zirkon

estetic ceram

Instruction for use

estetic ceram ag

CE 0483

zirkon Content

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The estetic ceram layering ceramic **zirkon** is a leucite glass ceramic and is coloured according to the Vita®* classical shade guide A1-D4. The **zirkon** 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 x 10^{-6} x K1 (25 - 500 °C) or
  - Lithium silicate glass ceramic with a thermal expansion of approx. 9.7 - 10.3 · 10^{-6} · K-1 (25 - 500 °C) or
  - Zirkon press with a thermal expansion of approx.10.5 × 10^{-6} × K^{-1} (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.
- Do not use liners and margins on lithiumdisilicate glass ceramics due to their high firing temperature.

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

zirkon 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 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.

2 nd 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 Margin Bake

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ZrO_2 cap prepared

ZrO_2 cap after liner bake

ZrO_2 cap before margin bake

ZrO_2 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 400 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at a rate of 45 K/min with vacuum (vacuum starting at 450 °C) to 840 °C (bake temperature). Hold time: 1 minute without vacuum. After the first bake, place the crown on the die and remove excess materials.

2 nd Margin Bake
A second margin application follows where necessary to optimize the fit. 2nd bake see first bake (830 °C).

zirkon 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 400 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at 45 K/min with vacuum (vacuum starting at 450 °C) to 780 °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.

2 nd 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 760 °C.

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

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, estetic 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 400 °C. Subsequently close the furnace with a 4 minute closing time and then heat at a rate of 45 K/min with vacuum to 760 °C (bake temperature). Hold time: 1 minute (without vacuum).

zirkon 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 Colour Matching

zirkon Modeling **«individual»**

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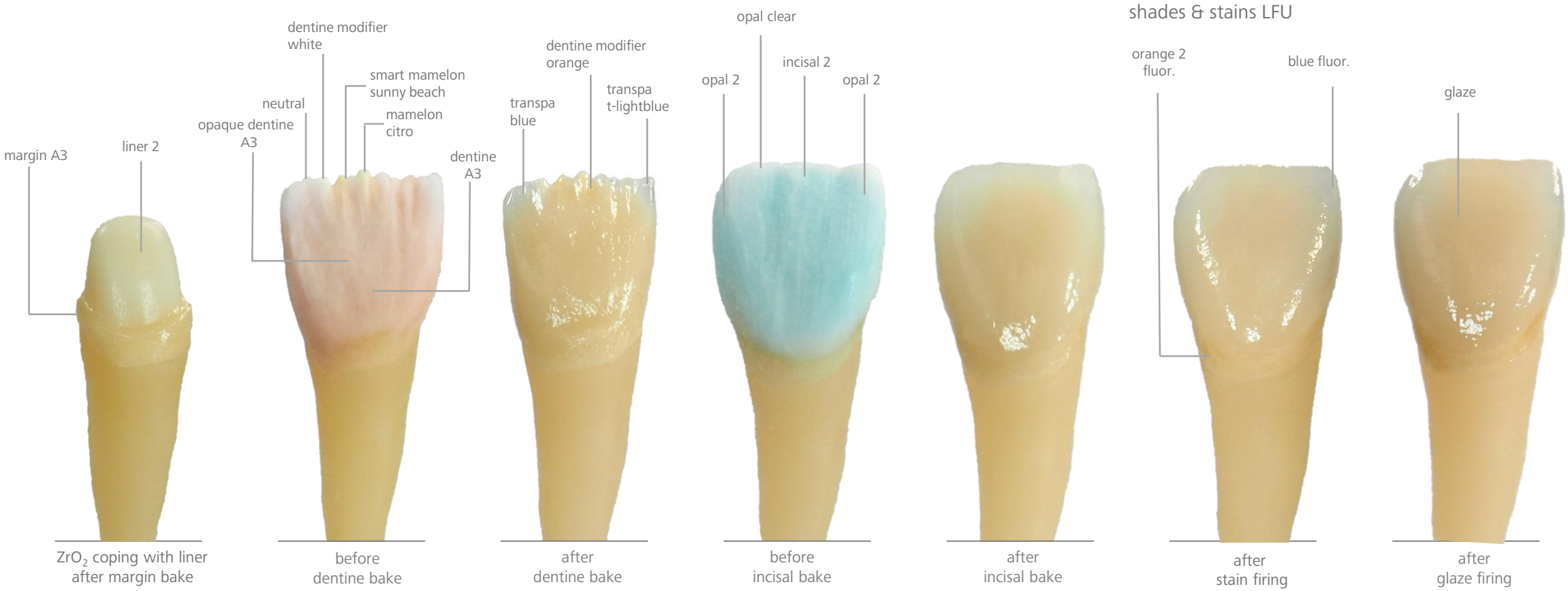

