

zirkon HFZ

Instruction for use

esthetic ceram ag



CE 0483

zirkon HFZ Content



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zirkon HFZ



The estetic ceram layering ceramic **zirkon HFZ** is a leucite glass ceramic and is coloured according to the Vita®* classical shade guide A1-D4. The **zirkon HFZ** layering ceramic is only intended for dental applications and for use by trained professionals.

Indication

- Veneering of suitable dental frameworks for the zirconium ceramic technique on stabilized tetragonal zirconium oxide (Y-TZP) with a thermal expansion of approx. $10.6 \times 10^{-6} \times K1$ (25 - 500 °C).
- The frameworks must have an anatomically reduced shape, have sufficient stability and allow uniform ceramic layer thicknesses with a maximum layer thickness of 1.5 - 2 mm. Edges and tips are to be rounded off. Missing substance must be replaced by the framework material.

Contraindication

- Combinations with ceramic materials outside of the described range of product systems and/or material from another manufacturer.
- Use of non-approved framework materials.
- Sharp edges and corners on the framework or non-anatomically reduced frame shapes.
- Dental ceramic and complete ceramic restorations made of glass ceramics are not recommended for patients with bruxism or parafunction.

* VITA® is a registered trademark of VITA-Zahnfabrik, Bad Säckingen

zirkon HFZ Framework Fabrication



prepared zirconia framework

The fabrication of zirconia framework (CAD, CAM, sintering, surface treatment, cleaning) must be performed according to the manufacturer's instructions. The framework must have a reduced anatomical shape and should provide enough space for an even coating of layering ceramic < 2 mm. Sharp edges and corners need to be rounded off.

zirkon HFZ Liner Bake



zirconia framework after liner bake

The liners are offered as powder in cans.
Mix the required liner with the special **liner liquid red** to a creamy consistency and apply it on the zirconium oxide frame in a thin layer using a brush or glass instrument.

1st Liner Bake

Once the liner is applied, the crown or bridge is placed on a firing tray in an open furnace for 2 minutes to dry. Subsequently the furnace is closed with a 4 minute closing time (standby temperature 400 °C) and heated at a rate of 60 K/min with vacuum (vacuum starting at 450° C) to 970 °C. Hold time: 1 minute with vacuum.

2nd Liner Bake

When a second liner bake is necessary, due to uneven application of the liner in the first bake, the mixed liner is applied again with a brush or spatula to the defective area and baked like the first time except 10 °C lower.

zirkon HFZ Margin Bake

ZrO₂ cap prepared



ZrO₂ cap after
liner bake



ZrO₂ cap before
margin bake



ZrO₂ cap after
margin bake



Apply a thin layer of **isolation liquid** to the shoulder of the die. Mix the **margin** powder with **modeling liquid L2 (margin)** to a creamy consistency. Apply margin shoulder ceramic mix in small portions and condense by tapping, suck off any excess liquid and dry well.

1st Margin Bake

Clean the framework and the layering with steam or water and brush thoroughly before another porcelain application. After the margin application, the crown or bridge is placed on a firing tray at a starting temperature of 500 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at a rate of 55 K/min with vacuum (vacuum starting at 500 °C) to 950 °C (bake temperature). Hold time: 1 minute without vacuum. After the first bake, place the crown on the die and remove excess materials.

2nd Margin Bake

A second margin application follows where necessary to optimize the fit. 2nd bake see first bake (940 °C).

zirkon HFZ Dentine/Incisal Bake



before dentine bake*



after dentine bake



before incisal bake



after incisal bake

Mix ceramic powder (dentine and/or incisal) with **modeling liquid** to a creamy consistency. Apply dentine or incisal ceramic in small portions to the cervical and interdental area and compact by light vibration. Then more dentine or incisal is applied according to the tooth layering.

1st Dentine/Incisal Bake

After the dentine application the crown is placed on a firing tray at a starting temperature of 500 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at 55 K/min with vacuum (vacuum starting at 500 °C) to 910 °C (bake temperature). Hold time: 1 minute without vacuum.

For multiple unit bridge with bigger amount of porcelain increase the firing temperature about 20-30 °C. After the first dentine/incisal firing is complete, trim the crown or bridge and clean. Next, apply a second layer of dentine and incisal for the second dentine firing.

2nd Dentine/Incisal Bake

Same procedure as by the first dentine firing, except with a firing temperature of about 10 °C lower than the previous bake. Following dentine bakes at 900 °C.

* Dentine and incisal bake is of course also possible in one go and is common practice.

zirkon HFZ Glaze Finish/Glaze Firing



elaborated for stains/glaze firing



after stains/glaze firing

After completely finishing the surface with a diamond instrument, thoroughly clean the crown or bridge.

