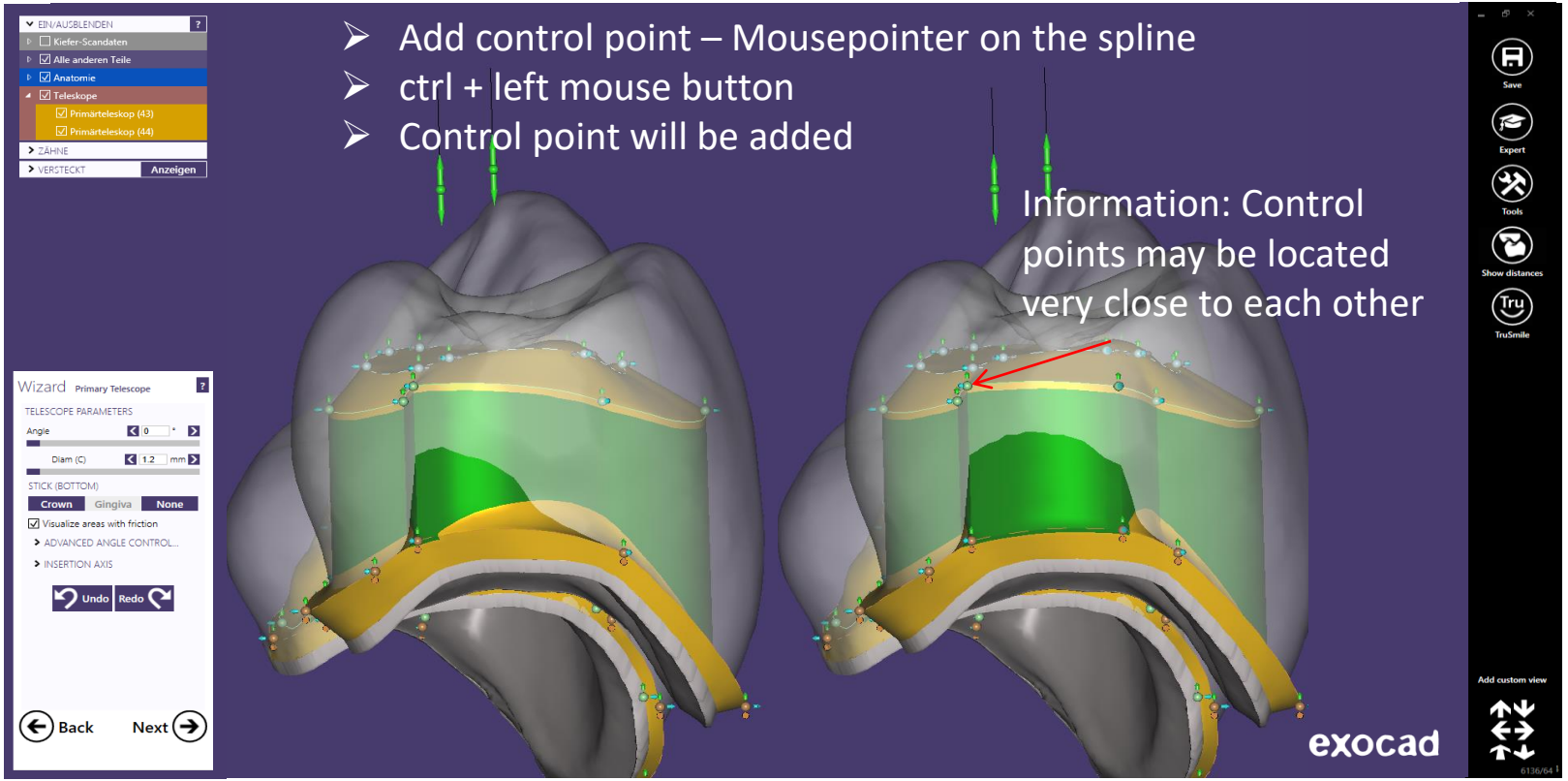
Primary telescope: Shoulder adapted – closed interdental space between 43 and 44

Hint: visualize full anatomy for perfect editing



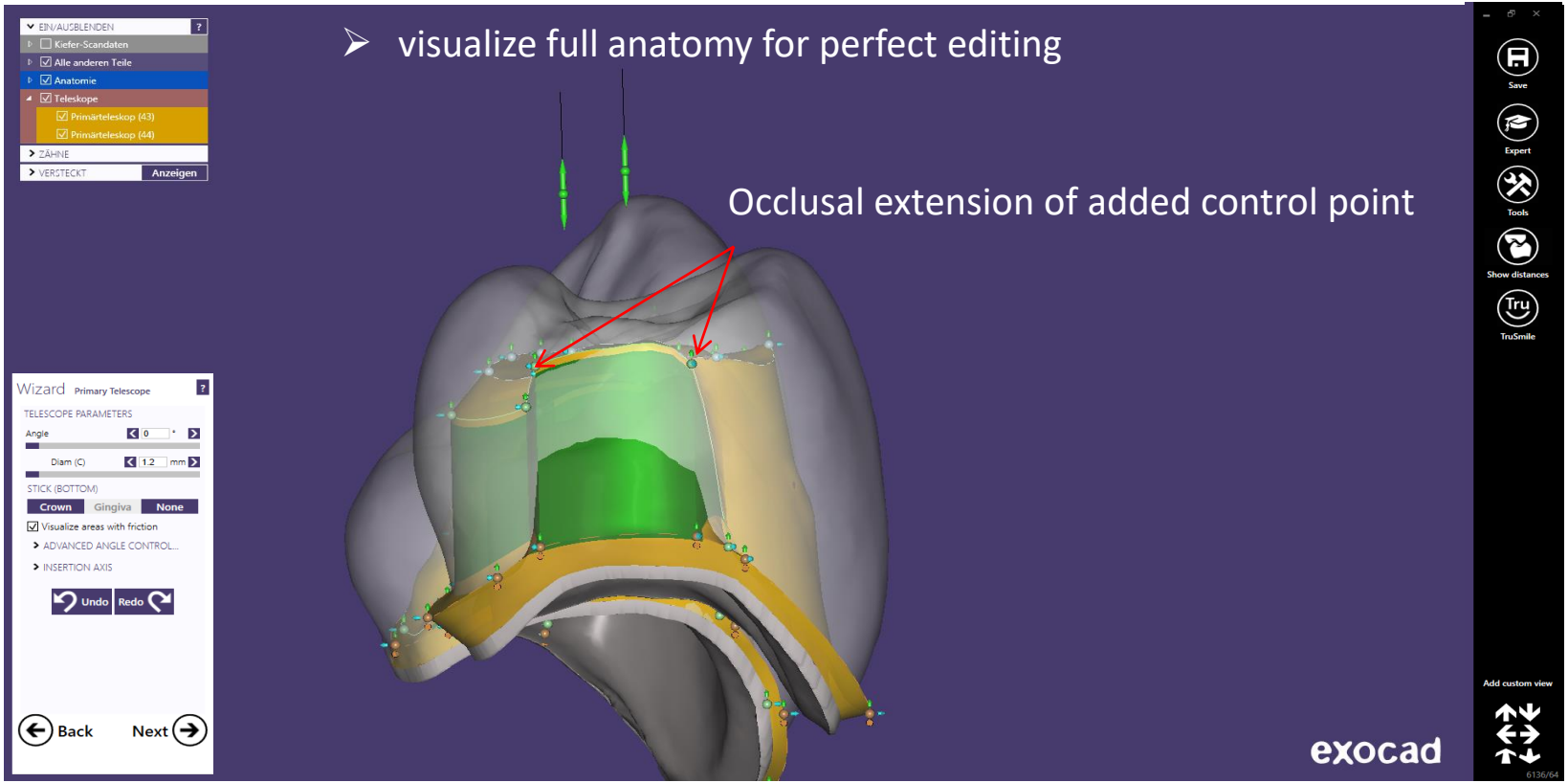
Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: Add Gripper for editing distal surface of the Preci-Vertix attachment



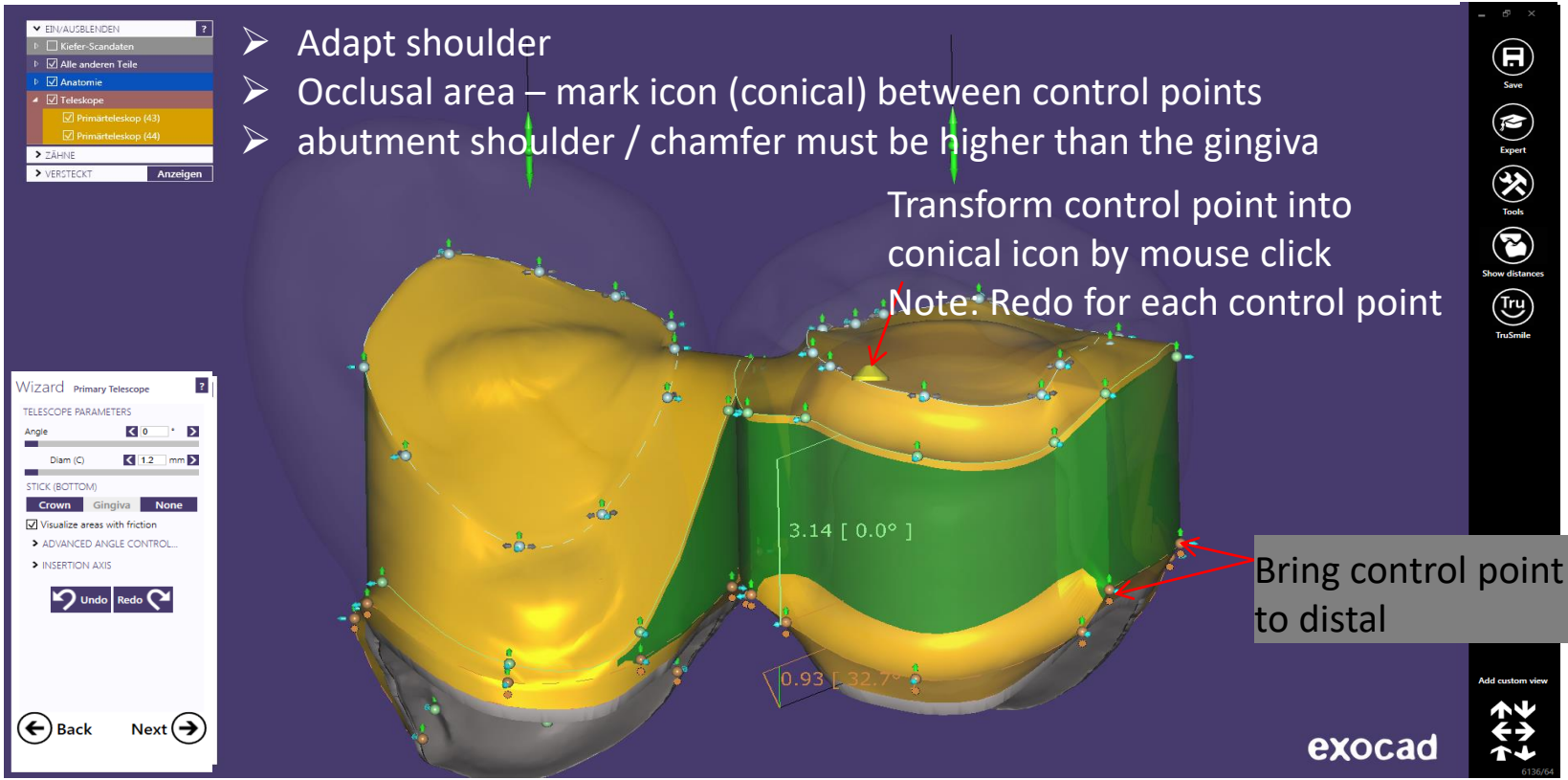
Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: Add Gripper for editing distal surface of the Preci-Vertix attachment



Attaching a Preci-Vertix® with interlock and circumference

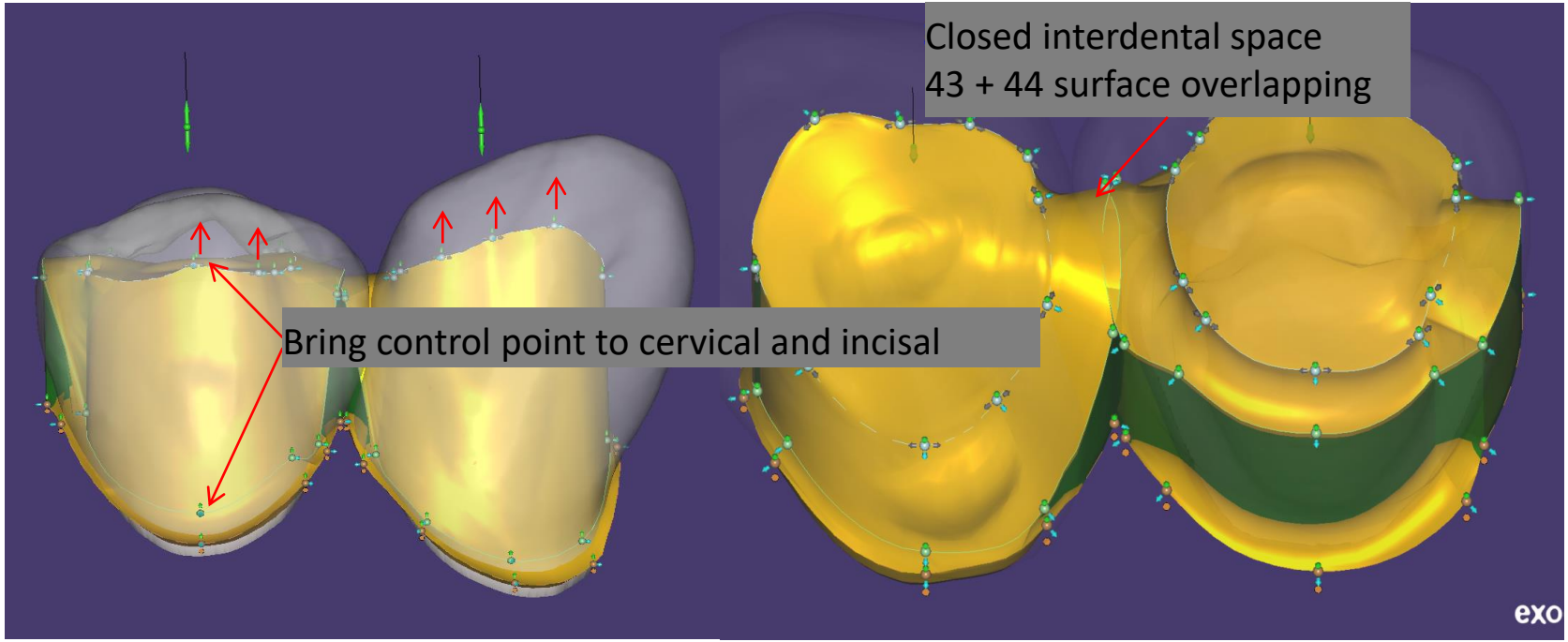
Primary telescope: Add Gripper for editing distal surface of the Preci-Vertix attachment and shoulder



