ceraMotion® P+PMe

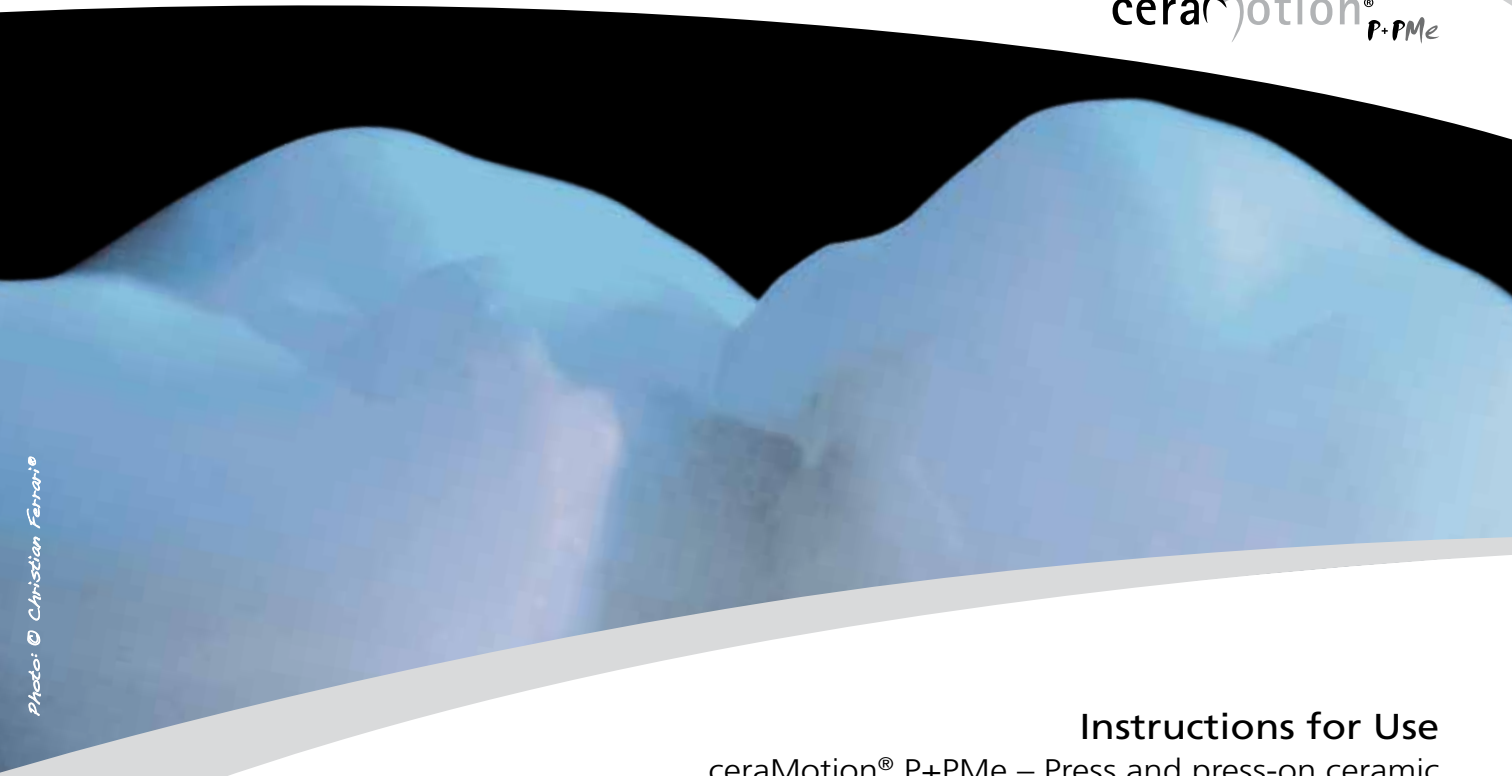

Photo: © Christian Ferrari®

Instructions for Use

ceraMotion® P+PMe – Press and press-on ceramic
for metal frameworks

DENTAURUM

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Classification CE 0483

ceraMotion® P+PMe is a press ceramic type 2, class 1 or 2 (according to DIN EN ISO 6872:2008).

