Heraeus

INSTRUCTIONS FOR USE

HeraCeram® — Ceramic for veneering zirconium dioxide frameworks

HeraCeram® Zirkonia

HERACERAM ZIRKONIA —
FOR ZIRCONIUM DIOXIDE FRAMEWORKS

HeraCeram is the perfect choice for veneering Zirkonia Oxide frameworks with a CTE of 10.5 µm/mK. The Stabilised Leucite Structure protects against crack propagation chipping and fracture, a recognised problem with some other Zirkonia ceramic systems. Heraceram Zirkonia with it's SLS formulation gives you proven reliability exactly when and where it's needed.

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HERACERAM —
NATURAL AESTHETICS EVERY TIME.

Ceramics that are perfectly adapted both in terms of their appearance and their technical properties: that means simple, reliable and fast processing with unbeatable aesthetic results. Each HeraCeram ceramic product is specifically tailored to suit your framework material. At the same time, all ceramics also offer consistent processing and aesthetics. For perfect results that you can rely on.

OPTICALLY PERFECT — with high-purity quartz glass

Synthetic quartz glass is your guarantee of the superior quality of all HeraCeram ceramics. Its extreme purity gives them unique aesthetic properties, e.g. pure opalescence and translucency from within.

TECHNICALLY PERFECT — with a stabilised leucite structure (SLS)

The stabilised leucite structure (SLS) ensures that HeraCeram ceramics are particularly resistant to stress. And the consistent level of microfine leucite crystals makes chipping a thing of the past.

SIMPLY PERFECT — with a consistent processing philosophy

All HeraCeram ceramics are processed in exactly the same simple way – allowing you to maximise your efficiency. There is also an added bonus: expensive processing time can be saved thanks to shorter firing and cooling times.

SLS —
THE RECIPE FOR SUCCESS

Leucite is the heart of dental ceramics. Without this silicate structure derived from mineral classed silicates, metal ceramics as we know them today would not exist. Leucite is responsible for the thermal expansion required when bonding ceramic to metal alloys. Adjusting thermal expansion however is not its only function. Leucite not only increases strength but more importantly reduces the bonding material's susceptibility to stress.

The disadvantage of leucite with many metal ceramics is uncontrollable and continual growth of the leucite crystals during multiple firings. This leads to an increase in thermal expansion that can cause unpredictable stress in the frameworks metal ceramic bond. Uncontrollable increase of thermal expansion can be attributed to unsuitable chemical composition and the type of manufacturing process implemented.

In dental ceramics, the leucite acts similarly to a green plant, which grows after absorbing nutrients. If the constituents are composed with an excess amount of Al2O3 and K2O, the leucite will continue to increase / grow during multiple firing.

In order to solve this problem, Heraeus dental ceramics are manufactured using completely different processing methods. All materials are manufactured using exactly coordinated constituents together with specific processing steps. This process, known as leucite management, produces a "Stabilised Leucite Structure" we term as S-L-S. Thanks to this processing method, all Heraeus dental ceramics enjoy the benefits of leucite, without the worry of adverse effects such as uncontrollable increase of CTE values.

For the user, this means maximum reliability and less stress.

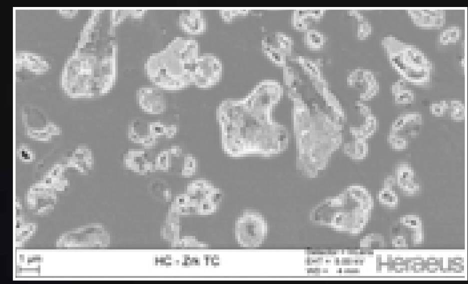

Fig. 1 HeraCeram etching micrograph with leucite

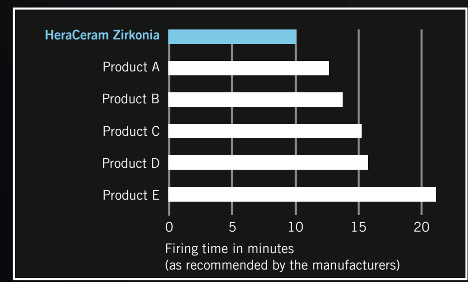

Fig. 2 Extremely short firing times

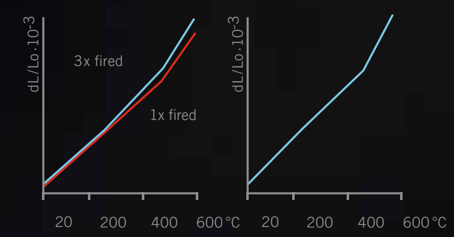

Fig. 3 Comparison of CTE increase:
Unstable CTE of other dental ceramic after multible firing.
Stabilisied CTE of HeraCeram after multiple firing.

PERFECT FRAMEWORKS FOR ALL REQUIREMENTS.