Attaching a Preci-Vertix® with interlock and circumference

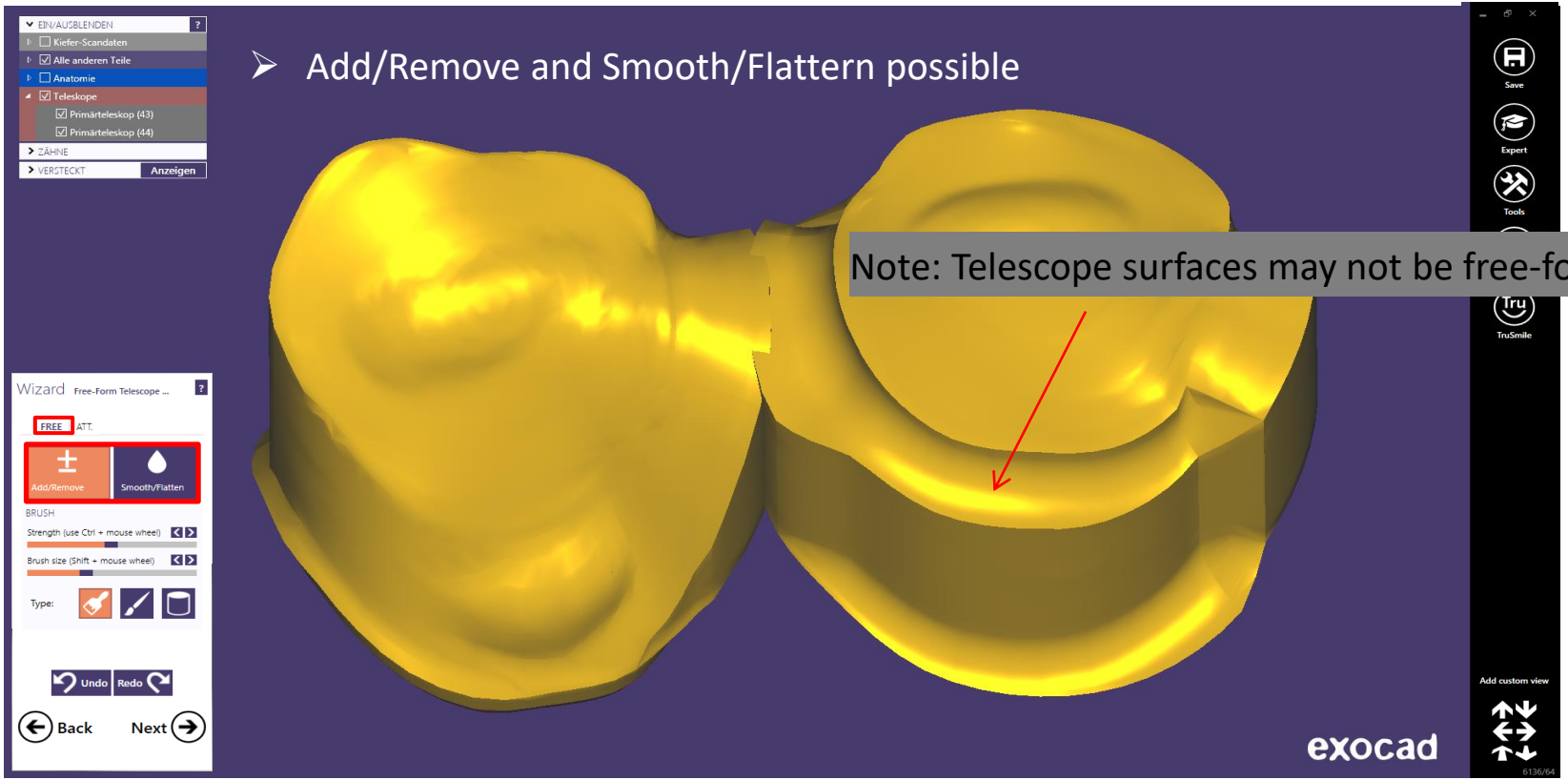
Primary telescope: Edit vestibular. distal surface and shoulder → press “next”

- Edit vestibular surface – bring control point to cervical
- Adapt incisal edge on full anatomy



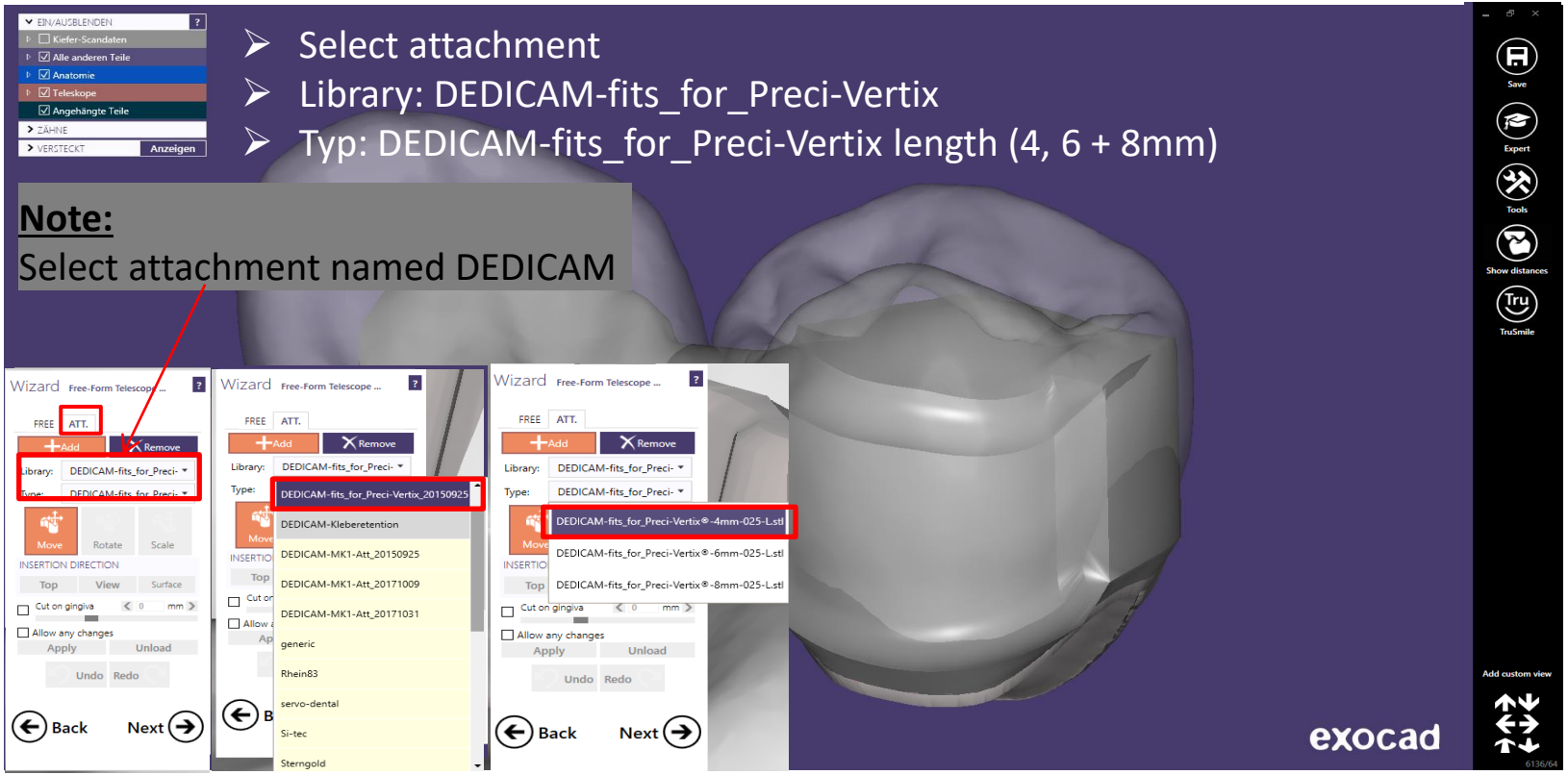
Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: Free-Form Telescope



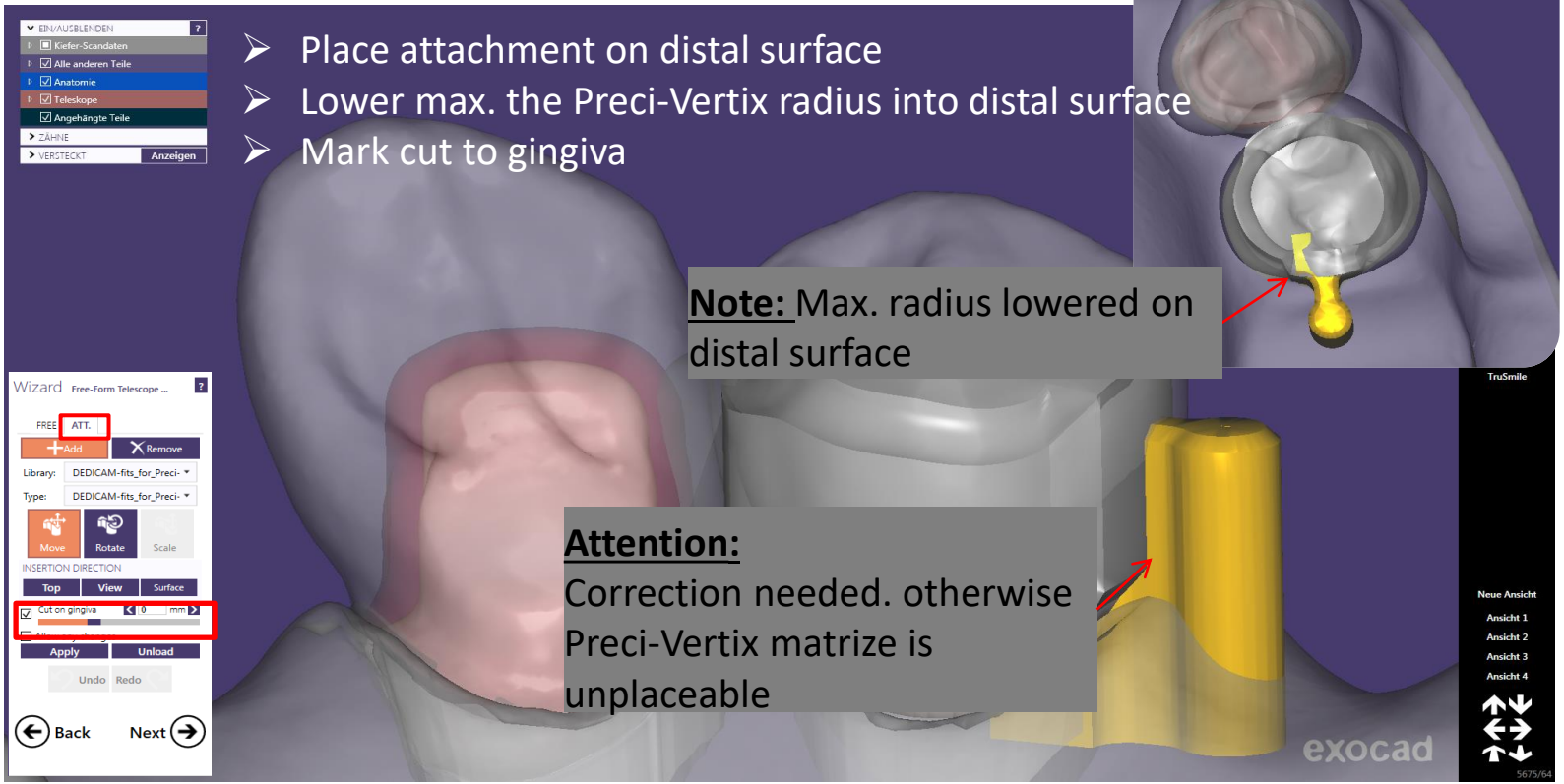
Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: Add attachment



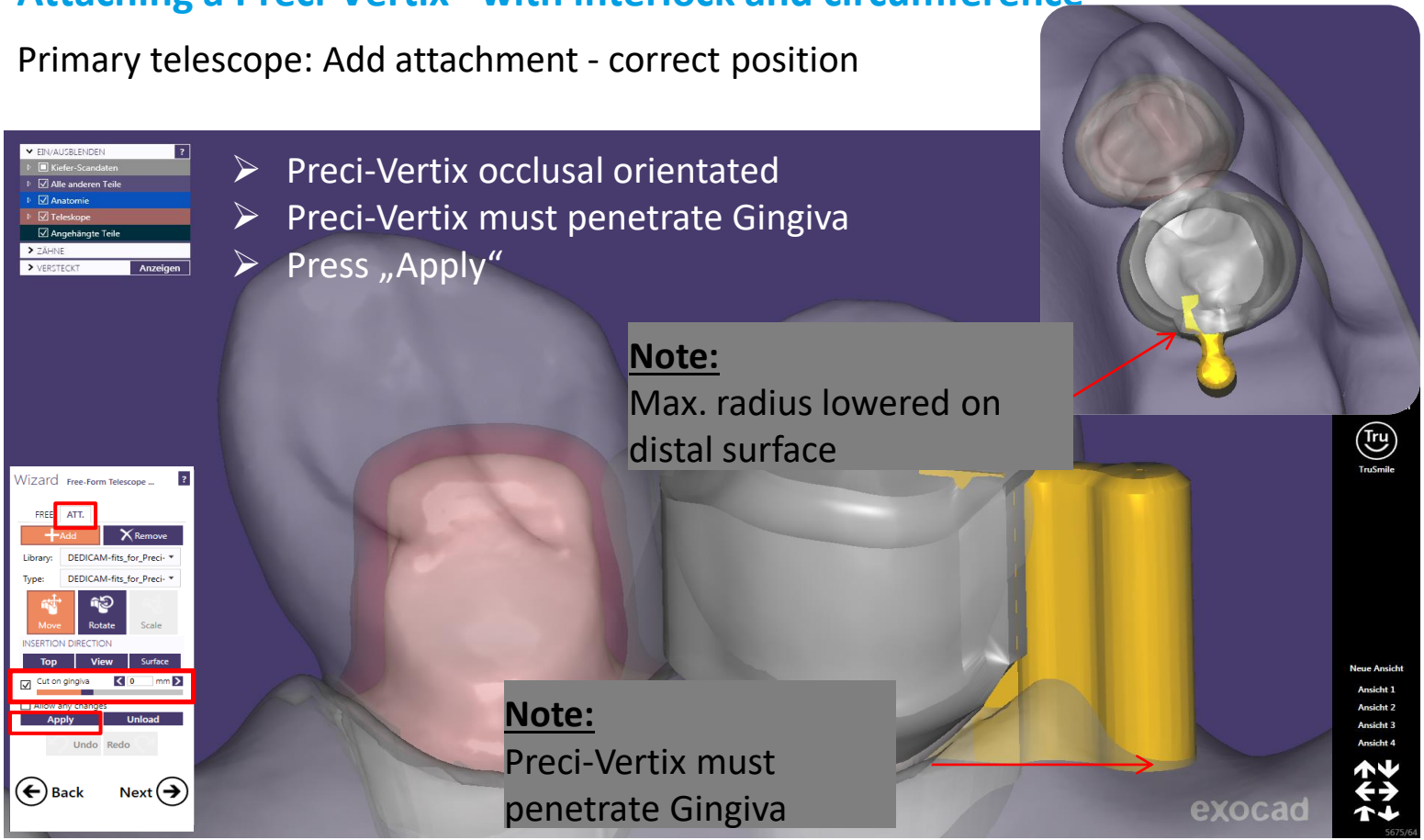
Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: Add attachment



