

INSPIRATION press

A New Symbiosis in Full Ceramic:
Aesthetics and Economic Efficiency




HEIMERLE+MEULE

INSPIRATION press

THE PRESS CERAMIC FOR FULL CERAMIC DENTAL RESTORATION

**Today, dental aesthetics is “a must” –
but so is efficiency!**

With this principle, the INSPIRATIONpress has been developed. INSPIRATIONpress is the perfect symbiosis of outstanding aesthetics and necessary economic efficiency. Made for everyday life. An excellent frame material enhances and inspires the already existing brilliant colour effect of the INSPIRATION facing ceramic. The high fluorescence share, now also available in the frame material, reflects light in a striking way.

The simple processing, described in this brochure, explains how quickly you can achieve effective results with INSPIRATIONpress. Moreover, this method represents a cost-effective and profitable alternative for creating full ceramic dental restoration.



Indication

The material of the INSPIRATIONpress pellets and its technical characteristic not only allow for working out full ceramic single crowns in the front and anterior teeth area; they also extend the indication area to inlays, onlays and veneers.

Inlay/Onlay

For anatomical contouring of the occlusal surface, special attention has to be paid to the contact points and the correct reproduction of the fissure area.

Veneer

Two options are available:

1. The exact anatomically shaped veneer, which reproduces the final shape and surface structure down to the last detail or
2. A veneer, which can be layered with the INSPIRATION facing material

Anterior and Posterior Teeth

For aesthetical reasons, the layering technique should be used. With the individual wax-up models, a minimum wall thickness has to be observed. The wall thickness for anterior front crowns should be 0.8 mm. For shoulder preparations you should work with a supporting wall thickness of 1 mm. The wax thickness should not be less than 1.5 mm in the posterior tooth area, when designing cusps and occlusal surfaces.

Basic Rule for Layering Technique

The volume of the pressed objects is set to at least 2/3 of the total size and may be expanded by no more than 1/3 using INSPIRATION layering ceramic. The tooth shape should not be completed in one work step; rather one should divide the layering process into smaller steps and several firing cycles.



Shade guide according to VITA – Classic Colour System

INSPIRATIONpress pellets for layering technique

ST layering technique transparent	Indication	SO layering technique opaque	Indication
A1, A2, A3, A3,5	for younger to middle-aged	A1, A2, A3, A3,5 A4	for age-related colour changes -
B1, B2, B3	tooth substance	B1, B2, B3, B4	and depositions at the
C1, C2		C1, C2, C3, C4	tooth stump
D2		D2, D3, D4	

INSPIRATIONpress pellets for staining technique

Staining technique	Colour	Indication
MT 3	A1, A2, B1, B2, C1, D2	Inlays, Onlays, Veneer
MT 4	A3, A3,5, B3, D3	Inlays, Onlays, Veneer
MT 5	A4, B4, D4	Inlays, Onlays, Veneer
MT 6	C2, C3, C4	Inlays, Onlays, Veneer

Calculation of the press pellets

1 or 2 ceramic ingots are placed into the investment ring. The material quantity required corresponds to the weight of the entire wax-up model plus sprue channel.

Up to a maximum wax weight of 0.6 g = 1 ingot per investment ring
Up to a maximum wax weight of 1.4 g = 2 ingots per investment ring

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SPRUEING

We recommend using wax wires with a diameter of 2-3 mm as sprues. Attach the press channel directly to the modelled object in the flow direction of the ceramic. The length of the sprues should not exceed 7-9 mm. The investment material may break if any sharp edges are present. Therefore the end of the wax wires is rounded in the investment ring area. This ensures easy penetration of the viscous ceramic.

If only one wax pattern is available, an additional sprue **must** be attached as a counter bearing.

Generally, the casting objects are weighed with the sprues.

Up to a max. wax weight of 0.6 g	= 1 ingot per investment ring
Up to a max. wax weight of 1.4 g	= 2 ingots per investment ring
Small investment ring (100 g)	= max. 3 units per investment ring
Large investment ring (200 g)	= max. 4 units per investment ring

INVESTMENT

Place the modelled waxed-up objects into a phosphate-bonded investment material (e.g. DUROCONT).

