

BEGO CAD/CAM

HYBRID DOUBLE CROWNS & HYBRID SECONDARY BAR CONSTRUCTIONS

Date of issue
August 2019

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BEGO CAD/CAM Hybrid Double Crowns & Hybrid Secondary Bar Constructions

Introduction

The combination possibilities of precise production processes and tried-and-tested materials open up the possibility of having BEGO CAD/CAM hybrid double crowns (in the CAD softwares **exocad*** and **3Shape***) and hybrid secondary bar constructions (initially only in **3Shape**) produced by BEGO Medical.

Production processes

- Selective laser melting (SLM)
In the SLM process, your CAD files guide a laser which additively builds up the workpiece layer by layer using a metal powder. This makes it possible to produce complex designs very quickly and in a high quality.
- High-speed cutting (HSC)
High-speed cutting (HSC) is a process used for the precise production of double crowns, customized bar restorations, and implant prosthetics. A precise production process avoids the typical issues encountered in conventional production such as variations in the fit or an inhomogeneous structure as a result of the casting.

BEGO CAD/CAM hybrid production

The procedure follows the standard workflow in the dental laboratory. The first step concerns the modeling of the primary crown(s)/bar, referred to as primary components in the following, which will subsequently be sent to the production department. Once BEGO has produced the primary components and the dentist has taken the transfer impression, you process your primary crown(s) on the transfer model as usual. This is followed by scanning of the primary crown(s) and modeling of the secondary construction.

Hardware and software requirements

- The ambient temperature has a major impact on the accuracy of fit of the hybrid secondary crown, as temperature fluctuations affect the precision of the scanner. Prior to the (start of the) processing of a new job, the scanner temperature should be checked and recalibration performed if necessary so as to ensure the precision.
- The PC configuration should correspond to the CAD software developer's software recommendation.
- The material file must be saved in exocad or 3Shape (if this is not the case, it needs to be uploaded by BEGO User Support.)
- On 3Shape systems from a third-party BEGO reseller, the reseller's authorization is required for the uploading of the BEGO DLL file. The "BEGO DLL DECLARATION OF CONSENT" form with the number MED-AWB-F-497/01_EN can be found in the Download area of our website.

Design of the primary components

Design the primary telescopes/bars in the CAD software as usual. We recommend smoothing the upper edge/positioning the lever centrally.

The recommended parameters for the primary components assume a cone angle of 1° or 0°.

Please note:

Generally speaking, primary crowns can be produced with or without a step. The step should be slightly tapered.



The primary components should not have any sharp edges. If they do, rounding off should be performed during fitting or the milling radius correction activated (however, this can result in possible friction loss). If the milling radius correction is not activated, increased manual follow-up work of the restoration may prove necessary. If the primary component is free from sharp edges, the milling radius correction will have no effects on the accuracy of fit. As such, it can also be deactivated in such cases!

Follow-up work recommendations for primary components

- Fit on the model as usual
- Final-mill the primary components in order to perform final adjustment of the path of insertion
- Then rubber-polish and polish