Apply the **glaze LFU** powder mixed with glaze liquid in a thin layer. For colour characterization, esthetic ceram **shades & stains LFU** can be applied and fired. The **shades & stains LFU** powder are also mixed with **glaze liquid**. Alternatively, the **glaze, shades & stains LFU** are also available as a pre-mixed paste. Before application, the pastes in the container must be mixed well with an agate spatula. Only then remove a small portion and mix it with **glaze liquid** to the desired consistency.

Glaze Firing

After the stains/glaze application the crown or bridge is placed on a firing tray at a starting temperature of 400 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at 45 K/min without vacuum to 710 °C (bake temperature). Hold time: 1 Minute (without vacuum).

Natural Glaze

Place the crown on a firing tray at a starting temperature of 500 °C. Subsequently close the furnace with a 4 minute closing time and then heat at a rate of 80 K/min with vacuum to 900 °C (bake temperature). Hold time: 1 minute (without vacuum).

zirkon HFZ Modeling «nature»



For the simpler «nature» modeling, a thin layer of opaque dentine was applied after the liner firing to create a depth effect. The tooth body is built up with dentine material, slightly contoured and covered with incisal material. After the dentine/incisal firing is complete, **shades & stains LFU** can be used to highlight the colour aspects of the finished crown that match the tooth colour. The gloss finish was then made with **glaze LFU**. (Firing table at page 24)

zirkon HFZ Colour Matching



zirkon HFZ Modeling «individual»



For the «individual» modeling, a thin layer of opaque dentine was applied after the liner and margin firing for the optical depth effect. Dentine, modifiers, mamelons and various transpa materials were then applied analogously to the internal structure of natural teeth. After the dentine firing, the crown was completed with various incisal and opal materials and fired. Special colour aspects of the finished crown can be highlighted with **shades & stains LFU**. The crown then got its gloss finish with **glaze LFU**. (Firing table see page 24)

Coloured Modeling Liquids



esthetic ceram

If desired, our ceramic powders can be coloured with coloured modeling liquid. This makes it easier for the dental technician to distinguish between the powders when layering.



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esthetic ceram ag



zirkon HFZ Monolayer



monolayer
M1



monolayer
M2



monolayer
M3

With esthetic ceram **zirkon HFZ monolayer** it is possible to produce all 16 Vita® tooth shades with coordinated transparency and fluorescence simply, quickly and efficiently with just 3 ceramic materials.

Note: Combination table on page 23.

colour matching



* VITA® is a registered trademark of VITA-Zahnfabrik, Bad Säckingen

zirkon HFZ Monolayer Modeling



In order to achieve the tooth shade A3 on this crown, the **zirkon HFZ monolayer M3** developed for this purpose was layered on a zirconium coping that was previously fired with zirkon liner 2. After firing and finishing the crown, the tooth shade (A3) can be optimally matched to the Vita® * shade guide with esthetic ceram **shades & stains LFU**. (see the matching colour assignment of the **shades LFU** in the combination table on page 24). The gloss finish was done with the esthetic ceram **glaze LFU**.

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zirkon HFZ Gingiva

Colour overview



The **zirkon HFZ gingiva** powders are used for reconstruction in the gum area. For this, our gingiva powders can be individually combined with each other, depending on the colour you want. The illustration shows a dental work in which several **zirkon HFZ gingiva** materials were combined in order to achieve a natural appearance of the gum restoration.



zirkon HFZ Gingiva

Colour overview on the model



zirkon HFZ Correction Bake



correction
dentine



correction
incisal



correction
neutral

If small additions (approximal contacts, apical pontic) are necessary to the restoration after complete finishing, as **zirkon titan correction** powder in dentine or incisal shading may be applied without altering the result of the layering. Before application clean the crown or bridge.

Mix **zirkon titan correction** powder with **modeling liquid** to a creamy consistency. Apply small portion of porcelain to the desired area of the restoration.

After the esthetic ceram correction powder application place the crown on a firing tray at a starting temperature.
See firing schedule (page 24).



bridge after
correction bake



shades & stains LFU



shades LFU



shade A light
fluor.



shade B light
fluor.



shade C light
fluor.



shade D light
fluor.



shade A
fluor.



