for 2 press SYSTEM

BioHPP in *for*2press system

Processing instructions

English

Please read these processing instructions and the associated user manual carefully prior to using the product!

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Introduction

The following instructions contain all the information needed to process BioHPP in the *for*2press unit. The protocols listed here enable the manufacture of prosthetic work using BioHPP while maintaining the characteristics of the polymer in the end product.

The vacuum press system *for*2press automatically performs the pressing process and subsequent cooling of the mould under pressure and under vacuum.

Only use the system components of the *for*2press system, such as the "brevest *for*2press" investment material, the "*for*2press filler" press plunger, the "*for*2press mould set" investment material moulds and the metal reinforcement ring.

Important information

Symbols:
The processing instructions include symbols as well as

special warnings,

with special processing tips to enable easier processing.

Safety information

Appropriate use:
The *for*2press system is intended to be used for the indications described in the user manual. Any other use will be considered as improper use.
Use of heat protection gloves, dust mask and safety glasses is strongly recommended when using this system.

User qualifications:
Users who work with the system must
- be appropriately trained for the relevant activities.
- know the relevant safety procedures.

It must be ensured that these processing instructions are always available for the user.

Please also note the operating and maintenance instructions for the *for*2press vacuum press unit REF 140 0061 0.

The unit

Set-up and operation

(see the device instructions included)

Compressed air unit and inlet pressure of min. 4.5 bar to max. 6 bar
Ensure that the compressed air maintenance unit supplied with the basic set is connected to the rear side of the *for*2press and that the inlet pressure is set to a maximum of 6 bar.

This compressed air maintenance unit also cleans the compressed air and removes moisture from it. It thus protects the pneumatic sensors and control units of the *for*2press vacuum press unit.

It is important to check beforehand whether any other users may have changed the pressure setting. The dynamic air inlet pressure in the cable must not fall below 4.5 bar or exceed 6 bar.

Location of the *for*2press unit

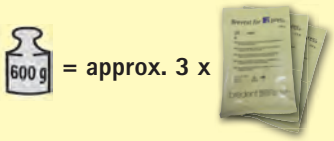
BioHPP is not melted in the *for*2press unit but in a preheating furnace.

To avoid heat loss when the mould is moved from the preheating furnace to the pressing unit, we recommend that the pressing unit is positioned close to the preheating furnace. Transfer time to the pressing unit: maximum 10 seconds (comparable to casting alloys).

Adjusting the air brake

Prior to first use, the screws that operate the pressing table's brakes (to be found underneath the table) need to be gently tightened. You only need to check this occasionally.

The pressing table must not come down too quickly, otherwise the moulds could be damaged by the impact. If this happens, the air brake should be tightened using the set screws. Tip: a weight of around 600 g helps to control the air brake on the pressing table!



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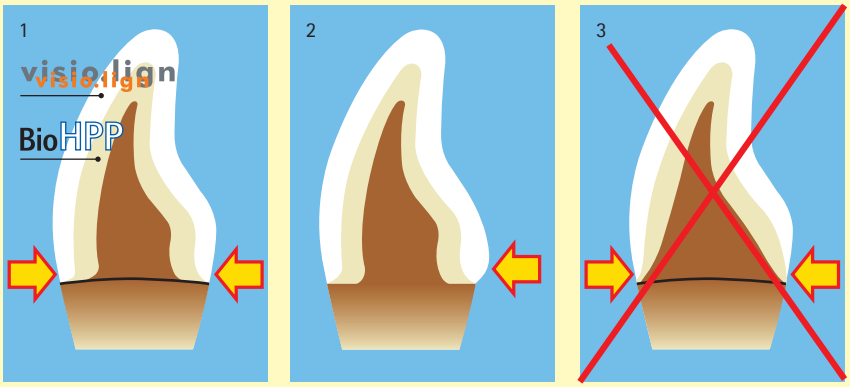
Preparing the framework

Preparing the tooth stump

In order to provide optimum support to the framework, a chamfer or shoulder preparation is required (Fig. 1+2).
A tangential preparation is not recommended (Fig. 3).



Temporary moulds

To produce temporary moulds, we recommend the use of all conventional waxes and modelling resins that burn completely without residue.

