Heraeus

INSTRUCTIONS FOR USE

HeraCeram® — Traditional Metal Bonding Alloys

HeraCeram®

HERACERAM —
FOR TRADITIONAL METAL BONDING ALLOYS

HeraCeram is the perfect choice for veneering traditional metal bonding alloys in a CTE range of 13.5–14.9 µm/mK. Thanks to the low firing temperatures of 880°C max, all alloys in this CTE range can be safely processed with HeraCeram.

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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 Al_2O_3 and K_2O, 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 that we term, 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.

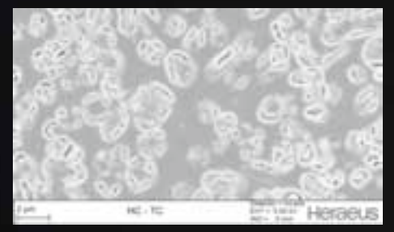


Fig. 1 HeraCeram etching micrograph with leucite structure

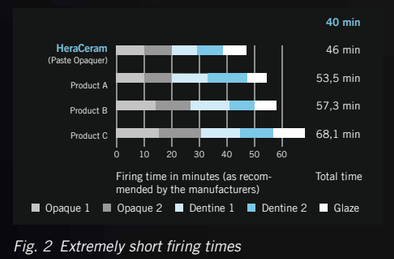
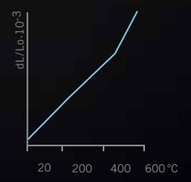


Fig. 2 Extremely short firing times

Fig. 3 Comparison of CTE. Unstable CTE of other dental ceramic after multible firing.



Stabilisied CTE of HeraCeram after multiple firing.

INSTRUCTIONS FOR TRADITIONAL BONDING ALLOYS

PERFECT FRAMEWORKS FOR ALL REQUIREMENTS.

EVERY DAY A–D SHADES
Reliable reproduction of classic A–D shades

- Opaquer set
- Dentine incisal set
- Optional: Stain set

PERSONALISED
Patient specific shade adjustment

- Opaquer set
- Dentine incisal set
- Optional: Stain set

\+

- Increaser set
- Enhancer set

Our starter sets: First-Touch set; Professional set

MATRIX
Truly natural for highly individualised restorations

- Opaquer set
- Dentine incisal set
- Optional: Stain set

\+

- Matrix set

SPECIAL
Special applications

- Margin set
- Mono set
- Bleach shades
- Pressable ceramics

A: SIMPLIFIED LAYERING

01 Framework preparation

To ensure high bond strength, the framework must be sandblasted with 125 µm alumina oxide prior to veneering. High gold content, palladium free alloys must only be sandblasted at a pressure of 2–3 bar and at an obtuse angle. This prevents alumina oxide particles penetrating the surface of the framework. All other alloys can be sandblasted at a pressure of 3–4 bar.

The micro retention created by sandblasting enhances the metal ceramic bond and consequently the quality of the prosthetic restoration. Conditioning the surface is the first step toward veneering with ceramics.

Fig. 4 Trimmed framework

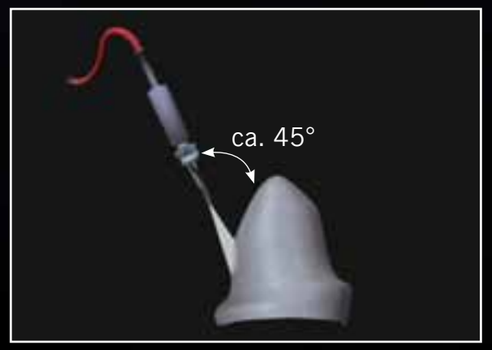


Fig. 5 Sandblasting at the correct angle

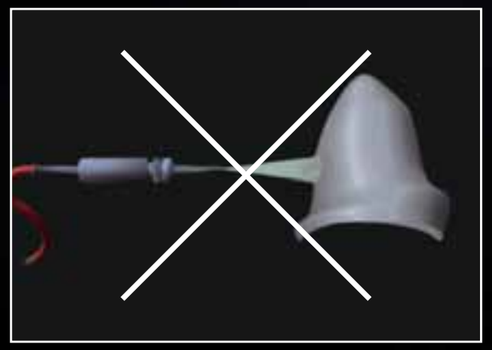


Fig. 6 Sandblasting at the incorrect angle

Cleaning the surface of the framework prior to Oxidation

The framework surface is best cleaned with a steam cleaner. After cleaning, the frameworks must no longer be touched with fingers but only with clean tweezers or haemostats.