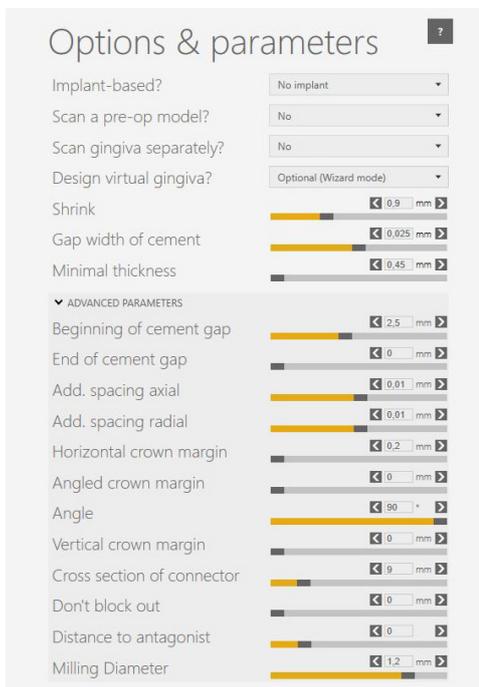
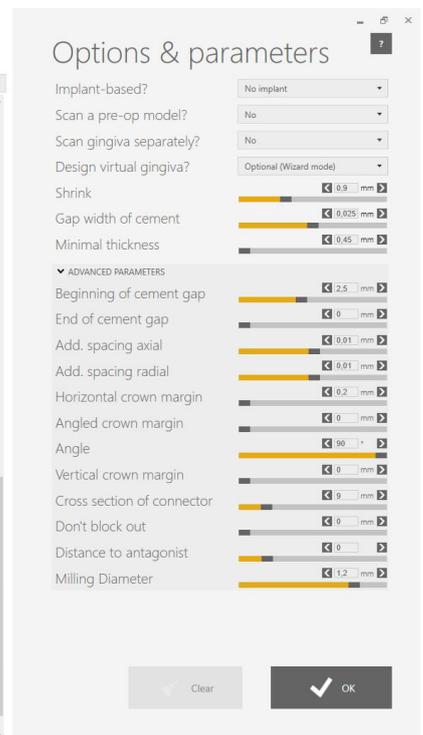
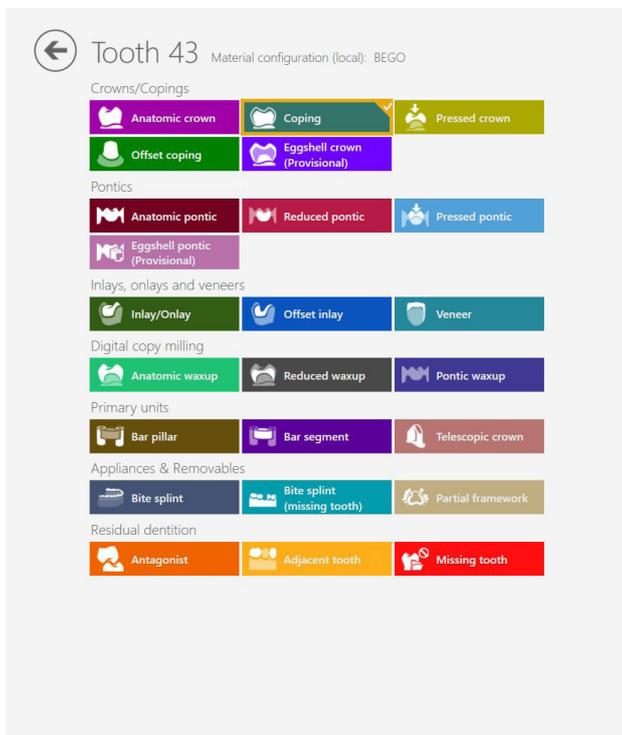
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Job creation

Hybrid double crowns and hybrid secondary bar constructions

Job creation in exocad* software for hybrid double crowns

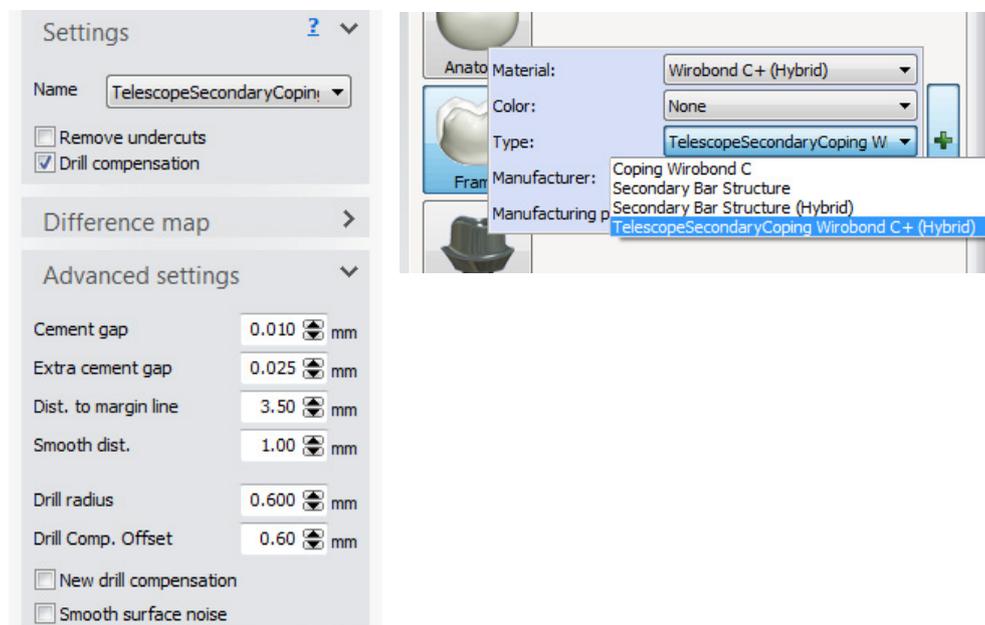
- Create the patient and customer
- Mark the tooth status
- Select “Wirobond® C+ TKS (Hybrid)” as the material for the double crown
- Adjust the parameters for the hybrid technology under “Options & parameters”