Modelling resin is suitable for making temporary moulds for crown and bridge frameworks and superstructures, e.g. bar assemblies or Toronto bridges, but not for over-pressing titanium bases; **these abutments should be moulded in wax.** Resin should be chosen which does not significantly increase in volume during the burning process, so that the investment materials are not put under too much stress. Therefore, when resins are used, a wax layer should also be applied to compensate for the expansion, particularly for very large frameworks.

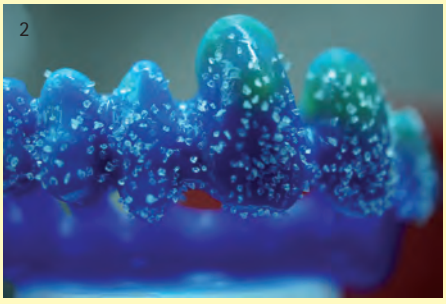
Caution!
Modelling resin must not be used for titanium abutments as the preheating temperature of 630°C is not sufficient for the modelling resin to burn without leaving any residue.

When producing the framework for subsequent veneering with composite veneers, the temporary mould for the framework must be anatomically scaled down.

The minimum material thickness **for BioHPP** is **0.6 mm**. For optimum accuracy in the fit around the preparation margin (crown margin), the circular modelling in that area needs to be increased. This area can be tapered and reduced to 0.3 mm after the pressing process.

When producing temporary moulds for back protection plates for veneering, the transition must be positioned outside the functional surface for veneering. Sharp-edged transitions in the mould must be avoided. Moulding scalloped edges has proven successful for veneer bridges in the anterior and posterior areas in order to increase stability. (Fig. 1)

It is recommended that retaining elements (coarse retention splinters or large retention beads) are also attached to the surface to be veneered (Fig. 2).



Evenly distributed retention crystals.

Image: Dentec Allergielabor Ehrenkirchen, Jens-Christian Fehsenfeld, (DE)

Preparing the framework

Insulating the plaster model

Conventional wax insulation has proven to be suitable when using modelling wax. If the temporary mould is made of modelling resin, Vaseline must be used for the insulation.

Material thickness, connector cross-sections and framework geometry

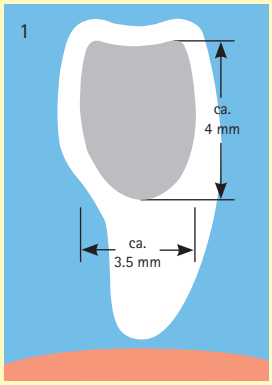
BioHPP	Anterior crowns	Posterior crowns	Primary telescopic crowns	Secondary telescopic crowns	4-unit anterior bridges	4-unit posterior bridges	Bar attachments
Minimum circular framework thickness	> 0.6–0.7 mm	> 0.6–0.7 mm	> 0.6–0.7 mm	> 0.6–0.7 mm	> 0.6–0.7 mm Abutment tooth	> 0.6–0.7 mm	> 0.8 mm
Minimum occlusal framework thickness	> 0.6–0.7 mm	> 0.8 mm	> 0.6–0.7 mm	> 0.6–0.7 mm	> 0.6–0.7 mm Abutment tooth	> 0.6–0.7 mm	> 0.8 mm
Connector thickness	–	–	–	–	> 12 mm²	> 14 mm²	–
Geometric proportion of pontics (horizontal/vertical)	–	–	–	–.	40/60 %	40/60 %	–

Connector cross-section design

Posterior region connectors: **min. 14 mm²**
Anterior region connectors: **min. 12 mm²**

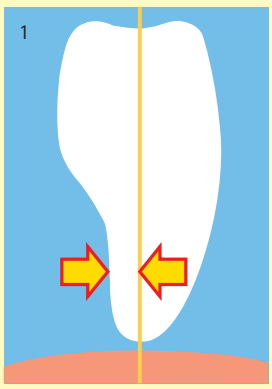
In the posterior region, the connector thickness of the wax model between pontics or between the pontic and the crown must cover a minimum area of 14 mm². In the anterior region, the connector thickness of the wax model between pontics or between the pontic and the crown must cover a minimum area of 12 mm². The distribution between the vertical and horizontal areas must be approx. 60% to 40%.