EVERY DAY A–D SHADES

Reliable reproduction of classic A–D shades

Opaquer Set
Dentin Incisal Set
Optional:
Stains Set

PERSONALISED

Patient specific shade adjustment

Opaquer Set
Dentin Incisal Set
Optional:
Stains Set

+

Increaser Set
Enhancer Set

Our starter sets: First-Touch set; Professional set

MATRIX

Truly natural for highly individualised restorations

Opaquer Set
Dentin Incisal Set
Optional:
Stains Set

+

Matrix Set

SPECIAL

Special applications

Margin Set | Mono Set | Bleach Shades | Pressable ceramic

A: EVERY DAY LAYERING

1 Zirconium oxide – Special high-performance ceramic

Zirconium oxide, or, to put it more precisely, zirconium dioxide (ZrO_2), exhibits a density of approx. 6.1 g/cm³ and a coeffi cient of thermal expansion (CTE) of approx. 25–500°C = 10,5 µm/mK. Therefore, the facings must be built up with special ceramics matched to this CTE.

It exhibits exceptionally high mechanical strength of 900–1400 MPa, allowing it to cover virtually the entire range of indications for crown and bridgework. This high strength is the result of the zirconium oxide being stabilised by tetragonal crystal modifi cation with additives such as yttrium oxide (Y2O3). When exposed to thermal or mechanical (fracture) energy, the tetragonal zirconium oxide crystal converts itself into a monoclinic crystal. This involves an increase in volume of approx. 5% which halts the development of crack nuclei and prevents the framework structure fracturing.

While trimming and sandblasting the zirconium oxide frameworks, partial conversion of tetragonal crystals into monoclinic crystals also takes place. As these crystals cannot absorb further high energy input, such as masticatory forces, the framework is weakened. For this reason, the frameworks must not be subjected to high thermal and mechanical loading while preparing them for the ceramic facing.

In detail:
- Frameworks must always be cooled with water during trimming and only minimal pressure exerted – ideally using a turbine.
- Frameworks must either not be sandblasted at all or only under a minimum of pressure. If the facings are to be added with HeraCeram Zirkonia, the zirconium oxide frameworks do not have to be sandblasted or fi red in advance to clean them. This is where HeraCeram Zirkonia stands out from the rest with its Zr-Adhesive.

Processing this paste-like adhesive covers four functions in one go:
- Cleaning firing
- Crystal reconversion firing
- Bonding firing
- Adds fluorescence to the framework

The adhesive optimizes wetting of the ZrO_2 surface and provides for the maximum bond strength between the ZrO_2 and HeraCeram Zirkonia. In addition, the ZrO_2 is provided with a fluorescent surface. This fluorescence is effective from within and enhances the vital aesthetics and natural looks of these restorations.

2 Framework preparation

Preparing the framework surface

First steam clean the ZrO_2 framework properly. The surface of the framework does not have to be sand blasted prior to bonding. After cleaning the Zr-Adhesive should be applied to the framework.

Ceramic firing cycles

The temperatures and firing cycle settings for HeraCeram Zirkonia are shown in the firing charts in section F.

3 Zr-Adhesive

HeraCeram Zirkonia Paste Adhesive is specifically developed for zirconium oxide veneering. It will ensure a maximum bond between the veneering ceramic and the zirkonia framework. No need for risky sandblasting of the sensitive zirconium oxide surface.

The adhesive firing process has three functions:
— Cleaning of the Zirkonia framework
— Realisation of an extreme adhesive bond due to optimised wetting of the zirconium oxide surface
— Provide internal fluorescence for a more natural appearance.

Fig. 4 Zirconium oxide crowns (white) ready for building up the ceramic

Fig. 5 Applying a uniform coat of Zr-Adhesive

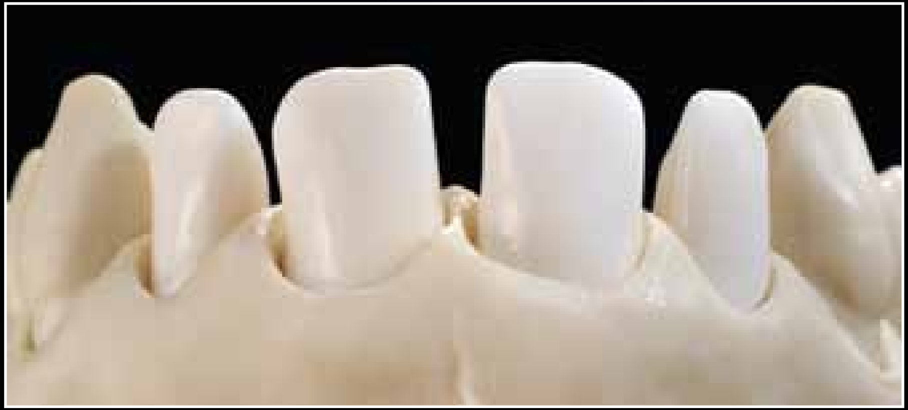

Fig. 6 Zirconium oxide copings with adhesive show a high surface lustre after firing.

Fig. 7 Zirconium oxide copings with and without Zr-Adhesive

Fig. 8 The fluorescence effect is visible in UV light

PLEASE NOTE: The Zr-Adhesive should be applied in a thin, uniform coat to the surfaces of the zirconium oxide framework by using a HeraCeram opaque paste brush. The firing temperature is 1050°C and the holdtime 10 minutes (see the recommended firing cycles in section F)

4 Liner

The Liner provides the framework with its basic shade. The Translucency and chroma are carefully balanced to ensure that the light floods through the framework.

