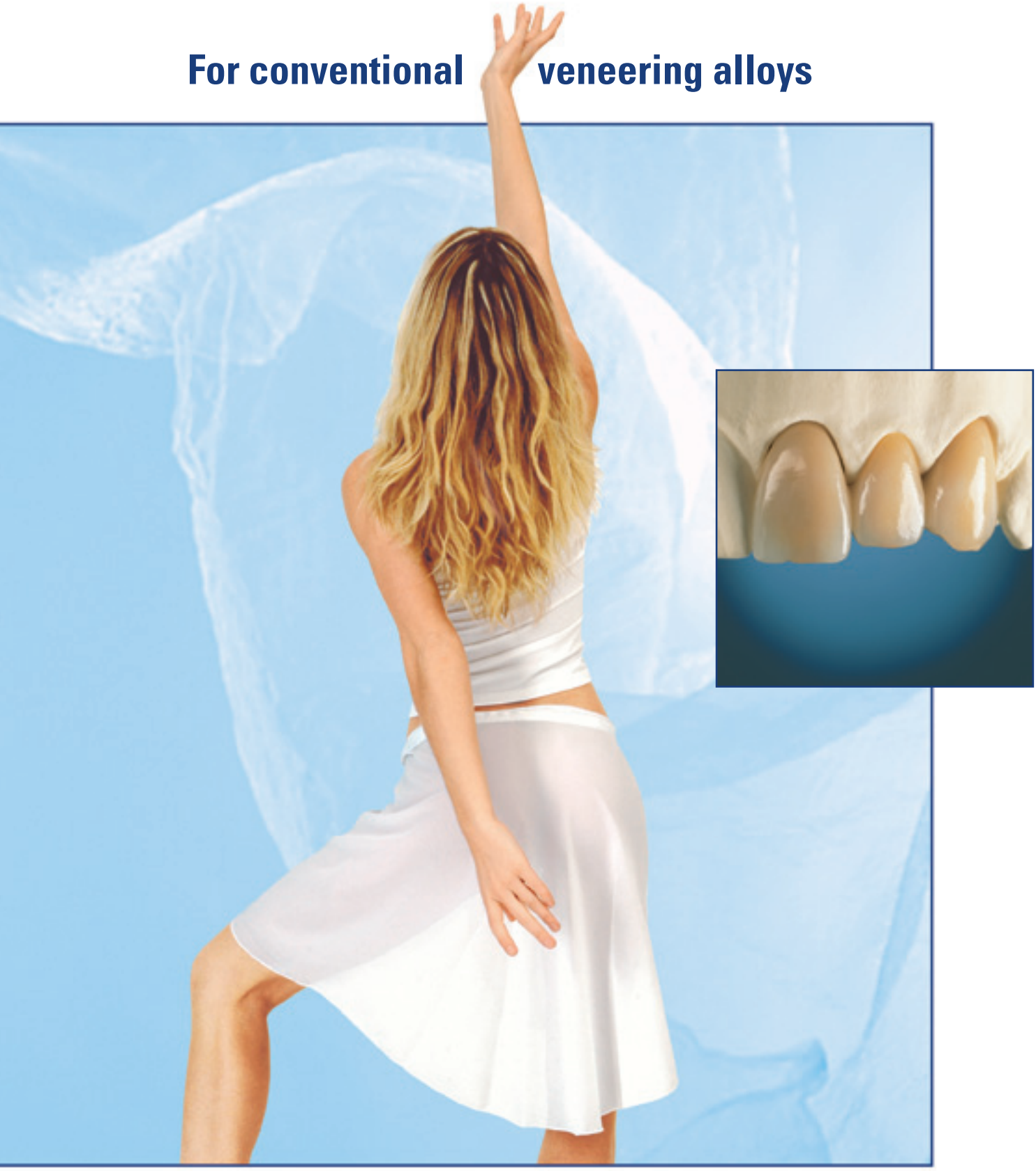
INSPIRATION

For conventional veneering alloys



Heimerle + Meule
Heimerle + Meule Group

good as gold in | dental | jewellery | technique

PFM (ceramo-metallic) restorations

INSPIRATION is a synthetic, two-phase leucite glass ceramic on an aluminium silicate base. The properties of these ceramic materials are far superior since they use synthetic base materials to ensure a high-quality and very pure end result. There is very little shrinkage in the occlusal and approximal areas after firing. This makes the materials much easier to work with and also saves time. Even large-span ceramic bridges can usually be made with just a few main firing cycles.