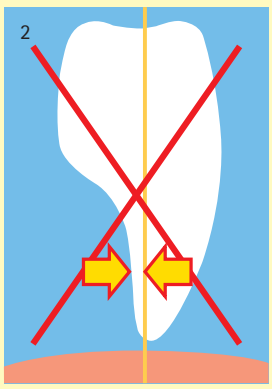
The largest framework diameter from the occlusal to the basal area should be along the axis of the central fissure. This is important for the stability of the framework. The elastic behaviour is thus restricted by up to 2 pontics, which also ensures the adhesive bond between the veneering resin and the BioHPP.



Mould showing distribution of chewing forces

As shown in figures 1 and 2, the largest diameter from the occlusal to the basal areas should be along the axis of the central fissure. This is important for the stability of the framework. Creating a shape like a flute mouthpiece should be avoided.





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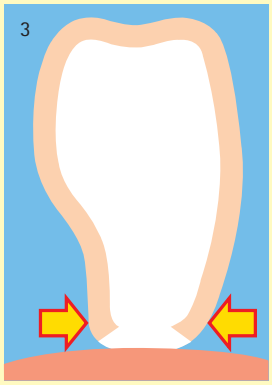
Basal rest mould on the gums

We recommend not veneering the basal application of the bridge pontics on the gingiva of the alveolar ridge with composite veneers. This area must be designed from BioHPP in order to ensure the greatest possible strength in the vertical extension. In the transitions from the composite veneer to the BioHPP framework material, an undercutting retentive end strip must be modelled using a wraparound technique (Fig. 3). The BioHPP has extremely good polishing properties, making direct contact to the gingiva possible.



Connector design*

- Veneering resin in the buccal basal area should not project beyond the basal BioHPP layer
- Even veneering thickness, supported everywhere by framework
- Veneering should not taper off sharply
- Veneering in the connector area should not have wide or sharp separations
- The basal pontic area should not be veneered
- Height: > 3.7 mm
- Width: > 3.5 mm

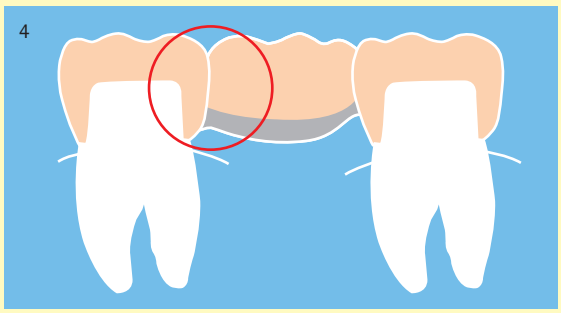
Veneering (composite):
- Even layer thickness
- 1–2 mm
- Round cusp formation (anatomically shaped, but not too angled)

Framework (BioHPP):
- Anatomically shaped
- Supports the veneering
- Round design

Tooth stump preparation options:
- Wedge with rounded interior edge
- Accentuated chamfer

** University of Regensburg UKR, Dr. Rosentritt (DE)*

Oral view



Palatinal view

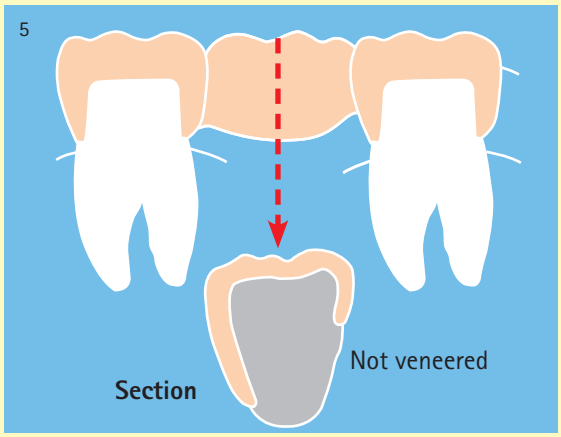


Image: Schwindt Dentallabor, Landau/Pfalz (DE)

Mould spruing

Insulate mould plate with Vaseline

To facilitate the subsequent removal of the mould plate or the press plunger spacer from the investment material, we recommend slightly greasing the mould plate and the vertical press plunger spacer with Vaseline.