The oxide firing settings (temperature, times, vacuum or atmosphere) are shown on the alloy packaging. Oxidation firing is a good indicator for assessing the cleanliness of the alloy. The oxide layer must be uniform and free of mottling. If the surface is mottled, the framework must be sandblasted again with alumina oxide, cleaned and the oxidation firing repeated.

When firing high gold content palladium free alloys it is highly advisable to provide the framework with firm, adequate support on the firing tray.

With Pt and Pd based alloys, the oxide layer extends deeper into the alloy than with high gold content alloys and the oxide is relatively dark. In cases where inadequate space is available and only a thin layer of ceramic can be applied thus causing difficulties with the shade, the oxide layer can be sandblasted off again with alumina oxide. The opaque is then applied directly onto the cleaned framework.

High gold content metal ceramic alloys containing zinc must be pickled after the oxide firing to remove the oxide (e.g. with Hera AM 99, 10 min).

Once they have been steam cleaned and dried, the frameworks are ready for veneering with ceramics.

IMPORTANT! The following data is based on procedures, equipment and materials recommended by Heraeus.
Revision mark: This arrow (➲) identifies all changes and additions compared with past versions. Moreover, the corresponding texts are in italics. The previously valid printed matter for HeraCeram, “Instructions for Use of High-Fusing Porcelain for Classic Metal-Ceramic Alloys. 02/2009”, is no longer valid and was updated and summarised in these Instructions for Use.

Firing the ceramic

The temperatures and settings for firing HeraCeram are shown in the firing charts in section G.

Firing cycles for high gold content, palladium free alloys: It is essential to provide the framework with firm, adequate support on the firing tray.

Firing ceramic onto soldered frameworks: The ceramic bearing surfaces should not be coated with large areas of solder.

Cooling After Ceramic Firing

When veneering with HeraCeram, it is no longer essential to cool the restoration slowly to allow the CTE of the ceramic to adapt to that of the alloy.

Fig. 7 Sandblasted framework

Fig. 8 Oxide fired framework

NP-Primer

➲ *The NP-Primer conditions nonprecious metal alloy surfaces by preventing uncontrolled excessive oxidation and thus ensures that the framework surface is wetted perfectly with the opaquer.*

The NP-Primer is applied very thinly (high brush pressure!) to the veneer surface with the paste opaquer brush and fired under vacuum for 1 minute at 950°C.

Fig. 9 NP-Primer applied very thinly (high brush pressure!) with paste opaquer brush.

Fig. 10 Fire at 950°C under vacuum for 1 minute.

When using the NP-Primer, non-precious metal specific expansion cooling may no longer be required

02 Applying the opaque

Pre-Opaque

Only required when veneering non-precious alloys

HeraCeram Pre Opaque enhances the use of HeraCeram on non-precious metal ceramic alloys. When Pre Opaque is used, no stress relieving cooling cycle specific to non precious alloys is required!

Processing:
After trimming and sandblasting the framework, a thin, uniform coat of ready to use paste is brushed onto the ceramic bearing surface of the dry framework and fired under vacuum using the oxide firing cycle recommended for the non-precious alloy in use.

If there is no recommended oxide firing cycle, the Pre Opaque should be fired at 980°C using the opaque firing cycle and a hold time of 10 min. under vacuum.

Fig. 11 Pre Opaque is applied in a thin coat

PLEASE NOTE: If no NP-Primer or Pre Opaque is used on non precious alloy, we recommend firing the first layer of opaque at 950°C. The ceramic firing charts are in section 3 of these instructions.

PLEASE NOTE: With some non precious alloys water soluble oxides may form during firing and cause yellowish discoloration in the ceramics. To prevent this discolouration, non-precious frameworks should be rinsed with water after every firing.

Fig. 12 After firing, the Pre Opaque should exhibit an eggshell finish

Paste Opaque

The Paste Opaque is applied in two thin coats. Paste Opaque is also fired at 880°C, whereby the pre drying phase must be adapted to the drying behaviour of the paste liquid (see the firing charts in section G). If the Paste Opaque has become dry and stiff due to excessive storage, PO liquid can be added carefully to restore the ideal consistency.