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Job creation in 3Shape* software for hybrid double crowns

- Create the patient
- Mark the tooth stumps
- Select the desired secondary restoration, e.g., anatomic crown/pontic, anatomically reduced crown/pontic, or standard coping/pontic
- Select “TelescopeSecondaryCoping Wirobond® C+ (Hybrid)” as the type for the secondary construction
- Pay attention to the correct material



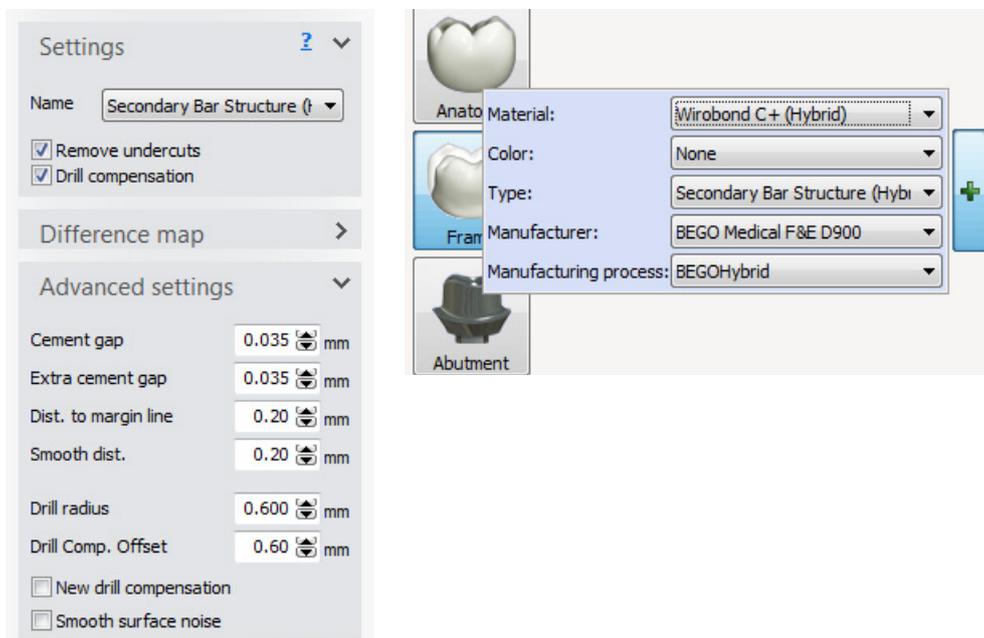
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Job creation

Hybrid secondary bar constructions

Job creation in 3Shape* software for hybrid secondary bar constructions

- Create the patient
- Mark the tooth stumps
- Select the required restoration
- Select “Secondary Bar Structure (Hybrid)” as the type for the secondary bar construction
- Pay attention to the correct material



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Preset parameters

in the CAD software

The preset values are standard values determined by BEGO and can be used as a starting point for calculated customized parameters.

Your CAD software offers you the possibility of making changes to your accuracy of fit settings in order to edit the properties between the primary and secondary component. These settings can be found in exocad* when selecting the material under "Options and Parameters" and in 3Shape* under "Settings/Advanced Settings".

