



PROCESSING INFORMATION

BEGO ZIRKON ST

for CAD/CAM-produced
restorations

BEGO Zirkon ST

Super translucent zirconium dioxide for large restorations

The super translucent zirconium dioxide guarantees not only excellent aesthetic results – especially in the posterior region – but also offers a range of other benefits. The high translucency facilitates natural aesthetics, which are indispensable for fully anatomical crowns and bridges. The high material strength allows for the production of bridge frames with up to two adjacent pontics.

The CAD/CAM products made of BEGO Zirkon ST are available in 16

VITA* classical shades from precolored blanks. The realization of the thin-tapered crown margins reduces the finishing work considerably. Restorations made of BEGO Zirkon ST can be veneered with all standard veneering ceramics, which are suitable for zirconium dioxide. Please follow the instructions for use of the respective manufacturer. For fully anatomical restorations, you can choose between finishing by simple polishing and/or glaze firing with stain.

Indications

- Fully anatomical crowns and bridges in the anterior and posterior regions with up to 16 units and a maximum of two pontics
- Brückengerüste für Teil- und Vollverblendung im Front- und Seitenzahnbereich mit bis zu 16 Einheiten und maximal zwei Zwischengliedern
- Inlays / Onlays / Veneers
- Telescopic primary crowns
- Dentine core crowns and bridges

Contraindications

- Tangential preparation
- Chamfer preparation with a circular rising preparation margin (“guttering effect”)
- All-ceramic restoration – if the minimal requirements in terms of the available space and the preparation shape are not satisfied clinically

Recommendations for Shade Selection

Zirconia with a high refractive index tends to look brighter on the posterior area. For posterior restorations, choose one shade darker than the target shade to achieve a natural look with surrounding teeth. Even when the same shade color is used, the glazing and polishing will result in different color outcomes:

- For glazing, select the target shade color.
- For polishing, it tends to become one shade darker. Therefore, select one lighter shade than the target shade color.

* This symbol is a commercial designation/registered trademark of a company which is not part of the BEGO company group.

Wall thicknesses

In order to achieve the clinically necessary stability, a wall thickness of 0.5 mm (crowns) to 0.7 mm (bridges) is recommended for the objects. At critical points on the objects, e.g., at the transition between a con-

ductor and a terminal pontic, the wall thickness should be increased to min. 0.9 mm. Terminal pontics should not be larger than the width of a pre-molar.

Wall thicknesses

Restoration	Single crown	Splinted crowns	3-unit bridge	4-unit bridge with 2 pontics	Bridge with terminal pontic
Anterior regions					
Wall thickness in mm	0.5	0.5	0.5	0.7	0.8
Posterior regions					
Wall thickness in mm	0.5	0.5	0.7	0.7	0.9



7-unit bridge made of BEGO Zirkon ST

Connector design

The design of the connector is based on the size and indication of the restoration to be inserted. A distinction is made between anterior and

posterior bridges. Connector stability is achieved more through height than width.

Connector cross section in mm² depending on the restoration

Restorations made from BEGO Zirkon ST	Splinted crowns	3-unit bridge	4-unit bridge with 2 pontics	Bridge with terminal pontic
Anterior region	min. 7	min. 9	min. 12	mind. 12
Posterior region	min. 9	min. 12	min. 14	mind. 12

Finishing of objects

The objects must not be overheated during finishing. Where finishing is necessary, this must not be done in the area around the connectors as this is the “weakest” point on the objects. Work should always be performed using the laboratory turbine or grinding stones which have been specially designated for zirconium dioxide.

When trimming, always cool the objects in water and apply as little pressure as possible in order to prevent damage through overheating (micro cracks, phase transformation). The water quantity should be set high enough so that the objects are “showered off” and the heat can be conveyed away properly thanks to the generous water supply.

Sand blasting

Sand blasting of the surfaces to be veneered is contraindicated as this can lead to undesired surface defects and a phase transformation which could weaken the structure of the objects in the long term and also change the CTE value. Complex stress distribution could develop in the

areas along the interface to the veneering ceramic, this could lead to cracks and/or delayed crack formation following insertion of the restoration. Sand blasting of the crown inner surfaces with aluminium oxide (Korox 50, 50 µm at 1–2.5 bar) is, however, generally permitted.

Frame design / ceramic veneering

The frames are anatomically reduced for the ceramic veneering; sharp edges must be avoided at all costs.

Restorations made of BEGO Zirkon ST can be veneered with all standard veneering ceramics, which are suitable for zirconium dioxide. Please

follow the instructions for use of the respective manufacturer. If the layer thicknesses of the veneering ceramic are too great, internal tension may be created (risk of chipping) due to the individual sintering processes.

Cleaning the frames

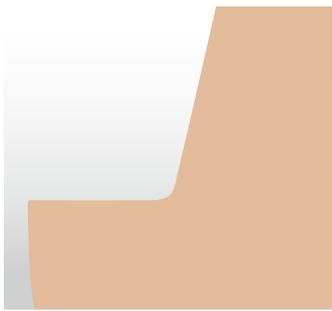
We recommend cleaning the frames in an ultrasound bath or via steam cleaning prior to veneering.