1

Spruing

Do NOT use casting bars or casting pears!

Only a few short sprues with a larger diameter (e.g. 4–5 mm) should be attached to the areas of the mould that have the largest volume. For larger structures, the sprues should be positioned symmetrically and evenly on at least every other element, so that the pressure during the cooling process is evenly distributed.
It is recommended that a bar (diameter 2 mm) made from hard wax is placed so that it provides a dorsal link on the section between the last elements, thus preventing potential tension.
Add two air channels leading from the last two elements towards the mould plate.


2


3

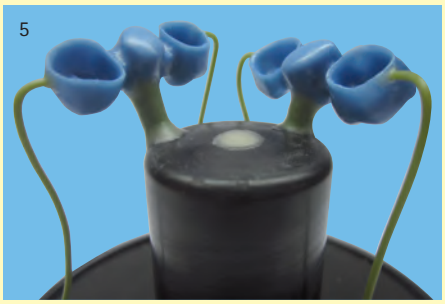

4

Summary of the most important spruing parameters	**Single crown, individual abutment, 4-unit bridges, model over-pressing technique** (PressOverModel)
Wax wire diameter	4–5 mm
Sprue length	max. 5
Layout of attachment points	Conical, with no sharp edges or corners
Distance between several objects	3–3.5 mm (except model over-pressing)
Distance between the mould and the edge and top of the ring	10 mm

In Figures 3 + 4, an individual abutment is sprued using the "*perfect*2press" (REF 430F2P30) specially formed, spiral sprue. These special sprues are very well suited for use with BioHPP granules. They prevent individual granules from falling into the mould too soon and ensure homogenisation during the pressing process as well as preventing air pockets.

Investment options

Investment can be carried out in two different ways. Either the resin or wax mould is taken from the master model and completely invested (Fig. 5), or the mould is made using an investment material duplicate model as per the model casting technique and subsequently invested (Fig. 6).


5 Removal procedure


6 Model over-pressing technique

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Spruing version 1: Removal procedure

Positioning in the mould plate

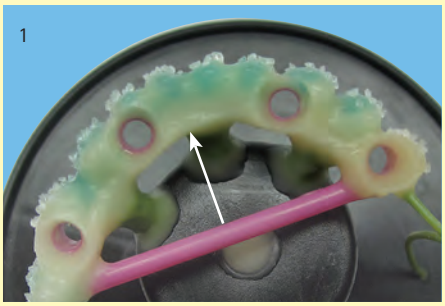
To reduce the risk of the mould bursting, as much of the investment material as possible should remain on the object to be pressed. If the hollow space in the mould is too large, this can lead to instability resulting in damage to the mould wall.

Model pressing: for some moulds/indications, e.g. telescopic secondary designs, the modelling of the secondary part is performed on an investment material duplicate model. In this case, it is important that the investment material model is significantly reduced in order to provide as much space as possible for the investment coverage. This significantly reduces the risk of the mould bursting – see the chapter on the model over-pressing technique.

To obtain flawless pressing results, the following points must be observed:

- The object must be placed outside the heat centre (Fig. 1)
- The distance between the object and the inside of the metal ring must be at least 5 to 10 mm (Fig. 2)
- The distance between the object and the upper edge of the mould ring must be at least 10 mm (Fig. 3)

1



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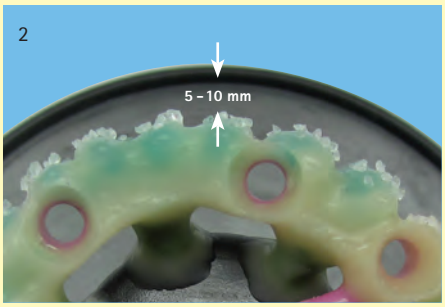

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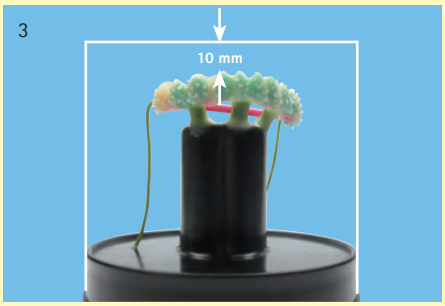


No sharp transitions to the objects.