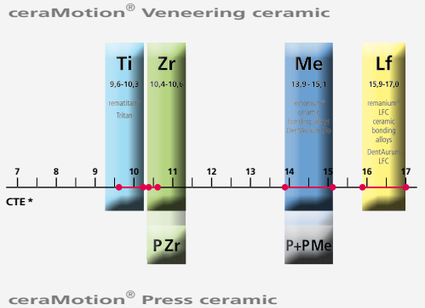
These materials are distinguished between **ceraMotion® P,** a press ceramic for inlays, veneers and single crowns, and ceraMotion® PMe, a press ceramic for full anatomical overpressing of metal frameworks.

It is possible to use the layering technique on ceraMotion® P using the Touch Up materials from ceraMotion® Me.

For ceraMotion® PMe it is possible to use both the ceraMotion® Me materials and the Touch Up materials.

Indication

Allocation of ceramic to framework material



ceraMotion® Press ceramic

*** CTE – Coefficient of thermal expansion of the framework material (10^{-6} K^{-1}, 25 – 500 °C / 77-932 °F)**

ceraMotion® PMe is used to overpress dental alloys with a thermal expansion of 13.9 to 15.1 · 10^{-6} K^{-1} (25-500 °C/77-932 °F) < 10 % compatible with silver.

If a ceramic shoulder is required then it is advisable to use an alloy with a CTE range of approx. 14.0 to 14.3 · 10^{-6} K^{-1} (25-500 °C/77-932 °F).

ceraMotion® PMe must not be used to overpress frameworks made of high performance ceramic (Al_2O_3, ZrO_2), titanium/ titanium alloys or dental alloys outside the stipulated CTE range.

ceraMotion® P+PMe must not be used if there is a known intolerance to any constituent.

Preparation

As a general rule, when a tooth is prepared for a ceramic restoration, the outer tooth substance should be reduced into a smaller, less detailed reproduction of the original tooth shape. There must be sufficient space for the restoration. In addition, there should be no sharp edges or inner angles left.

Undercuts must be avoided; larger cavities must be blocked out with an underfilling material.

When preparing inlays or partial crown restorations, it is important to ensure there are no thin edges.
The cavity of the preparation must not be prepared with parallel walls.

When preparing for a restoration made from ceraMotion® P in the form of a crown, the preparation must have a circumferential groove or step of at least 1 mm width, with a rounded inner edge. In preparation for an anterior crown, the tooth must be reduced by 2 mm incisally and 1.5 mm circumferentially.

When preparing a molar or partial crown, the tooth must be reduced occlusally by 1.5-2 mm.

The cavity for an inlay should be no less than 2 mm wide at the isthmus and 2 mm deep in the fissure area.

For veneers, a step width of 0.6 mm, an incisal reduction of 1 mm and preparation depth of 0.8 mm is sufficient.

The required reduction of tooth substance in the incisal, occlusal and circumferential regions for the various types of restoration can be seen in the pictures 1-4.

Please also observe the minimum required wall thicknesses for the restorations.