The following parameters have a significant effect on the accuracy of fit between the primary and secondary components.

- Cement line/cement line thickness
This is the compensation value beneath the accuracy of fit parameter Distance axial/radial.
- Start of cement line (exocad)
This setting is used to preset the frictional surface height.

The activation of the milling radius correction depends on the primary component design. Deactivation can result in increased manual adjustment requirements. In case of transitional edges between the occlusal surface and the crown wall area, activation is recommended.

The parameters must be determined for each of your scanners and the scan spray, as the manual steps can have a significant effect on the accuracy of fit here.

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Scanning

The foundations for reliable accuracy of fit

The settings must be selected in the "DETAILS" degree of detail for a 3Shape* scanner.

- Calibrate the scanner
- Open the scanning software and perform the scan
- The high-luster polished primary components need to be sprayed evenly and thinly with a scan spray, for example Diasol Occlusionsspray* or fine-particle sprays from other manufacturers
- Shake the scan spray sufficiently and then spray the crowns evenly and thinly from a distance of approx. 20 cm. The thickness of the layer of scan spray applied has a significant influence on the accuracy of fit parameters. This means that the thicker the layer of scan spray film applied, the broader the secondary construction will be.
- For the individual stump scan, please remove all the scan spray (if it has been smeared when positioning the individual stump) and reapply. This procedure prevents uneven layer thicknesses on the surface, which can result in an imprecise accuracy of fit.



Hybrid secondary crown design

For 3Shape & exocad* software

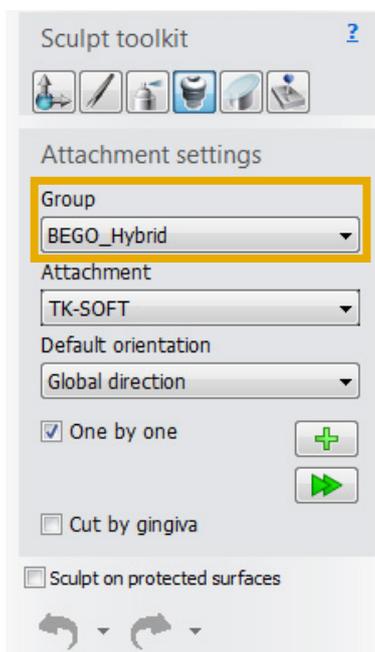
- Select CAD Button and design the crown as usual
- Upload the construction to the BEGO production center

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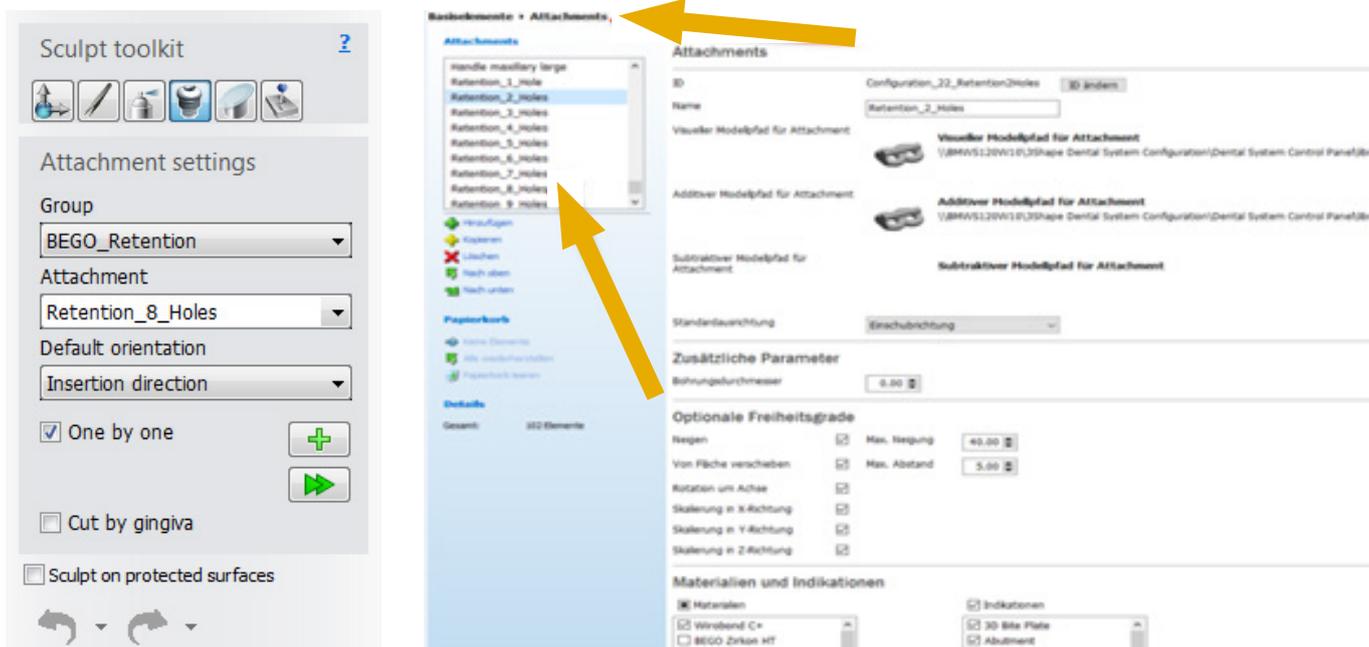
Attachments and retentions

