HEIMERLE+MEULE

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PLATINA® m.

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The System Ceramic

PLATINA®m is a modern, innovative, two-phase leucite glass ceramic stained in accordance with the VITA® colour system. Simple layering and minimum expenditure of time allow the reconstruction of natural teeth. The exact firing behaviour guarantees high-quality and reproducible results. Even if only limited space is available, an excellent reproduction of the tooth colour can be achieved using materials that exactly match in terms of colour.

Glass matrix in which regularly distributed leucite crystals and fine colour particles ensure a very dense and homogeneous surface increases the patient's mucosa compatibility. Reflection, light transport, opalescence and fluorescence have the same characteristics as natural teeth.

The high stability when layering facilitates the perfect form design. Low shrinkage during firing leads to higher form stability of the framework. Since the colour value of the ceramic adapts to the immediate vicinity of the adjacent tooth, crowns and bridges made of PLATINA®m ceramic excellently match to the natural tooth colour.

The hardness values of the PLATINA®m ceramic correspond to those of the dental enamel ensuring a normal abrasion behaviour. When using fusible universal alloys in the temperature range 25 – 500 °C, the CET values ideally lie between 16.0 – 16.7 µm/mK.
PLATINA®m ceramic can be employed beyond the boundaries of existing systems. The patient chooses the material on which facing ceramic is to be carried out:

- highly expanding alloys
  - PLATINORM
  - PLATINOR® M 1
  - PLATINOR® M 3
  - AUROPLADENT® M
  - ECONOR® M
- full ceramic restorations
  - PLATINA®press
- electroplated frameworks

With this system, the patient can be provided with inlays, crowns, bridges, telescopic work, model casting and metal-ceramic constructions using just one alloy.
The major benefit of the PLATINA®m ceramic is in the choice of application.

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The System Alloys

Heimerle + Meule has adapted the dental ceramic PLATINA®m to these universal alloys. The potential applications of the system are nearly unlimited and meet even the highest requirements with respect to safety, biocompatibility and aesthetics.

- PLATINORM
- PLATINOR® M 1
- PLATINOR® M 3
- AUROPLADENT® M
- ECONOR® M

They allow the user to select the respective alloy, depending on the area of indication and the patients' expectations. AUROPLADENT® M (copper-free) a yellow, but gold-reduced and therefore low-priced variant, is an alternative to the high gold content alloy PLATINOR® M 3 (copper- and palladium-free) and the common universal alloys PLATINORM and PLATINOR® M 1 (palladium-free). ECONOR® M (copper-free) is a silver-palladium alloy which covers the lower price range.

The System Press Ceramic

Glass ceramic is not only the material for classical metal facing ceramic, but also the basis of full ceramic restorations. Due to the already characteristic basic tooth colour of the ingots, good colour reproductions can be achieved using the layering and staining technique.

The major advantages are:

- aesthetic good looking results
- simple lab-technical processing
- exact fit of the pressed ingots

With inlays, onlays, veneers and single crowns – PLATINA®press offers many possibilities for practical application. The large number of ingots in different shades allows the fabrication of optimum dental protheses.

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1 – Wax-up contouring

The wax-up of the later metal framework should be designed as a reduced-size model of the crown or bridge, taking into account the planned facing ceramic. Thus the ceramic material can be applied evenly and it can cool off without creating any tension. Avoid sharp edges and undercuts while contouring the framework.

When creating the wax-up, the wall thickness of the contoured single crowns may not be less than 0.4 mm (0.3 mm) and that of the tooth abutments not less than 0.5 mm (0.4 mm). The cross-section of the interdental link should be adequately dimensioned. As the form stability of the framework increases with larger wall thicknesses and cross-sections in the course of ceramic firing, we recommend for high gold content alloys to contour inlay-like reinforcements or metal collars in the palatinal-lingual area.

FRAMEWORK

2 – Shaped crown

Preferably, crowns should be shaped using carbide mills. Avoid sharp edges and undercuts and try to obtain smooth transitions.

Move the rotating instruments in one direction only to avoid overlapping of metal chippings, in order to avoid potential bubbles within the ceramic.