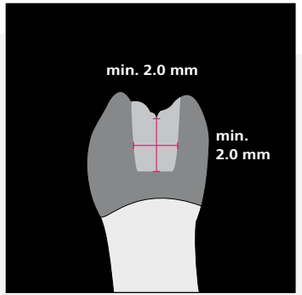


Fig. 1: preparation instructions
for an inlay

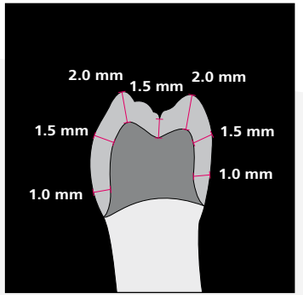


Fig. 2: preparation instructions
for a crown

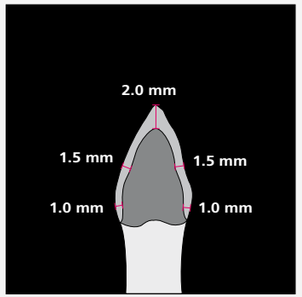


Fig. 3: preparation instructions
for an anterior crown

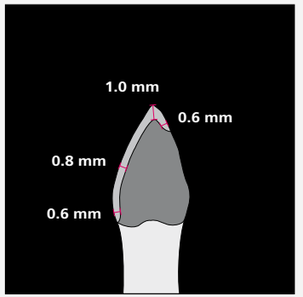


Fig. 4: preparation instructions
for a veneer

Modelling preparation

The master models are produced in the same way as they would be produced for metal ceramic restorations and inlays. The preparation margin is determined, a sealant layer is recommended to harden the surface.

Crowns / Veneers
Apply 2 layers of distance lacquer for the cement gap, to approx. 1 mm apical to the preparation margin.

Inlays / Onlays
Apply 3 layers of distance lacquer for the cement gap, to just above the preparation margin.

Note:

Use a die lacquer in a tooth coloured shade to make individual characterisation easier when fabricating veneers and inlays.

Modelling

Decide between the staining technique and the layering technique. Only use wax which will burn-out without leaving a residue, eg. StarWax CB.

Do not use thermoforming foils! Even though they burn-out without leaving a residue, they unfortunately produce a space between the die and the foil cap, which means the pressed object will not have sufficient support in that particular area and can therefore not guarantee the full amount of strength.

Depending on which type of restoration, each finished fabrication must have the required minimum wall thickness. The ratio of press ceramic framework should be 2/3 of the wall thickness of the finished restoration. The framework must have a wall thickness of no less than 0.8 mm. Just as with the metal ceramic framework, the finished design must be a reduced anatomical tooth shape with sufficient support for the incisal edges and cusps.

Spruing

Ring system	100 g and 200 g
Press sprues	Ø 3 mm
Length of the press sprue	5-6 mm
Spruing the waxed object	at the thickest point, with veneers -> incisally inlays and partial crowns -> approximally
Angle of the sprue to the waxed object	in the direction of the pressed flow
Angle of the sprue to the ring base	45-60°
Distance between the press objects	at least 5 mm
Distance to the silicone ring	10 mm

Fig. 5: sprued objects on the ring base

Fig. 6: sprued objects on the ring base

Investing

Coat the ring base, the ring former and the ring gauge with a thin layer of Vaseline.

Remove the separating agent from the press object carefully with oil-free compressed air.

Allow the investment material to flow into the ring using light vibration, without creating any bubbles. When the objects are completely covered with investment material, fill up the ring without using any more vibration.

Place the ring gauge on top, the investment material should spill out through the opening. Only when this happens can the ideal height be guaranteed.

Now allow the ring to set without further agitation. After having set, remove the ring gauge and base by twisting off. Remove the silicone sleeve and take away any imperfections on the standing surface of the ring using a plaster knife. Check that the ring stands securely at a 90° angle.

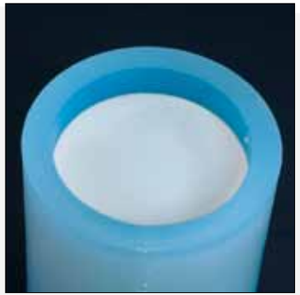


Fig. 7: fill with investment material up to the marked point

Fig. 8: placing the ring gauge

Fig. 9: placing the ring gauge

Fig. 10: straightening the top of the ring

Preheating the press ring

Always place the ring into the back of the furnace in order to ensure that the heat becomes evenly distributed. Always place the ring into the preheating furnace with the ring channel opening towards the bottom, to allow the wax to flow out without hindrance. Ensure that the ring is not in direct contact with any other ring in the furnace. The furnace temperature depends on the investment material used (please observe the investment material's instructions for use).

In order to achieve best results, ensure that the preheating furnace is clean and calibrated. Always work with clean press plungers, remove any ceramic residues and investment material deposits using the sandblaster, or use disposable plungers. Place the press plungers made from aluminium oxide into the preheating furnace. Disposable plungers and press pellets do not require preheating.