In addition to excellent modelling and firing properties, the shape and edge stability, brilliant shades, high translucency, opalescence and the effect of depth are truly impressive. Because of the microcrystalline structure of INSPIRATION, the interplay of reflection and brightness creates the same impression of depth as natural dentition

The colours remain stable even after several correction firings and there is no need for slow cooling. The lower firing temperature range of 900 – 840 °C reduces thermal stresses on the metal framework and helps to prevent any distortion of the framework.

The outstanding properties of this leucite glass ceramic enable natural teeth to be reconstructed reliably and safely when using conventional veneering alloys with a CTE of 13.8 – 14.8 x 10^{-6} K^{-1} (25 – 500 °C).

INSPIRATION is especially suitable for veneering with the PLATINOR® high-gold or reduced-gold alloys and ECONOR®-palladium-based alloys from Heimerle + Meule. Restorations can be shaded according to the Vita®-F shading system (A1 to D4) and additionally modified with shades A0 and B0.

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PREPARING THE FRAMEWORK

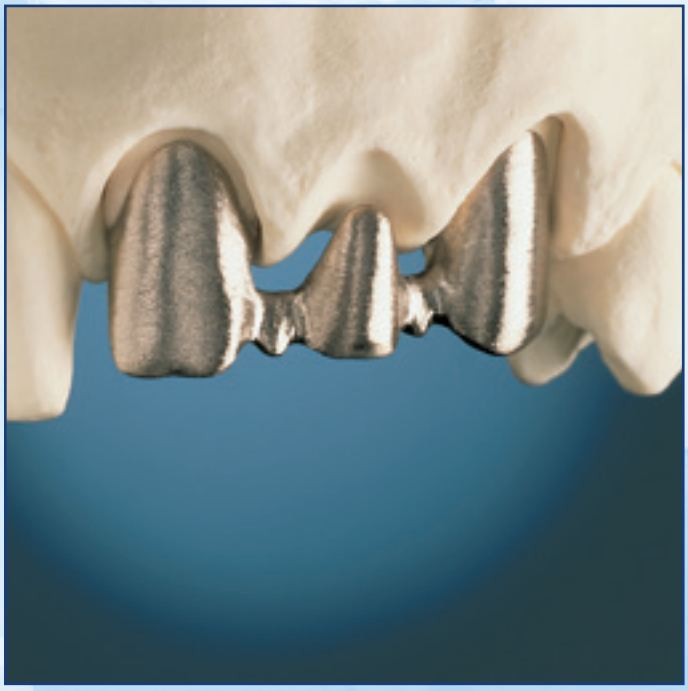
1 – Wax-up

Frameworks for porcelain fused to metal (PFM) crowns and bridges, also known as ceramo-metallic restorations, should be modelled as full-contour restorations which are slightly smaller than the final size. An even layer thickness throughout helps to prevent thermal stresses from forming during the subsequent processing stages and sharp edges and undercuts should be avoided.

In order to make the restorations suitably strong, the wall thickness of the wax-up should be no less than 0.4 mm for crowns (0.3 mm of the finished framework) and 0.5 mm for bridges (0.4 mm when finished). The surface of the interdental connectors must be sufficiently large.

When using high-gold veneering alloys, especially in the case of large-span restorations, we recommend improving the stability by incorporating an inlay-type interdental reinforcement and a lingual band.

2 – Cast bridge



Use carbide burs for adjusting and trimming the framework. Avoid sharp edges and aim for gentle transitions. Pass the carbide bur over the surface in one direction only in order to prevent any overlapping on the surface of the framework. Otherwise, undesirable bubbles could form when the ceramic is fired.

3 – Sandblasted bridge

After the bridge has been trimmed, blast the surface with abrasive grit (aluminium oxide 100 – 125 µ). When doing so, aim the jet at an obtuse angle and keep the pressure between 2 and 3 bar. Preparing the surface in this way creates micro-retentions and thereby improves the PFM bond. After blasting, clean the framework thoroughly and degrease it by steam cleaning or boiling.