3Shape* software

- TK Soft as a hybrid attachment
- Attachments can be found in the specially created "BEGO_Hybrid" group



- New round hole retentions as an attachment in 3Shape. No need to create as a pontic any more!



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Attachments and retentions

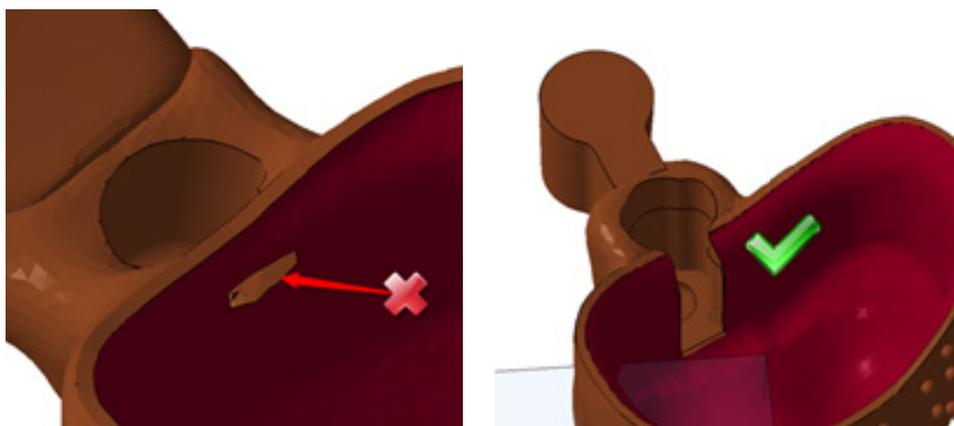
exocad* software

- TK Soft as a hybrid attachment is only selectable in the exocad software if the customer has the implant module.
- Round hole retentions are stored as BEGO retentions in the Attachment library under “TKS” > “BEGO Retentions”.

- BEGO Retention 01.sdfa
- BEGO Retention 02.sdfa
- BEGO Retention 03 Gebogen.sdfa
- BEGO Retention 03.sdfa
- BEGO Retention 04 Gebogen.sdfa
- BEGO Retention 04.sdfa
- BEGO Retention 05 Gebogen.sdfa
- BEGO Retention 05.sdfa
- BEGO Retention 06 Gebogen.sdfa
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- config.xml
- retention-kugel.sdfa
- retention-kegel.sdfa
- retention-kugelzapfen.sdfa

Note concerning 3Shape* & exocad software:

The attachment must be completely punched out to the frictional surface.