After firing, the opaque should have a glossy surface.

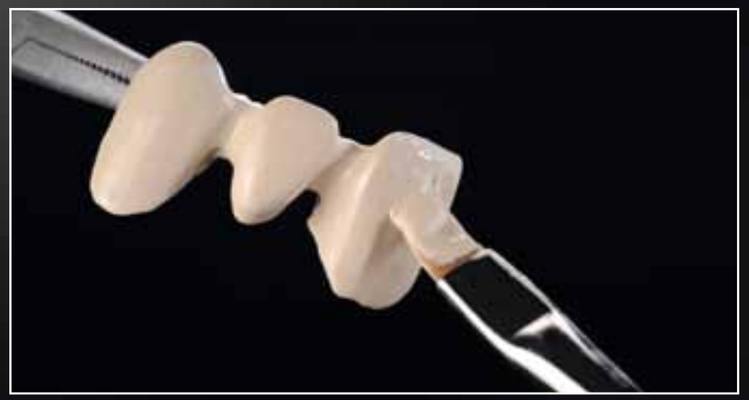


Fig. 13
A uniform coat of **Paste Opaque**

For custom designs of the opaque layer, 6 intensive opaquers are available in paste and powder form:

— Bleach, a whitish opaque for reproducing extremely light shades or lightening the opaque shades.
— Gold, for creating a “warmer” basic tone by increasing the chroma from within the veneer.
— Gingiva, pink opaque for use in those regions where gingival ceramics is applied.
— OCA; OCB; OCC, high chroma opaques for the A, B and C shades, e.g. special effects in the cervical region.

A full shade configuration chart for HeraCeram ceramics is shown in section F.

PLEASE NOTE: Cooling after firing the ceramic
The firing platform is lowered immediately after the cycle is finished. The firing tray with the restorations can be removed immediately and cooled in air.

Powder Opaque

The Powder Opaque is mixed with opaque liquid OL2 to form a paste with lacquer like consistency and applied in a thin, uniform layer to the ceramic bearing surface.

Depending on the preferred technique, this can be carried out with a ceramics brush or ball end instrument (e.g. glass). The firing temperature is 880°C. The opaque layer is glossy after firing. A second coat is then applied using the same technique and fired at the same temperature.

Fig. 14 …or **Powder Opaque** *is applied*

Fig. 15 Glossy, semi masking opaque surface after the first opaque firing.

Fig. 16 The opaquer colour indicator

Fig. 17 The masking power of the opaque can be seen after applying and firing the second coat.

03 Dentine/Incisal build up

Firing temperature: 850°C (see the firing charts in section G)

Fig. 18 In order to reproduce ready mixed shades, HeraCeram can be built up in two simple layers using dentine and enamel.

Fig. 19 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. 20 The vitality of the incisal region can be further enhanced by inlaying transparent wedges.

Fig. 21 The facing is then built up fully with the appropriate incisal ceramics (refer to shade chart)

PLEASE NOTE: If no Pre Opaque and NP-Primer is used on non precious alloys, it is advisable to relieve stresses by cooling these alloys as they are very hard. This is achieved by leaving the firing tray with the restorations on the firing platform of the furnace for 1–2 minutes after firing. Or programme a cooling phase of 1–2 minutes.

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

Second firing

Fig. 22 After firing, the ceramic has a glossy, structured finish. The proximal and occlusal contact areas are ground in with diamond stones.

Fig. 23 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.

Glaze firing

Fig. 24 The restoration after the second dentine firing

Fig. 25 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.

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 G (firing temperature 850°C). HeraCeram can also be polished by hand. Our Signum HP Pastes has proven really effective for creating a high lustre.

Control

Fig. 26 Checking the surface morphology with silver powder

Fig. 27 Final individualisation with HeraCeram stains. For glaze firing, the ceramic can still be given final individual characterisation. Wetting the porcelain surface with staining liquid makes the layering and colour impression more visible. This gives good control for custom characterisation with glazing material and stains.

Fig. 28 In reflected light after glaze firing

Fig. 29 In transmitted light after glaze firing

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 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).