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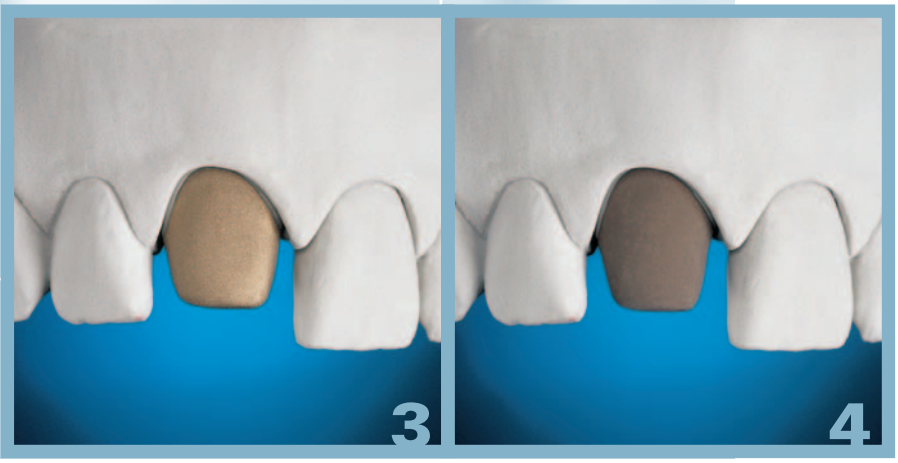
3 – Blasted crown

After shaping the metal surface is conditioned by blasting it with Al_2O_3 (grain size 100 – 125 µm and 2 – 3 bar blasting pressure) at an obtuse angle.
This surface conditioning is the first step of ceramic facing. The microretentions created during blasting increase the metal-ceramic bonding.

After blasting the framework is cleaned and degreased (steam cleaned or boiled in distilled water).
After cleaning the framework may only be touched with clean tweezers and clamps.



4 – Oxidised crown

Avoid too large span widths in the support of the framework on the firing tray should be avoided. An adequate support or an individual firing tray increase the exact fit of the framework.

The heat-up rate should be about 55 °C/min to prevent "overshooting" of the furnace temperature.
The oxide firing is carried out in accordance with the alloy manufacturer's directions. Oxidising is also considered as a cleaning firing and serves for quality control of the framework surface. After the oxide firing the colour of the framework should be consistent.

Before applying the first opaque layer, the parts to be facened are blasted again with Al_2O_3 at an obtuse angle, or they are pickled in an acid bath (e.g. Amisul).
Subsequent cleaning of the metal facing areas concludes work on the framework.

6 OPAQUE

1 – Opaque I

When applying opaque paste, make sure the paste has a creamy consistency. If the paste opaque should become drier and, therefore, harder due to longer storage, the ideal consistency can be restored again by carefully adding opaque liquid. Opaque liquid has to be added only in smallest amounts and is not required for every application. The opaque paste is best applied using a flat, short brush. Brushstrokes that are visible after application of the opaque paste are smoothed by slightly tipping on the brush or by vibrating. The opaque brush should be cleaned only with opaque liquid.

Firing chart:

Standby temp.	Closing time	Vac. start	Rise	Final temp.	Holding time
400 °C	6–8 min	450 °C	55 °C	820 °C	2 min

2 – First opaque firing

The first base material firing should result in a coverage of 60–70 % and a gently shining surface. Typically, there is not much space available for the ceramic layer to be applied; therefore during the second application a thinner coat will be applied onto the created shadow zones.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3 – Opaque II

When applying the second priming coat to the framework, not only the selected colour can be applied but different colour variations can be obtained by using intensive opaque. Four intensive opaques each are available for individualisation of the opaque layer.
In depth colour retouching enhances the aesthetic overall result since the distribution of the rays of light will be reflected creating different effects.

Firing chart:

Standby temp.	Closing time	Vac. start	Rise	Final temp.	Holding time
400 °C	6–8 min	450 °C	55 °C	820 °C	2 min

4 – Second opaque firing

The second base material firing should produce a gently shining but slightly rough surface.
The colour intensity of the fired opaque paste reflects the actual colour type. After this work step the second opaque layer is ready for further layering.

1 – Shoulder I

The principle of shoulder porcelain materials is based on the translucent effect of the gingiva.
When using conventional techniques, undesired shadows appear in the root area. The brilliance of the shoulder materials has been improved by a higher share of fluorescent components so that the entire reflection replicates a vivid colour transition and a natural appearance.