For the «individual» modeling, a thin layer of opaque dentine was applied after the liner and margin firing for the optical depth effect. Dentine, modifiers, mamelons and various transpa materials were then applied analogously to the internal structure of natural teeth. After the dentine firing, the 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

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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.

zirkon Monolayer

monolayer
M1

monolayer
M2

monolayer
M3

With estetic ceram **zirkon 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

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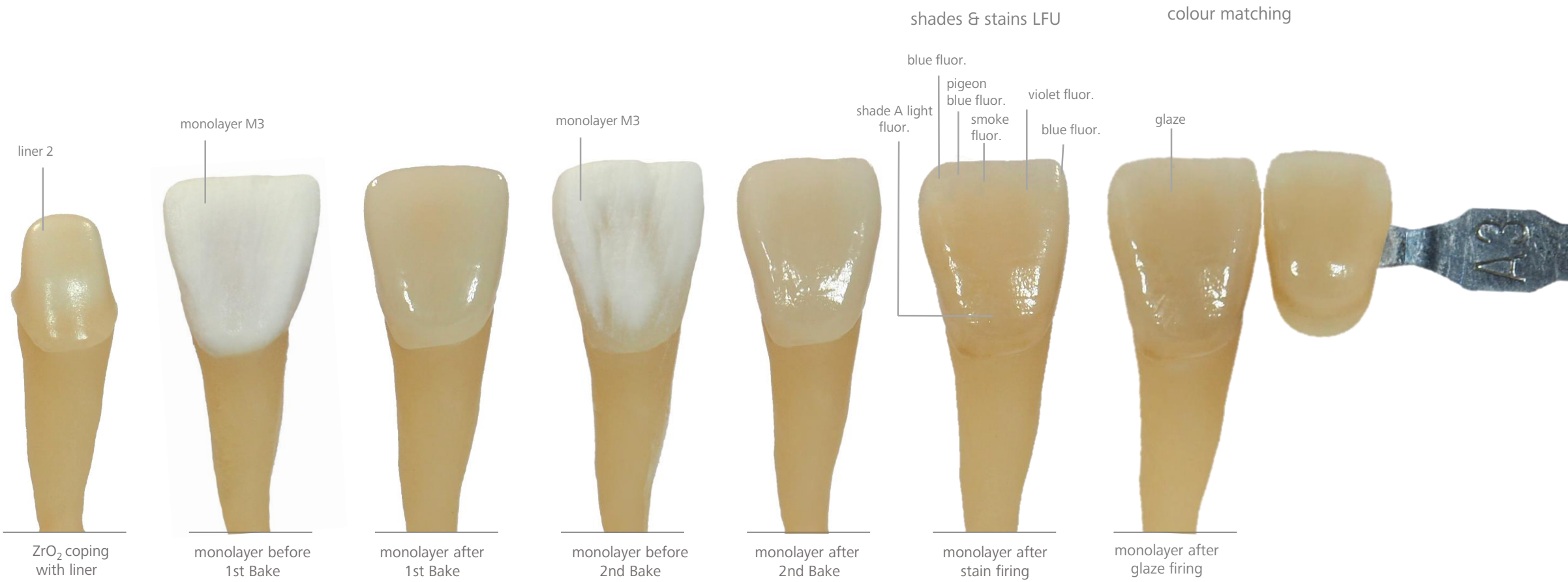
zirkon Monolayer Modeling



In order to achieve the tooth shade A3 on this crown, the **zirkon 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 estetic 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 estetic ceram **glaze LFU**.