Preparation

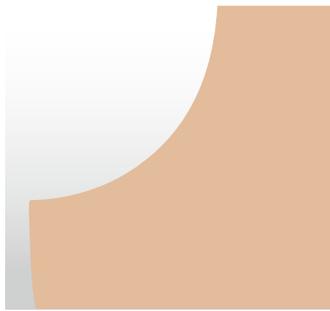
In order to ensure the successful production of a zirconium dioxide restorations, the following points must be taken into account prior to preparation:

- The preparation boundaries must be clearly visible
- A chamfer or step preparation is recommended with an axial convergence angle of 4–6° with conventional cementing
- As of a convergence angle of 15°, adhesive cementing is recommended since the mechanical retention with conventional cementing is no longer sufficient
- In terms of the preparation depth, the minimum layer thicknesses for the frame and veneering must be observed!

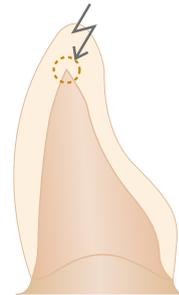
As a rule, anatomically reduced preparation is recommended. Special care must be taken to ensure that no sharp angles or edges are created in order to avoid stress peaks in the frame material. These should be broken off before taking the impression using a suitable instrument, e.g., a flexible plastic diamond wheel.



Step preparation



Chamfer preparation



Avoidance of sharp edges

Cementing

There are many factors which can influence the decision about which type of cementing to employ, for example the cost and time factors, the geometry of the tooth stump and certain biological or mechanical complications. For this reason, it is not possible to formulate a clear recommendation for the fixation at this point. Provisional cementing and the associated trial wearing should be omitted.

- Conventional
 - The use of conventional cements requires adequate preparation of the abutment tooth. In principle, all-ceramic restorations made from zirconium dioxide can be cemented in the conventional manner using zinc phosphate or glass ionomer cements.
 - Experience has shown that conventional zinc phosphate cements have lower removal forces than glass ionomer cements and, due to their opacity, block natural light scattering in the ceramic.

- Adhesive
 - In the case of limited stump retention, adhesive fixation of the restoration is advantageous.

Removal/trepanation of a zirconium dioxide restoration

Even though zirconium dioxide restorations conduct considerably less heat than metal-based restorations, endodontic treatment following the prosthetic restoration may be necessary.

In order to protect the restoration and, above all, the remaining dental hard substance below, the method below should be followed for trepanation of a zirconium dioxide restoration:

- 1 Removal of the veneering ceramic on the area to be trepanned
- 2 Perforation of the zirconium dioxide frame with a coarse-grain, spherical diamond with maximum water cooling and at a speed of 120,000 rpm
- 3 Circular application of the instrument when drilling through the frame at an angle of 45°

In order to remove a permanently cemented zirconium dioxide restoration (irrespective of the cement used), the following procedure is recommended:

- 1 Removal of the veneering ceramic from vestibular
- 2 Separation of the zirconium dioxide frame using a cylindrical diamond instrument with maximum water cooling and at a speed of 120,000 rpm
- 3 Approximal removal of the veneering ceramic in order to be able to break up the separated frame, if necessary

Note

- Restorations are custom products in accordance with Directive 93/42/EEC.
- Because of their different designs, ceramic furnaces may differ in their firing conditions. It is imperative to take this fact into consideration and it is the user's responsibility to seek clarification on this point. **The firing temperatures given are only guidelines!**
- The ceramic powder must not be put back into the container once it has been mixed or has come into contact with fluid or humidity! It is imperative to ensure that damp brushes or instruments do not come into contact with the powder in the crucible. Great care must be taken to ensure that instruments and accessories, such as brushes or spatulas, are completely clean! Any contamination introduced will impair the quality of the firing result.
- Our recommendations for use, whether given verbally, in writing, or by practical instruction, are based upon our own experience and trials and can therefore only be regarded as guidelines. Our products are subject to continuous development. We thus reserve the right to make modifications in design, appearance and materials without notice.
- Please report any occurrences when using BEGO Zirkon ST restorations to BEGO Medical GmbH and the responsible bodies.

Precautionary measures

No findings concerning the safety and efficacy of treatments on children or pregnant/breastfeeding mothers are available.

Side effects

No side effects of BEGO Zirkon ST are known. However, we cannot completely exclude the possibility of personal reactions to individual components in isolated cases. In this case, BEGO Zirkon ST should not be used.

Safety instructions

The restorations made from BEGO Zirkon ST are manufactured and tested in accordance with the highest quality standards. All the information and instructions must be followed to pass this quality on to the patient. Please read all the processing information carefully. Improper use and failure to observe the information can have a detrimental effect on the quality and reduce the service life of the restoration.

Warning: Milling and grinding dust that arises during the processing can irritate the eyes, the mucosae and the skin.

Use

Only to be used by dental staff.

Rx only

Composition and physical data

Chemical composition of the ceramic

ZrO ₂ + HfO ₂ + Y ₂ O ₃	≥ 99.5 Gew.-%
Yttrium oxide (Y ₂ O ₃)	6.9 Gew.-%
Aluminium oxide (Al ₂ O ₃)	0.05 Gew.-%
Sum of all other oxides	≤ 1.5 Gew.-%

Physical material data

Density	6.06 g/cm ³
Strength biaxial	> 1,000 MPa
Vickers hardness (HV 1)	1,250 MPa
Translucency	45 %
Coefficient of thermal expansion (RT – 600 °C)	10.8 x 10 ⁻⁶ K ⁻¹
Grain size	≤ 0.4 μm

Chemical solubility

Acetic acid 4 % solution in water quality 3 as per ISO 6872	≤ 50 μg/cm ²
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www.bego.com

Not all products and services shown are available in all countries.

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