Fig. 11: ring in the preheating furnace

Pressing programme

General	100 g ring	200 g ring
Start temperature (°C / °F)	800 / 1472	800 / 1472
Heat rate (°C/min / °F/min)	60 / 140	60 / 140
Amount to be pressed	up to 0.6 g wax weight 1 pellet 2 g	up to max. 1.2 g wax weight 2 pellets 2 g
Pressing temperature (°C / °F)	920 / 1688	950 / 1742
Holding time (min)	20	20
Pressing time* (min)	8	8
Pressing pressure **	maximum	maximum
Vacuum	yes	yes

* Depending on the furnace, the pressing time can be entered as post pressing time or stopping speed.
On the other hand, mechanical pressing furnaces control the pressing time automatically with pressure or movement sensors.

** Depending on the furnace, the pressing pressure can be entered in bar or as press level.

Note:

Please read the press furnace instructions for use.

Pressing

Select the pressing programme and allow the pressing furnace to reach the start temperature. Place the press pellets quickly into the ring channel and position the plunger on top. Immediately place the ring into the press furnace and start the programme. It is essential to ensure that the ring does not lose too much heat between the preheating furnace and the press furnace.

After the pressing programme has ended, remove the ring from the press furnace. Place the ring onto a grid and allow it to cool down to room temperature.

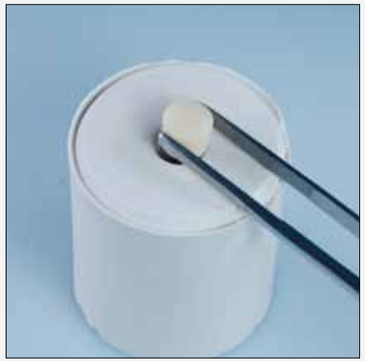


Fig. 12: placing the press pellets into the channel

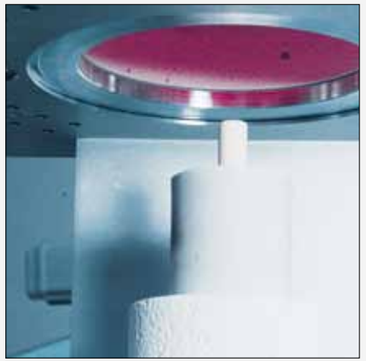


Fig. 13: placing the ring into the press furnace

Divesting the press ring

Once the ring is cool, the end of the press plunger is determined by holding a second plunger against the ring to assess its length. This is then marked in pencil.

Using a separating disc, cut along the marked line across the entire ring, in order to determine a breaking point.

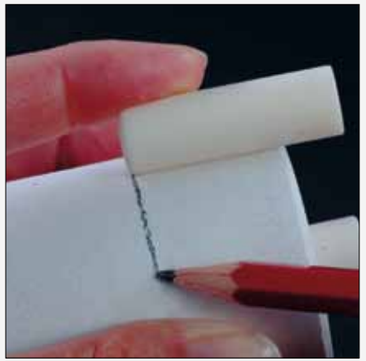


Fig. 14: marking the press plunger

Fig. 15: cutting with a separating disc

Divesting the press ring

Using a plaster knife, break the cut area off.

There will be a clean cut between the part of the ring with the press plunger and the part with the press cylinder and ceramic structure.

Fig. 16: breaking the cut area off

Fig. 17: the separated ring

Divesting the press ring

Using glass sandblasting beads (50 µm, 4 bar pressure), blast a cylinder of investment material, containing the pressed objects, out of the ring.

Delicately sandblast the pressed objects with glass sandblasting beads in the pressing direction at 2 bar pressure (do not use aluminium oxide for sandblasting the ceramic objects).

Sandblast the aluminium oxide press plunger clean.

Caution! Sandblasting can damage the edges. Please sandblast the object at a shallow angle to the surface. Finally, carefully clean the objects using the steam cleaner.