B: PERSONALISED LAYERING

04 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. 30 Amazing "custom" 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. 31 (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.

Fig. 32 Crown contours built up fully with dentine

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

A full shade configuration chart for HeraCeram ceramics is shown in section F.

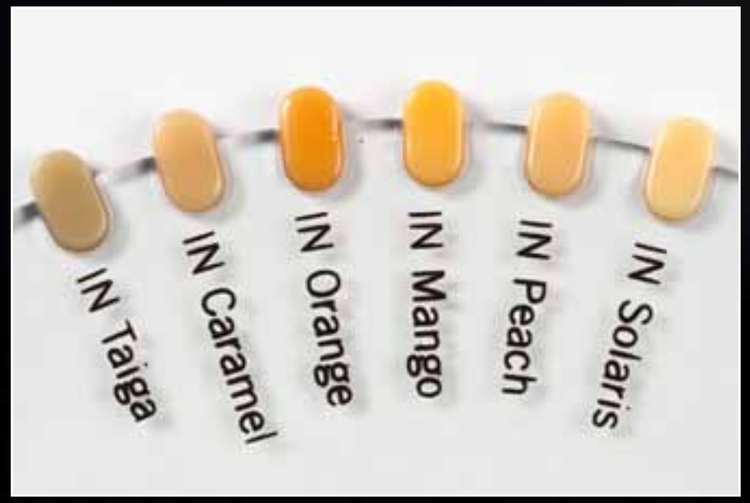


Fig. 33 Increaser colour indicator

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

Fig. 35 …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. 36 …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. 37 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. 38 The Mask components and a typical example of how they are applied: After the body has been built up and cut back…

Fig. 39 …a thin layer of Mask material is applied to the incisal area of the dentine to mask the undersized framework

Fig. 40 Then the mamelons are cut out…

Fig. 41 …and built up again as usual using incisal and transparent materials.

Fig. 42 With only minimal yet efficient effort, results can be achieved which, are a pleasure to see.

The Increaser Set and the Enhancer Set can also be used for building up posterior restorations.

Fig. 43 Opaqued crowns

Fig. 44 The so called "fish mouth" has been built up with dentine

Fig. 45 Modifier such as **Increaser Orange (IN O)** *has been inlaid to create an in depth effect in the occlusal depth*

Fig. 46 Modifier such as **Increaser Orange (IN O)** *has been inlaid to create an in depth effect in the occlusal depth*

Fig. 47 **Enhancer neutral (EH Neutral)** *is then applied to increase the transparency*

Fig. 48 Fully built up crowns with **incisal** *and* **Enhancer materials and EH** *bright on the cusp tips*

Fig. 49 Crowns after the first firing

Fig. 50 Corrections carried out with **Enhancer EH neutral**

Fig. 51 Crowns after the second firing

Fig. 52 Crowns after trimming with diamond burs and silicone polishers

Fig. 53 Staining with **HeraCeram stains**

Fig. 54 After the glaze firing

C: MATRIX LAYERING

06 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 , developed in cooperation with MDT Paul A. Fiechter, has a simple layered structure that is easy to implement.

Fig. 55 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 fluorescence. (Alternatively, the colour-coordinated Increasers can also be used)

Fig. 56 The crowns are built up fully with dentine to allow them to be cut back in a controlled manner

Fig. 57 The central incisor has been cut back

Fig. 58 All crowns have been cut back

Fig. 59 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. 60 Smooth transitions are important to avoid distinct borders between the material and base shade

Fig. 61 **Mamelon dentines** *are flooded into the* **Value ceramics** *...*

Fig. 62 ...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. 63 A ridge of e. g. **Opal transpa Ice** *is laid over the mamelons*

Fig. 64 The mamelon structures are then overlaid with **Opal incisal**

Fig. 65 The desired anatomical contours are then built up with the correct shade of **Opal incisal** *or various* **Opal Transpa** *materials*

Fig. 66 Fully built up crown

Fig. 67 After the first dentine firing

Fig. 68 After firing, the sintering shrinkage is compensated for and fine corrections of form and layering are carried out with e.g. Opaltranspa materials (OT). Characterisation can then be done with HeraCeram stains and glaze.