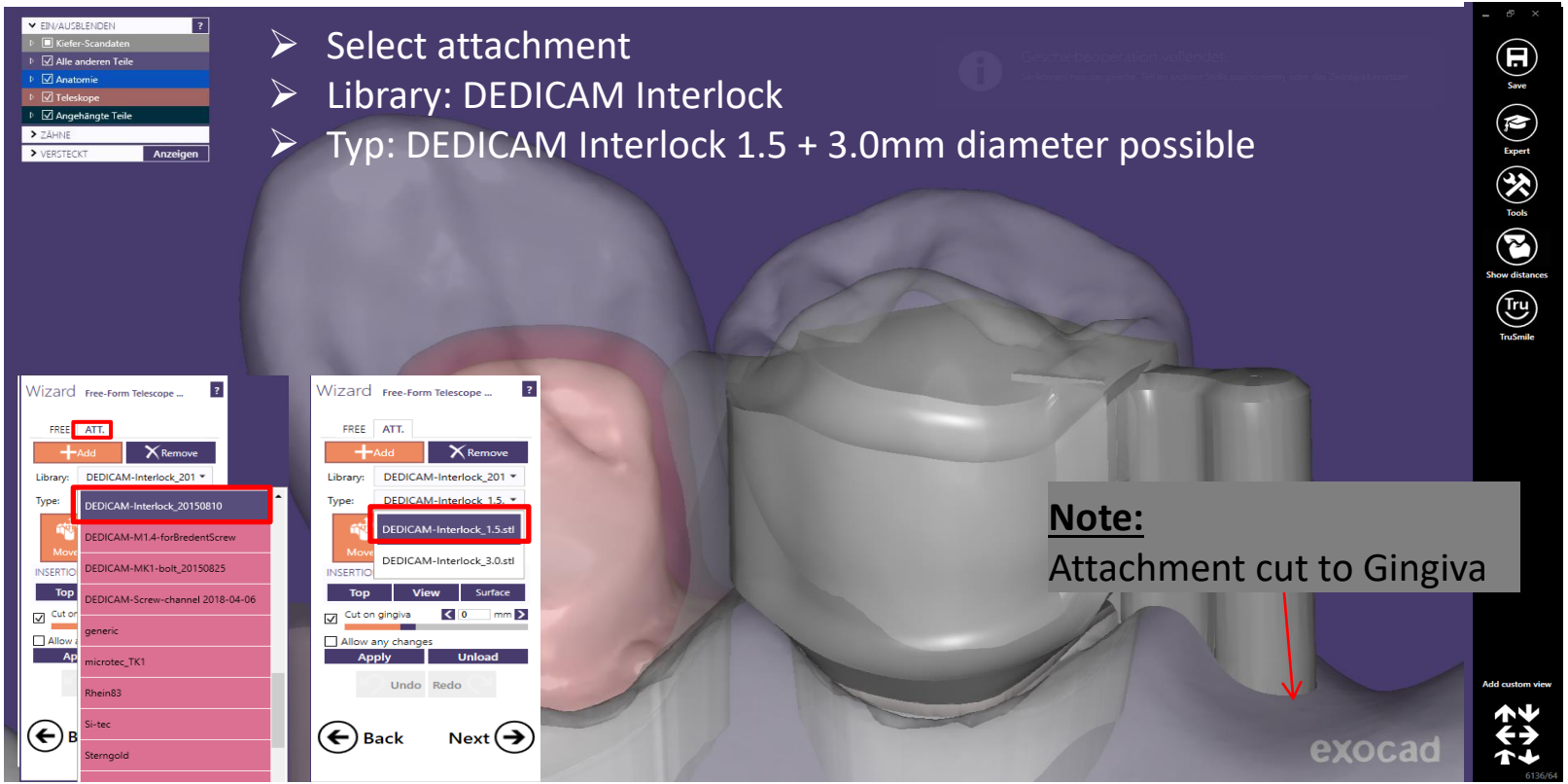
Attaching a Preci-Vertix® with interlock and circumference

Primary telescope: Add attachment - correct position



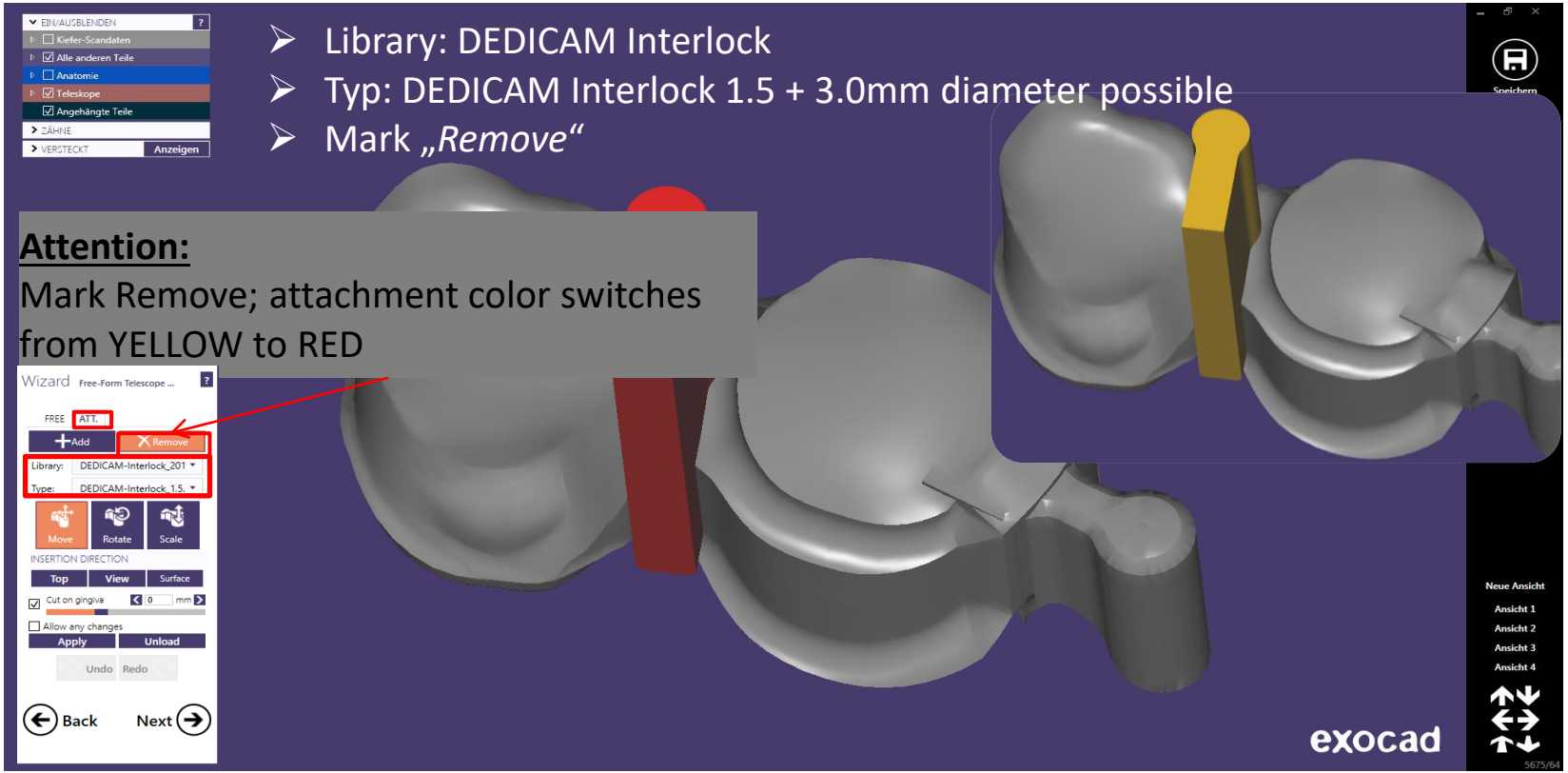
Attaching a Preci-Vertix® with interlock and circumference

Select interlock according approximal space



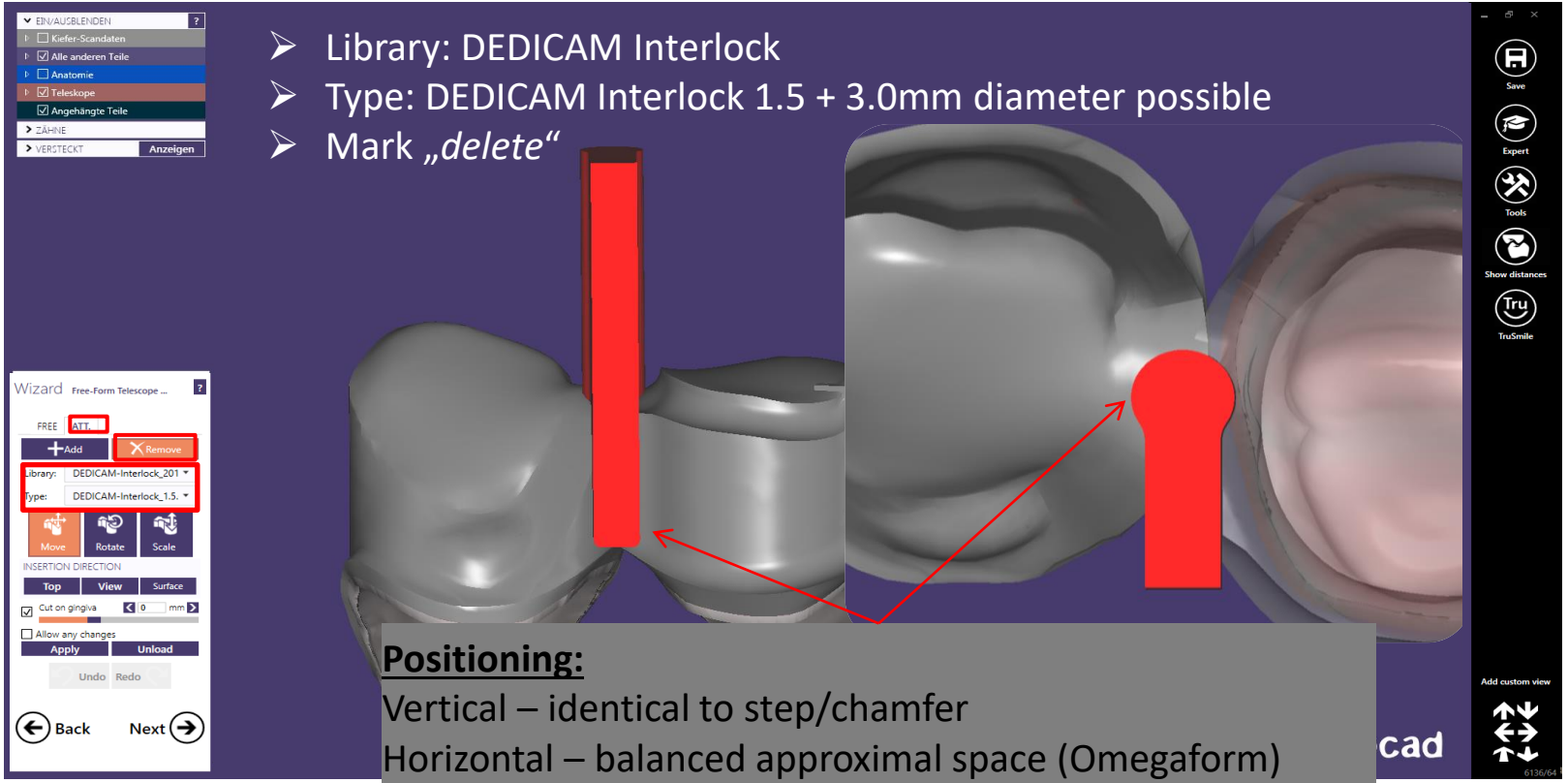
Attaching a Preci-Vertix® with interlock and circumference

Select interlock according approximal space



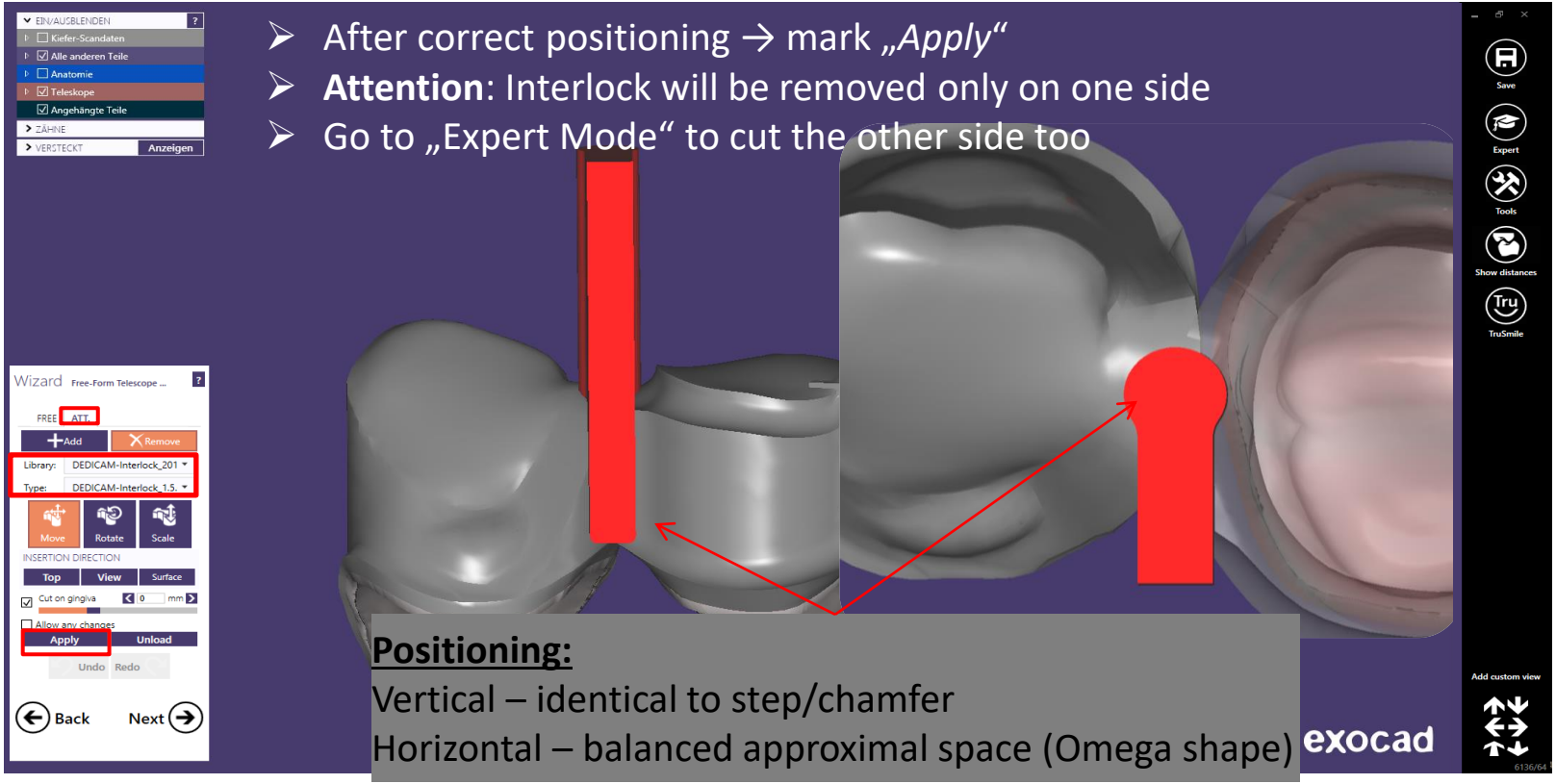
Attaching a Preci-Vertix® with interlock and circumference

Vertical and horizontal interlock position



Attaching a Preci-Vertix® with interlock and circumference

Vertical and horizontal interlock position



- After correct positioning → mark „*Apply*“
- **Attention**: Interlock will be removed only on one side
- Go to „Expert Mode“ to cut the other side too