The Liner is applied to the framework in a thin coat and fired at 880°C, similar to opaque paste. The firing cycle is identical to that used for HeraCeram opaque paste. After firing, the Liner coat has a structured, glossy surface.

Fig. 9 Shaded cara framework: No Liner is required with shades A1, A2, B1 and B2

Liner Modifiers are available for customising the Liner.

- **Bleach,** a whitish Liner for extremely light tooth shades or lightening the Liner shades.
- **Gold,** creates a warmer base shade by increasing the chroma from within the facing.
- **Gingiva,** pinkish Liner for use in regions where Gingiva ceramic is used.
- **LCA; LCB; LCC;** high-chroma Liner for the A, B and C shades, e.g. for adding special effects to the cervical region

A full shade combination list for HeraCeram Zirkonia ceramics is shown in section E

Fig. 10 The structured glossy surface of the Liner after firing

PLEASE NOTE: When grinding ceramic it is essential to wear a mask and safety glasses and use a dust extractor. Avoid inhaling dust.

5 Dentine/Incisal build up

Fig. 11 In order to reproduce ready mixed shades, HeraCeram Zirkonia can be built up in two simple layers using dentine and enamel..

Fig. 12 The dentine body can either be built up directly or first built up full size before cut back – this provides for better control over dimensions and positioning.

Fig. 13 The dentine body has been cut back and structured to create space for the incisal material

Fig. 14 The vitality of the incisal region can be further enhanced by inlaying transparent wedges.

Fig. 15 The facing is then built up fully with the appropriate incisal ceramics (refer to shade chart)

Fig. 16 HeraCeram Zirkonia after the first firing

Fig. 17 The appropriate ceramics (dentine, incisal or transparent) are then built up to compensate for firing shrinkage and finalise the shape before being fired with the Dentine 2 cycle.

Fig. 18 The restoration after the second dentine firing

Fig. 19 If no further ceramic needs to be added, the ceramic should be ground with diamond burs to finalise the shape and surface morphology. Ceramic dust and contamination are then removed from the surface using, for example, a steam cleaner.

Glaze firing

As HeraCeram stain liquid exhibits an optical refraction index resembling that of ceramic, the layering and shade effects can be made visible by wetting the ceramic surface with stain liquid. This allows special effects created with glaze and stains to be evaluated easily.

The level of glaze and texture of the ceramic surface can be influenced while firing the glaze by adjusting the temperature, hold time and final temperature. Further influencing factors are the type of surface finishing and preparation for glaze firing. Therefore, the settings quoted for glaze firing may only be considered as guidelines which have to be adjusted to the desired outcome. The firing cycle is shown under Glaze

Firing in section 3 (firing temperature 850°C).

HeraCeram can also be polished by hand. Our Signum HP Pastes has proven really effective for creating a high lustre.

Fig. 20 Wetted surface with HeraCeram stain liquid

Control

Fig. 21 Checking the surface morphology with silver powder

Correction ceramic is for adjustment after the glaze firing, e.g. building up contact areas – its firing temperature of 810°C is at a safe distance from the dentine firing temperature. Correction material is unshaded and transparent. If the corrections need shading, it can be mixed with any of the HeraCeram Zirkonia ceramics. Depending on the mixing ratio, the firing or processing temperature of the correction material must be increased (e.g. 1:1 mixture – Firing temperature approx. 835°C).

Fig. 22 In reflected light after glaze firing

Fig. 23 In transmitted light after glaze firing

B: PERSONALISED LAYERING

6 Personalised Layering

The additional compounds Increaser, Enhancer and Mask expand the design possibilities of a standard layering for custom characterisations oriented to the shade guide tooth and also ensures natural and colourful aesthetics when there is very little space available.

Fig. 24 Amazing personalised results can be achieved in just a few easy steps.

INCREASER

They are orientated on the 16 dentine shades A1–D4 and exhibit increased chroma and lower transparency in comparison to dentine ceramics.

Fig. 25 (Teeth: 13–23): Increasers enhance the chroma and are placed in critical areas such as the cervical area or other regions, if necessary without further layering, or wherever a base has to be masked properly even where only limited space is available. Light optical distinct borders at the incisal ends of frameworks can be avoided by slightly over contouring with Increasers.

This provides the user with more control over the shade effect wherever space is limited, such as in the cervical region, or for masking frameworks in the incisal region. Optical differences caused by very different layer thicknesses, such as on pontics, can also be harmonised very well.

For distinctive (patient-oriented) characterisations and individual modifications, 6 highly chromatised increasers are available.