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. 69 In reflected light

Fig. 70 In transmitted light

Fig. 71 Picture of Matrix colour indicator

D SPECIAL

7 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) and 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.

Framework design

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

Fig. 72 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 and masked with opaque.

Fig. 73 When applying the opaque, ensure that the metal margin is fully masked where the ceramic shoulder is to be built up

Fig. 74 Applying the separating agent to the margin area. Firstly, HeraCeram separating agent is applied to the die stone surface in the shoulder region. Any sealant applied to the die stone previously will impede the separating properties!

First build up with HM margin ceramic

Fig. 75 The shoulder material is mixed with SM Liquid to produce a kneedable dough before being applied to the cervical region of the crown.

Fig. 76 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.

Fig. 77 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 D.

Correction build up

Fig. 78 After firing, the marginal fit is checked and 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. 79 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.

Fig. 80 The ceramic margin fits perfectly after correction

Fig. 81 The ceramic is then built up as usual

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. 82 Metal ceramic crown with inadequate marginal fit

Fig. 83 Correcting the marginal fit with LM margin ceramic…

Fig. 84 …in the pontic and cervical regions

Fig. 85 Finished metal ceramic crowns with ceramic margins

8 HeraCeram Mono

Instructions for Use

HeraCeram 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.

Opaquer Layer

Fig. 86 For the monolayering technique, the mono-opaquer MO is simultaneously thinly applied and fired. (See Assignment Table for colour selection.) The firing temperature is 880°C.

Fig. 87 The opaquer surface has a silky sheen after firing. Repeat this step if the framework is not completely covered.

Color Assignment of HeraCeram Mono

V Colour	Mono Opaquer MO	Mono Body MB	Body Stains BS
A1	MO-Light	MB-Light	50 % BS A-50 % Glaze
A2	MO-A	MB-A	Glaze
A3	MO-A	MB-A	BS A-1 Layer
A3.3	MO-A	MB-A	BS A-2 Layers
A4	MO-A	MB-A	BS A-3 Layers
B1	MO-Light	MB-Light	50 % BS B-50 % Glaze
B2	MO-B	MB-B	Glaze
B3	MO-B	MB-B	BS B-1 Layer
B4	MO-B	MB-B	BS B-2 Layers
C1	MO-Light	MB-Light	50 % BS B-50 % Glaze
C2	MO-C	MB-C	Glaze
C3	MO-C	MB-C	BS C-1 Layer
C4	MO-C	MB-C	BS C-2 Layers
D2	MO-Light	MB-Light	BS C-1 Layer
D3	MO-A	MB-Light	BS C-1 Layer
D4	MO-B	MB-C	50 % BS C-50 % MF19 Olive

Anatomical Build-Up

Fig. 88 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. 89 Complete anatomical shaping with the Mono Body

Fig. 90 The losses of shape after the first firing, is amended and corrected with Mono-Body.

Fig. 91 These corrections do not influence the colour effect, because a monochrome build-up does not result in any colour changes.

Fig. 92 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. 93 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. 94 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. 95 Buccal view of the veneer

Fig. 96 Finished work after glaze firing

9 Final Treatment

HeraCeram is easy to mechanically polish. For final polishing, our HP Paste is ideal.

To achieve a smooth and shiny alloy surface, the polishing process should correspond to the hardness of the alloy in question. The direction of the polishing tool should be constantly changed. For high-lustre polishing with rotating linen, untreated cotton and wool buffs, only a small amount of polish should be used.

Polishing the Ceramic

The object should be cleaned before every change of the polish. Cleaning before changing the polishing tool is not required for the same polish. Smooth alloys are pre-polished with a rubber polisher until the polished surface is free of streaks and grooves.

Polishing the Metal Surface

Polishing is then done with a hard brush in the handpiece at low speed (5000 RPM) with a little Hera GPP 99 gold polishing paste and slight contact pressure. High-lustre polishing is carried out with a soft goat's-hair brush in conjunction with the Hera GPP 99 gold polishing paste at low speed (5000 RPM) in a handpiece and with low contact pressure. The final residue of the applied paste is then removed with wool buffs.

Pickling the Crown Margins of Finished Workpieces

If oxide residue remains on the crown margins of ceramic veneers, this may cause gum irritation. Pickling of finished restorations to completely remove oxide residue is therefore generally recommended to increase safety for patients. For this, pickling is done in Hera AM 99 for about 10 minutes at around 70°C. (The same bath can be used to remove oxides after oxide firing.)