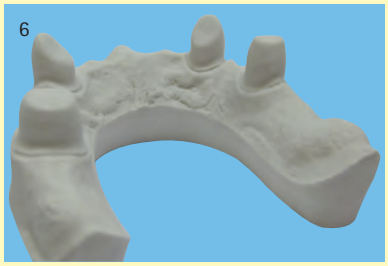
In order to avoid the risk of mould separations in one plane, it is recommended that, when moulding several, larger objects, these are placed in the mould at different heights.

Spruing version 2: Model over-pressing technique (size 9)

Creating the duplicate model

Recommended concentration:	
65–75%	Investment material model
65–75%	Investment coverage

The EBM model can be removed from the mould after 25 min.



The EBM should now be reduced and then dried at max. 80 °C for 30 min.

Minimum framework thickness:	Secondary telescope:	Secondary constructions:
circular	> 0.6–0.7 mm	> 0.8 mm
occlusal	> 0.6–0.7 mm	> 0.8 mm

The transitions from the veneering composites to the BioHPP should be made using a wraparound technique, showing the 'undercut'.

It is recommended that the basal and vertical aspects of the EBM model are reduced to the minimum size required.

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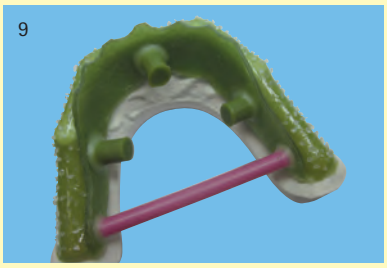
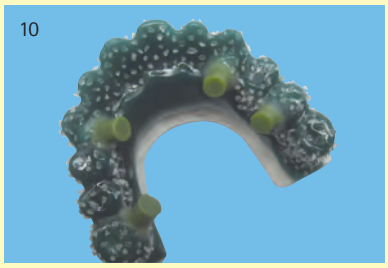
Investment mould set size 9

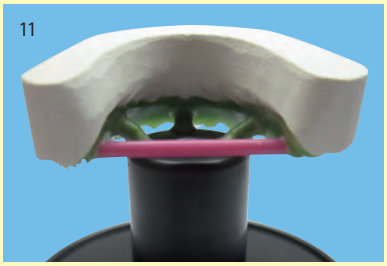
Summary of mixing parameters:	Model over-pressing technique
Wax wire diameter:	4–5 mm
Sprue length:	max. 5 mm
Design of attachment points:	no sharp edges or corners
Distance between several objects:	–
Distance between the mould and the edge and top of the ring	10 mm



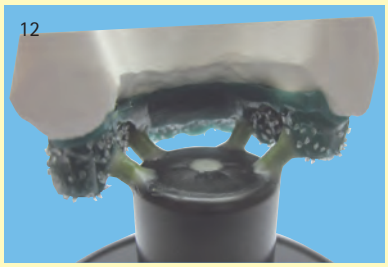
It is recommended that retentions are attached to the surface to be veneered.



It is important to use short sprues for spruing.



It is recommended that a bar made from hard wax is placed at the end.



It is recommended that the sprues are attached to the radius of the press plunger reservoir.

For the investment coverage, 3 bags of Brevest *for*2press (total 630 g) and 159 ml of Bresol (concentrate & dist. H_2O) *for*2press are required.

Spruing version 3: Model over-pressing technique mould set

Creating the duplicate model

Recommended dosage of Bresol *for*2press with dist. water:

Recommended concentration:	
65–75%	Investment material model
65–75%	Investment coverage

Mixing ratio:
For the investment coverage, three 210 g bags (a total of 630 g of Brevest *for*2press with 159 ml of Bresol *for*2press) are required.