Production steps:

1. Apply a thin coat of shoulder isolating liquid onto the stone die.
2. Mix the shoulder material powder with build-up liquid 2.

During the first firing cycle, make sure to apply the shoulder material such that it phases out thinly beyond the rim of the crown in order to avoid shadow effects caused by the metal.

Firing chart:

Standby temp.	Closing time	Vac. start	Rise	Final temp.	Holding time
400 °C	4 min	450 °C	45 °C	780 °C	1 min

SHOULDER MATERIAL

2 – First shoulder firing

After the firing process, grind the shrunken material slightly and then add the required material.

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3 – Shoulder II

Insulate the die, if necessary. Since the insulating liquid might diffuse into the ceramic material applied, no wet shoulder insulation must be left on the plaster die.
Then put the mixed shoulder material into the shrinkage gap by vibrating motions, carefully lift off the framework and fire it as follows.

Firing chart:

Standby temp.	Closing time	Vac. start	Rise	Final temp.	Holding time
400 °C	4 min	450 °C	45 °C	770 °C	1 min

4 – Second shoulder firing

Two firing cycles are needed to produce an efficient shoulder. Small irregularities can be corrected in the course of further firing cycles. Slightly rework the fired shoulder and add further layers as usual.

Correct layer composition and precise arrangement of the colour attributes are important for a true-to-nature shade reproduction of the ceramic wax-up.

Base layering

The framework covered with opaque material is coated with a layer of tooth-coloured opaque dentine and then a layer of dentine material having the same colour shade is added. The ceramic materials are applied to create an anatomical tooth shape and a correct tooth axis position.

In order to achieve translucent effects in the incisal area, the incisal layering is cut back generously. Now all desired variations can be applied.

LAYERS

1a/b
Layering scheme adolescent tooth

Consider the typical mamelon structure when cutting back the previous dentine layering. The internal mamelon structure can be replicated in two ways:

1. Dilute and apply original mamelon material citro or cream or.
2. Build up several fingers of dentine modifier white-yellow or dentine modifier white-orange.

To obtain visible mamelons wedge-shaped demarcations are created using effect enamels (e.g. light-blue and grey). Using a modelling instrument the hollow for the decalcification line is prepared specifically and, depending on the colour effect, either the dentine material of the next brighter tooth colour is added, or a mixture of dentine modifier white and neutral is applied (white strips). The approximal dental ridges are layered with enamel material.
This work step is completed by an alternate layering made of Clear, enamel and a mixture of enamel/Clear.

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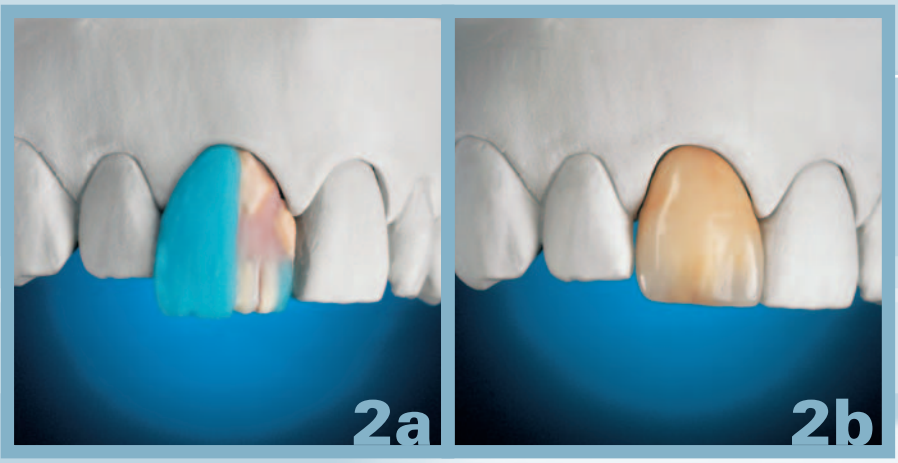
2a/b
Layering scheme ageing tooth

When cutting back the dentine layer, no are incorporated intensive structural features rather an even level is strived at. The approximal incisal edge is reinforced with effect enamel (blue, light-blue).