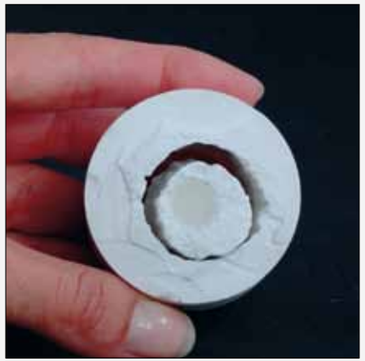


Fig. 18: blasting the inner cylinder of investment

Fig. 19: delicate sandblasting

Separating

It is advisable to work with low pressure and use water cooling. Cut through the press sprues using a thin diamond disc and without using pressure. Grind the base of the press sprues with ceramic bonded grinding burs.

Note:

When grinding the press ceramic, always ensure that the object does not become overheated.

Finishing

Carefully fit the object onto the die. Check the fit using control spray or control paste, if necessary repeat the process. It is advisable to use a fine diamond bur or ceramic rubber wheel to finish the marginal area.

Carefully grind the complete surface with a suitable bur. Please sandblast the entire surface area before the glaze firing or subsequent layering in order to remove any possible inclusions of investment material.

Layering technique for inlays, veneers and full ceramic crowns

The piece of work is finished using the Touch Up materials from ceraMotion® Me (Touch Up Set REF 252-800-50).

Use the Touch Up materials to build-up and then fire the incisal area.

When building-up a ceramic inlay, ensure that the layered ceramic is separated down to the pressed core before firing, in order to guarantee controlled shrinkage.

	Start temperature (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temperature (°C / °F)	Holding time (min)
Finishing with the Touch Up materials	500 / 932	6	55 / 131	500 / 932	790 / 1454	790 / 1454	1
Glaze firing with the Touch Up and glaze	500 / 932	6	55 / 131	500 / 932	790 / 1454	790 / 1454	1

Glaze firing for layering and staining technique

In order to achieve an even layer, wet the entire surface of the ceramic with the Glaze material, mixed with the Stains Liquid (REF 254-010-02).

Mix the Stains/Body Stains with Glaze in order to achieve an individual intensive character. Paint the ceramic with the desired characterisation using the Stains/Body Stains, and then fire the object.

Repeated application and firing will intensify the shades.

	Start temperature (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temperature (°C / °F)	Holding time (min)
Glaze firing with glaze liquid	500 / 932	6	55 / 131	500 / 932	790 / 1454	790 / 1454	1

Fig. 20: Stains/Glaze application

Framework design

The substructure is an anatomically reduced version of the finished tooth, whereby corners or edges within the framework must be avoided. The thickness of the fired press-on ceramic material must not exceed 2 mm.

The minimum thickness of the metal framework is 0.4 mm with crowns and 0.5 mm with abutment teeth.

In order to achieve a good aesthetical appearance, the ceraMotion® PMe press-on ceramic should have a minimum thickness of 0.8 mm.

Note:

When fabricating a ceramic shoulder, shorten the framework so that it ends exactly at the inner edge of the groove or step preparation to get functional support for the framework on the prepared tooth. In order to prevent shoulder material from being pressed inside the framework, it is essential to ensure that the framework sits securely and accurately on the die.

Tangential preparations are contraindicated when a ceramic shoulder is required.

It is possible to construct palatial retention, to ensure that the framework sits securely within the investment material.

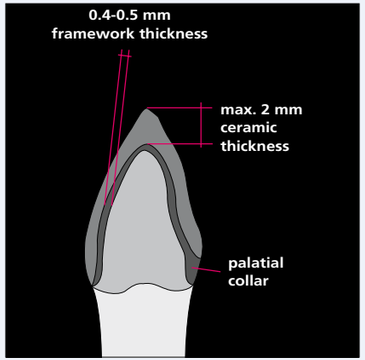


Fig. 1: framework design of an anterior crown

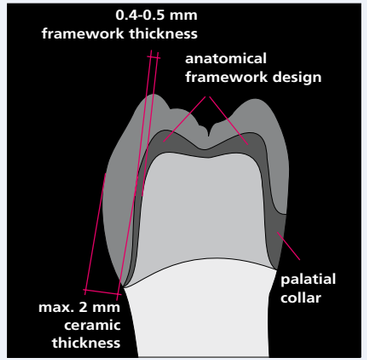


Fig. 2: framework design of a molar crown

Preparing the framework

When grinding, sandblasting and carrying out the oxide firing, please follow the alloy manufacturer's instructions.