4 – Oxidised bridge

Using a firm support or individual firing tray ensures that the work will not become distorted during firing. This will not adversely affect the accuracy of the fit. A slow heat rise of 55°C/min will prevent the furnace temperature from overshooting the mark.

The purpose of the oxide bake is to clean and check the surface of the framework. After firing, the oxide should be uniform in colour.

Before applying the first opaque layer, the work should be etched in an acid bath (Amisul) or subsequently sandblasted. Finally, clean or steam the surface of the framework one more time.

OPAQUE BAKE

5 – Opaque bake

Opaque I

Apply the ready-to-use opaque paste directly onto the framework. Best results are obtained by applying the opaque layer with a short, flat brush. Please use only the special opaque liquid to clean the brush.

The consistency of the opaque paste can be changed at any time by adding opaque liquid. Apply the opaque evenly to the surface of the work by dabbing lightly or by gentle strokes. Aim for a coverage of about 70 % for the first opaque layer.

Opaque II

In order to ensure that the framework is fully coated, two opaque bakes should always be carried out.
Apply the second, thinner opaque layer over the whole surface and if necessary modify with intensive opaque.

Firing program for opaque I and II:

Base temp.	Preheat	Heat rise	Start vac.	End temp.	Holding time
400°C	6-8 min.	80°C/min.	450°C	900°C	1 min.

SHOULDER BAKE

6 – Shoulder bake

Shoulder I

Apply a thin layer of isolating liquid to the chamfered dies. Then mix the shoulder material with SF carving liquid and apply systematically.

Build up the shoulder layer by dabbing or applying in gentle strokes and then dry the work. When applying the material, allow it to flow thinly over the edge of the metal in order to make sure that all metal parts are fully covered.

Shoulder II

After the ceramic has been fired, grind the shrunken material and carry out a second shoulder bake.

Firing program for shoulder I and II:

Base temp.	Preheat	Heat rise	Start vac.	End temp.	Holding time
400°C	4 min.	80°C/min.	450°C	900°C	1 min.

Shoulder chart

A0	A1	A2	A3	A3.5	A4	B0	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
SM1	SM1	SM2	SM2	SM3	SM4	SM5	SM5	SM5	SM6	SM6	SM8	SM7	SM7	SM7	SM8	SM9	SM7
			SM3							SM-I 10		SM-I 10		SM-I 10			SM9
–	–	–								SM-I 11							
			1:1	–	–	–	–	–	–	4:1:1	–	1:1	–	4:1	–	–	1:1

BUILD-UP

7 – Build-up

Perfect dental restorations are obtained by systematically applying a number of basic principles during build-up. In order to obtain the required shade, the build-up must be carefully carried out according to plan. The basic structure is defined by selecting layers of different colours. Accurate results can be obtained even with the time-saving standard build-up. By using just three or four materials (opaque dentine, dentine, incisal and transpa) best results and a perfect shade match with the Vita® Classical shade guide are guaranteed.

Standardised ceramic restorations can only be partially successful in recreating the shading effects of natural-looking ceramic crowns. In order to increase the depth of shade and imitate certain natural characteristics, a methodical approach is required.

Type of build-up used for the bridge shown in the illustrations
First of all, the selected opaque is applied to the prepared metal framework. This forms the basis for the subsequent shading procedure.

Once the shoulder bake is complete, a layer of opaque dentine is applied to the framework. It is important to ensure that a suitably thick layer of opaque dentine is applied. Then the dentine material is built up to form the tooth shape. The tooth form should be made up of 1/3 opaque dentine and 2/3 dentine material. The incisal/transpa area should be designed to create a gentle taper toward the incisal edge.

When cutting back the mesial and distal shoulder, take care not to excessively reduce the layer toward the incisal edge. Additionally modify the dentine area by working areas of lighter dentine shades into the approximal area. With older people, the incisal edges occasionally show marked differences in shades in the incisal area.