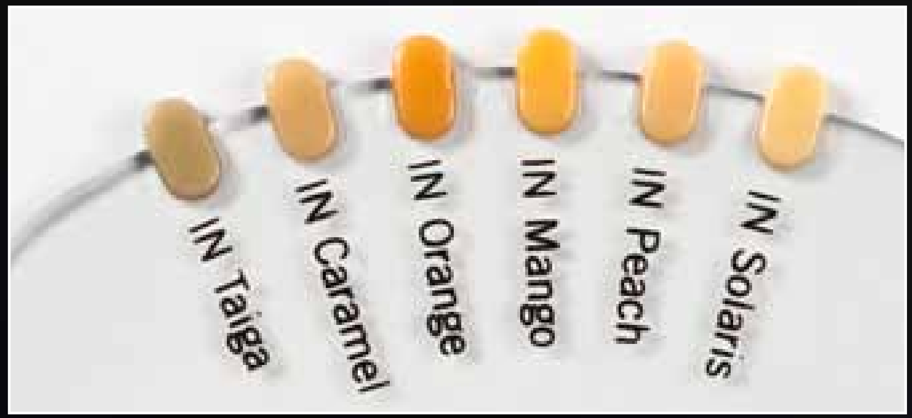

Fig. 26 Increaser colour indicator

Fig. 27 Crown contours built up fully with dentine and cut back...

Fig. 28 ...and adapted by brush

Enhancer

Enhancers are customised transparent ceramics with which the hue or brightness of the layering can be influenced slightly but without affecting the character of the shade. This enables the typical shade tones of central and lateral incisors as well as canines to be reproduced easily. Even those deviations in shade which cannot be shown on a shade guide can be achieved in a controlled manner using the 6 Enhancers.

Fig. 29 The effect created by Enhancers: Once the dentine has been cut back, the mamelons are formed smoothly with a brush. After that...

Fig. 30 ...the correct incisal ceramic for the shade is applied and feathered toward the dentine body. The restoration is then customised by completing the build up with Enhancers. This may involve.

Fig. 31 ...for example, lightening the central incisors with a thin layer of EH bright. The lateral incisors are provided with neutral transparency using EH neutral ceramic and the surfaces of the canines turned reddish with EHA, yellowish with EHB or greyish with EHC.

Fig. 32 The outcome of applying Enhancer viewed from various perspectives: Despite only requiring minimal effort and working with virtually standardised build up techniques, the restorations are attractively aesthetic.

Mask

Incisal like ceramic with increased opacity, balances the transparency so that on the one hand, the in depth effect is retained yet on the other hand the structure of the frameworks can no longer be perceived. MA bright and MA shadow can also be used to modify the brightness of the facing.

Fig. 33 The Mask components and a typical example of how they are applied: After the body has been built up and cut back.....

Fig. 34 ...a thin layer of Mask material is applied to the incisal area of the dentine to mask the oversized framework

Fig. 35 Then the mamelons are cut out...

Fig. 36 ...and built up again as usual using incisal and transparent materials.

Fig. 37 With only minimal yet efficient effort, results can be achieved which are a pleasure to see.

C: MATRIX LAYERING

7 Individualised layering with the Matrix Set

Custom build up concentrates on reproducing patient specific shades and shade characteristics with their light optical elements such as brightness, transparency, fluorescence and opalescence.

The ceramic compounds of the Matrix set have remarkable aesthetic properties. With their easy layering, they make completely natural results possible. The Matrix aesthetic concept, which is developed in cooperation with MDT Paul A. Fiechter, has a simple layered structure that is easy to implement.

Explanation of the Matrix components

- **MD Mamelon Dentine; SD Secondary Dentine** — Ceramics which balance chroma and fluorescence to illuminate the mamelon structures naturally.
- **VL Value** — Highly fluorescent ceramics for influencing the brightness in the incisal region.
- **OS Opal Incisals** — These incisal ceramics replace the corresponding standard incisal materials. They are arranged and used in the same manner.
- **OT Opal Transpa** — Transparent ceramics for use with custom build up techniques, which reflect the spectrum of natural enamel.
- OT1 – OT10 — Neutral opalescence, where the concentration increases from
- OT1 to OT10, whereby the transparency decreases.
- OT1 is the most transparent Opal ceramic.
- OT10 is whitish opal.
- OTY; OTB; OTA; OTG and OT Ice: Opal Transpa ceramics with modified shades
- OT Yellow
- OT Blue
- OT Amber
- OT Grey
- OT Ice

Fig. 38 Matrix shade guide

Fig. 39 Mixing the appropriate shade of dentine with Mamelon or Secondary dentine increases its chroma in the cervical region. These compounds intensify the colours' luminosity with their matching of chroma and fl uorescence. (Alternatively, the colour-coordinated Increasers can also be used)

Fig. 40 The crowns are built up fully with dentine to allow them to be cut back in a controlled manner

Fig. 41 The central incisor has been cut back

Fig. 42 To control the brightness or partial brightening of the dentine, the Value materials in the incisal region are somewhat thicker (about 0.3 mm) and layered to the tooth with thin tapering

Fig. 43 Smooth transitions are important to avoid distinct borders between the material and base shade

Fig. 44 ...and contoured like mamelons with a brush. This creates impressive interaction between the lighter and darker shaded areas. The resulting mamelon structures are further illuminated from within the layers by the highly fluorescent Value materials.