Prepare remanium® alloys using a cross-cut tungsten carbide bur, sandblast using Al_2O_3 (125 µm) blasting material and then clean. remanium® does not require an oxide firing (Fig. 3).

Note:

Dental alloys which contain zinc (Zn) must be placed in a pickling solution for 5-10 min after the oxide firing, see manufacturer's instructions for use.

Fig. 3: framework

Paste Opaque

Paste Opaque:

Paste Opaque can be used for all precious and non-precious metal alloys.

Apply an even covering of the Paste Opaque to the framework, a wash firing is not required (please observe the alloy manufacturer's instructions).

Fig. 4: application with a brush

Fig. 5: Paste Opaque after the first firing

Note:

Use only Paste Opaque when overpressing metal frameworks. Before use, mix the Paste Opaque in its pot using a glass or agate spatula. The paste should have a creamy consistency. In order to achieve the correct consistency after mixing, it is possible to add Paste Liquid (REF 254-006-02) in very small quantities.

Avoid contact between Paste Opaque and water; clean the brush with Paste Liquid.

Fig. 6: second layer of Paste Opaque

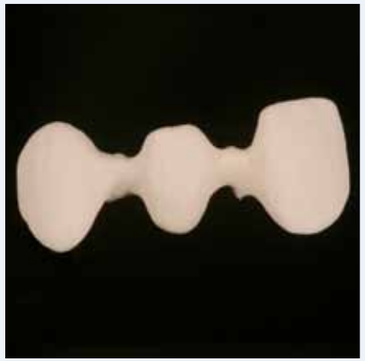


Fig. 7: Paste Opaque after firing

	Start temperature (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temperature (°C / °F)	Holding time (min)
Paste Opaque 1+2	500 / 932	8	75 / 167	500 / 932	950 / 1742	950 / 1742	1 (with vacuum)

Wax-up for staining and layering technique

In order to calculate the weight of the wax, weigh and note the weight of the opaqued framework. Clean non-precious metal frameworks thoroughly under running water in order to remove the oxide layer. Apply a separating agent to the plaster dies, in particular to the cervical area. Position the framework onto the model and fix it in the cervical area with wax.

Note:

In order to achieve good aesthetics and avoid faulty press results, always maintain a minimum layer thickness of 0.8 mm within the wax pattern.

Staining technique

When using the staining technique, the wax-up must be constructed in a full anatomical shape (Fig. 8 and Fig. 9).

Fig. 8: full anatomical wax-up, labial view

Fig. 9: full anatomical wax-up, lingual view

Layering technique

In order to enhance the incisal area with incisal and effect materials from the ceraMotion® Me programme, the wax-up is reduced in the incisal area (Fig. 10 and Fig. 11).

Fig. 10: reduced wax-up, labial view

Fig. 11: reduced wax-up, lingual view

Spruing

Ring system	100 g and 200 g
Press sprues	Ø 2.5-3.0 mm
Length of the press sprue	3-10 mm
Spruing the waxed object	at the thickest part of the wax-up
Angle of the sprue to the waxed object	in the direction of the pressed flow
Angle of the sprue to the ring base	45-60°
Distance between the press objects	minimum 3 mm
Distance to the silicone ring	crowns 10 mm, bridges 5-8 mm

Fig. 12: sprues on the ring base

Note:

Calculating the wax weight of the object to be pressed.

Weigh the ring base, fix the objects to the ring base and then weigh once again.

The wax weight is calculated by subtracting the weight of the ring base and the weight of the opaqued framework from the total weight.

Investing

Coat the ring base, the ring former and the ring gauge with a thin layer of Vaseline.

Remove the separating agent from the press object carefully with oil-free compressed air.

Allow the investment material to flow into the ring using light vibration, without creating any bubbles. When the objects are completely covered with investment material, fill up the ring without using any more vibration.

Place the ring gauge on top, the investment material should spill out through the opening. Only when this happens can the ideal height be guaranteed.