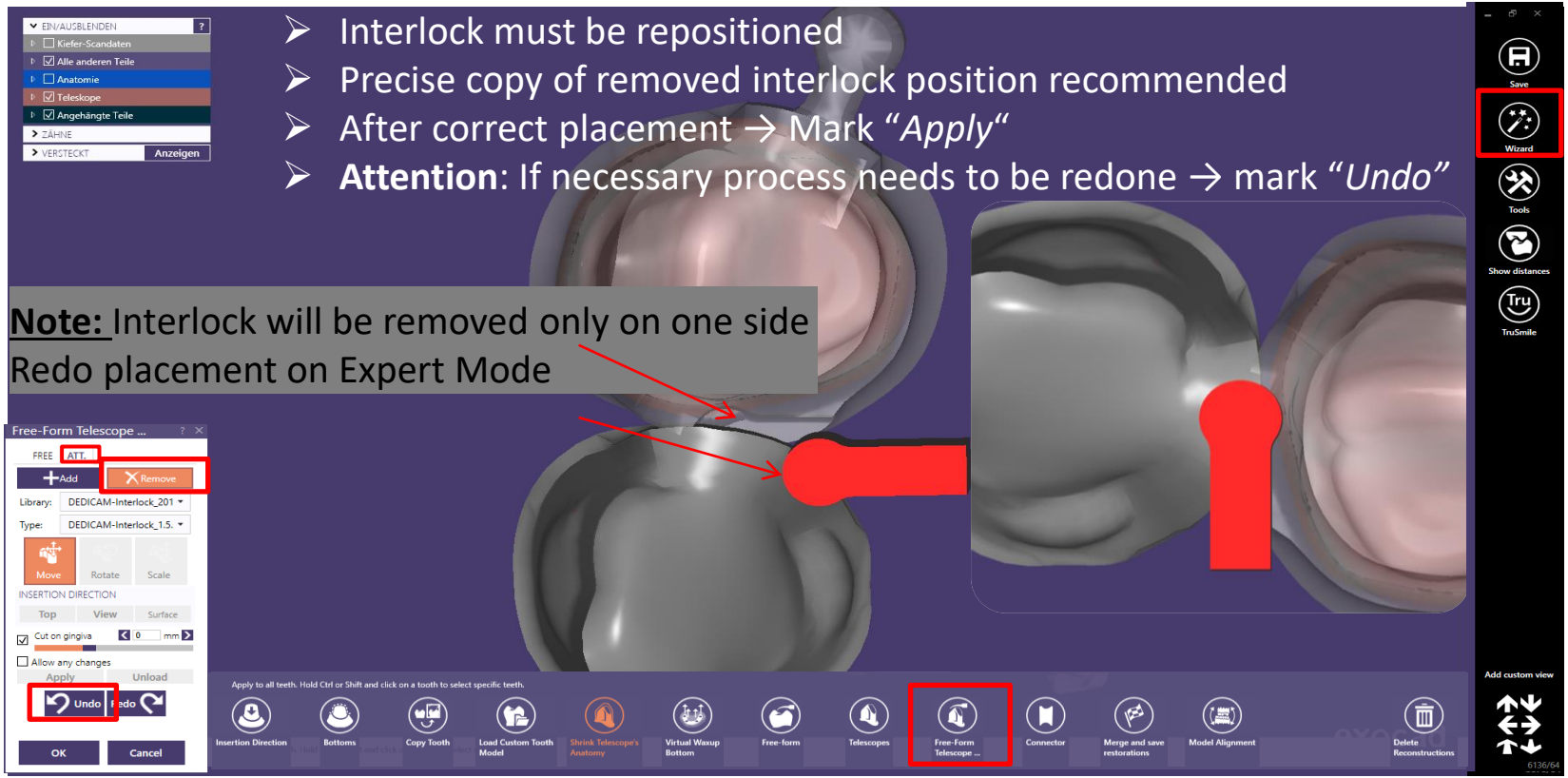
Positioning:

Vertical – identical to step/chamfer

Horizontal – balanced approximal space (Omega shape)

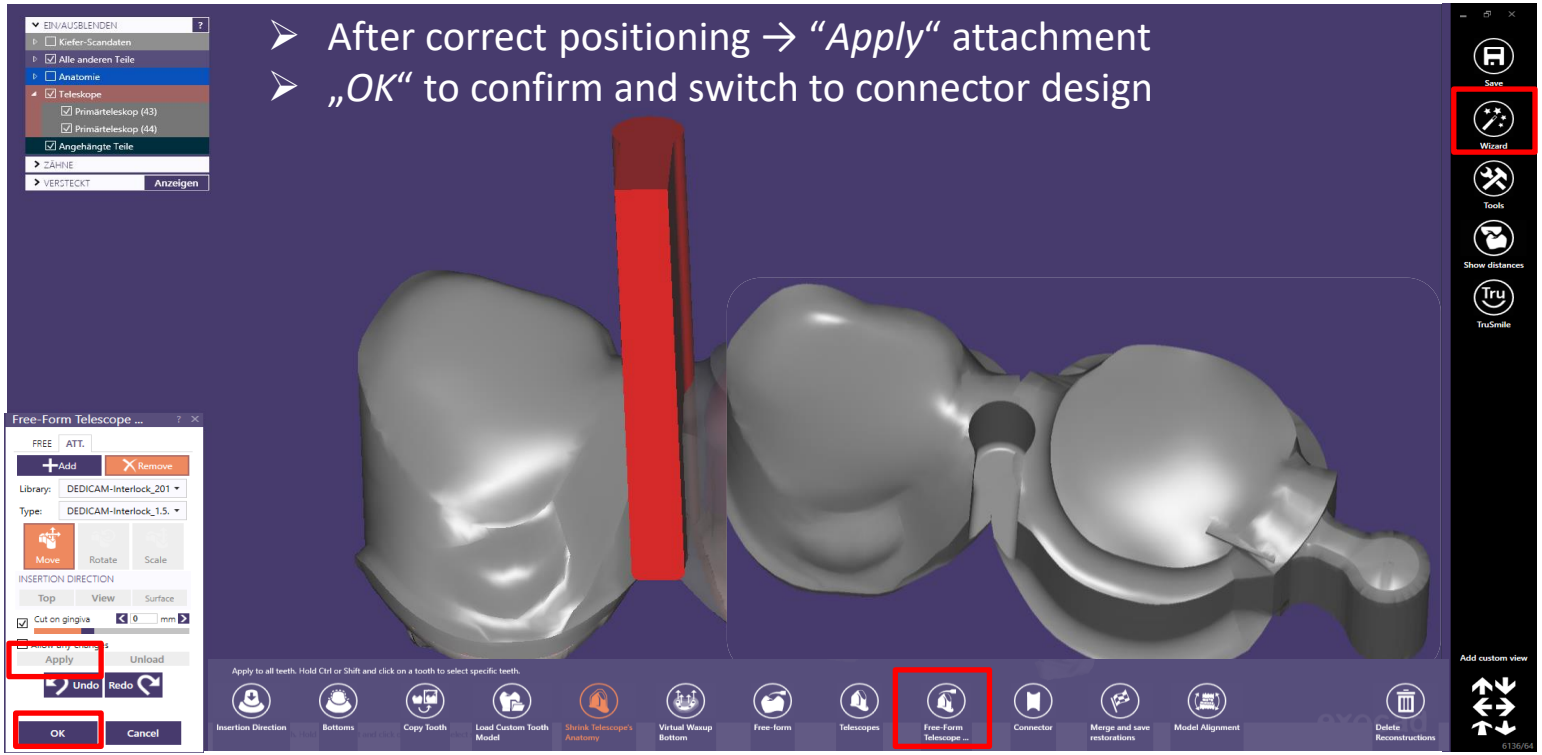
Attaching a Preci-Vertix® with interlock and circumference

Vertical and horizontal interlock position after one side cut → go to Expert Mode



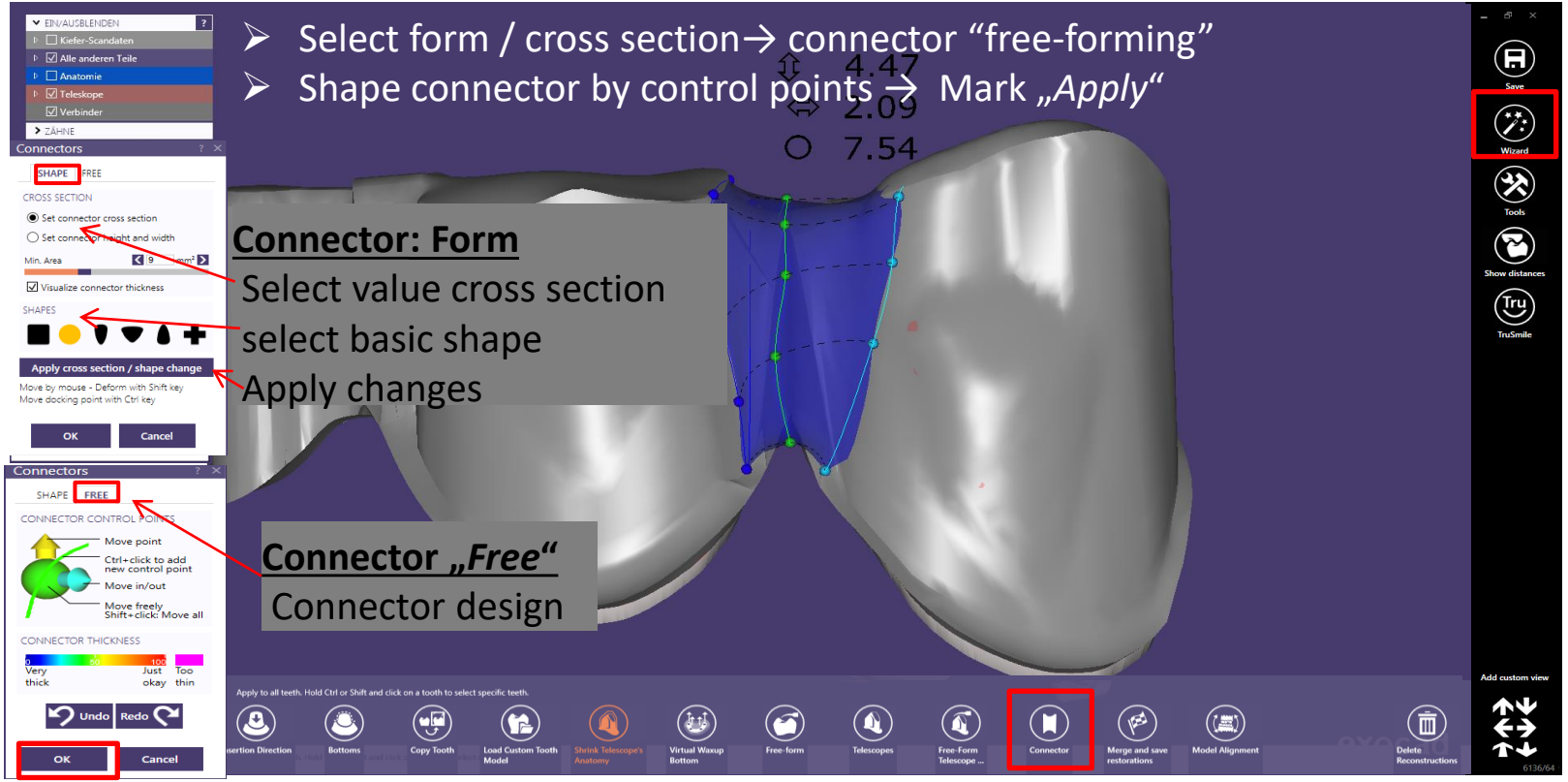
Attaching a Preci-Vertix® with interlock and circumference

Vertical and horizontal interlock position after cutting (omega shape) on Expert Mode. Now continue with connector.



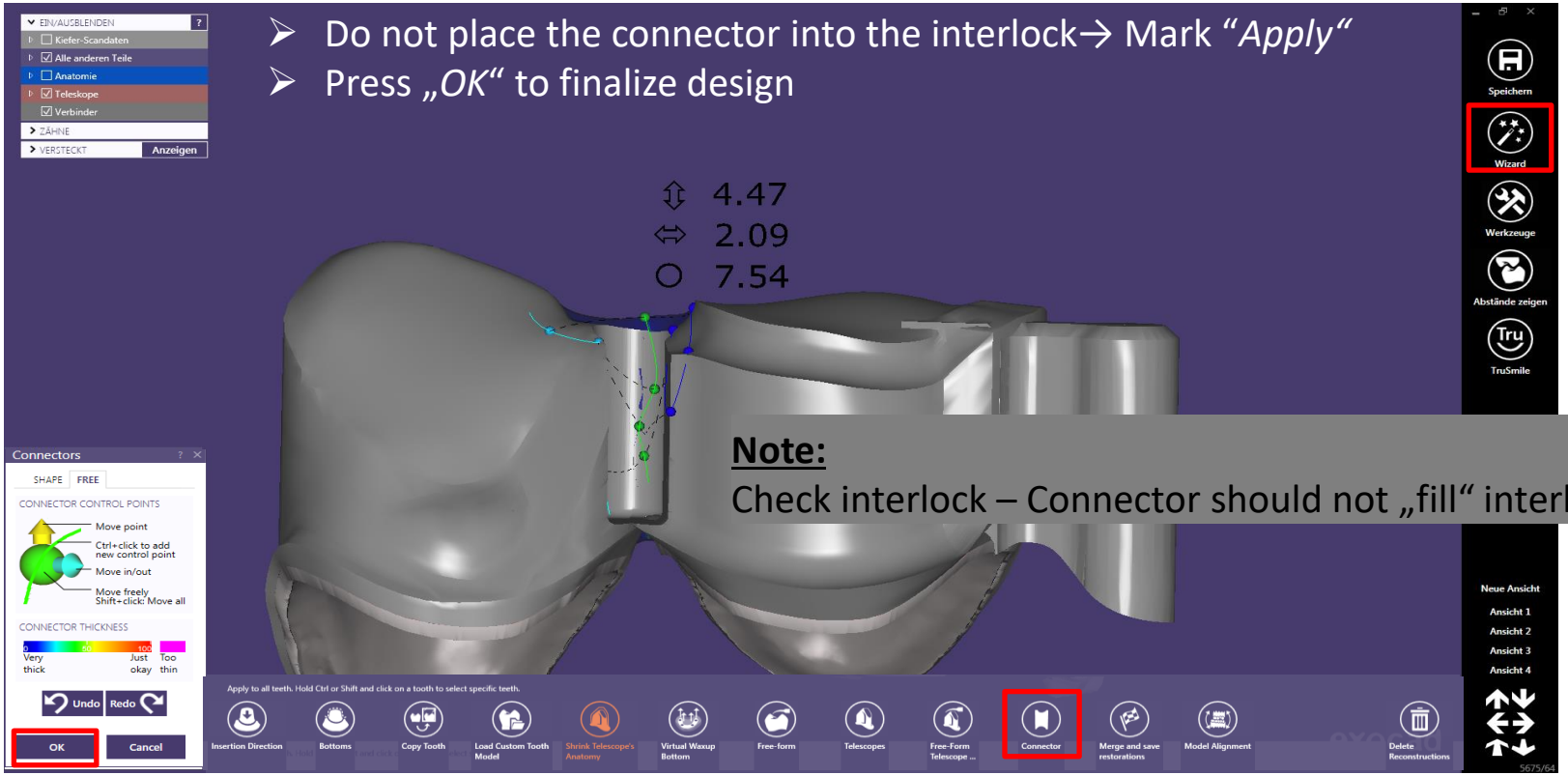
Attaching a Preci-Vertix® with interlock and circumference

Connector design → Interlock must stay untouched→ otherwise redesign is required



Attaching a Preci-Vertix® with interlock and circumference

Connector design → Interlock must stay untouched→ otherwise redesign is required



Attaching a Preci-Vertix® with interlock and circumference

Connector design → Interlock must stay untouched→ otherwise redesign is required

Design of healing abutments

Design of healing abutments

General notes / prerequisites for custom healing abutments:
Custom healing abutments made of PEEK can be additionally ordered - without redesign - as individual impression posts for open or closed impression taking within the same order.