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Follow-up work recommendations

3Shape* & exocad* software

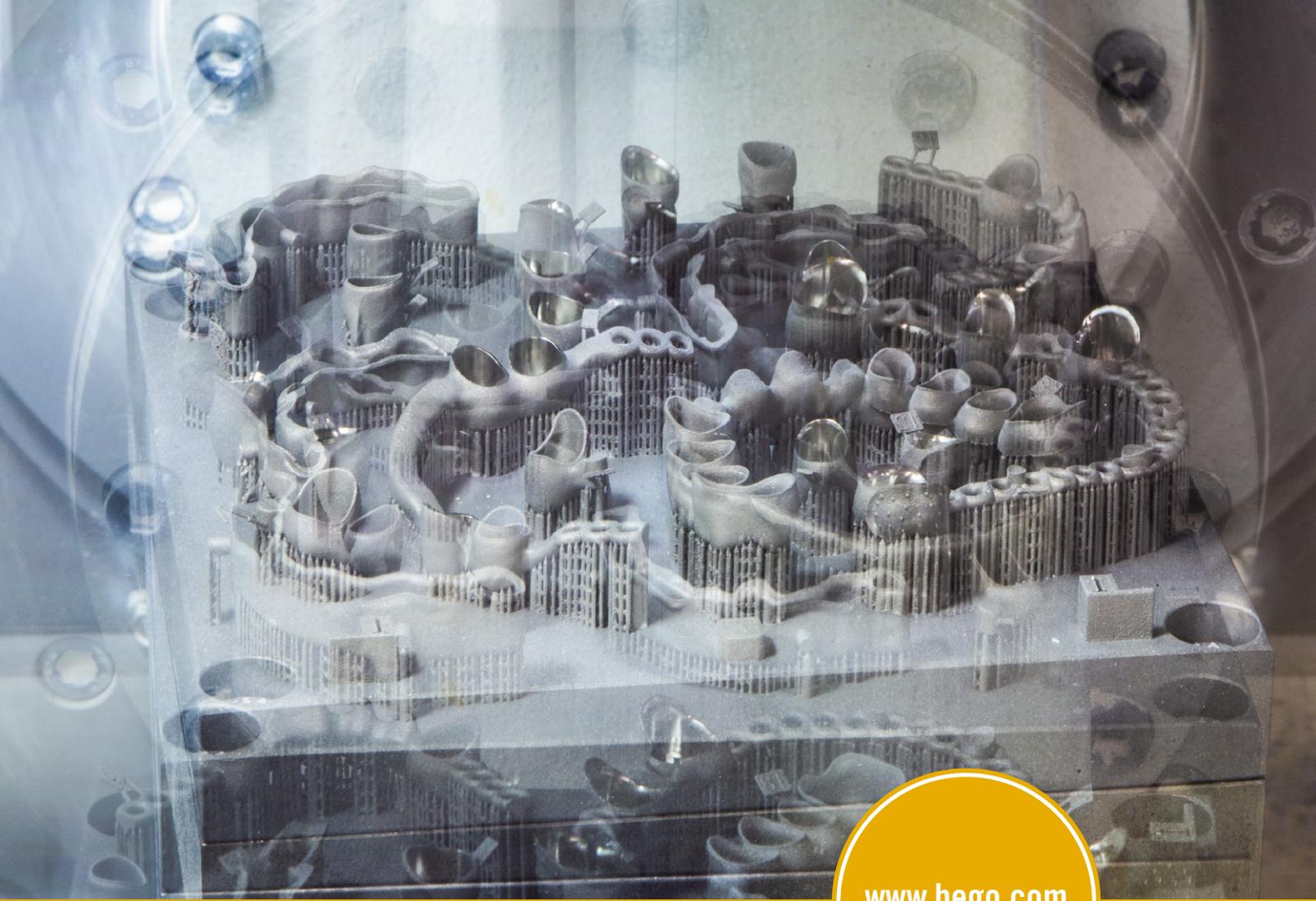
- Accuracy of fit check
- If necessary: Rubber polishing of the inner geometry with rubber polisher rollers
- Prepolishing and final polishing with brushes
- Polishing of the primary component in the handpiece or on the polishing motor up to final accuracy of fit

Veneering recommendations

3Shape & exocad software

- Acrylic veneers only
- A metal primer (e.g., GC Europe*) should be used in case of missing retention pearls on the veneering surface in particular
- Please follow the instructions for use provided by the acrylic veneer supplier precisely

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