Filling effects at the neck of tooth or in the interdental area are shaped spot-wise with dentine modifier brown or orange, depending on their intensity. Orange-coloured incisal effects are overlaid with dentine modifier orange and a cover layer with effect enamel yellow.

For the replication of a brown enamel crack the incisal dentine modifier material is cut in, slightly split, and one side is characterised with a brushstroke of staining colour no. 11. The gap is then pushed together again.

The ridges are created with enamel and completed with alternating layers of Clear, enamel and a mixture of enamel/Clear.



PLATINA® m.

BASE MATERIALS

Opaque

The opaque pastes have been designed is away that optimum coverage of the framework is obtained after two firing cycles. Pre-treatment of the metal with "Deckgold" is not required. The shading of the opaque pastes ensures the creation of soft and natural basic shades after firing.

Opaque dentine

Opaque dentines are essential when working with the PLATINA®m ceramic, since the direct reflection of the opaque material is blocked and, therefore, reduced without changing the actual colour shade.

Dentine

Dentine materials have a higher translucency than opaque dentines – but the same colour shade. They form the transition from the lower opaque layers into the enamel transparent layer.

Incisal materials

At natural teeth, the incisal area appears to be translucent with enhanced depth effect.

Incisal no. 1	with highest whitish share
Incisal no. 2	with whitish-yellowish share
Incisal no. 3	with yellowish share
Incisal no. 4	with yellowish-orange share

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Colour display

The colour display is the basis for fabricating metal-ceramic facings. Special attention was paid to the fact that the opaque, opaque dentines and dentine materials included in the basis kit match the colours of the accustomed VITA® colour classification A 1 – D 4.

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EFFECT MATERIALS

Transparent material Clear

This material does not contain any colour pigments. Correctly applied it transfuses the colour shading of lower and adjacent layers.

Transparent material Opal Clear

Opalescence is primarily a phenomenon of light which is utilized in the incisal area. Light is selected and radiates white-blue or reddish-orange depending on the respective light spectrum that is being reached.

Transparent material Neutral

This material contains a high proportion of white and is suitable for the partial application on cusp tips and de-mineralised spots. It is preferably used for overlayering white strips or simulated lime blasts.

Effect enamels

Yellow, orange, light brown, grey, light blue, blue and pink effect enamels are pigment-enhanced transparent ceramic materials. They can be placed safely in their original state and do not cause any contrast effects but harmonise naturally with the enamel layering.

Chroma materials

Divided into colour type A, B, C, D.

When mixing chroma shades the selected colour scheme does not change in its primary colour but only varies in intensity.

If used in the neck of tooth area, age-related root defects can be simulated.

Dentine modifier

Yellow, orange, white, blue, pink, purple, brown dentine modifiers have a distinct and concise colour effect and should, therefore, be applied very precisely.

Possible fields of application are, for example:

- Mamelon structures:
  Mixture of yellow, orange and white.
- Secondary dentine:
  Layers of the colour shades yellow or orange are incorporated into the enamel structure.
- Nicotine discolouring:
  Brown, spot-like depositions are placed into the dentine layer.