Availability (July 2022):

	CAMLOG®	CONELOG®	CERALOG®[1]	iSy® on Implant shoulder	BioHorizons® [2]	Further implant systems
Titanium healing abutments [1] ZrO_2 for CERALOG	✓	✓	✓	✓	✓	✓
PEEK healing abutments	✓	✓	✓	✓	✓	⊘
PEEK impression posts [2] BioHorizons: For open tray technique only	✓	✓	✓	✓	✓	⊘

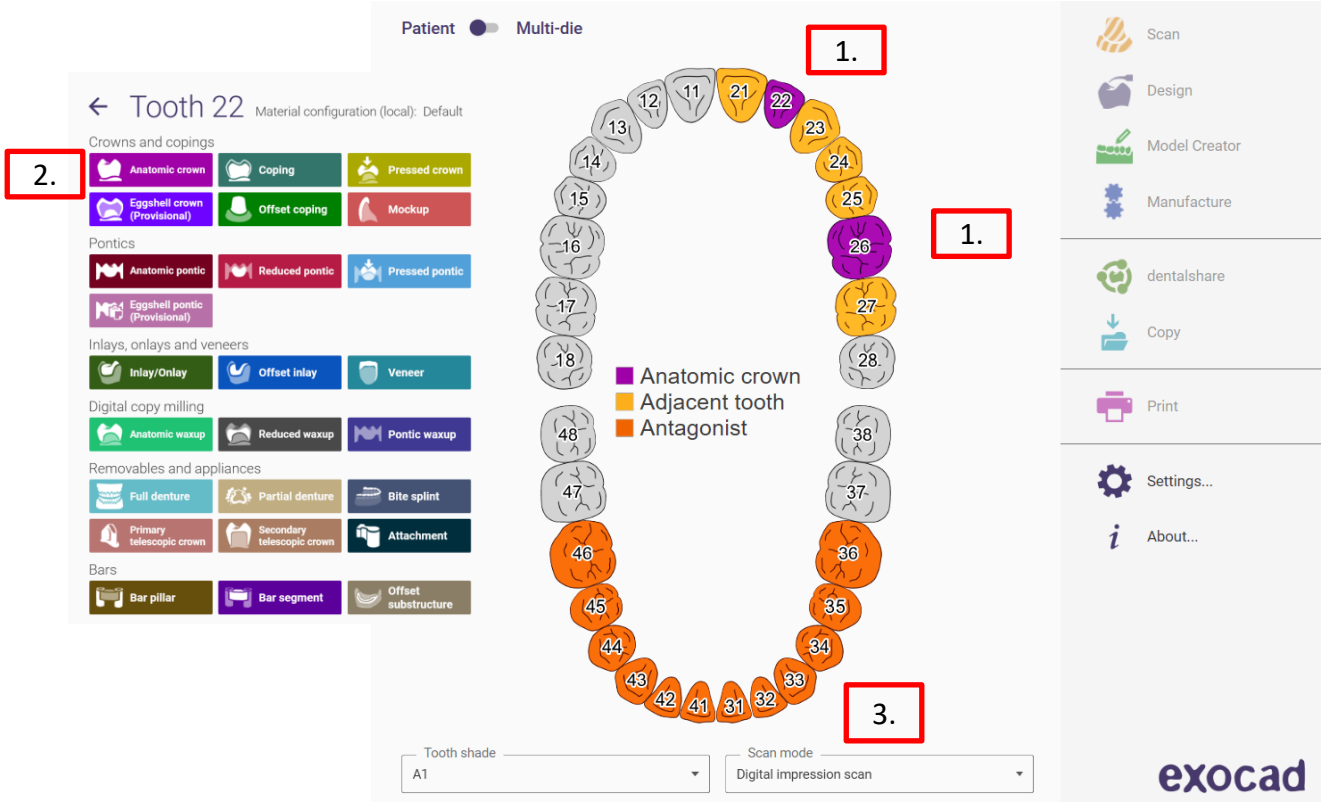
Design of healing abutments

Order form:

1. Define tooth position

2. Select prosthetics «Anatomic crown»

3. Scan mode: e.g. Digital impression scan

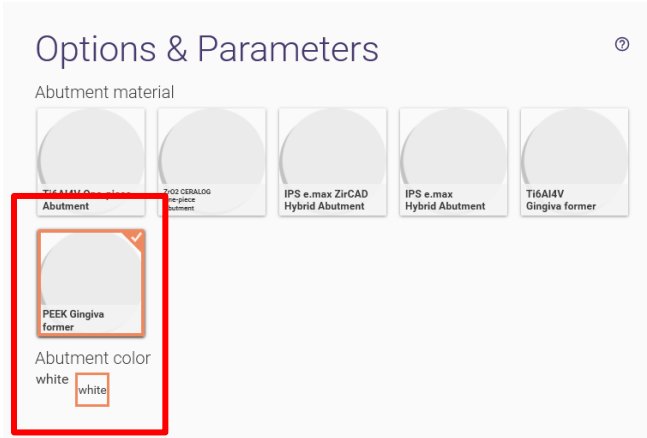


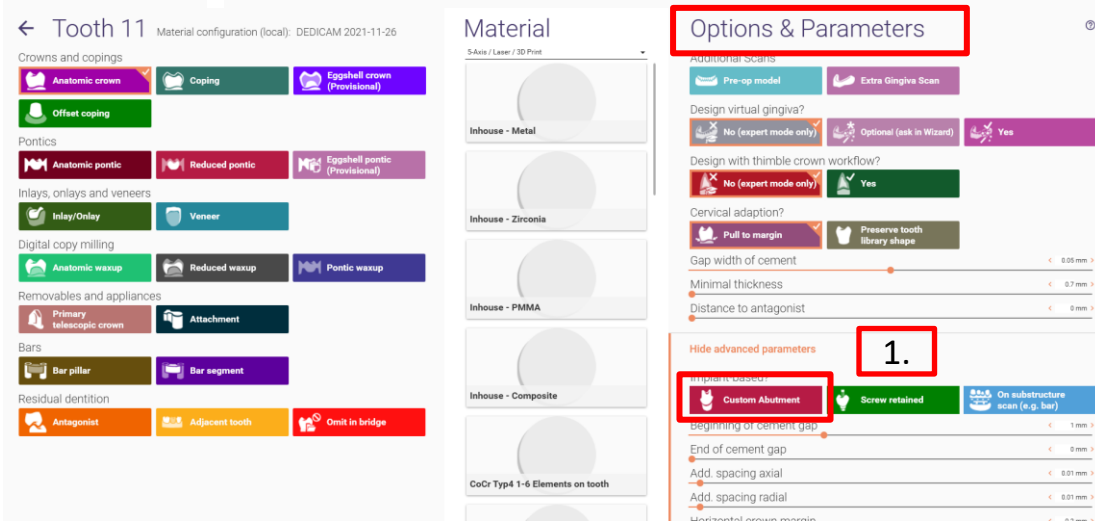
Design of healing abutments

Order form:

1. Select «Custom Abutment» from «Options and Parameters»

2. Select «PEEK Gingiva former» from Abutment material; Color «white»

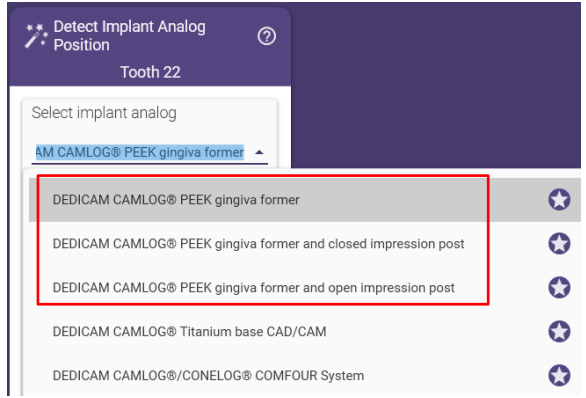


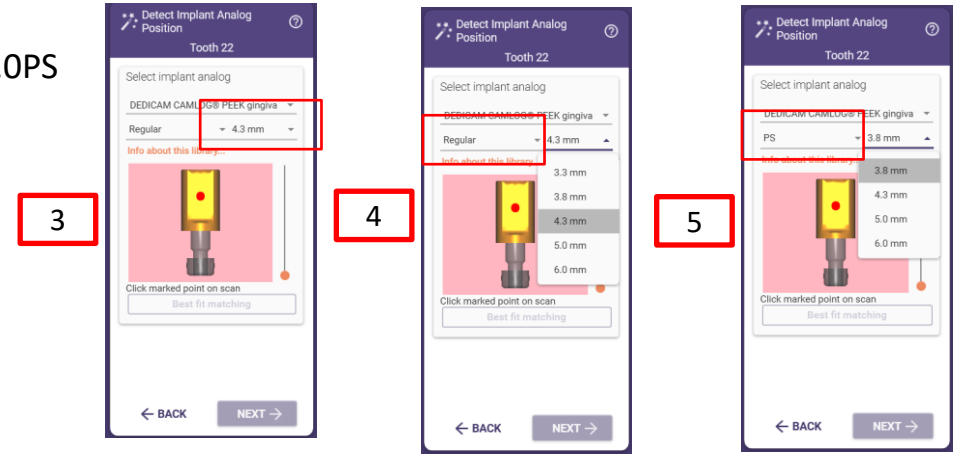


Design of healing abutments

CAD library selection for CAMLOG, CONELOG, CERALOG, iSy and BioHorizons:

1. Example: DEDICAM CAMLOG library
2. Select your desired set of healing abutment / impression post
3. Implant diameter
4. Regular for CAMLOG: Ø 3.3 – 6.0
5. Platformswitched for CAMLOG: Ø3.8PS – 6.0PS





Design of healing abutments

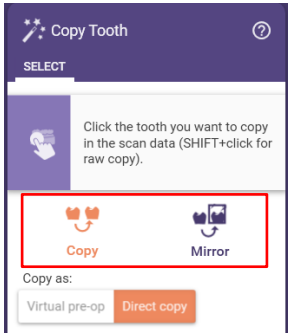
After import, alignment, cropping and data matching of the scan data, the healing abutment design starts.

1 Due to the selection of the anatomy (crown, bridge) a draft of the basic restoration shape is defined on the scan.

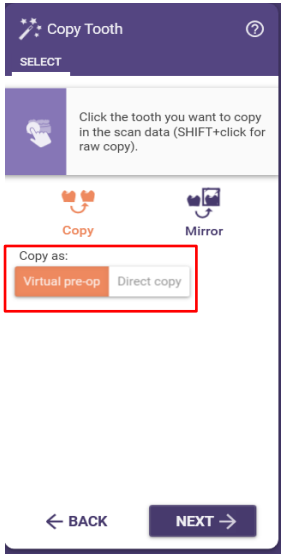
2 Options are „Copy“ or „Mirror“ of the corresponding tooth

3 as „Virtual pre-op“ or „Direct copy“

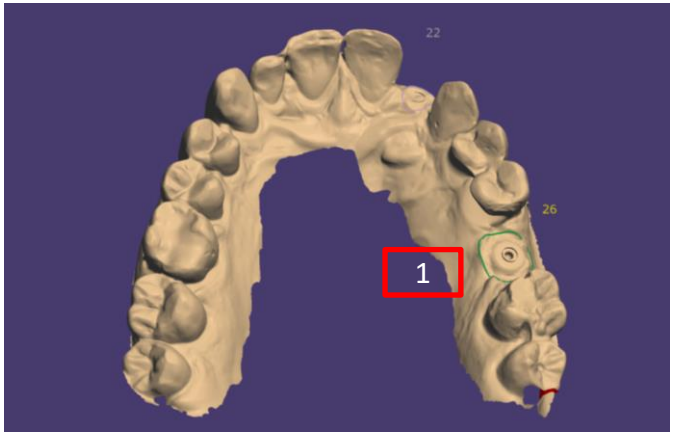
4 Tooth placement tools for positioning and scaling



2



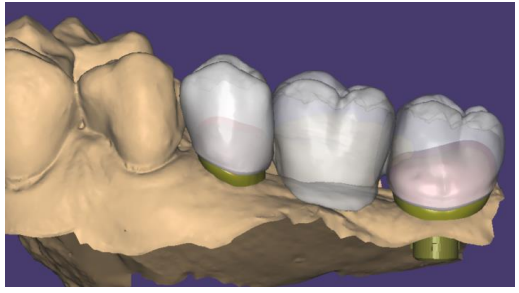
3

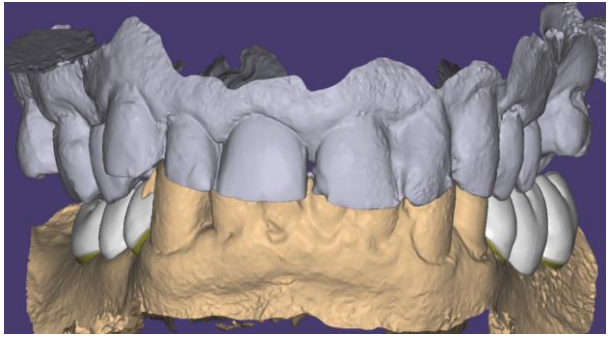


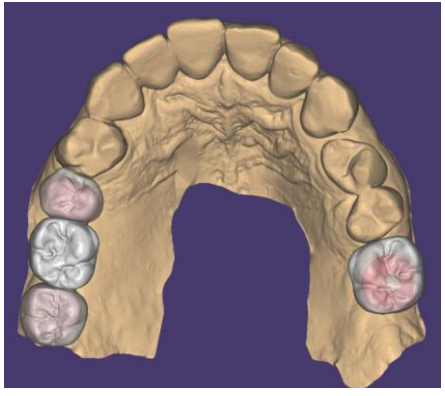
Design of healing abutments

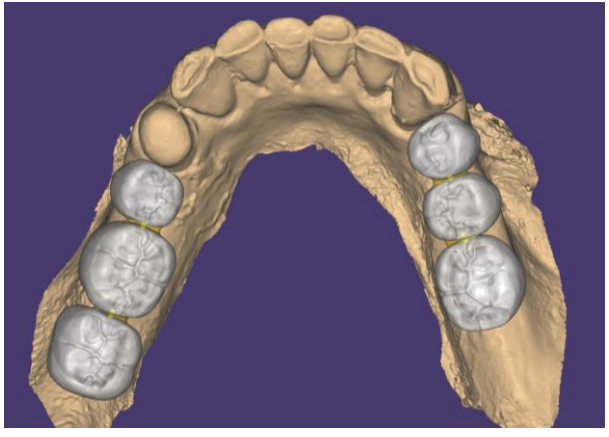
The additional anatomy (crown, bridge) supports the design of the healing abutments. Healing abutments are the basis, the foundation, for the prosthetic restoration.

If implant positions serve for bridges **always** create a bridge „virtual Wax-up“









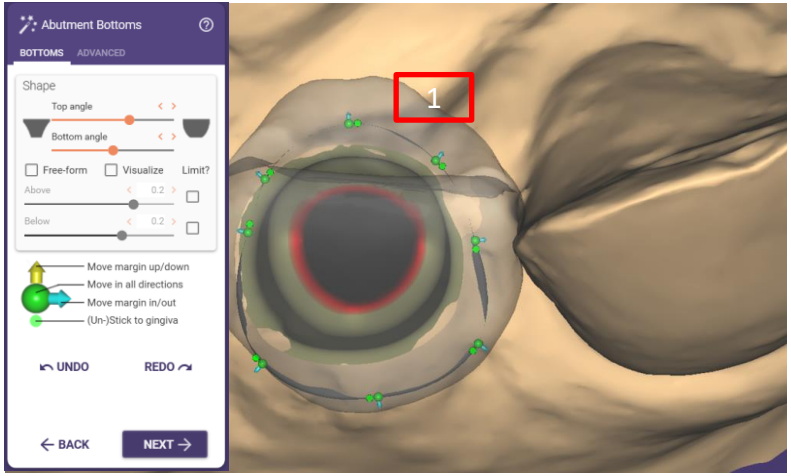
Design of healing abutments

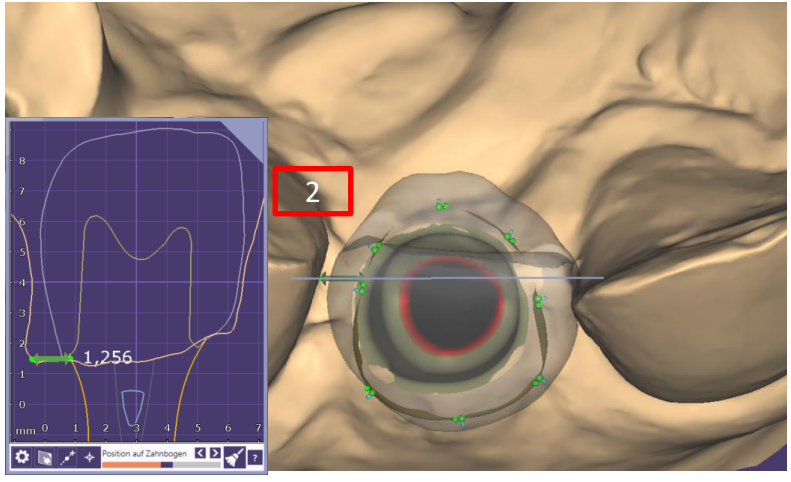
The anatomy supports the circular design of the healing abutments.
This is created comparable to the design of an abutment.