Mixing ratio:

100 g powder /25 ml liquid

Crowns and caps:	15.0 ml DUROCONT liquid/10.0 ml distilled water
Inlays, MODs:	10.0 ml DUROCONT liquid/15.0 ml distilled water
Onlays:	12.5 ml DUROCONT liquid/12.5 ml distilled water

Put the respective liquid mixture in a **clean** mixing bowl, add 100 g DUROCONT powder and pre-mix manually for approx. 20 sec. Then mix 60 sec. under vacuum. More DUROCONT liquid yields a higher setting expansion. Less DUROCONT liquid results in a lower setting expansion.

The setting time for speed investment in investment ring 1 (100 g) is 17 min and in investment ring 2 (200 g) 19 min. If you wait for a longer time, the DUROCONT investment material has to be heated up normally.

Speed

After a setting time of 17-19 min, take the investment ring out of its form, remove excess investment material and then check the basic area of the investment ring. It has to be made sure that the investment ring is **plane**. Place the investment ring upright, with the opening facing down, into the furnace which has been pre-heated to 850 - 900 °C. The holding time is 60 minutes.

Normal

After a setting time of more than 25 minutes, put the investment ring at room temperature into the furnace. Heat it up to 290 °C by increasing the temperature approx. 5 °C/min., hold for 30 min (investment ring 2 = 45 min). Continue heating it up to 590 °C by increasing the temperature 5 °C/min and hold for 30 min (investment ring 2 = 45 min). Then heat the furnace up to 850 - 900 °C increasing the temperature 5 °C/min and hold for 30 minutes (investment ring 2 = 45 min).

Do not use any relaxants to avoid harmful reactions with the DUROCONT investment material



MANUFACTURING OF AN INLAY

In general, white or pastel-coloured super hard stone plaster should be used for the model preparation. The basic model is fabricated in the usual way as a model with removable stumps. In order to protect the preparation border of the plaster stump, we recommend to apply a plaster hardener (e.g. Margidur). According to the manufacturer's instructions a light spacer shall be applied once or twice. To avoid colour irritation, it is important that no coloured varnishes are used.

*Sprueing technique
see page 4.*

Divested press object



Perfect fitting and optimum border seal are achieved if the spacer is applied with 1 mm distance to the preparation border.



After the final form and surface shaping and the checking of the border areas, the inlay is thoroughly cleaned.

The anatomical wax-up is fabricated in view of aesthetical and functional aspects. Apply the wax wire in flowing direction.



Then effect two glaze firing cycles

*1. Firing cycle
For individualisation mix staining colour with glaze liquid*

*2. Firing cycle
Mix glaze paste with glaze liquid to a creamy consistency*



Firing Data/Staining Technique

Staining technique	Base temperature (°C)	Pre-dying (min)	Heating rate (°C/min)	Vacuum (°C)	Final temperature (°C)	Holding time (min)
Staining colour/Shade	400	4	60	-	860-865	1
Gloss firing	400	4	60	-	860-865	1

Place inlay for gloss firing on firing cotton.

MANUFACTURING OF AN ANATOMICALLY SHAPED VENEER

Apply light spacer with max. 1 mm distance to the preparation border.



Divested press object



Anatomical modelling with a minimum thickness of 0.7 - 0.8 mm in the body of the tooth and 1 mm at the incisal edge.



The veneer is tested for fitting, form and function. The surface contours are grinded and cleaned. The preparation for colouring has been finished now.



Apply the wax wire in flowing direction. Sprueing technique see page 4.



Again two or three gloss firing cycles are necessary as well. Step by step the requested colouring is adapted using the staining colours and especially the shade masses.



Firing Data/Staining Technique

Staining technique	Base temperature (°C)	Pre-dying (min)	Heating rate (°C/min)	Vacuum (°C)	Final temperature (°C)	Holding time (min)
Staining colour/Shade	400	4	60	-	860-865	1
Gloss firing	400	4	60	-	860-865	1

MANUFACTURING OF A LAYERED VENEER

Apply light spacer



If possible, grind the divested layering plate with low surface pressure. To avoid stress fields, the layering material is applied in small dimensions and several layers.