In order to emulate nature, prime the middle section of the incisal edge with orange dentine modifier and cover it with brown cervical transpa. Apply a layer of blue effect incisal over the shortened shoulder area. Complete the shoulders with incisal material, striving to attain the final shape. Complete the modellation with alternative layers of incisal, clear incisal and yellow effect incisal. Then add a layer of opal clear to the lighter dentine areas.

8 – Dentine bake

In order to create the desired shading effect and transparency, the work must be correctly fired. Individual characterisation in the dentine area gives the whole bridge a three-dimensional appearance which is further enhanced by the positive effects of shrinkage.

The low degree of shrinkage makes it easier to give the ceramic restoration the required shape and size, since an interdental closure can often be obtained after just one correction.
The fired bridge can be given extra layers using the same build-up technique as for the first ceramic bake.

Finish and glaze

The restoration should be finished according to morphological principles. Especially in the case of anterior bridges, the overall appearance requires three-dimensional sculpting.
The following factors are important to creating the desired shape:

- Basic shape, surface features and curvature of the shoulder
- Tooth position and axis
- Signs of abrasion
- Effect of the interdental gaps

The aesthetic result is largely dependent on the skill and expertise of the dental technician. Once the tooth surface has been ground, certain details can be modified further by pre-polishing with very fine emery paper or silicone/diamond polishers.
The teeth are given a natural-looking lustre by means of a glaze bake.

Irrespective of whether the glaze bake is carried out with glaze paste and stains or whether the bridge is simply fired, the surface finish should not be completely melted away. Lowering the firing temperature for the glaze bake gives the surface an irregular structure. The can be smoothed out by further physical finishing, e.g. with pumice and felt buffs.

Firing program for 1st dentine bake:

Base temp.	Preheat	Heat rise	Start vac.	End temp.	Holding time
400°C	4 – 6 min.	60°C/min.	450°C	880°C	1 min.

Firing program for 2nd dentine bake:

Base temp.	Preheat	Heat rise	Start vac.	End temp.	Holding time
400°C	4 – 6 min.	60°C/min.	450°C	870°C	1 min.

Firing program for glaze bake with glaze paste:

Base temp.	Preheat	Heat rise	Start vac.	End temp.	Holding time
400°C	4 min.	60°C/min.	–	840°C	1 min.

Firing program for glaze bake without glaze paste:

Base temp.	Preheat	Heat rise	Start vac.	End temp.	Holding time
400°C	4 min.	60°C/min.	–	850°C	1 min.

BASIC MATERIALS

Shade display

The INSPIRATION shade display is a useful aid to making restorations with a ceramic veneer.
The basic assortment includes opaques, opaque dentines and dentines in the same shades as the familiar Vita® A1 – D4 shades plus A0 and B0 for additional modifications.

Opaque

The opaque pastes are designed to give perfect coverage of the framework after just two firings. There is no need to pre-layer the frameworks with veneering or masking gold. The pastes are ready stained to give gentle, natural-looking base shades after firing. The intensive opaques A and B can be used to add local shade nuances. A good way to characterise the cervical area of the tooth and obtain special effects in the body of the tooth is to mix in opaque materials in tooth shades.

Opaque dentine

The opaque dentines reduce the direct reflection of the opaque materials without detriment to the actual shade itself.
The opaque dentine range is supplement by the shades white, salmon and caramel.

Dentines

Dentines are more translucent than opaque dentines. They come in the same shades and are used as a transition between the opaque layers and the incisal transpa layer.

Incisals

The dominant feature of the incisal area of natural teeth is a range of translucencies.
Nr. 1 – white incisal
Nr. 2 – whitish/yellowish incisal
Nr. 3 – yellowish incisal
Nr. 4 – yellowish/orangey incisal

EFFECT MATERIALS

CTI materials

These deep chroma translucent ceramics can be used in their original strength or mixed with the base materials of the INSPIRATION range. This means that only a few materials are needed to create an individual shade palette. Detailed information can be found in the brochure “INSPIRATION CTI – Individuality Step by Step“.

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EFFECT CERAMICS

Transpa clear

These translucent ceramic materials possess no pigments whatsoever. In the transpa zones, small amounts of the incident light are absorbed and diffused to the neighbouring layers.
In order to obtain as realistic an effect as possible, the transpa clear material can be used underneath a layer of incisal or mixed with an incisal.