Note:

1 If needed add „Gripper“ to design an anatomical shape.
The "abutment shoulder" runs at the level of the gingiva.

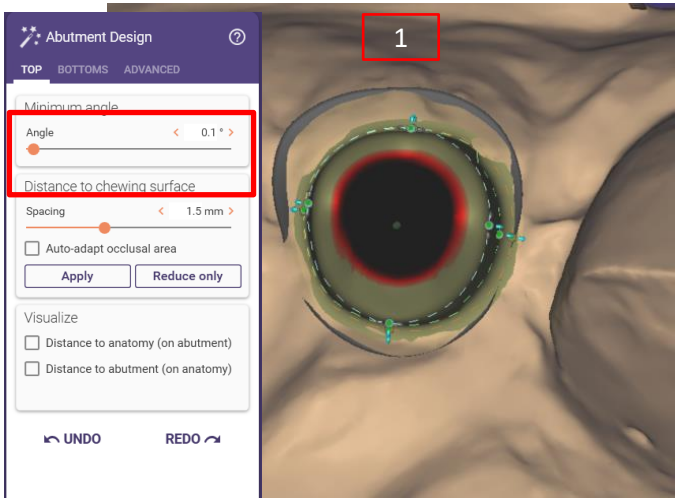
2 The distance between the healing abutments
and the neighboring tooth should be at least 1.0 - 1.5mm.

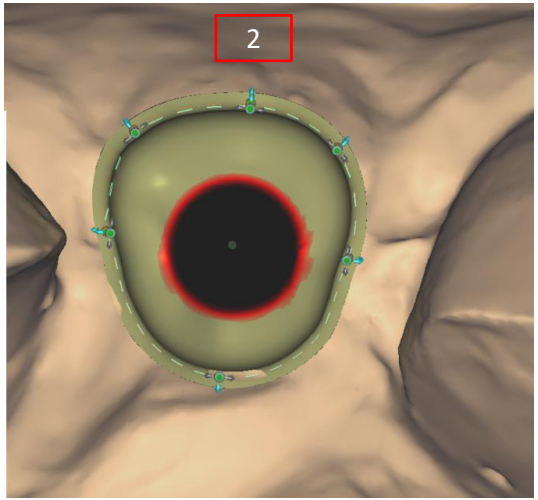


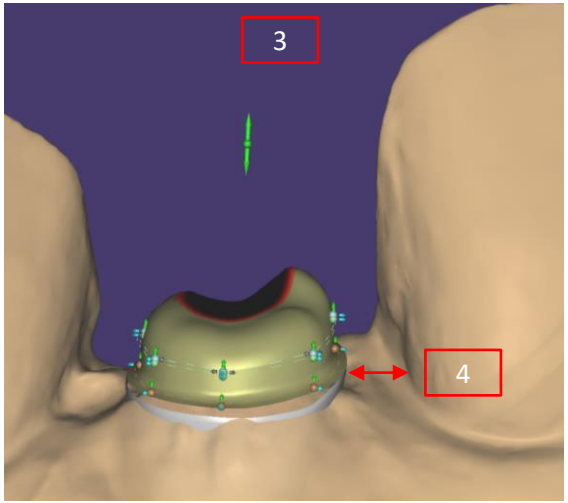


Design of healing abutments

1. After defining the outer contour and the subgingival design, the abutment shoulder is reduced to the value 0.1mm
2. Drag all „Gripper“ as far as possible to the abutment shoulder
3. Push the upper part of the gingiva former downwards with the green arrow
4. The distance between the healing abutment and the neighboring tooth should be at least 1.0 - 1.5mm







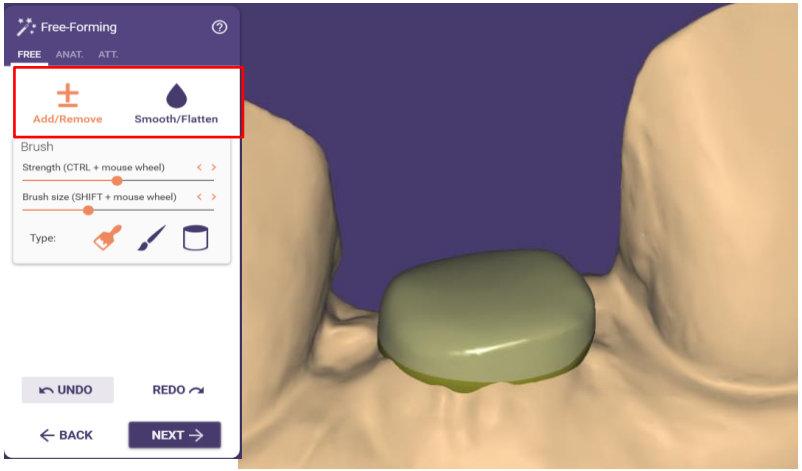
Design of healing abutments

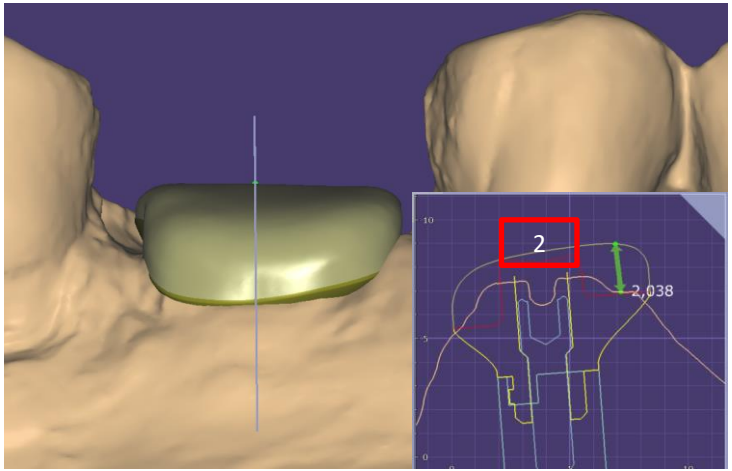
Rounding and reducing the height of the healing abutments.
The healing abutment should protrude approx. 1.5mm above gingival level.
Reason: Soft tissue should not "grow" over the healing abutment during healing.
Depending on its size, the healing abutment displaces a corresponding volume of soft tissue; therefore, the height should not exceed the displaced gingiva.

1 Use the free-forming tools „Add/Remove“ and „Smooth/Flatten“ to shape the upper part

2 The minimum height of healing abutment must be considered

1



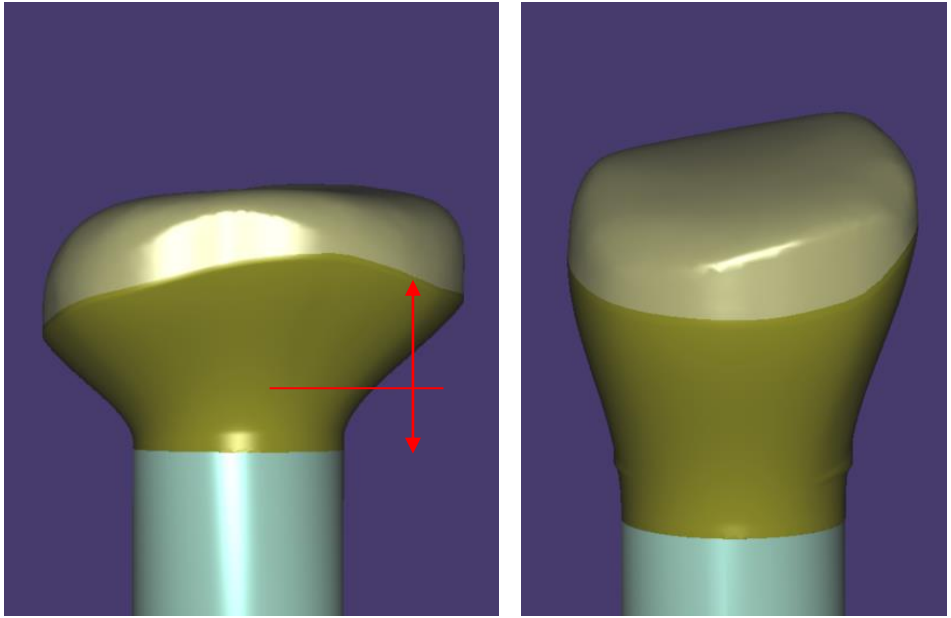


Design of healing abutments

The subgingival design should be discussed with the dentist.

Recommendations:
Lower third almost follows the implant diameter.

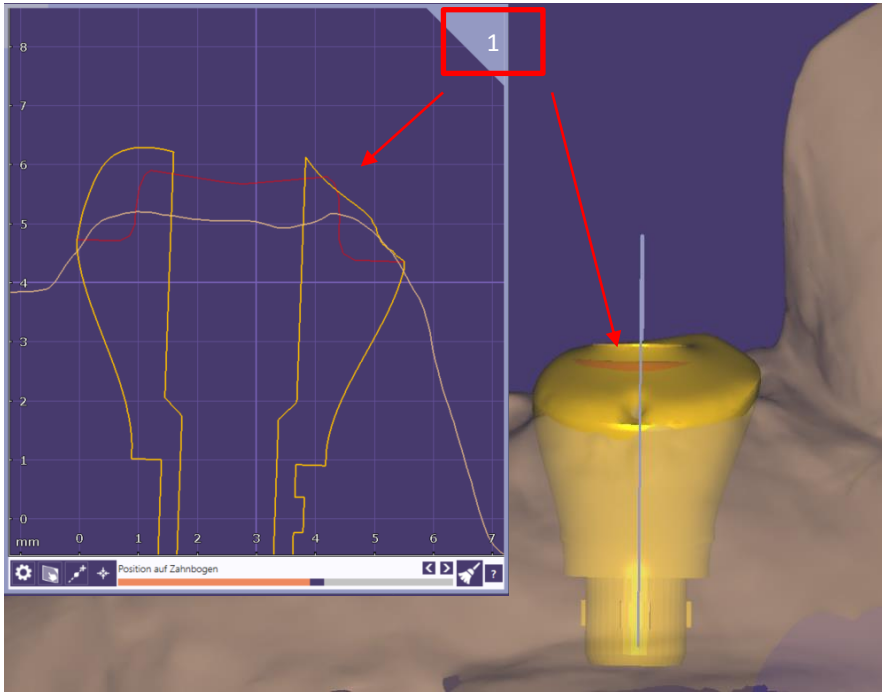
Upper two-thirds: concave / convex design to the cross section of the planned prosthetics.



Design of healing abutments

Minimum geometry

1 The inner blank limit regarding the screw seating cannot be ignored.



Design of healing abutments

Maximum geometry

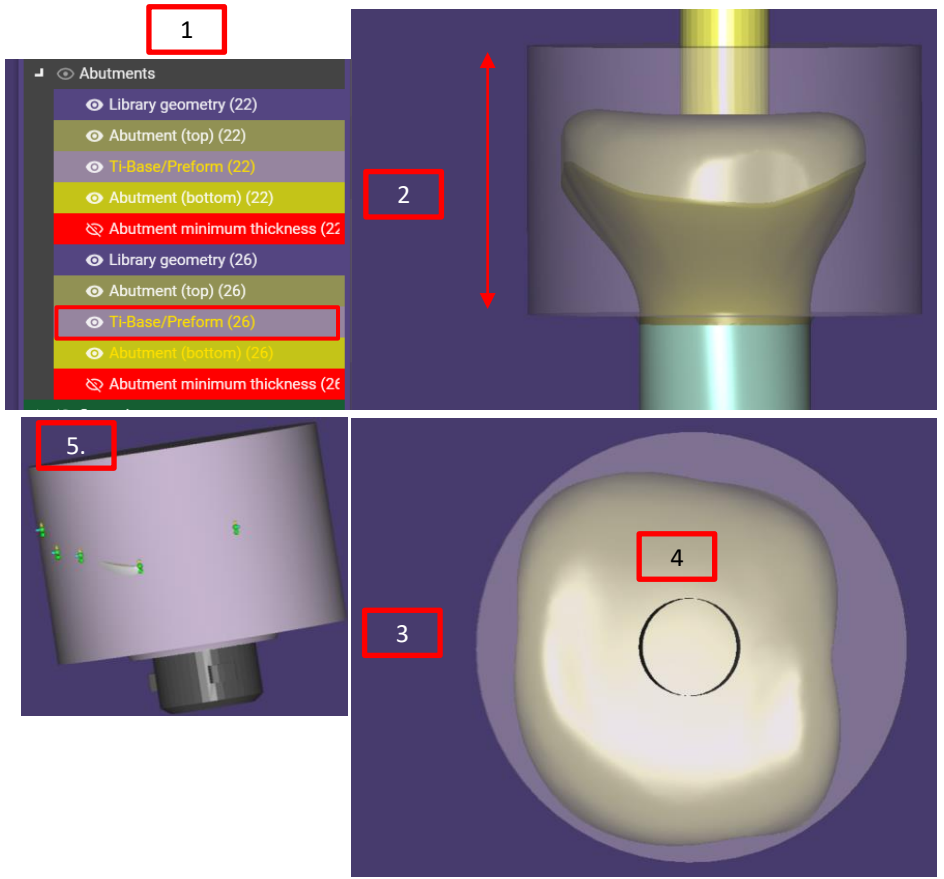
1 To control the design in height and diameter the “Ti-Base/Preform” can be displayed

2 The maximum height of the healing abutment from implant shoulder is 7mm

3 The maximum diameter of the healing abutment is 9.9mm

4 The screw channel is always central in the maximum geometry

5. Recommendation: for large shapes, remove the transparency of the preform in order to better recognize the parts that stand out from the geometry



Design of healing abutments

Since individual healing abutments have oval, square / rectangular or triangular shapes, it is helpful to facilitate the correct insertion of the healing abutments for the dentist by means of marking / notching.

To apply a marker the following are suitable methods:

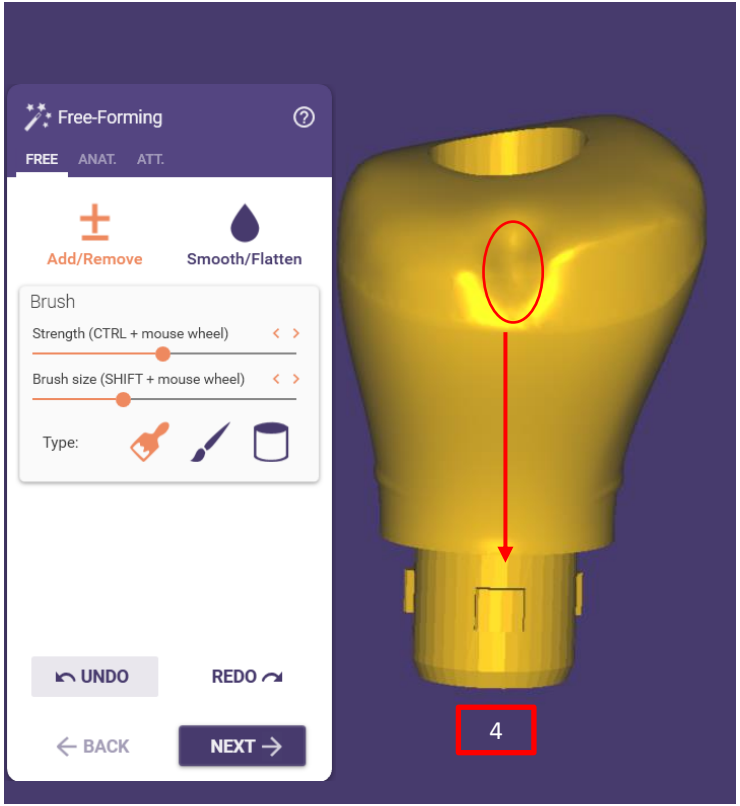
1 Free-Forming

2 Add/Remove

3 Remove brush size / medium strength

Note: additional smoothing is not necessary

4 Recommendation: A position of the marking/groove corresponding to the vestibular cam facilitates the correct insertion of the healing abutment and impression post for the dentist.
Always create only one marking/groove - no double grooves.



Design of healing abutments

Since individual healing abutments have oval, square/rectangular or triangular shapes, it is helpful for the practitioner to make additional dot-like markings when there are several "shape-matched" healing abutments.