Fig. 45 A ridge of e. g. Opal transpa Ice is laid over the mamelons

Fig. 46 The mamelon structures are then overlaid with Opal incisal

Fig. 47 The desired anatomical contours are then built up with the correct shade of Opal incisal or various Opal Transpa materials

Fig. 48 Fully built up crown

Glaze firing

Fig. 49 After glaze firing

Fig. 50 In transmitted light

D: SPECIAL

8 Building up ceramic margins

The shoulder ceramic range includes 7 HM (high fusing margin) and LM (low fusing margin) shoulder ceramics.
HM/LM 1 – 6 are coordinated with the respective shades as shown in the shade chart.
HM/LM 7 is also referred to as bleach. It is a whitish opaque shoulder ceramic with increased fluorescence. It is used for masking dark areas (discoloured tooth structure) modifying the brightness and transparency of HM or LM material.
HM margin ceramics (high fusing) are used in the classic manner and fired at a temperature of 870°C. LM margin ceramics (low fusing) are not used until the veneering is complete, i.e. after glaze firing. Due to their low firing temperature of only 790°C LM margin materials can also be used for correction e.g. the contours, pontics or contact areas.

Preparation and framework design

Metal free crown margins require a shoulder or, at least, deep chamfer preparations.

Fig. 51 The crown margin is reduced by approx. 1 mm to create space for the ceramic shoulder. The margin of the metal framework should be reduced by approx. 1–1.5 mm, conditioned as usual with the HeraCeram Adhesive and masked with the Liner.

Fig. 52 The crown margin is reduced by approx. 1 mm to create space for the ceramic shoulder

Fig. 53 Applying the separating agent to the margin area

First build up with HM margin ceramic

Fig. 54 The shoulder material is mixed with SM Liquid to produce a kneedable dough before being applied to the cervical region of the crown.

Fig. 55 Any excess liquid is then absorbed to condense the ceramic slightly. Drying the margin ceramic carefully with a hair dryer increases its firmness making it safer to handle. Once the ceramic surface has been contoured and smoothed, the crown can be released from the model again and fired. The firing cycle is shown in section F.

Fig. 56 After firing, the marginal fit is checked after the changes caused by sintering compensation. The model is coated with separating agent again and the HM margin material is mixed as for the first build up. To ensure that margin material adapts properly to the fired ceramic shoulder, the ceramic shoulder should be trimmed slightly to roughen it.

Fig. 57 Once the HM margin ceramic has been applied, it is replaced on the model by tapping it gently. The excess is removed. Once dried, the restoration is released from the model again and fired. Afterwards, you build up your restoration in the usual way.

Fig. 58 The ceramic margin fits perfectly after correction

Fig. 59 The ceramic is then built up as usual

Fig. 60 ceramic crown with inadequate marginal fit

Fig. 61 Correcting the marginal fit with LM margin ceramic…

LM Margin ceramic (low fusing)

LM margin materials can be used for adding a ceramic margin after building up the restoration, i.e. after the glaze firing. They are processed the same as HM margin materials except that the firing temperature is 790°C.

LM margin ceramics are not only for building up and correcting margins, but can also be used for all other corrections, e.g. contouring or building up contact areas.

Fig. 62 correction in the pontic and cervical regions

9 HeraCeram Zirkonia Mono

Instruction for use

HeraCeram Zirkonia Mono is used in the monolayering technique. The advantage of this technique is its very simple and efficient processing. The veneering process is divided into shape and colour design during the procedure. The materials are coloured so that the entire anatomical build-up is layered with one unique material. The colour design of the dentine and incisal layer is created at the final process by painting with the Mono Body Stains. Within a colour group (e.g. the A colours), you can create both an A2 and A3.5 this way. This gives you a great deal of flexibility and leeway in your design.

Frame preparation

The frameworks are prepared for veneering in the usual way.

Liner Layer

Fig. 63 For the monolayering technique, the mono-liner ML is simultaneously thinly applied and fired. (See Assignment Table for colour selection.) The firing temperature is 880°C.

Fig. 64 The Liner surface has a silky sheen after firing. Repeat this step if the framework is not completely covered.

Color Assignment of HeraCeram Zirkonia Mono

Shade	Mono Liner ML	Mono Body MB	Body Stains BS
A1	ML Light	MB Light	50 % BS A 50 % Glaze
A2	ML-A	MB A	Glaze
A3	ML-A	MB A	BS A 1 Layer
A3,3	ML-A	MB A	BS A 2 Layer
A4	ML-A	MB A	BS A 3 Layer
B1	ML Light	MB Light	50 % BS B 50 % Glaze
B2	ML-B	MB B	Glaze
B3	ML-B	MB B	BS B 1 Layer
B4	ML-B	MB B	BS B 2 Layer
C1	ML Light	MB Light	50 % BS C 50 % Glaze
C2	ML-C	MB C	Glaze
C3	ML-C	MB C	BS C 1 Layer
C4	ML-C	MB C	BS C 2 Layer
D2	ML Light	MB Light	BS A 1 Layer
D3	ML-A	MB Light	BS C 1 Layer
D4	ML-B	MB C	50 % BS C 50 % MF19 Olive

Anatomical Build-Up

Fig. 65 In accordance with the colour assignment, the anatomical shape is fully built-up with one of the 5 Mono Bodies MB and fired. Firing temperature is 860°C.