Acid residue must then be removed from the restoration by washing and careful evaporation, and it should also be cleaned.

F: COLOUR MAPPING TABLE

	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Powder Opaquer	OA1	OA2	OA3	OA3,5	OA4	OB1	OB2	OB3	OB4	OC1	OC2	OC3	OC4	OD2	OD3	OD4
Paste Opaquer	POA1	POA2	POA3	POA3,5	POA4	POB1	POB2	POB3	POB4	POC1	POC2	POC3	POC4	POD2	POD3	POD4
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 Porcelain	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.

G: FIRING PROGRAMMES

General Firing Programme

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
Preheating or starting temperature: [°C]	*600*	600	600	600	600	600	600	600	600	*400*	600	600
Predrying and preheating time: [min]	*3*	6	6	2	4	3	5	5	4	*5*	4	4
Temperature increase: [°C/min]	*100*	100	100	100	100	100	100	100	100	*100*	100	100
Final temperature: [°C]	*950*	980[2]	880	880	870	860	860	850	850	*850*	810	790
Holding time: [min]	*1*	10	1	1	1	1	1	1	0.5–1	*0.5–1*	1	1
Vacuum start: [°C]	*600*	600	600	600	600	600	600	600	–	*400*	600	600
Vacuum stop: [°C]	*950*	980[2]	880	880	870	860	860	850	–	*850*	810	790

Heramat C/C2/C3/C3 press

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	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	600	600	*400*	600	600
DRY [min]	*3*	6	6	2	4	3	5	5	4	*5*	4	4
PRE HEAT [min]	*1:00*	1:00	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*	100	100
HIGH TEMP [°C]	*950*	980[2]	880	880	870	860	860	850	850	*850*	810	790
HOLD [min]	*1*	10	1	1	1	1	1	1	0,5–1	*0,5–1*	1	1
TEMPER [°C]	–	–	–	–	–	–	–	–	–	–	–	–
TEMP HOLD [min]	–	–	–	–	–	–	–	–	–	–	–	–
COOL TIME [min]	–	–	–	–	–	–	–	–	–	–	–	–
V ON [°C]	*600*	600	600	600	600	600	600	600	–	*400*	600	600
V OFF [°C]	*950*	–	880	880	870	860	860	850	–	*850*	810	790
V HOLD [min]	–	10	–	–	–	–	–	–	–	–	–	–

[1] = Only when veneering non-precious metal-ceramic alloys
[2] = Or at the oxide firing temperature recommended by the manufacturer
[3] = Under vacuum

Austromat 3001/Press-i-dent

➲ *NP-Primer*[1]	*C600*	*T120•L9*	*T60*	*V9*	*T099•C950*	*V0*	*T60*	*C0*	*L0*	*T2*	*C600*
Pre-Opaque[1]	C600	T360	T60•L9	T60	V9	T099•C980	T600	V0	C0	L0	T2	C600
Pasten-Opaker	C600	T120•L9	T60	V9	T099•C880	V0	T60	C0	L0	T2	C600	
Pulver-Opaker	C600	T180	T60•L9	T60	V9	T099•C870	V0	T60	C0	L0	T2	C600
Schultermasse HM1	C600	T180	T60•L9	T60	V9	T099•C870	V0	T60	C0	L0	T2	C600
Schultermasse HM2	C600	T120•L9	T60	V9	T099•C860	V0	T60	C0	L0	T2	C600	
1.Dentinbrand	C600	T180•L9	T120	V9	T099•C860	V0	T60	C0	L0	T2	C600	
2.Dentinbrand	C600	T180•L9	T120	V9	T099•C850	V0	T60	C0	L0	T2	C600	
Glanzbrand	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*	
Korrekturmasse	C600	T120•L9	T120	V9	T099•C810	V0	T60	C0	L0	T2	C600	
Schultermasse LM	C600	T120	T60•L9	T60	V9	T099•C790	V0	T60	C0	L0	T2	C600