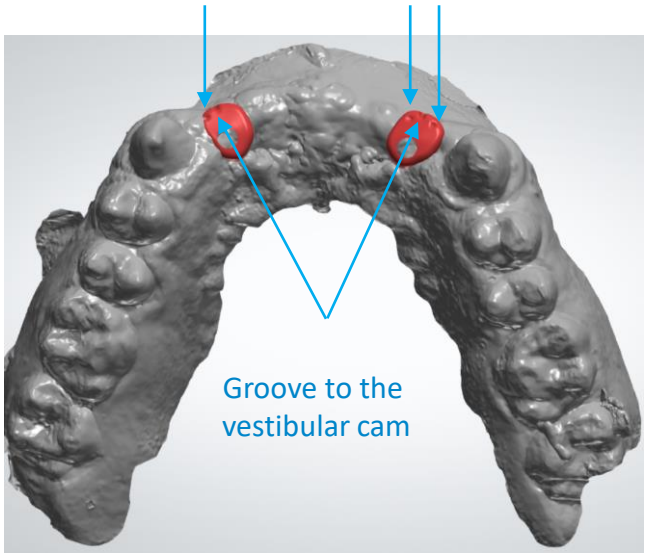
1. Quadrant =
one identification

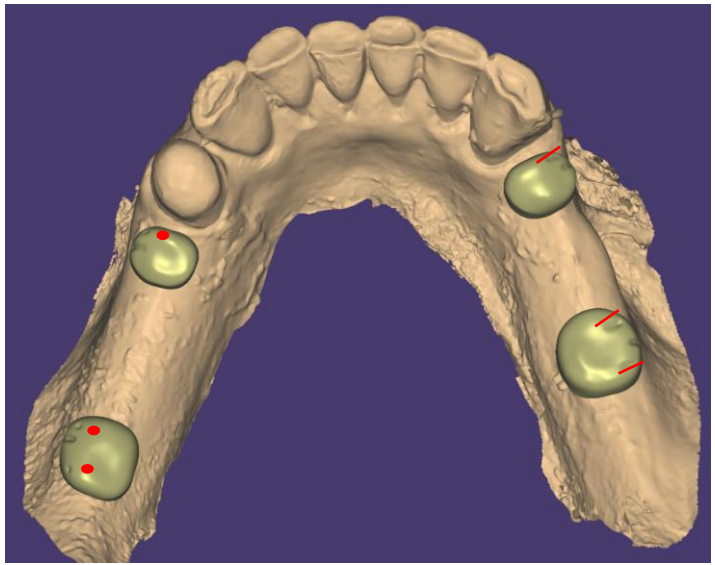
2. Quadrant =
two identifications

without identification

3. Quadrant =
dot identification

4. Quadrant =
line identifications

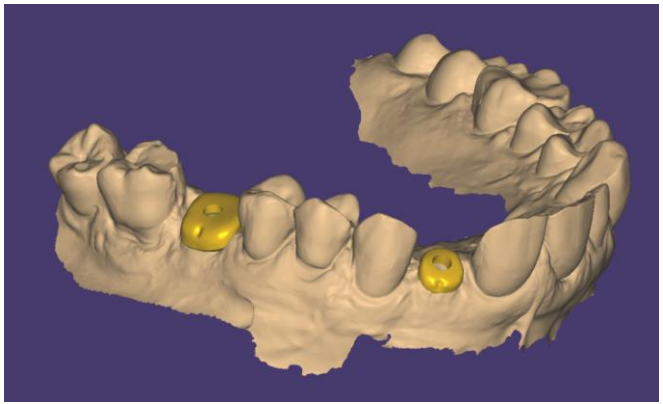


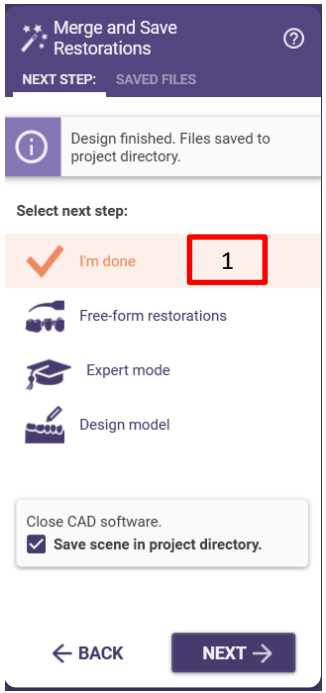


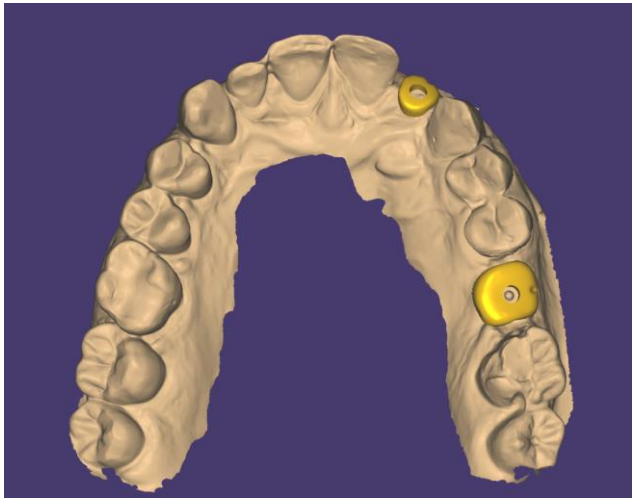
Design of healing abutments

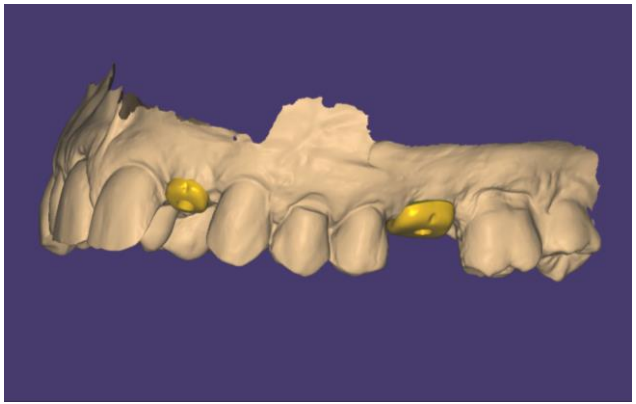
After finishing the design, healing abutment stl-file is created by clicking “I`m done". 1

Send design data via dentalshare or eService to DEDICAM production









Design of printed models

Design of printed models

General notes / requirements for printed DEDICAM models*:

- Activated Model Creator function on exocad license dongle
- Software version 2.2 Valletta or higher
- Software version 2.4 Plovdiv or higher allows to choose between several analogs in the Model Creator. In earlier versions, only one analog provider per implant family can be stored for system reasons. I.e., for CAMLOG® and CONELOG® either the original analogs from Camlog or the DIM analogs from NT.
- Software version 3.0 Galway allows an individual gap dimension to the analog. Therefore, a separate library is required. Please contact the DEDICAM Technical Service to use this function.
- Gingiva masks designed with version 3.0 Galway are produceable by DEDICAM print model partner *
- Checking and printing of the design data transmitted to Camlog is done by Innovation MediTech GmbH (Dreve)*

* This service might not be available in your country

Design of printed models

Overview of implant analogs available in the DEDICAM CAD libraries for printed models

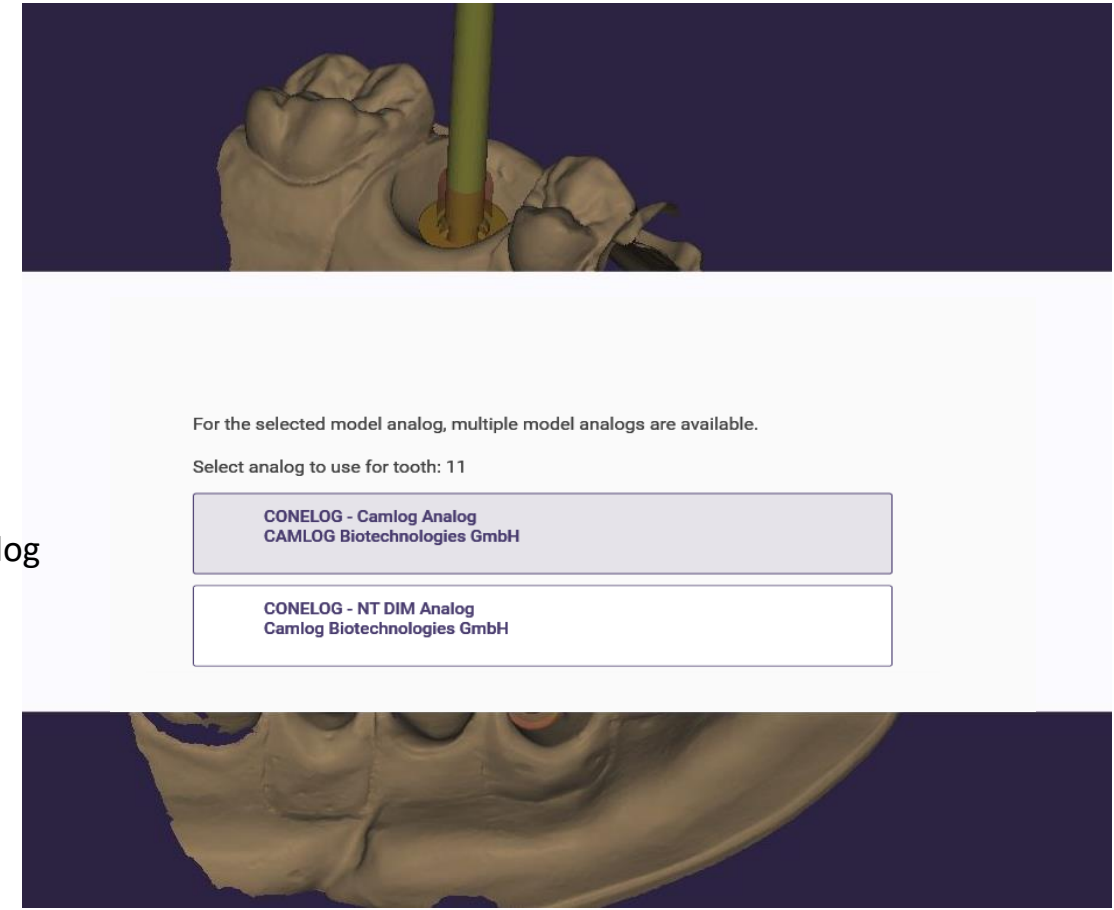
	CAMLOG®	CONELOG®	CERALOG®	iSy®	BioHorizons®	Further implant-systems
Original analogs from Camlog	✓	✓	✓	✓	⊗	⊗
DIM Analogs from NT-Trading	✓	✓	⊗	⊗	✓	✓

Design of printed models

From software version 2.4 Plovdiv it is possible to choose between several analogs in the Model Creator. In earlier versions, only one analog provider per implant family can be stored for system reasons. I.e. for CAMLOG® and CONELOG® either the original analogs from Camlog or the DIM analogs from NT.

1 Option original implant analog from Camlog

2 Option DIM analog from NT

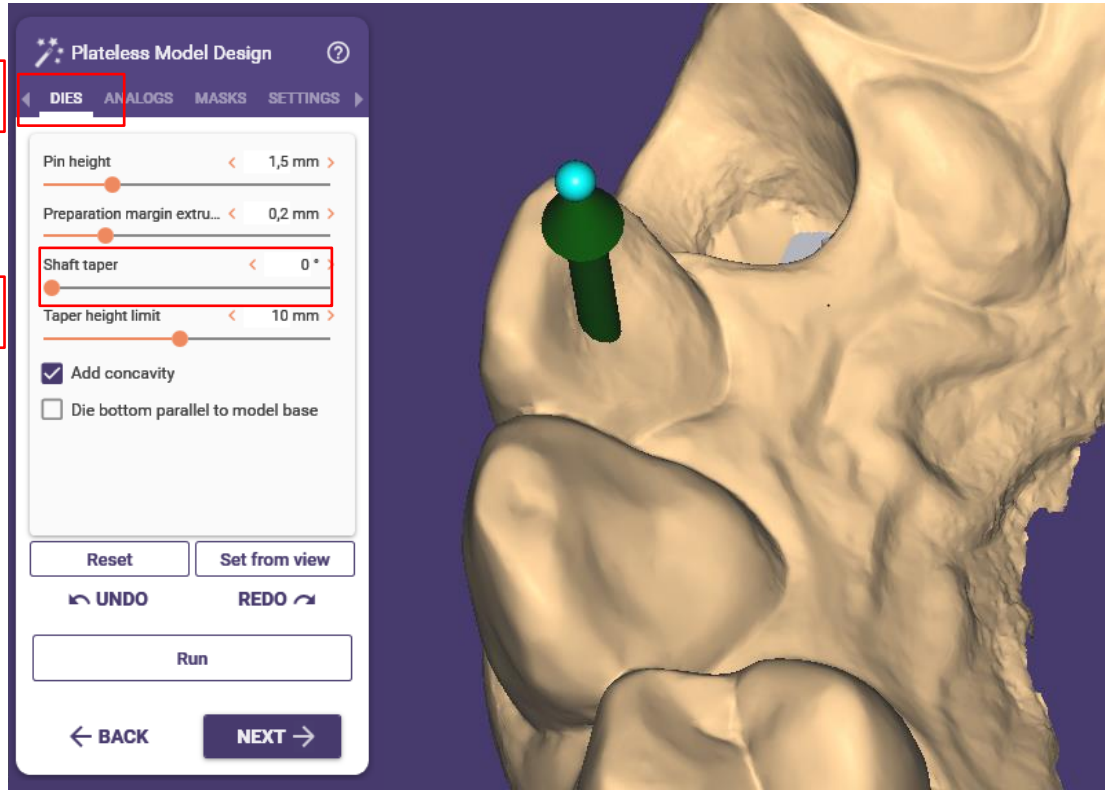


Design of printed models

New features in version 3.0 Galway:

1 «Stump» settings

2 Value on «Shaft taper» generates conical stump shape



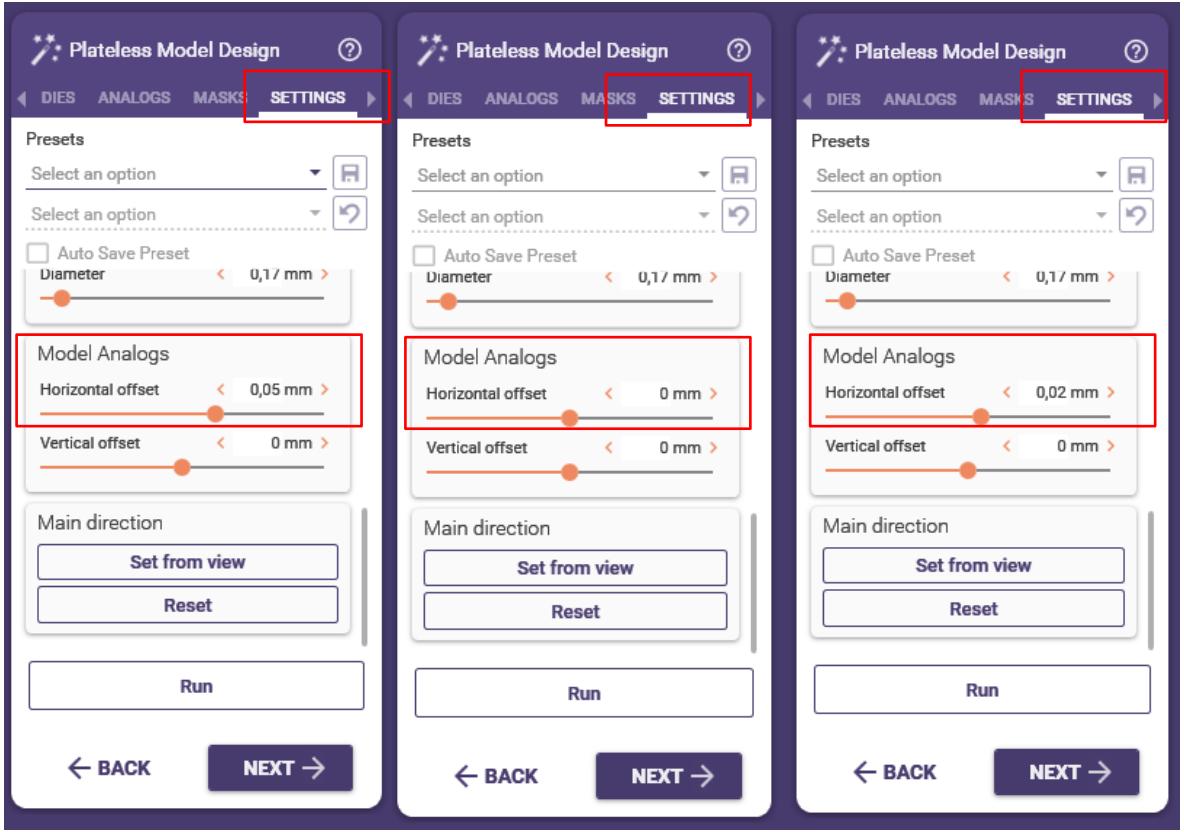
Design of printed models

New features in version 3.0 Galway:

«Settings»

- Default value «Horizontal distance» of 0,05mm must be reduced between **0.00 and 0.02mm** to ensure the proper fit of Camlog analogs for printed models.