Fig. 66 Complete anatomical shaping with the Mono Body

Fig. 67 The losses of shape after the first firing, is amended and corrected with Mono-Body.

Fig. 68 These corrections do not infl uence the colour effect, because a monochrome build-up does not result in any colour changes.

Fig. 69 If the anatomical shape is complete, the microstructure and surface texture are now created with diamond and polishing tools.

Surface Design

For a homogeneous surface, it is advisable to either completely retouch the veneer or blast it with alumina (50µm) at a low blasting pressure of about 1 bar.

Colour Design with a Staining Technique

Following thorough cleaning (e.g. with steam cleaning) and drying of the restoration, the “inner” tooth structure is created visually by using a staining technique. The entire surface is then wetted very thinly with glaze material.

Fig. 70 Accentuation of the dentine region with Body Stains

The lower and middle thirds of the body are stained with the appropriate body stain (BS). Careful application reinforces the visual differences between dentine and enamel and creates the impression of a multilayered veneer.

Fig. 71 Other characterisations can be carried out with the enamel stains (EN) and HeraCeram stains. Dentine, stain and glaze firing takes place at 850°C

Fig. 72 Buccal view of the veneer

Fig. 73 Finished work after glaze firing

E: COLOUR MAPPING TABLE

	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Paste Opaquer	LA1	LA2	LA3	LA3,5	LA4	LB1	LB2	LB3	LB4	LC1	LC2	LC3	LC4	LD2	LD3	LD4
Increaser	INA1	INA2	INA3	INA3,5	INA4	INB1	INB2	INB3	INB4	INC1	INC2	INC3	INC4	IND2	IND3	IND4
Increaser			INC	INC	INC			INS	INS		INT	INT	INT	INT	INT	INT
Dentine	DA1	DA2	DA3	DA3,5	DA4	DB1	DB2	DB3	DB4	DC1	DC2	DC3	DC4	DD2	DD3	DD4
Incisal	S1	S1	S2	S2	S4	S1	S1	S2	S4	S1	S3	S3	S3	S1	S2	S2
Mamelon, Secondary Dentine	MD1	MD1	SD2	SD2	SD2	MD2	MD2	MD3	MD3	MD2	SD1	SD2	SD2	MD1	MD3	MD1
Value	VL1	VL2	VL3	VL4	VL4	VL1	VL2	VL3	VL4	VL1	VL2	VL3	VL4	VL2	VL3	VL4
Opal Incisal	OS1	OS1	OS2	OS2	OS4	OS1	OS1	OS2	OS4	OS1	OS3	OS3	OS3	OS1	OS2	OS2
Shoulder Ceramics HM/M	1	1	2	2	6	3	3	4	4	5	5	6	6	1	2	4

All stains and liquids can be used for HeraCeram and HeraCeram Zirkonia.

F: FIRING PROGRAMMES

IMPORTANT: The firing temperatures quoted here are guidelines only. Deviations may occur due to differences in furnace performance and may have to be compensated for if necessary.

General Firing Programme

	Zr-Adhesive	Liner	1st Shoulder Ceramic HM1	2nd Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glanze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
Preheating or starting temperature: [°C]	600	600	600	600	600	600	600	*400*	600	600
Predrying and preheating time: [min]	6	6	4	3	5	5	4	*5*	4	4
Temperature increase: [°C/min]	100	100	100	100	100	100	100	*100*	100	100
Final temperature: [°C]	1050	880	870	860	860	850	850	*850*	810	790
Holding time: [min]	10[1]	1	1	1	1	1	1	*0,5–1*	0.5 – 1	1
Vacuum start: [°C]	600	600	600	600	600	600	–	*400*	600	600
Vacuum stop: [°C]	–	880	870	860	860	850	–	*850*	810	790

Heramat C / C2/C3/C3 press

	Zr-Adhesive	Liner	1st Shoulder Ceramic HM1	2nd Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
START [°C]	600	600	600	600	600	600	600	*400*	600	600
DRY [min]	5:00	5:00	3:00	2:00	3:00	3:00	2:00	*3:00*	2:00	3:00
PRE HEAT [min]	1:00	1:00	1:00	1:00	2:00	2:00	2:00	*2:00*	2:00	2:00
HEAT RATE [°C/min]	100	100	100	100	100	100	100	*100*	100	100
HIGH TEMP [°C]	1050	880	870	860	860	850	850	*850*	810	790
HOLD [min]	10:00	1:00	1:00	1:00	1:00	1:00	0:30	*0:30–1:00*	1:00	1:00
TEMPER [°C]	–	–	–	–	–	–	–	–	–	–
TEMP HOLD [min]	–	–	–	–	–	–	–	–	–	–
COOL TIME [min]	–	–	–	–	–	–	–	–	–	–
V ON [°C]	600	600	600	600	600	600	–	*400*	600	600
V OFF [°C]	–	880	870	860	860	850	–	*850*	810	790
V HOLD [min]	10:00	–	–	–	–	–	–	–	–	–