Modelled base plate with a wall thickness of 0.7 - 0.8 mm. Please take care to create an accurate border! To avoid irreparable damages in the border area caused by layering, the border seals are slightly reinforced.



Layering 1: Partial and coloured modifications are applied to selected areas.



Apply sprueing channel in flowing direction. Sprueing see page 4



Layering 2: Aim for the optimal tooth form after the first firing cycle with an alternating layering of enamel and transpa masses.



Divested veneer



Imitating the anatomical surface is crucial to promote light reflection. Layered veneers require only one gloss firing cycle.



Place the veneer for gloss firing on firing cotton.

MANUFACTURING OF AN ANTERIOR TOOTH

Apply light spacer with max. 1 mm distance to the border seals.



With the first layering discolouring, such as mamelon structure and transpa sections are incorporated.



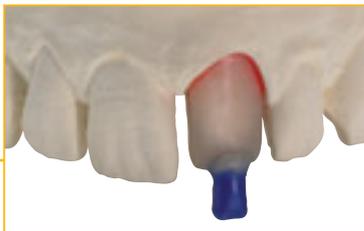
Aim for a scaled down tooth form. Fix the volume to 2/3 of the entire size. Minimum thickness of 0.8 mm must be observed.



After the firing cycle check internal characteristics.



Apply wax wire in flowing direction. For sprueing see page 4



After the first firing cycle correct the second layer with regard to colours and optimize the tooth form with an alternating layering of enamel and transpa masses.



Divested press object with blind channel as counter bearing. Overwork and clean surface. Carry out further steps.



After final form and surface design, clean the object and effect gloss firing.



After finishing apply the layering material in small portions and several layers.



Layered crowns are subjected to only one gloss firing cycle. Only use firing trays with thin and flexible metal pins.

Do not use carrier pins made of ceramic because of the very high risk of fracture.

Firing trays see page 12

MANUFACTURING OF A POSTERIOR TOOTH

Apply light spacer with max 1 mm distance to the border seals.



The dimension of the layering material is 1/3 of the total size of the tooth. We recommend to apply the layering material in 2 firing cycles.



Aim for a scaled down tooth form. Fix the volume to 2/3 of the entire size and make sure to model the rough cusp structure as well.



Check the colour effect after the first firing cycle.



Apply wax wire in flowing direction. For sprueing see page 4



Apply second layer according to the anatomical conditions.



Divested press object



After the second firing cycle check fitting, contact points and the quality of the border. Then grind and clean the object.



Layered crowns require only one gloss firing cycle.

Overwork and clean surface.



For firing control see page 13. For gloss firing put the object on firing cotton or use firing trays with thin metal pins.



Firing trays see page 12.

INSPIRATION press

PRESSING PROCESS IN THE PLATINA[®]mat (PRE-HEATING PROGRAMME)

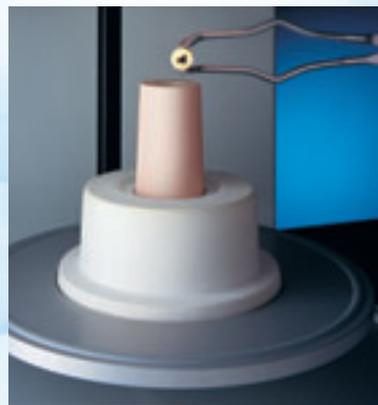
- Turn furnace on and select a programme between programme space No. 90-99. The INSPIRATIONpress programme -if programmed by the manufacturer- is located at programme space No. 92.
- Push the Start button. The furnace now checks the function of the pressure jack. After approx. 10-20 seconds you will hear a beep.
- Push the Start button. The furnace closes and the temperature starts rising from a base temperature of 450 °C up to 700 °C. As soon as the temperature value of the parameter is reached, you will hear another beep.
- Push the Start button.



Step 1

The furnace now opens and its base plate moves down. Now replace the hot investment ring from the pre-heating furnace into the centre (recess) of the press platform.