Attention: Setting parameters for the model analogs are only available after library update by the DEDICAM Technical Service! Inhouse-manufacturers must determine the value adjusted to their printer themselves.



Design of an angulated screw channel

Design of an angulated screw channel

General notes:

The Titanium-base CAD-CAM free is suitable for a design with an angulated screw channel up to a maximum of 25° for CAMLOG and CONELOG. Exception: CONELOG® GH 2.0 mm → up to **15°**.

The Titanium-base CAD-CAM free is contraindicated for bridges. The angulation of the screw channel results in the abutment screw being trapped in the Titanium-base after the restoration has been bonded.

To tighten the abutment screw with the angulated screw channel,

the "Ballpoint" screwdriver Art. no. J5319.050x must always be used.

Design of an angulated screw channel

The overview table shows the dependencies between the prosthetic components and a design with or without an angulated screw channel

	CAMLOG	Screw	CONELOG	Screw	Screwdriver
Angulated screw channel design (Ti-base CAD/CAM free)	 K2247.xxxx (short)  K2265.xxxx (long)	 J4005.1601 or J4005.2001	 C2247.xxxx (short)  C2265.xxxx (long)	 C4015.1601 or C4015.2001	 J5319.050x
Straight screw channel design (Ti-base CAD/CAM)	 K2244.xxxx	 J4005.1601 or J4005.2001	 C2242.xxxx	 C4015.1601 or C4015.2001	 J5317.0502

Design of an angulated screw channel

General notes:

The BioHorizons Hybrid titanium base is suitable for an angulated screw channel design of up to a maximum of 15°.

The BioHorizons Hybrid titanium base with an angulated screw channel is contraindicated for bridges.

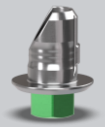
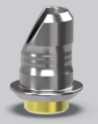
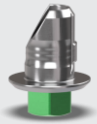
With an angulated screw channel, the yellow anodized abutment screw,

and the "Precision Angled" screwdriver. Art. no. BZ5334.2014

must be used.

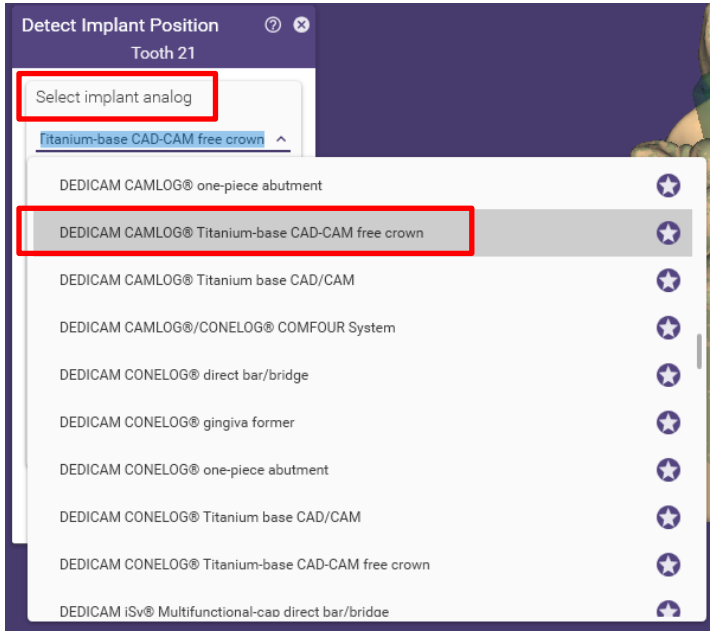
Design of an angulated screw channel

The overview table shows the dependencies between the BioHorizons components and a design with an angulated screw channel

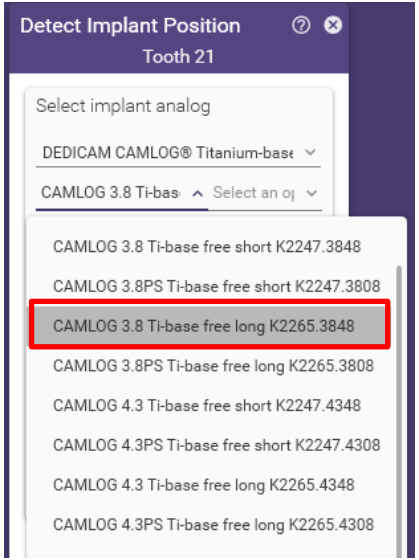
	Titanium base hexed	Titanium base non-hexed	Screw	Screwdriver
Straight screw channel design	 All diameters	 All diameters	 BZ4015.0010 (PXMUAS)	 BZ5305.5020 (135-351)
Angulated screw channel design	 All diameters	X not possible	 BZ4022.0010 (PXPAS)	 BZ5334.2014 (PADM14)

Design of an angulated screw channel

1. Select the implant system CAMLOG or CONELOG from the «Select implant analog» box



2. Selection of the diameter and the height of the chimney, and if available, the gingival height

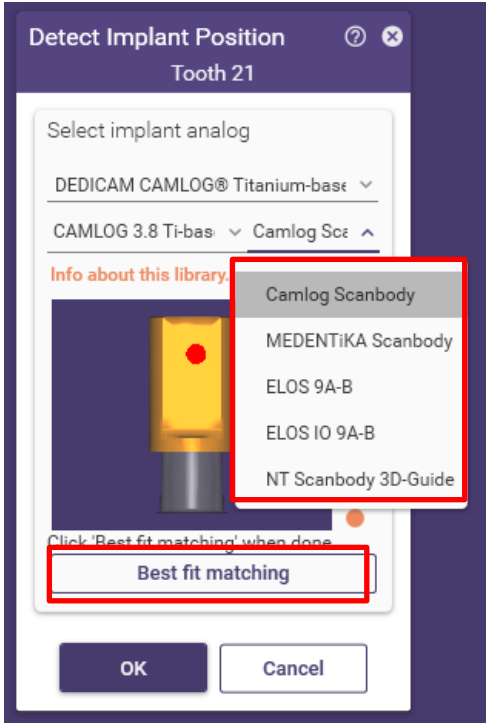


Example: CAMLOG 3.8 | Ti-base free long | K2265.3848

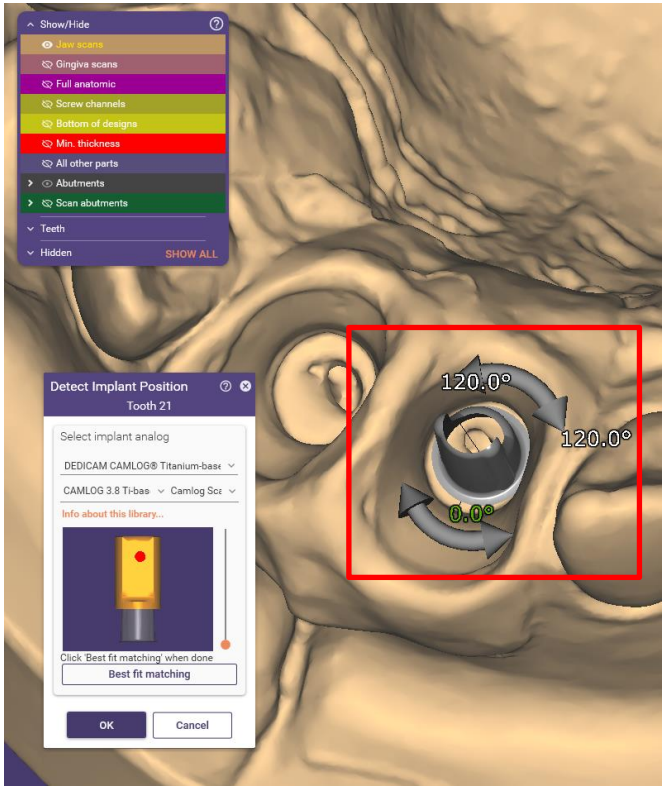
Type and Ø | Chimney height | Art.-Nr.

Design of an angulated screw channel

1. Select the desired scan body and perform Best-Fit-Matching



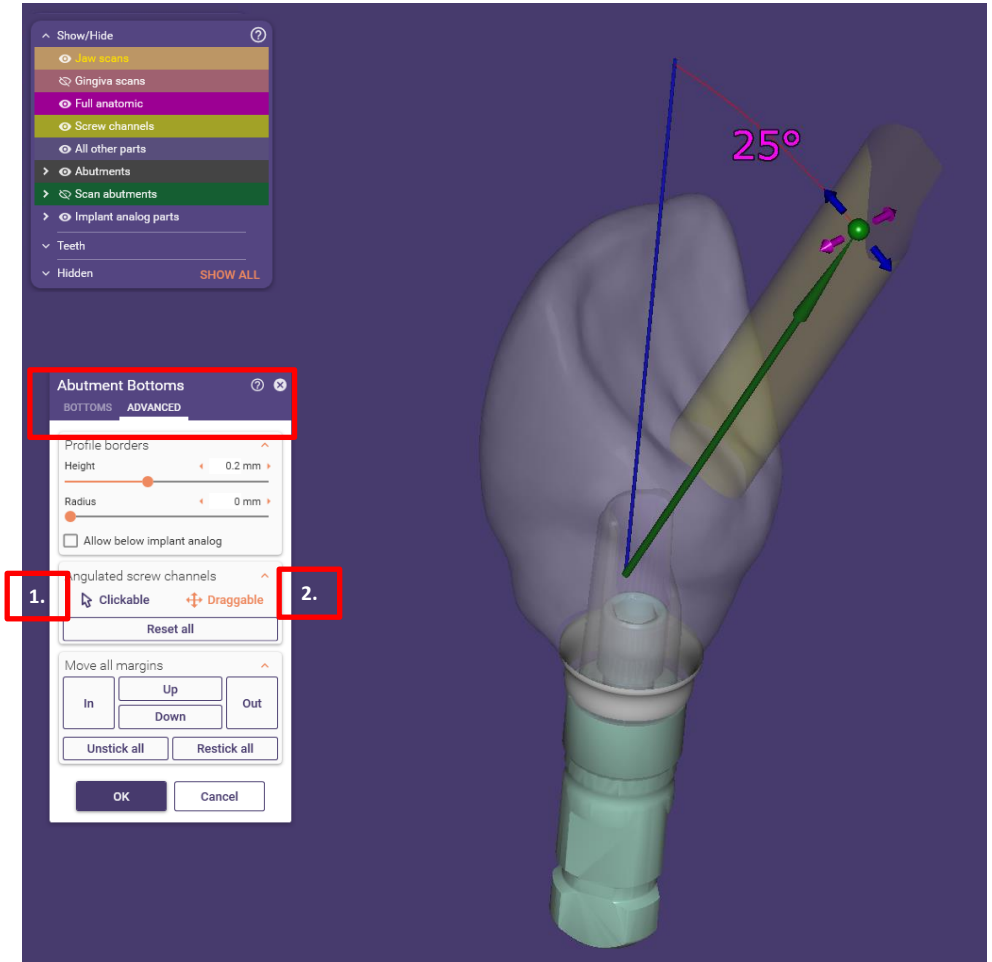
2. The CAD/CAM base free can be rotated to the preferred orientation using the arrow



Design of an angulated screw channel

In the "Generate abutment bases" step under "Advanced", the angulated screw channel function appears. Either by clicking with the mouse 1. or by dragging 2. the green dot in the desired direction, the individual inclination of the screw channel can be set.

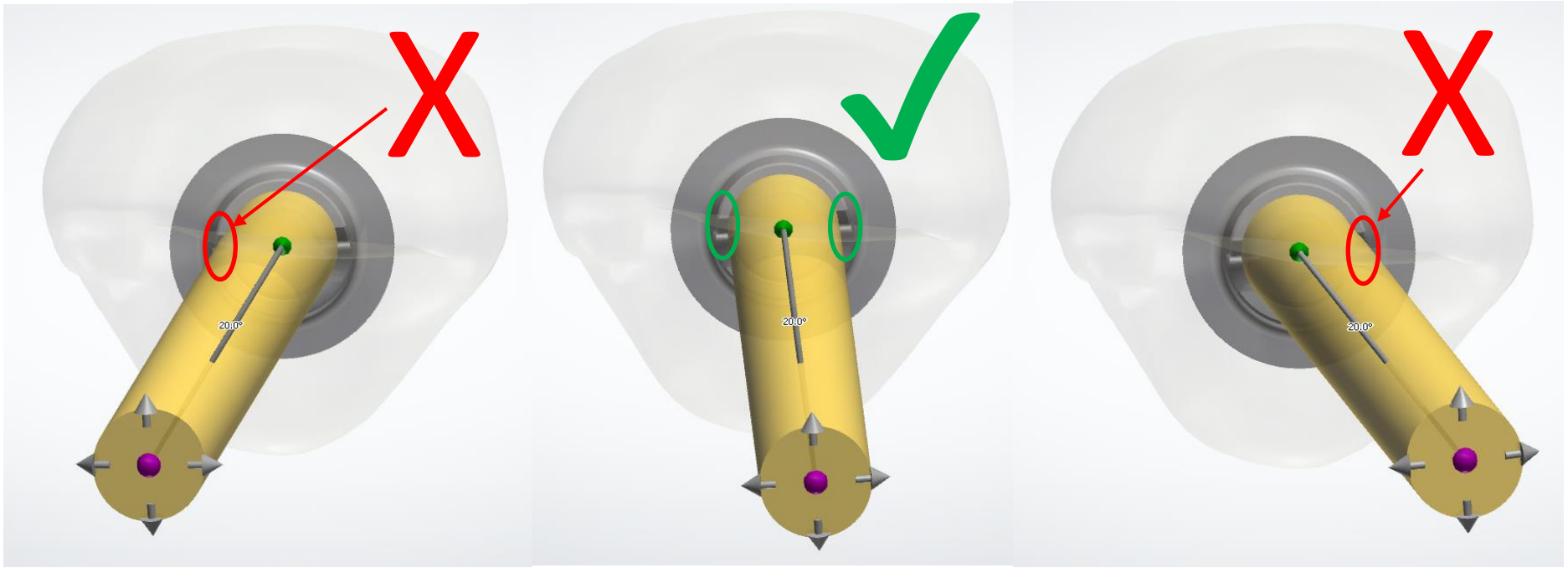
Note: The inclination of the screw channel causes the screw cannot be removed once the restoration is bonded to the titanium base.



Design of an angulated screw channel

In addition to the angulation of the screw channel, its positioning to the anti-rotation surfaces must be considered.

If the screw channel is positioned too far to the left or right and thus covers the titanium base's anti-rotation surface, the restoration's anti-rotation function will be lost. There is no control on the production side.



Disclaimer

The information provided does not qualify the viewer to adopt or implement the product in a clinical setting. For proper use of the product(s), please refer to the relevant instructions for use (IFU) and work instructions.

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