Now allow the ring to set without further agitation. After having set, remove the ring gauge and base by twisting off. Remove the silicone sleeve and take away any imperfections on the standing surface of the ring using a plaster knife. Check that the ring stands securely at a 90° angle.

Fig. 13: fill with investment material up to the marked point

Fig. 14: placing the ring gauge

Fig. 15: placing the ring gauge

Fig. 16: straightening the top of the ring

Preheating the press ring

Always place the ring into the back of the furnace in order to ensure that the heat becomes evenly distributed. Always place the ring into the preheating furnace with the ring channel opening towards the bottom, to allow the wax to flow out without hindrance. Ensure that the ring is not in direct contact with any other ring in the furnace. The furnace temperature depends on the investment material used (please observe the investment material's instructions for use).

In order to achieve best results, ensure that the preheating furnace is clean and calibrated. Always work with clean press plungers, remove any ceramic residues and investment material deposits using the sandblaster, or use disposable plungers. Place the press plungers made from aluminium oxide into the preheating furnace. Disposable plungers and press pellets do not require preheating.

Fig. 17: ring in the preheating furnace

Pressing programme

General	100 g ring	200 g ring
Start temperature (°C / °F)	800 / 1472	800 / 1472
Heat rate (°C/min / °F/min)	60 / 140	60 / 140
Amount to be pressed	up to 0.6 g wax weight 1 pellet 2 g	up to max. 1.2 g wax weight 2 pellets 2 g
Pressing temperature (°C / °F)	920 / 1688	950 / 1742
Holding time (min)	20	20
Pressing time* (min)	8	8
**Pressing pressure ** **	maximum	maximum
Vacuum	yes	yes

* Depending on the furnace, the pressing time can be entered as post pressing time or stopping speed.
On the other hand, mechanical pressing furnaces control the pressing time automatically with pressure or movement sensors.

** Depending on the furnace, the pressing pressure can be entered in bar or as press level.

Note:

Please read the press furnace instructions for use.

Pressing

Select the pressing programme and allow the pressing furnace to reach the start temperature. Place the press pellets quickly into the ring channel and position the plunger on top. Immediately place the ring into the press furnace and start the programme. It is essential to ensure that the ring does not lose too much heat between the preheating furnace and the press furnace.

After the pressing programme has ended, remove the ring from the press furnace. Place the ring onto a grid and allow it to cool down to room temperature.

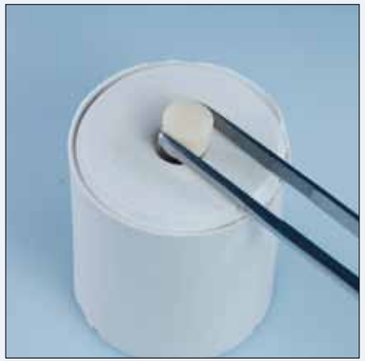


Fig. 18: placing the press pellets into the channel

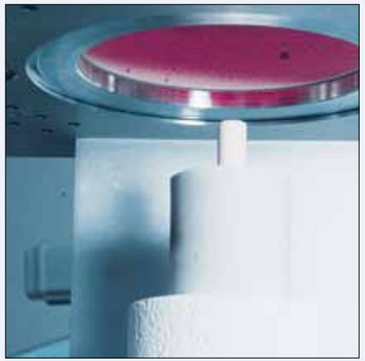


Fig. 19: placing the ring into the press furnace

Divesting the press ring

Once the ring is cool, the end of the press plunger is determined by holding a second plunger against the ring to assess its length. This is then marked in pencil.

Using a separating disc, cut along the marked line across the entire ring, in order to determine a breaking point.

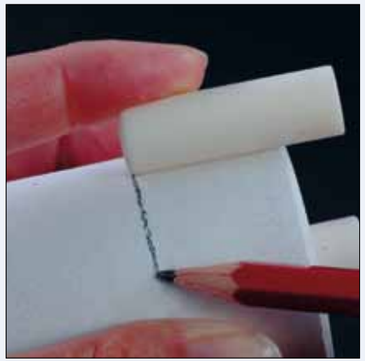


Fig. 20: marking the press plunger

Fig. 21: cutting with a separating disc

Divesting the press ring

Using a plaster knife, break the cut area off.