Make sure that the investment ring is placed in a perfect upright position in the press platform.



Step 2

Place a cold ingot into the investment ring.

Step 3

Then insert the **hot and clean alumina plunger** into the investment ring. **ATTENTION:** Ceramic residues on the alumina plunger may result in miscasts! If necessary, clean the alumina plunger with glass beads.

If a **one-time plunger** is used, it has to be placed cold into the hot investment ring.

Push the Start button.

The pressing process now proceeds automatically. The vacuum pump starts up and the temperature rises in steps 60 °C/min to the final temperature of 1080 °C. When reached, this temperature will be held for 20 minutes. Then the malleable ingot is pressed into the investment ring for 9 minutes at a maximum pressure of 3.5 bar (in the PLATINAmat)

During pressing, make sure that the maximum pressure does not exceed 3.5 bar and, if necessary, regulate the pressure.



Step 4

At the end of the programme the furnace opens for about 5 cm and remains in this safety mode. Again, this setting is indicated by a beep.

Push the Start button

Step 5

Now the safety mode is cancelled and the support tray of the furnace opens completely (final position). Take the investment ring out, place it on a fireproof tray and allow it to cool to room temperature.

DIVESTING

After the investment ring has cooled down, use a second press plunger and mark the inner end of the press piston on the outer surface of the investment ring. Using a large diamond disk, carefully cut open the surface of the investment material. Thus the investment material can be separated into two parts.

Clean the alumina plunger for further pressing procedures by blasting it with glass beads. To avoid adverse effects on subsequent pressing processes, make sure no ceramic residues will be left on the plunger.

If you are using a one way plunger, the penetrated plunger and the entire upper investment ring will be disposed.

The pressed objects are located in the lower part of the investment ring. They are removed from the investment material by means of a sand blast unit. Handle this part of the investment ring with caution and carefully remove the pressed objects from the investment material by using 50-100 μm glass beads at 3-4 bar. Reduce the pressure to approx. 1.5 – 2 bar as soon as the objects are visible. Do not use aluminium oxide blasting agents because of its abrasive effect. The consequences would be poor fit and cracks as a result of too much heat.

Remove the investment material completely from the surface. Even smallest residues may cause minor bubbles during further firing cycles and may have a detrimental effect on subsequent work.

FINISHING

Carefully detach the sprues using a thin, sintered diamond disk. Remove irregularities and early contacts using diamonds and an occlusion spray (e.g. touch-on) and carefully fit the pressed parts onto the die. Fine diamond and ceramic wheels are suitable for work at the object and subsequent surface structuring.

Due to the risk of fractures, please avoid overheating of selective points when working on the surface. Apply fairly little pressure when grinding.

After finishing the pressed restorations, blast them with glass beads and then clean them thoroughly.

Now you may continue working according to the technique employed, layering or staining technique.

FIRING TRAY

In order to keep the contact points at a minimum, place the objects on firing cotton or on thin metal pins during firing.

Do not use carrier pins made of ceramic! Due to adhering, tensions in the press object would be created after firing. This means a high risk of fracture.



PRESSING PROCESS INSPIRATIONpress



Cooling phase	0 min
Internal cooling/pressing	9 min
Holding time	20 min
Final temperature	1080 °C
Vacuum stop/hold	1250 °C/0 min
Vacuum strength	90 %
Vacuum start	700 °C
Heat-up rate	60 °C/min
Drying time	700 °C
Closing temperature	0 min
Base temperature	450 °C

INSPIRATIONpress Firing Chart

	Base temperature (°C)	Pre-drying time (min)	Heating rate (°C/min)	Vacuum start (°C)	Final temperature (°C)	Holding time (min)
Layering technique						
Dentine-incisal firing	400	4-6	60	450	880	1
Gloss firing	400	4	60	-	840-850	1
Staining technique						
Staining colour/Shade	400	4	60	-	860-865	1
Gloss firing	400	4	60	-	860-865	1

Gloss and glaze firing for staining technique:

Two gloss or glaze firings are carried out to obtain a smooth surface.