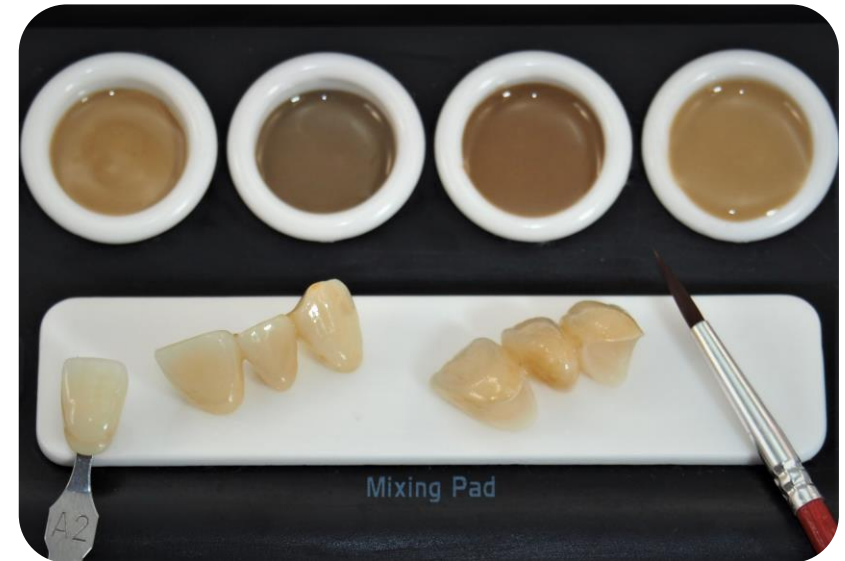
shade B
fluor.



shade C
fluor.



shade D
fluor.



Mixing Pad

Body colours

Area of application: Body colours for the characteristic colouring of A - D colours.

stains LFU



stains LFU



white fluor.



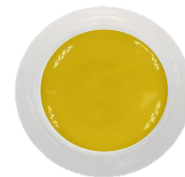
snow white fluor.



vanilla fluor.



beige fluor.



yellow fluor.



yellow 2 fluor.



orange fluor.



orange middle fluor.



orange 2 fluor.



champagne fluor.



safari fluor.



safari + fluor.



olive fluor.



khaki fluor.



rose fluor.



rose pink



red purple fluor.



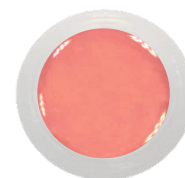
blue rose fluor.



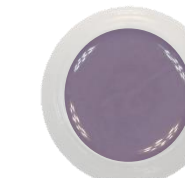
purple fluor.



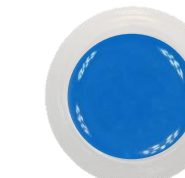
red



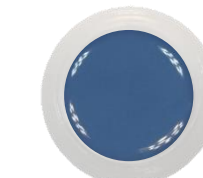
red bright



smoke fluor.



blue fluor.



pigeon blue fluor.



green fluor.



brown fluor.



dark brown fluor.



red brown fluor.



black fluor.



grey fluor.

Effect colours

Area of application: Effect colours for extensive characteristic colouring.

Note: The colours shown are a selection from our wider range only.

stains LFU

Recommendation for the gingival area



The illustration shows a restoration made of monolithic zirconium oxide, which was individually painted in the gum area with stains LFU for a natural look before the gingival materials were applied.

The listed **stains LFU** without fluorescence are ideal for an individual shade design in the gingival area.



zirkon HFZ Combination Table

Combination table	A					B				C				D		
tooth colour	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon liner	1	2	2	2	4	1	1	2	2	1	3	3	4	1	5	5
zirkon HFZ margin	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon HFZ margin (SM)	1 + 2*	2	2	3 + 4*	4 + 5*	1 + 2*	1 + 3*	3	3 + 5*	1 + 5*	1 + 5*	5	5	2 + 5*	2 + 5*	3 + 5*
zirkon HFZ opaque dentine	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon HFZ dentine	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon HFZ chroma modifier	A					B				C				D		
zirkon HFZ incisal	1	2	2	4	4	1	2	3	4	2	2	3	4	1	2	3
zirkon HFZ opal incisal	1	2	2	4	4	1	2	3	4	2	2	3	4	1	2	3
zirkon HFZ monolayer	M1	M2	M3	M3	M3	M1	M2	M3	M3	M1	M3	M3	M3	M1	M2	M2
shades LFU	A					B				C				D		
shades LFU (monolayer)**	A light	A light	A light	A light	A	B light	B light	B	B	C light	C light	C	C	D light	D light	D light

* Margin (SM) mixing ratio 1:1

** The shades LFU colour combinations were specially designed for the colour scheme of the zirkon HFZ monolayer.

zirkon HFZ Firing Chart

Note: The given firing temperatures were determined in a Zubler Vario 300 dental furnace and are approximate values. For other furnace types, corrections to the firing temperatures may be necessary.

