

## **Ultra highly translucent, individually paintable 3D zircon CADtools 3D ML**

### **Delivery forms**

Blank diameter: 98 mm step

Color: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4

Heights: 16, 18, 25 mm

### **Instructions for use**

Please read the contents of this instruction manual carefully. For general and technical questions we are at your disposal under the telephone number: +49 821 455252-0.

### **Description**

CADtools 3D ML Blanks are pre-sintered zirconium dioxide blanks for the milling-technical production of all-ceramic dental restorations.

### **General information**

Please check the delivery immediately upon receipt for completeness and external damage to the packaging or the product. If a blank shows discoloration, breakouts or cracks, it cannot be used for the production of high quality dentures. Careful handling is imperative in the further course of the work, since the blanks have not yet reached their final material strength.

### **Storage**

CADtools HT White blanks must be stored dry in the original packaging at a temperature between 10 °C and 40 °C. Protect the product from vibrations and impacts, dirt, moisture and direct sunlight.

### **Preparation guidelines**

Successful work with CADtools zirconium dioxide is only possible if the guidelines and minimum layer thicknesses are observed.

The information we provide is a recommendation, but it is up to the dentist or dental technician to decide.

### **Recommendations for the preparation**

Generally, a step preparation with rounded inner edges or a chamfer preparation at an angle of approx.  $10^{\circ}$  -  $30^{\circ}$  should always be provided. The width of the step or chamfer should be at least 1,0 mm. The preparation angle should be between  $6^{\circ}$  -  $8^{\circ}$ .

The wall thickness should be at least:

- Posterior teeth: 0,5 mm
- Anterior teeth: 0,4 mm
- Pillar crowns of bridge frameworks: 0,6 mm

The connectors should be designed as follows:

- Anterior tooth structure with a pontic: 6 mm<sup>2</sup>;  
anterior tooth structure with max. two pontics: 9 mm<sup>2</sup>
- Posterior tooth structure with a pontic: 9 mm<sup>2</sup>;  
posterior tooth structure with max. two pontics: 12 mm<sup>2</sup>

### **Milling / instructions for use**

After the blanks have been checked, suitable milling machines, tools and milling parameters are required for processing. For this, the general information of the machine manufacturer must be observed. It is strongly recommended not to use coolants during the milling process as these can lead to undesired changes in the material. Since the restoration shrinks in the subsequent sintering process, the shrinkage factor specific to the blank must be taken into account. You will find this on the packaging and the respective blank. After the milling process the dental work must be subjected to an optical inspection.

Please note the following:

- Damage to the blank and the milled work such as cracks or breakouts.
- Contamination of the surface such as shiny spots or discoloration.

**In these cases, the blank may not be processed further.**

### Safety instructions

When processing CADtools zirconium dioxide dusts are created that can irritate the skin, eyes and damage the lungs. The processing may therefore only be carried out with a perfectly functioning suction device, protective goggles, gloves and an approved dust mask.

All post-processing should be carried out with protective gloves in the unsintered state. Pay attention to low contact pressure, as the unsintered material is very susceptible to damage. Sanding should be done with fine carbide burs or finely diamond-coated abrasive bodies to avoid chipping or contamination. Clean the adhering dust with a soft brush and then blow off with oil-free compressed air.

### Sintering

The milled restorations can be sintered in all standard sintering furnaces suitable for zirconium dioxide. Please also note the information from the kiln manufacturer. To ensure that there are no deviations in color and translucency, regular calibration of the kiln is recommended.

### Sintering processes

Single crowns and bridges up to 4 units

	Temperature 1 °C	Temperature 2 °C	Heating rate °C / min	Hold time min
Heating phase	20	900	9,7	-
Hold phase	900	900	-	30
Heating phase	900	1530	3,5	-
Hold phase	1530	1530	-	120
Cooling phase	1530	800	10,4	-
Cooling phase	800	100	5,8	-

For bridges with 5 units or more

	Temperature 1 °C	Temperature 2 °C	Heating rate °C / min	Hold time min
Heating phase	20	900	9,7	-
Hold phase	900	900	-	30
Heating phase	900	1530	2,6	-
Hold phase	1530	1530	-	120
Cooling phase	1530	800	6	-
Cooling phase	800	100	5,8	-

**Further processing after final sintering**

The following recommendations apply:

- Processing should be kept to a minimum.
- Only use diamond-coated abrasive wheels in perfect condition for finishing.
- Use water cooling to avoid overheating.
- Low contact pressure and low speed.

**Technical data sheet for CADtools 3D ML**

Chemical composition	CADtools 3D ML
ZrO <sub>2</sub> / HfO <sub>2</sub>	87,5 – 95,95 wt. %
Y <sub>2</sub> O <sub>3</sub>	4,0 – 10,0 wt. %
Al <sub>2</sub> O <sub>3</sub>	< 0,5 wt. %
Fe <sub>2</sub> O <sub>3</sub> / Er <sub>2</sub> O <sub>3</sub>	0,05 – 1,5 wt.%
Other oxides	< 0,5 wt. %

Material data	
Color	A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
Density	6,03 g / cm <sup>3</sup>
Flexural strength	750 - 1250 MPa
CTE	10 · 10 <sup>-6</sup> K <sup>-1</sup>
Vickers hardness	1250 HV
Open porosity	none

Biocompatibility: The tests to assess biocompatibility according to the series of standards EN ISO 10993 were carried out.

**Disposal**

The material can be disposed of in household waste.