First firing: For individualisation, mix staining colours with glaze liquid

Second firing: Mix glaze material and glaze liquid until you get a creamy consistency. We recommend using a light hardening composite material as a reference to adjust the required tooth colour. This material represents the basic colour. The colouring of the inlays, onlays or veneers is applied in thin layers and in several firing cycles.

Gloss and glaze material for the layering technique:

The crucial difference between staining and layering technique is the condition of the surface. The major advantage is the ceramic structure of the layering material. This has a positive effect on the surface— even with thin layers – on the surface. As a result, only one gloss firing is necessary to achieve a satisfactory high gloss.

Colour display

Four shade and ten staining colours are available for individual characterisation.



INSPIRATION FACING CERAMIC



The synthetic, two-phase leucite glass ceramic is perfectly suited for layering on frames made of INSPIRATIONpress material. Furthermore, the INSPIRATION masses are optimally adapted to the high-gold content and the gold-reduced PLATINOR-bonding alloys, the ECONOR-palladium-based bonding alloy and the NEM-alloys ecoNEM classic and ecoNEM nova.

INFORMATION FOR THE DENTIST

Preparation

For full-ceramic restoration that is sufficiently able to withstand pressure, the dental preparation has to be oriented at the specific requirement of the material.

We do not recommend using feather edge preparations or edged internal angles.

The INSPIRATIONpress ceramic needs a circular substance removal of at least 1.0 mm, occlusal at least 1.5 - 2.0 mm.

Fitting/Seating

With respect to the later colour of the bonding composite, the use of stained glycerine paste (e.g. Variolink II Try-in/Vivadent or Calibra Try-in/DeTrey Dentsply) plays an important role in order to achieve the desired aesthetic results.

Prior to integration of the restoration, the degreased and acid-activated inside of the ceramic has to be silanized (e.g. Monobond S/Vivadent or Silicer/Heraeus Kulzer) to ensure adequate bonding.

Typically, a dual-hardened adhesive system is recommended for bonding of the respective bonding composite to enamel and dentine.

Only chemical or dual-hardened composite cement may be used as bonding composite. Inorganic cements are contra-indicated and increase the risk of fracture.

Generally, suitable dual-hardened composite cements (e.g. Variolink II/Vivadent or Calibra/DeTrey Dentsply) offer various colour graduations and consistencies.

Note: Always comply with the manufacturer's direction for the bonding system or the bonding composite.

PROCESSING AIDS

Results	Possible cause	Recommendation
Impurities (black specks) in the pressed object	Preheating furnace dirty	Clean preheating furnace
Porosities in the pressed object	Temperature in furnace chamber too high	Reduce temperature
	Wrong modelling wax used	Use special, organic wax
	Investment material residues broken in hollow form	Distribute wax modelling evenly in the investment ring, avoid sharp edges during sprueing
Single wax-ups not pressed out	Inaccurate sprueing	Always attach a sprue as counter bearing if only one object has been placed in the investment ring
Miscasts	Investment ring not placed vertically	Press platform dirty, supporting area of investment ring bottom not level
Cracks in investment ring	Investment ring not placed upright	Take conical form of investment ring platform into account while surface grinding the bottom area
	Check investment material	If the share of Durocont liquid is too low stability of the investment ring, pay attention to the mixing ratio
	Check investment material liquid	Please store liquid at room temperature
	Relaxant reacts with investment material	Do not use any relaxant
	Dirty alumina plunger may get canted during processing	Always keep alumina plunger clean





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Your partner with tradition and competence



Genuine partnership with the dental labs and practice dental laboratories is our constant goal. Your trust is our concern. Guaranteed by the high quality "Made in Germany", which is based on our in-house research and development. Qualified and dedicated employees are our advantage.

In the last 100 years, Heimerle + Meule has developed into a reliable dental partner as well for precious metal alloys, dental ceramic, devices and consumables and for new digital solutions in the field of dentistry.

Heimerle + Meule with its 230 employees represents a medium-sized German enterprise, founded in 1845 as a classic gold and silver refinery. Today, there are three business segments: dental, jewellery and technique.

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