Austromat 3001/Press-i-dent

Zr-Adhesive	C600 T360 T60•L9 T60 V9 T099•C1050 T600 V0 C0 L0 T2 C600
Liner	C600 T360 T60•L9 T60 V9 T099•C880 V0 T60 C0 L0 T2 C600
1st HM shoulder ceramic	C600 T180 T60•L9 T60 V9 T099•C870 V0 T60 C0 L0 T2 C600
2nd HM shoulder ceramic	C600 T120•L9 T60 V9 T099•C860 V0 T60 C0 L0 T2 C600
1st Dentine firing	C600 T180•L9 T120 V9 T099•C860 V0 T60 C0 L0 T2 C600
2nd Dentine firing	C600 T180•L9 T120 V9 T099•C850 V0 T60 C0 L0 T2 C600
Glaze firing	C600 T120•L9 T120 T099•C850 T30 C0 L0 T2 C600
➲ *Mono dentine and glaze bake*	*C400 T120•L9 T120 V9 T099•C850 V0 T30 C0 L0 T2 C600*
Correction ceramic	C600 T120•L9 T120 V9 T099•C810 V0 T60 C0 L0 T2 C600
LM shoulder ceramic	C600 T120 T60•L9 T60 V9 T099•C790 V0 T60 C0 L0 T2 C600

Austromat M

	START	→	↑	→	Vacuum	°C ↗ min.	END	→	1↘	↘2
Zr-Adhesive	600	0	6	1	9 (d)	99	1050	10:00	0	00
Liner	600	0	6	1	9	99	880	1:00	0	00
1st HM shoulder ceramic	600	0	3	1	9	99	870	1:00	0	00
2nd HM shoulder ceramic	600	0	2	1	9	99	860	1:00	0	00
1st Dentine firing	600	0	3	2	9	99	860	1:00	0	00
2nd Dentine firing	600	0	3	2	9	99	850	1:00	0	00
Glanze	600	0	2	2	0	99	850	0:30	0	00
➲ *Mono dentine and glaze bake*	*400*	*0*	*3*	*2*	*9*	*99*	*850*	*0,5–1*	*0*	*0*
Correction ceramic	600	0	2	2	9	99	810	1:00	0	00
LM shoulder ceramic	600	0	3	1	9	99	790	1:00	0	00

Gemini II bzw. HT/HT Press

	Zr-Adhesive	Liner	1st HM shoulder ceramic	2nd HM shoulder ceramic	1st Dentine firing	2nd Dentine firing	Glaze firing	➲ *Mono dentine and glaze bake*	Correction ceramic	LM shoulder ceramic
Low temp. [°C]	600	600	600	600	600	600	600	*400*	600	600
Up time [min]	6:00	6:00	3:00	3:00	3:00	3:00	2:00	*3:00*	2:00	3:00
Preheat time [min]	1:00	1:00	1:00	1:00	2:00	2:00	2:00	*2:00*	2:00	1:00
Heat rate [°C/min]	100	100	100	100	100	100	100	*100*	100	100
Vac. start [°C]	600	600	600	600	600	600	–	*400*	600	600
Vac. end [°C]	–	880	870	860	860	850	–	*850*	810	790
Vac. delay [min]	10:00	0:00	0:00	0:00	0:00	0:00	0:00	*0:00*	0:00	0:00
Vac. level [mm]	710	710	710	710	710	710	–	*710*	710	710
High temp. [°C]	1050	880	870	860	860	850	850	*850*	810	790
Temp. delay [min]	10:00	1:00	1:00	1:00	1:00	1:00	0:30	*0:30–1:00*	0:30	0:30
Final temp. [°C]	–	–	–	–	–	–	–	–	–	–
Final delay [min]	0:00	0:00	0:00	0:00	0:00	0:00	0:00	*0:00*	0:00	0:00
Down time [min]	0:00	0:00	0:00	0:00	0:00	0:00	0:00	*0:00*	0:00	0:00

Multimat MC II/Mach 2/Touch & Press

	Preheat.temp.	Drying	Preheating	Vac.time	Firing time	Firing temp..	Heat rate	Vacuum
Zr-Adhesive	600 °C	6.0	1.0	9.6	10.0	1050 °C	100	50
Liner	600 °C	6.0	1.0	0.1	1.0	880 °C	100	50
1st HM shoulder ceramic	600 °C	3.0	1.0	0.1	1.0	870 °C	100	50
2nd HM shoulder ceramic	600 °C	2.0	1.0	0.1	1.0	860 °C	100	50
1st Dentine firing	600 °C	3.0	2.0	0.1	1.0	860 °C	100	50
2nd Dentine firing	600 °C	3.0	2.0	0.1	1.0	850 °C	100	50
Glaze firing	600 °C	2.0	2.0	0.0	0.5–1.0	850 °C	100	–
➲ *Mono dentine and glaze bake*	*400 °C*	*3.0*	*2.0*	*0.1*	*0.5–1.0*	*850 °C*	*100*	*50*
Correction ceramic	600 °C	2.0	2.0	0.1	1.0	810 °C	100	50
LM shoulder ceramic	600 °C	3.0	1.0	0.1	1.0	790 °C	100	50