Firing parameters	Start temperature [°C]	Closing time [min]	Vacuum start [°C]	Heating rate [K/min]	(Vacuum end) 1 st Bake [°C]	(Vacuum end) 2 nd Bake [°C]	(Without vacuum) Holding time [min]
zirkon liner	400	4	450	60	970	960	1
zirkon HFZ margin	500	4	500	55	950	940	1
zirkon HFZ dentine/incisal	500	4	500	55	910	900	1
zirkon HFZ monolayer	500	4	500	55	910	900	1
zirkon HFZ natural glaze	500	2	500	80	900	---	1
LFU glaze/stains	400	4	---	45	710	---	1
zirkon titan correction	400	4	450	45	720	---	1

Please note: In case of layering on zirconia, retarded opening of the furnace after each bake, is required in general, beginning with margin bake in particular, in case of voluminous layering of ceramic! Firing temperature depends on the number of units in the furnace. More units require up to 20-30 °C higher dentine/incisal firing temperature.

zirkon HFZ Technical Data



zirkon HFZ comply to all applicable standards for dental porcelains (DIN EN ISO 6872 / DIN EN ISO 10993-5). All limits are undercut and thresholds are outperformed.

Materials classification				
Material:		Silicate glass ceramics		
Chemical composition:		Mayor glass ceramic constituents: SiO ₂ , Al ₂ O ₃ , K ₂ O, Na ₂ O, CaO, B ₂ O ₃		
Physical-chemical properties acc. To DIN EN ISO 6872:2019				
Type:	1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/>	Class:	1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	a <input type="checkbox"/> b <input checked="" type="checkbox"/> c <input type="checkbox"/>
Physical-chemical properties acc. to DIN EN ISO 6872				
Property	Spezification dentine, incisal , opal		Spezification liner	Spezification zr/ti correction (25 - 450 °C) [$\cdot 10^{-6} \cdot K^{-1} \pm 0.5$]
Coefficient of thermal expansion (25 - 500 °C) [$\cdot 10^{-6} \cdot K^{-1} \pm 0.5$]	2 x: 9.4 4 x: 9.4		2 x: 9.4 4 x: 9.4	2 x: 8.5 4 x: 8.5
Transformation temperature Tg [°C ± 20]	2 x: 585 4 x: 585		2 x: 635 4 x: 635	2 x: 490 4 x: 490
Bending strength [MPa]	≥ 50		≥ 50	≥ 50
Solubility [µg/cm ²]	< 100		< 100	< 100

zirkon HFZ

Regulatory Information



zirkon HFZ meet all requirements of applicable directives and regulations for medical devices. The manufacturing complies to a certified Quality Management System acc. **ISO 13485**, annex 2 of **Medical Device Directive 93/42**, annex IX, Chapter 1 of regulation (EU) **2017/745** and further international requirements.

Medical device classification acc. annex IX, rule 8 of MDD 93/42:
Medical device classification acc. annex VIII, rule 8 of MDR 2017/745

Ila
Ila

UMDNS Code:

16-187 Dental-ceramics

MDR Code acc. MDCG 2019-14:

MDT 2003, MDN 1103

Classification acc. DIN EN ISO 6872:

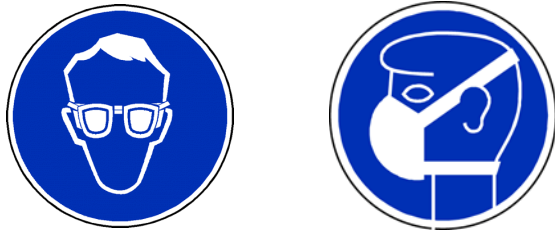
type 1, class 1

zirkon HFZ

Warnings

Use only by trained specialists.

Wear protective goggles or suitable face protection when finishing the ceramic restorations. Remove splinters and dust with a suction device or wear a suitable dust mask.



Be careful with the high temperatures when burning. There is a risk of burns! Use oven tongs / tweezers and gloves!

Use only in a clean work environment! Contamination of the aids (waxes) and devices (mixing plate, preheating furnace) through residues from alloy processing, especially CoCr or NiCr alloys, can lead to discoloration of the ceramic.








The framework or framework that has already been veneered must be cleaned thoroughly with steam or under running water with a brush before each ceramic application.

There are different firing conditions due to the different ceramic furnaces on the market. This fact must be taken into account and clarified by the customer on his own responsibility!

The specified firing temperatures are only guide values!

Recommended storage conditions: 12-38 °C and normal humidity 40-60%. Store in tightly closed original containers. Protect from direct sunlight. Do not put mixed powders back into the can. Use clean, dry instruments for removal.

Label Symbols

-  Manufacturer
-  Date of manufacture YYYY MM
-  Medical Device
-  Batch code /LOT number
-  Reference number
-  Unique Device Identification
-  Caution, consult instruction for use

Manufacturer Information

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