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zirkon Gingiva

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Colour overview

gingiva 1 bright
gingiva 2 middle
gingiva 3
gingiva 4 dark
gingiva 5 dark orange
gingiva 6 violet
gingiva 7 light orange
gingiva 8 middle orange
gingiva 9 orange
gingiva 10 rose
gingiva 11 bright
gingiva 12 dark
gingiva 13 dark pink
gingiva 14 brown
gingiva 15 violet
gingiva 16 brown pink
gingiva 17 flamingo
gingiva 18 rose orange
gingiva 19 dark pink opaque
gingiva 20 violet brown
gingiva 21 neutral
gingiva 22 pink light
gingiva 23 intensive red

The **zirkon 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 gingiva** materials were combined in order to achieve a natural appearance of the gum restoration.

zirkon Gingiva

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Colour overview on the model

zirkon Correction Bake

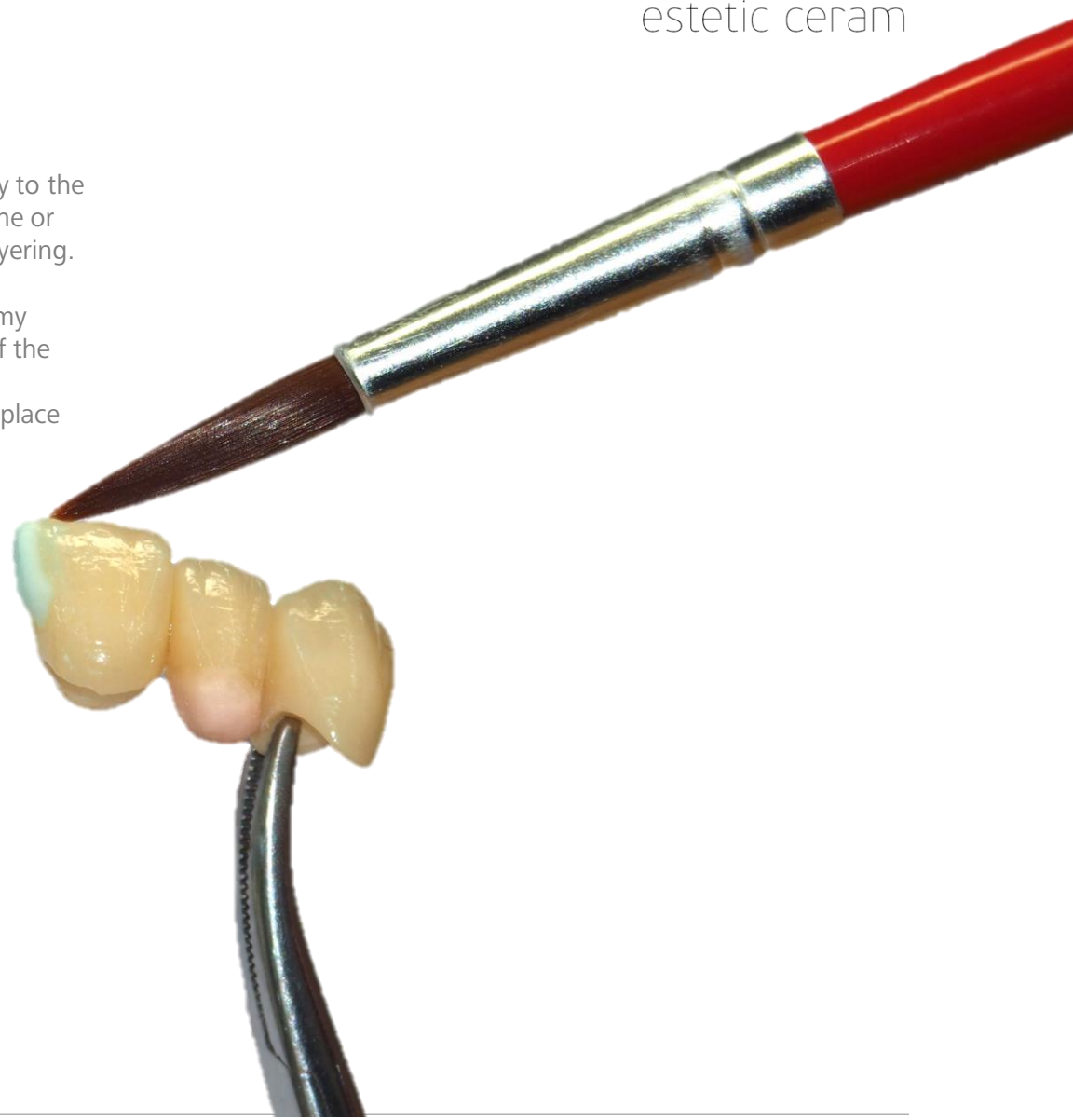
correction dentine

correction incisal

correction neutral

If small additions (approximal contacts, apical pontic) are necessary to the restoration after complete finishing, as 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 estetic ceram **zirkon titan 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.