Programat P90/P95

	Standby temp.	Heat rate	Firing temp.	Clos. time	Holding time	Vac. ON	Vac. OFF
Zr-Adhesive	400 °C	100	1050 °C	6	10	500 °C	1050 °C
Liner	400 °C	100	880 °C	6	1	500 °C	879 °C
1st HM shoulder ceramic	500 °C	100	870 °C	4	1	500 °C	869 °C
2nd HM shoulder ceramic	500 °C	100	860 °C	3	1	500 °C	859 °C
1st Dentine firing	400 °C	100	860 °C	5	1	500 °C	859 °C
2nd Dentine firing	400 °C	100	850 °C	5	1	500 °C	849 °C
Glaze firing	400 °C	100	850 °C	4	0.5–1	no vacuum	no vacuum
➲ *Mono dentine and glaze bake*	*400 °C*	*100*	*850 °C*	*5*	*0.5–1*	*400 °C*	*849 °C*
Correction ceramic	400 °C	100	810 °C	4	1	500 °C	800 °C
LM shoulder ceramic	500 °C	100	790 °C	4	1	500 °C	789 °C

Programat X1/EP 600

	B Standby temp. [°C]	S Clos. time [min]	t Heat rate [°C/min]	T Firing temp. [°C]	H Holding time [min]	V% Vacuum level [%]	VE Vac. ON [°C]	VA Vac. OFF [°C]
Zr-Adhesive	400	6:00	100	1050	10.00	100	500	T
Liner	400	6:00	100	880	1.00	100	500	1° below T
1st HM shoulder ceramic	500	4:00	100	870	1.00	100	500	1° below T
2nd HM shoulder ceramic	500	3:00	100	860	1.00	100	500	1° below T
1st Dentine firing	400	6:00	100	860	1.00	100	500	1° below T
2nd Dentine firing	400	6:00	100	850	1.00	100	500	1° below T
Glaze firing	400	4:00	100	850	0.30	–	no	no
➲ Mono dentine and glaze bake	*400*	*5:00*	*100*	*850*	*0.5–1.0*	*100*	*400*	*1° below T*
Correction ceramic	400	4:00	100	810	1.00	100	500	1° below T
LM shoulder ceramic	500	4:00	100	790	1.00	100	500	1° below T

Vacumat 2500

	Standby temp. [°C]	Final temp.	Predrying time	Heat rate	Holding time	Vac. time
Zr-Adhesive	600 °C	1050 °C	6.0	100	10.0	13.5
Liner	600 °C	880 °C	6.0	100	2.0	3.0
1st HM shoulder ceramic	600 °C	870 °C	4.0	100	1.0	3.0
2nd HM shoulder ceramic	600 °C	860 °C	3.0	100	1.0	3.0
1st Dentine firing	600 °C	860 °C	5.0	100	1.0	3.0
2nd Dentine firing	600 °C	850 °C	5.0	100	1.0	3.0
Glaze firing	600 °C	850 °C	4.0	100	0.5	0.0
➲ Mono dentine and glaze bake	*400 °C*	*850 °C*	*5.0*	*100*	*0.5–1.0*	*4.5*
Correction ceramic	600 °C	810 °C	5.0	100	1.0	2.5
LM shoulder ceramic	600 °C	790 °C	4.0	100	1.0	2.5

Cergo Press/Cergo Compact

	Zr-Adhesive	Liner	1st HM shoulder ceramic	2nd HM shoulder ceramic	1st Dentine firing	2nd Dentine firing	Glaze firing	*➲ Mono dentine and glaze bake*	Correction ceramic	LM shoulder ceramic
Predrying [°C]	120	120	135	135	135	135	135	*135*	135	135
Predrying [min]	4:00	4:00	3:00	3:00	3:00	3:00	2:00	*2:00*	3:00	3:00
Closing time [min]	2:00	2:00			2:00	2:00	2:00	*3:00*	2:00	2:00
Preheating [°C]	600	600	600	600	600	600	600	*400*	600	600
Preheating [min]	1:00	1:00	1:00	1:00	1:00	1:00	1:00	*1:00*	1:00	1:00
Heat rate [°C/min]	100	100	100	100	100	100	100	*100*	100	100
Vacuum	On	On	On	On	Cont.	Cont.	Off	*On*	On	On
Vac. on [°C]	600	600	600	600	600	600	–	*400*	600	600
Vac. off [°C]	–	880	870	860	860	850	–	*850*	830	800
Final temp. [°C]	1050	880	870	860	860	850	845	*850*	830	800
V HOLD [min]	10:00	0:00	0:00	0:00	0:00	0:00	0:00	*0:00*	0:00	0:00
HOLD [min]	0:00	1:00	1:00	1:00	1:00	1:00	0:30	*0:30–1:00*	1:00	1:00
TEMPER [min]	0:00	0:00	0:00	0:00	0:00	0:00	0:00	*0:00*	0:00	0:00
TEMPER [°C]	–	–	–	–	–	–	–	–	–	–
COOL TIME [min]	0:00	0:00	0:00	0:00	0:00	0:00	0:00	*0:00*	0:00	0:00

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