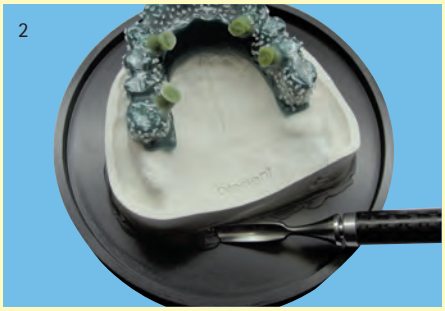
Do not use any casting pears, instead use wax sprues that are as short and thick as possible, or the optional spiral-shaped *perfect*2press wax sprues. Figure 1 shows the investment material duplicate model made from Brevest *for*2press.

After pouring out the silicone duplicate, the model needs to dry for at least 30 min. The model can then be removed from the silicon duplicate mould. The model can also be dried at a maximum of 80°C for 30 min.


1

Positioning on the base plate

It is recommended that the underside of the model is prepared with either wax or modelling material, as appropriate (Fig. 2). A small gap should be left under the investment material model, to be filled with the investment material in the coverage process. This ensures a sufficient bond between the model and the investment coverage.


2

To fix the sprues to the press plunger spacer, simply shorten them using a hot modelling knife. (Fig. 3). The investment material model must be placed in the centre of the base former, leaving a circular space between it and the metal ring of at least 5 mm. This leaves enough space for coverage with the investment material.


3

The transparent height limiter with the access window is slid sideways onto the base plate. The window enables the press plunger spacer to be more easily held in place from all sides.


4

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MP (size 10) Investment mould set MP size 10*

Positioning in the mould plate

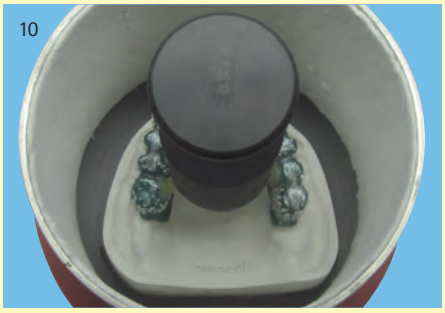
The centring aid for the press plunger spacer is simply attached to the transparent height limiter.

Using the centring aid, the press plunger retainer is aligned precisely in the middle of the wax sprues. The transition from the cylindrical to the conical section of the press plunger spacer marks the maximum depth.

The wax sprues should then be fixed with the press plunger retainer.

After the press plunger spacer has bonded with the wax sprues, the centring aid can be lifted off the top.

After the centring aid and the height limiter have been removed, the silicone fixing ring can be attached to the base plate. The round groove on the silicone fixing ring fits precisely into the base plate.



* only possible with *for*2press 2 unit

Mixing and investment

Controlling the expansion of the investment material

General mixing ratios
Recommended dosage for Bresol *for*2press investment material liquid.

210 g of Brevest *for*2press (1 bag) = 53 ml of Bresol *for*2press liquid

Brevest *for*2press investment material has been specially developed for processing BioHPP with the *for*2press unit.

Quantity	210 g (size 3)		420 g (size 9)		630 g (size 10)	
Mixing concentrate	Bresol *for*2press liquid	distilled water	Bresol *for*2press liquid	distilled water	Bresol *for*2press liquid	distilled water
55%	29	24	58	48	87	72
70%	37	16	74	32	111	48
100%	53	0	106	0	159	0

Recommended concentrations

Removal technique
50% to 55% liquid = single crowns and bridges
70% to 80% liquid = secondary parts (telescopic) and tertiary constructions

Model over-pressing technique
65% to 75% liquid = investment material for over-pressing technique

If you thin the mixing liquid with demineralised water, this will reduce expansion. All values are intended as a guide. The precise adjustment of the concentrate is to be done based on the prevailing environmental conditions and indications in the laboratory.

Mixing the investment materials:
Investment materials and liquid are to be stirred by hand for approx. 30 seconds.

Vacuum mixer:
We recommend that where possible, you use a prevacuum (approx. 10 sec.)

Rpm: approx. 390 r/min.
Mixing time: 90 seconds under vacuum

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Investment

Removal technique
To prevent air pockets inside the crowns, it is recommended that a suitable brush or a special "transfuser" (REF 390S0001) is used during the investment process. This ensures that the crown interior is free of bubbles.

(Fig. 1).