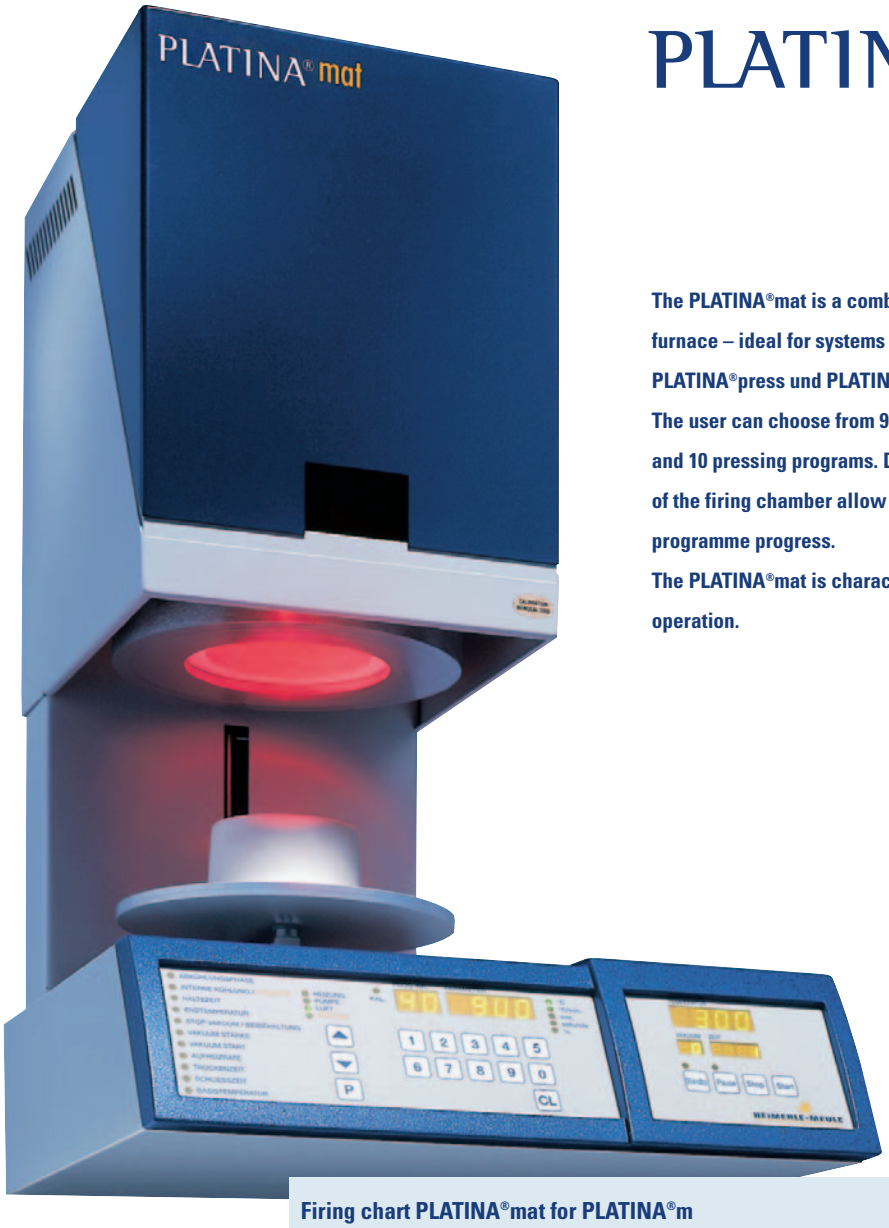
Mamelon

Citro, cream

Mamelon materials feature a high level of opacity; therefore, these materials should be diluted before application in order to obtain the desired nuances.

The mamelons are marked off by transparent materials (effect enamels, e.g. light blue, grey) in order to obtain a clear appearance of the mamelon structure.

PLATINA® mat



The PLATINA®mat is a combined pressing and firing furnace – ideal for systems ceramics such as PLATINA®press und PLATINA®m.

The user can choose from 90 individual firing programs and 10 pressing programs. Display and viewing window of the firing chamber allow permanent monitoring of the programme progress.

The PLATINA®mat is characterized by its most simple operation.

Firing chart PLATINA®mat for PLATINA®m

		Opaque 1	Opaque 2	Shoulder 1	Shoulder 2	Dentine 1	Dentine 2	Gloss with glaze	Gloss wo. glaze
Programm No.		**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**
Base temperature	[°C]	400	400	400	400	400	400	400	400
Closing time	[min]	6 - 8	6 - 8	4	4	6	4 - 6	4	4
Drying time	[min]	0	0	0	0	0	0	0	0
Heat-up rate	[°C/min]	55	55	45	45	45	45	55	55
Vacuum start	[°C]	450	450	450	450	450	450	0	0
Vacuum strength	[%]	90	90	90	90	90	90	0	0
Vacuum stop	[°C]	819	819	779	769	769	759	0	0
Hold	[min]	0	0	0	0	0	0	0	0
Final temperature	[°C]	820	820	780	770	770	760	745 - 750	750 - 755
Holding time	[min]	2	2	1	1	1	1	1	1
Internal cooling	[min]	0	0	0	0	0	0	0	0
Cooling phase	[min]	0	0	0	0	0	0	0	0

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