Austromat M

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
START	*600*	600	600	600	600	600	600	600	600	*400*	600	600
→	*0*	0	0	0	0	0	0	0	0	*0*	0	0
↑	*1*	1	1	1	1	1	2	2	2	*2*	2	1
→	*2*	6	6	2	3	2	3	3	2	*3*	2	3
VAC	*9*	9 (d)	9	9	9	9	9	9	–	*9*	9	9
°C↗min.	*99*	99	99	99	99	99	99	99	99	*99*	99	99
END	*950*	980	880	880	870	860	860	850	850	*850*	810	790
→	*01:00*	10:00	01:00	01:00	01:00	01:00	01:00	01:00	00:30–01:00	*00:30–01:00*	01:00	01:00
[1]↘	*0*	0	0	0	0	0	0	0	0	*0*	0	0
↘[2]	*0*	0	0	0	0	0	0	0	0	*0*	0	0

[1] = Only when veneering non-precious metal-ceramic alloys
[2] = Or at the manufacturer's recommended oxide firing temperature

Gemini II bzw. HT/HT Press

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
Low temp. [°C]	*600*	600	600	600	600	600	600	600	600	*400*	600	600
Up time [min]	*02:00*	06:00	06:00	02:00	03:00	03:00	03:00	03:00	03:00	*04:00*	02:00	3:00
Preheat time [min]	*01:00*	01:00	01:00	01:00	01:00	01:00	02:00	02:00	02:00	*02:00*	02:00	1:00
Heat rate [°C/min]	*100*	100	100	100	100	100	100	100	100	*100*	100	100
Vac. start [°C]	*600*	600	600	600	600	600	600	600	–	*400*	600	600
Vac. end [°C]	*950*	–	880	880	870	860	860	850	–	*850*	810	790
Vac. delay [min]	–	10	–	–	–	–	–	–	–	–	–	0:00
Vac. level [min]	*710*	710	710	710	710	710	710	710	–	*710*	710	710
High temp. [°C]	*950*	980[2]	880	880	870	860	860	850	850	*850*	810	790
Temp. delay [min]	*1*	10	1	1	1	1	1	1	0,5–1	*0,5–1*	1	0:30
Final temp. [°C]	–	–	–	–	–	–	–	–	–	–	–	–
Final delay [min]	*00:00*	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	*00:00*	00:00	0:00
Down time [min]	*00:00*	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	*00:00*	00:00	0:00

[1] = Only when veneering non-precious metal-ceramic alloys
[2] = Or at the manufacturer's recommended oxide firing temperature

Multimat MC II/Mach 2/Touch & Press

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
Pre-heating Temp. [°C]	*600*	600	600	600	600	600	600	600	600	*400*	600	600
Drying [min]	*2.0*	6.0	6.0	2.0	3.0	2.0	3.0	3.0	2.0	*3.0*	2.0	3.0
Pre-Heating [min]	*1.0*	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	*2.0*	2.0	1.0
Vac. Time [min]	*1.0*	9.6	0.1	0.1	0.1	0.1	0.1	0.1	–	*0.1*	0.1	0.1
Firing Time [min]	*2.0*	10.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5–1.0	*0.5–1.0*	1.0	1.0
Firing Temp.[°C]	*950*	980[2]	880	880	870	860	860	850	850	*850*	810	790
Heating-Up Rate [°C/min]	*100*	100	100	100	100	100	100	100	100	*100*	100	100
Vacuum [hPa]	*50*	50	50	50	50	50	50	50	–	*50*	50	50

Programat P90/P95

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material ▼	Shoulder Ceramic LM
Starting Temp. [°C]	*400*	400	400	400	500	500	400	400	400	*400*	400	500
Temp. Increase [°C/min]	*100*	100	100	100	100	100	100	100	100	*100*	100	100
Firing Temp. [°C]	*950*	980	880	880	870	860	860	850	850	*850*	810	790
Closure Time [min]	*4*	6	6	2	4	3	5	5	4	*5*	4	4
Holding Time [min]	*1*	10	1	1	1	1	1	1	0,5–1	*0,5–1*	1	1
Vac. ON [°C]	*500*	500	500	500	500	500	500	500	–	*400*	500	500
Vac. OFF [°C]	*949*	980	879	879	869	859	859	849	–	*849*	809	789
Vacuum [mbar]	*50*	50	50	50	50	50	50	50	–	*50*	50	50