When using a metal mould, a protective fleece liner at least 1 mm thick should be attached. (REF 360 F2PV 1, REF 360 F2PV 2, REF 360 F2PV 3)

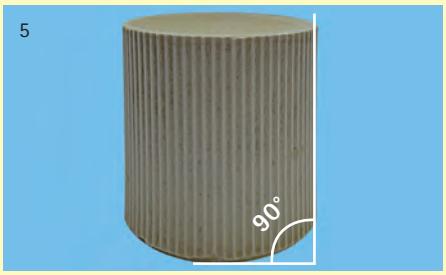
The whole mould can then be filled with EBM (Fig. 2).

After a 25 min. setting time, the hot mould is removed from the resin base former using a slight turning motion (Fig. 3 and 4).

Please always remove the mould keeping the opening facing downwards. This prevents the risk of investment material parts entering the mould.

Check the right angle
To ensure that the pressing process runs smoothly, the mould needs to be kept straight and at a right angle.
It may be necessary to trim the mould on the opposite side from the filler opening, to ensure
that the mould remains straight
during the pressing process. It should be at a 90° angle (Fig. 5).

If the size 3 mould set is used without a metal ring, only a silicone ring can be used (Fig. 3).



Model over-pressing technique
Once the metal ring has been lined with a 1 mm insert (REF 360F2PV1), it can be filled with a total of 630 g of investment material, mixed with 159 ml of mixing liquid (65% to 75%). (Fig. 6)

Once the coverage has cured for 25 min., the press plunger spacer can be removed from the investment material mould (Fig. 7).

Preheating

Recommendation: Setting the temperature of the preheating furnace

Application	Recommended max. temperature		Modelling material	Heating-up rate	Waiting times/ mould size Ø		Benefits
					3 (16 cm)	9 + 10 (26 cm)	
Over-pressing titanium bases	630°C	Speed	Wax	Directly into the hot furnace			Up to four hours, faster, more delicate structures can be devested.
		Conventional	Wax	8°C/min. Stopping times at 290°C at 580°C	 45 min. 45 min.	 60 min. 60 min.	
All other applications	850°C – 900°C	Speed	Wax Resin	Directly into the hot furnace			smoother surface, more stable mould
	850°C – 900°C	Conventional	Wax Resin	8°C/min. Stopping times at 290°C at 580°C	 45 min. 45 min.	 60 min. 60 min.	

Next, reduce the temperature of the furnace to 400°C and hold for an hour to allow the BioHPP to melt. When using a metal ring, the hot mould can be transferred directly into a second furnace preheated to 400°C (time-saving).

Preheating process of the investment material mould

Speed heating process:
The setting time of the investment material is 25 min. For the speed process, the mould is then placed directly into a preheating furnace that has been set to the end temperature. The optimum preheating temperature is around 850°C–900°C. At this temperature, the investment material has maximum stability due to the fused quartz. The preheating temperature of 630°C is only used when investing titanium parts such as elegance abutments. At 630°C, the formation of an oxide layer is minimised. The press plunger must also run through the same entire preheating process as the mould. After the holding time at the end temperature of 45 min. for a size 3 mould and 60 min. for a size 9 mould, the furnace is cooled to 400°C and then held for another 60 min. The max. cooling speed of 5°C/min must not be exceeded as this could affect the stability of the investment material mould. This cooling speed is maintained if the furnace door remains closed the whole time. The mould is now ready for the BioHPP melting process.

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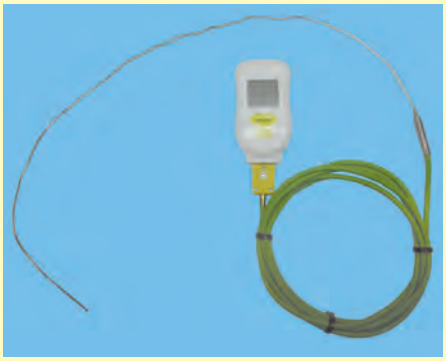
Preheating process of the investment material mould

Conventional heating process:
After allowing to set for 25 min., the mould can be placed in the cold preheating furnace. The max. heating-up rate of 8°C/min should not be exceeded. In order to precisely control the expansion of the investment material during the conventional heating-up process, the guide times of 290°C for 45 min. and a second stage of 580°C for another 45 min. must be adhered to. Once the end temperatures of 630°C and 850°C have been reached, the holding time for a size 3 mould is at least 45 min. and for a size 9 mould, at least 60 min. If several moulds are preheated at the same time, the holding time per mould increases by around 10 minutes. After this holding time, the mould is slowly cooled down, with the furnace door shut, to 400°C at a speed of 5°C per minute.
When using a metal ring, the mould can be transferred directly into a second furnace at 400°C.