Body colours

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

stains LFU

stains LFU

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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.

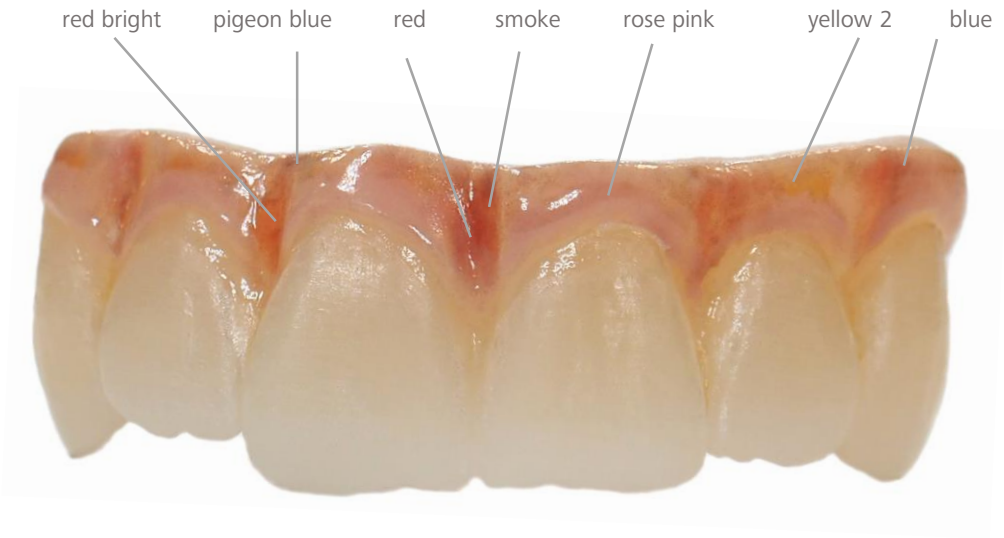
Effect colours

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 Combination Table

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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 margin	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon 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 opaque dentine	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon dentine	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon chroma modifier	A					B				C				D		
zirkon incisal	1	2	2	4	4	1	2	3	4	2	2	3	4	1	2	3
zirkon opal incisal	1	2	2	4	4	1	2	3	4	2	2	3	4	1	2	3
zirkon monolayer	M1	M2	M3	M3	M3	M1	M2	M3	M3	M1	M3	M3	M3	M1	M2	M2
shade 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 shade LFU colour combinations were specially designed for the colour scheme of the zirkon monolayer.

zirkon Firing Chart

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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) 1st Bake [°C]	(Vacuum end) 2nd Bake [°C]	(Without vacuum) Holding time [min]
zirkon liner	400	4	450	60	970	960	1
zirkon margin	400	4	450	45	840	830	1
zirkon dentine/incisal	400	4	450	45	780	770	1
zirkon monolayer	400	4	450	45	780	770	1
zirkon natural glaze	400	4	450	45	760	---	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 Technical Data

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zirkon 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_2O_3, K_2O, Na_2O, CaO, B_2O_3

Physical-chemical properties acc. To DIN EN ISO 6872:2019					
Type:	1 ☒ 2 ☐	**Class:**	1 ☒ 2 ☐ 3 ☐	a ☐ b ☒ c ☐	

Physical-chemical properties acc. to DIN EN ISO 6872

Property	Spezification dentine, incisal	Spezification int. opal	Spezification liner	Spezification margin	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: 9.0 4 x: 9.0	2 x: 9.3 4 x: 9.3	2 x: 9.4 4 x: 9.4	2 x: 9.5 4 x: 9.5	2 x: 8.5 4 x: 8.5
Transformation temperature Tg [°C ± 20]	2 x: 510 4 x: 510	2 x: 530 4 x: 530	2 x: 635 4 x: 635	2 x: 560 4 x: 560	2 x: 490 4 x: 490
Bending strength [MPa]	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50
Solubility [µg/cm²]	< 100	< 100	< 100	< 100	< 100

zirkon Regulatory Information

zirkon 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:	**IIa**
Medical device classification acc. annex VIII, rule 8 of MDR 2017/745	**IIa**
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**

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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
- MD Medical Device
- LOT Batch code /LOT number
- REF Reference number
- UDI Unique Device Identification
- Caution, consult instruction for use

Manufacturer Information

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