[1] = Only when veneering non-precious metal-ceramic alloys
[2] = Or at the manufacturer's recommended oxide firing temperature

Programat X1/EP 600

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
B Starting Temp. [°C]	*400*	400	400	500	500	500	400	400	400	*400*	400	500
S Closure Time [min]	*03:00*	06:00	06:00	03:00	04:00	03:00	06:00	06:00	04:00	*05:00*	04:00	04:00
t Temp. Rise [°C/min]	*100*	100	100	100	100	100	100	100	100	*100*	100	100
T Firing Temp. [°C]	*950*	980	880	880	870	860	860	850	850	*850*	810	790
H Holding Time [min]	*01:00*	10:00	01:00	01:00	01:00	01:00	01:00	01:00	00:30	*00:30*	01:00	01:00
V % Vacuum Quality [%]	*100*	100	100	100	100	100	100	100	–	*100*	100	100
VO Vac. ON [°C]	*500*	500	500	500	500	500	500	500	–	*400*	500	500
VOff Vac. OFF [°C]	*1° below T*	T	1° below T	1° below T	1° below T	1° below T	1° below T	1° below T	no	*1° below T*	1° below T	1° below T

Vacumat 2500

	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
Starting Temp. [°C]	600	600	600	600	600	600	600	600	600	*400*	600	600
Final Temp. [°C]	950	980[2]	880	880	870	860	860	850	850	*850*	810	790
Pre-Drying Time [min]	3.0	6.0	6.0	3.0	4.0	3.0	5.0	5.0	4.0	*5.0*	5.0	4.0
Heating-Up Rate [°C/min]	100	100	100	100	100	100	100	100	100	*100*	100	100
Holding Time [min]	1.0	10.0	2.0	1.0	1.0	1.0	1.0	1.0	0.5	*0.5*	1.0	1.0
Vac. Time [°C]	3.0	12.5	3.0	3.0	3.0	3.0	3.0	3.0	–	*4.5*	2.5	2.5

[1] = Only when veneering non-precious metal-ceramic alloys
[2] = Or at the manufacturer's recommended oxide firing temperature

												Cergo Press/Cergo Compact
	➲ *NP-Primer*[1]	Pre-Opaque[1]	Paste Opaquer	Powder Opaquer	Shoulder Ceramic HM1	Shoulder Ceramic HM2	1st Dentine	2nd Dentine	Glaze	➲ *Mono dentine and glaze bake*	Correction Material	Shoulder Ceramic LM
Pre-Drying [°C]	*120*	120	120	135	135	135	135	135	135	*135*	135	135
Pre-Drying [min]	*00:00*	04:00	06:00	02:00	03:00	03:00	03:00	03:00	02:00	*03:00*	02:00	03:00
Closure [min]	*02:00*	02:00	02:00	02:00	00:00	00:00	02:00	02:00	02:00	*02:00*	02:00	02:00
Pre-Heating [°C]	*600*	600	600	600	600	600	600	600	600	*400*	600	600
Pre-Heating [min]	*01:00*	01:00	01:00	01:00	01:00	01:00	01:00	01:00	01:00	*01:00*	01:00	01:00
Increase [°C/min]	*100*	100	100	100	100	100	100	100	100	*100*	100	100
Vacuum	*On*	On	On	On	On	On	Cont.	Cont.	Off	*On*	On	On
Vac. On [°C]	*600*	600	600	600	600	600	600	600	–	*400*	600	600
Vac. Off [°C]	*950*	–	880	880	870	860	860	850	–	*850*	810	790
Final Temp. [°C]	*950*	980[2]	880	880	870	860	860	850	850	*850*	810	790
Hold V [min]	*00:00*	10:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	*00:00*	00:00	00:00
Hold [min]	*01:00*	00:00	01:00	01:00	01:00	01:00	01:00	01:00	00:30	*00:30*	01:00	01:00
Tempering [min]	*00:00*	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	*00:00*	00:00	00:00
Tempering [°C]	–	–	–	–	–	–	–	–	–	–	–	–
Cooling [min]	*00:00*	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	*00:00*	00:00	00:00

[1] = Only when veneering non-precious metal-ceramic alloys
[2] = Or at the manufacturer's recommended oxide firing temperature

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