Transpa opal clear

This is a milky translucent ceramic with a large portion of white. The light is refracted and diffused depending on the wavelength and the angle of incidence. Depending on how the material is applied, the incident light is reflected in different ways.

Effect incisals

In the colours yellow, brown, light blue, grey and pink, the effect incisals give the final restoration its aesthetic characteristics. The amount of pigment in these special translucent ceramics is dosed so that they can be used undiluted without causing unwanted contrasts. Because of the sense of depth they create, these effect ceramics are suitable for incisal edges and abrasion facets.

Cervical transpa

The neutral, orange and brown transpa materials can also be used in their original strength.
Neutral: Translucent, whitish material which creates bright, transparent effects. Used together with the white dentine modifier, this material is ideal for emulating demineralised areas and calcium spots.
Orange: Light orangey yellowish transparent special ceramics for the cervical area and the lower third of all warm and yellow tooth shades. This material can also be blended into the incisal area.
Brown: gives a brownish shade with transparent areas. This shade can also be used to add an extra layer to cervical area.

Chroma A, B, C, D

These materials darken the basic shade of the tooth. This does not change the colour scheme selected for the veneer, but makes the shades warmer and deeper. They can also be used to imitate the effects of ageing in the tooth root.

Dentine modifier

These are available in the shades white, yellow, orange, blue, brown and terra. These heavily pigmented ceramics need to be chosen carefully. The high portion of opaque substances in their composition can significantly influence the overall effect. The main area of application for these intense dentines is in the abrasion zones. They are also ideal for use as natural secondary dentines on the abraded incisal edges of anteriors and on the cusps of posteriors.

Stains and glaze

The ten stains are supplied as pastes. This makes them quick and easy to apply. Four fluorescent materials in the basic shades A, B, C and D complement this assortment. The glaze is also supplied as a paste. Adding glaze liquid changes the depth of shade and the degree of lustre of the ceramic restoration.

PLATINA® mat

PLATINA®mat is a combined press and furnace for all conventional build-up and press ceramics – ideally suited to the INSPIRATION PFM ceramics and the PLATINA®m and PLATINA® press system ceramics.

PLATINA®mat can store 100 individual programs. The touch panel and function display makes it easy to select the program and constantly monitor the process.

Standard firing program for PLATINA® mat

		Opaque I	Opaque II	Shoulder I	Shoulder II	Dentine I	Dentine II	Glaze bake with paste	Glaze bake without paste
Program number		11	12	13	14	15	16	17	18
Base temperature	(°C)	400	400	400	400	400	400	400	400
Closing time	(min.)	6 – 8	6 – 8	4	4	4 – 6	4 – 6	4	4
Drying time	(min.)	0	0	0	0	0	0	0	0
Heat rise	(°C/min.)	80	80	80	80	60	60	60	60
Start vacuum	(°C)	450	450	450	450	450	450	0	0
Vacuum	(%)	95	95	95	95	95	95	0	0
Stop vacuum	(°C)	899	899	899	899	879	869	0	0
Dwell time	(min.)	0	0	0	0	0	0	0	0
End temperature	(°C)	900	900	900	900	880	870	840	850
Holding time	(min.)	1	1	1	1	1	1	1	1
Internal cooling	(min.)	0	0	0	0	0	0	0	0
Slow cooling phase	(min.)	0	0	0	0	0	0	0	0

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Perfection in precious metals

Established in 1845 as a classical gold and silver refinery, Heimerle + Meule has been recovering high purity precious metals from precious metal waste ever since. As a result of its competence and expertise in the handling of precious metals, the company has grown steadily and continuously expanded its range of products and services.

Nowadays our customer-oriented service covers three business divisions:

- Dental
- Jewellery
- Industry

For nearly 100 years, Heimerle + Meule has been involved in the development and production of precious metal dental alloys – and is today a reliable and trusted partner in the area of dental technology. The range of precious metal dental alloys is complemented by outstanding dental ceramics, consumables and equipment.

With 250 employees, Heimerle + Meule is a medium-sized enterprise offering personal customer service. In addition to official certifications, a quality management system is in place to ensure that products are of consistently high quality and service is second to none.

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