There will be a clean cut between the part of the ring with the press plunger and the part with the press cylinder and ceramic structure.

Fig. 22: breaking the cut area off

Fig. 23: the separated ring

Divesting the press ring

Using glass sandblasting beads (50 µm, 4 bar pressure), blast a cylinder of investment material, containing the pressed objects, out of the ring.

Delicately sandblast the pressed objects with glass sandblasting beads in the pressing direction at 2 bar pressure (do not use aluminium oxide for sandblasting the ceramic objects).

Sandblast the aluminium oxide press plunger clean.

Caution! Sandblasting can damage the edges. Please sandblast the object at a shallow angle to the surface. Finally, carefully clean the objects using the steam cleaner.

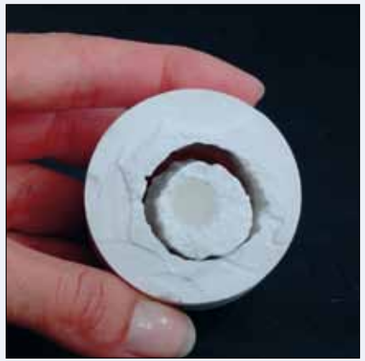


Fig. 24: blasting the inner cylinder of investment

Fig. 25: delicate sandblasting

Separating

It is advisable to work with low pressure and use water cooling. Cut through the press sprues using a thin diamond disc and without using pressure. Grind the base of the press sprues with ceramic bonded grinding burs.

Note:

When grinding the press ceramic, always ensure that the object does not become overheated.

Thermal homogenisation

In order to optimise the surface of the ceramic, thermal homogenisation is carried out in the form of a firing sequence. The objects are thermally treated after having been separated and sandblasted.

	Start temperature (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temperature (°C / °F)	Holding time (min)
Thermal homogenisation	500 / 932	2	90 / 194	500 / 932	870 / 1598	870 / 1598	1 (with vacuum)

Finishing

Carefully fit the object onto the die. Check the fit using control spray or control paste, if necessary repeat the process. It is advisable to use a fine diamond bur or ceramic rubber wheel to finish the marginal area.

When grinding the shoulder, use gentle pressure in order to avoid splintering and cracks from occurring.

Carefully grind the complete surface with a suitable bur. Please sandblast the entire surface area before the glaze firing or subsequent layering in order to remove any possible inclusions of investment material.

Layering technique

The piece of work is finished using the materials from ceraMotion® Me. The incisal area (Incisal allocation table) including any individual characterisation, is built-up and then fired.

Fig. 26: application of effect materials

Fig. 27: enhancing the incisal area

Incisal allocation table:

Dentin shade	Incisal Standard	Incisal Opal	Incisal Transpa
A1, A2, B1	I 1	IO 1	IT 1
A3, A3,5, B2, B3, B4, C1, C2, C3, D2, D3, D4	I 2	IO 2	IT 2
A4, C4	I 3	IO 3	IT 3

	Start temperature (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temperature (°C / °F)	Holding time (min)
Dentin and correction	500 / 932	6	55 / 131	500 / 932	870 / 1598	870 / 1598	1

Glaze firing for layering and staining technique

In order to achieve an even layer, wet the entire surface of the ceramic with the Glaze material, mixed with the Stains Liquid (REF 254-010-02).

Mix the Stains/Body Stains with Glaze in order to achieve an individual intensive character. Paint the ceramic with the desired characterisation using the Stains/Body Stains, and then fire the object.

Repeated application and firing will intensify the shades.

	Start temperature (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temperature (°C / °F)	Holding time (min)
Glaze firing with glaze liquid	500 / 932	6	55 / 131	500 / 932	840 / 1544	840 / 1544	1

Fig. 28: finished piece of work

Fig. 29: finished piece of work

Notes

ceramotion® P+PMe

➲ For more information on our products and services, please visit www.dentaurum.de

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