

INSTRUCTIONS FOR USE

xZIRCON WHITE TRANSPARENT

& ML4D FUNCTION



Material-related characteristics

Chemical Composition (wt%)

ZrO ₂ + HfO ₂ + Y ₂ O ₃	≥ 99.0
Y ₂ O ₃	< 8
Al ₂ O ₃	< 0.15
Other oxides	< 1

Physical specifications

Density (after sintering)	g/cm ³	> 6.0
CTE (25-500°C)	10 ⁻⁶ K ⁻¹	~ 10.5
Fracture toughness (SEVNB)	MPa√m	~ 10
Fracture toughness (SEPB)	MPa√m	3.2
Flexural strength*	MPa	> 1250
E modulus	GPa	> 200

* determined by 3-point flexural test

1. Indications

xZIRCON are dental mill blanks made from zirconium dioxide for the manufacture of dental prostheses. xZIRCON can be used for all dental constructions incl. bridges ≥ 4 units with up to two connected pontics in the front and side tooth area.**

2. Contraindications

Parafunctional habits, insufficient space, inadequate preparation, known intolerance to the contained components, insufficient oral hygiene.

3. Safety information

Please pay attention to the information in the safety data sheet in its current version. Avoid the inhalation of dust particles during processing. Wear protection gloves, safety glasses and a dust mask to prevent irritations of eyes, skin and respiratory system.

4. Handling and storage

Verify the integrity of the packaging and the blank itself before first processing. Check if packaging content corresponds to declaration given on the label. Do not use damaged material. Storage only in original containers in a cool and dry environment. Avoid vibrations, contaminations and contact with fluids.

5. Processing / Designing

Handling this medical device should only be allowed to trained staff. xZIRCON is a sensitive high performance ceramic and should be processed with caution also in pre-sintered condition.

Generally, the following construction parameters need to be considered!

Indication			Min. wall thickness (mm)	Connector cross section (mm ²)
Single crown		incisal	0.5	-
		occlusal	0.5	
		circular	0.5	
Telescope		incisal	0.7	-
		occlusal	0.7	
		circular	0.5	
Anterior Bridge 3 units		incisal	0.5	> 7
		circular	0.5	
Posterior Bridge 3 units		occlusal	0.7	> 9
		circular	0.5	
Anterior Bridge 4 or more units**		incisal	0.7	> 9
		circular	0.6	
Posterior Bridge 4 or more units**		occlusal	0.8	> 12
		circular	0.7	
Cantilever Bridge with 1 Pontic		occlusal	0.8	> 12
		circular	0.7	

Note: Cantilever pontics must not be longer than 2/3 of the supporting crown width.

** The indication for bridges in Canada is limited to six units with a maximum number of two pontics.

5. Processing / Designing (continuation)

Please note: Depending on the construction, the connector cross section might need to be of larger dimensions. For example, in the case of wide-span bridges in the posterior region, the connector cross-section between two bridge pontics should be increased to at least 20 mm² if possible. An oval connector cross section is desirable; the height of the connector is the decisive factor. Frameworks for ceramic veneering need to be designed in a way to support the veneering ceramic in the cusp region and allow a constant layer thickness. Shoulder or chamfer preparation is recommended. For tangential preparations, the crown border parameters in the construction design can be slightly increased. The individual layer heights for design and positioning of the construction in the xZIRCON ML blank can be taken from the following nesting table.

Nesting Table:

Blank height	Layer 1+2: Incisal	Layer 3: Intermediate	Layer 4: Intermediate	Layer 5: Body / Dentine
mm	mm/%	mm/%	mm/%	mm/%
14 mm	3.5 / 24.9	2.1 / 15	2.1 / 15	6.3 / 45.1
18 mm	3.5 / 19.4	2.1 / 11.7	2.1 / 11.7	10.3 / 57.2
22 mm	3.5 / 15.9	2.1 / 9.6	2.1 / 9.6	14.3 / 64.9
25 mm	3.5 / 14	2.1 / 8.4	3.3 / 13.2	16.1 / 64.4

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6. Milling, sintering and further processing

Machining of blanks should always be conducted in the corresponding milling system. All information given by the manufacturer of the machine shall be taken into account. Information for Amann Girrbach users: Please find code (scale factor) for utilization of 98 mm discs in Amann Girrbach milling machines on blank margin. The frameworks need to be examined for visible defects. Do not process damaged or contaminated frameworks. The framework can be colored before final sintering with DD Pro Shade Z and DD Art Elements (pay attention to separate instruction manual).

!!! Please pay attention to our separate sintering instruction !!!

Sintering cycle for normal furnace filling without cover:

- ↑ Heating up to 900°C (1652°F) with 8°C / min (46°F / min),
- dwell at 900°C (1652°F) for 30 minutes
- ↑ heating up to final temp. 1450°C (2642°F) with 3°C / min (37°F / min)
- dwell at final sintering temperature 1450°C (2642°F) for 120 min
- ↓ cooling to 200°C (392°F) with 10°C / min (50°F / min)

Avoid additional mechanical actions after sintering like blasting or grinding. If corrections are inevitable use water-cooled tools for the conditioning and make sure that there is no development of heat, which could lead to cracks in the material. Please work only with sharp, diamond-coated tools and very slight contact pressure. Areas that are under tension in clinical use (e.g. connectors) must not be reworked. Do not separate in interdental regions. Avoid sharp edges.

7. Ceramic veneering

Please use a veneering ceramic with a suitable CTE and pay attention to the manufacturer's recommendation. Slowing down heating and cooling rate in case of massive constructions is strongly recommended.

Weight per tooth unit (g)	< 1	2	3	> 4
Heating & cooling rate (°C / min)	55	45	35	25

8. Mounting

For mounting we recommend conventional cementation with zinc oxide phosphates cements or glasionomer cements. Also luting composites may be used. Sufficient retentions and a stump with height of at least 3 mm are essential. A temporary mounting is not recommended!

Explanation of symbols



Manufacturer



Date of manufacture



Use-by date



Batch Code



Catalog number



Height



Consult instructions for use



Content (Quantity)



Keep dry



Caution: U.S. Federal law restricts this device to sale by or on the order of a dentist.

We reserve the right to make changes as a result of the continuous development of our products. Please find the current version of the instruction manual on our website: www.x-dentaldepot.com

This version replaces all previous versions.

Cooperation and development partner



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