Caution!
When investing titanium patterns, such as the individual BioHPP elegance abutment, a maximum end temperature of 630°C must not be exceeded, as otherwise an Alpha Case layer will form!

Filling capacity

Wax/BioHPP granules conversion table

BioHPP delivery form	Size 3 base mould with 16 mm press plunger diameter		Size 9 base mould with 20 mm press plunger diameter		Size 9 base mould + size 10 with 26 mm press plunger diameter
Mould weight	< 1 g	< 2 g	< 3 g	< 4 g	> 5 g
Granules	3 g	max. 4.5 g	7.5 g	max. 9 g	smoother surface, more stable mould
15 mm pellet (4 g each)	1 pellet	1 pellet	2 pellets	2 pellets	3 pellets
25 mm pellet (15 g each)	not possible				1 pellet

Preheating

Melting the material

Fitting the BioHPP disposable press plunger to the mould
Once the mould has been in the preheating furnace for an hour at 400°C, the sprues can be filled with granules or pellets. It is then put back in the preheating furnace for another 20 min. (filled with BioHPP) at 400°C.

Melted or used material should never be used.
The material would degrade during another melting process and important physical qualities would be lost. If the melting time or temperature is exceeded, the BioHPP will be darker than at the beginning of the process.

Melting time (BioHPP): 20 min.

Note: if the material turns darker, it can no longer be used and must be replaced.

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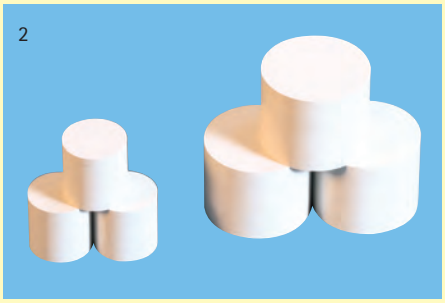

Pressing process with *for*2press

Attaching the press plunger

When fixing the mould with the disposable press plunger (*for*2press filler), the surface with the identification mark must face upwards (Fig. 1). This ensures that the rounded edge of the plunger goes into the mould. This prevents the plunger from tilting during the pressing process (Fig. 2).

The mould containing the melted BioHPP is then immediately transferred into the pressing unit. Please avoid placing the preheating furnace and the pressing unit a long way apart!

Before pressing with *for*2press
The set parameters, such as the pressing force or the vacuum time, must be checked before each pressing process.

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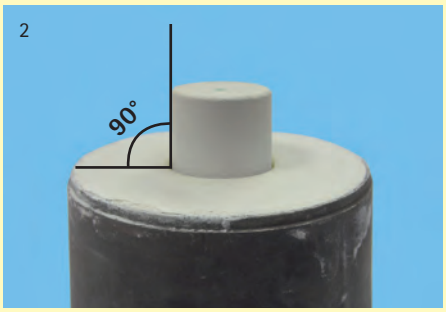

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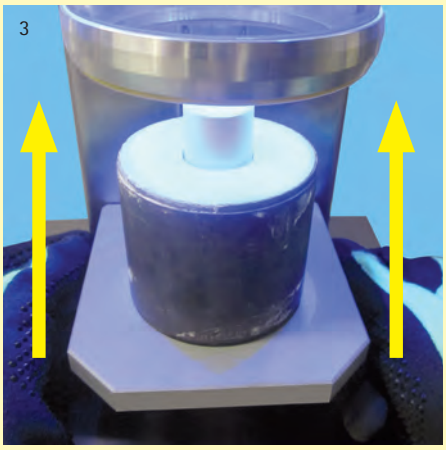
Pressing process with *for*2press

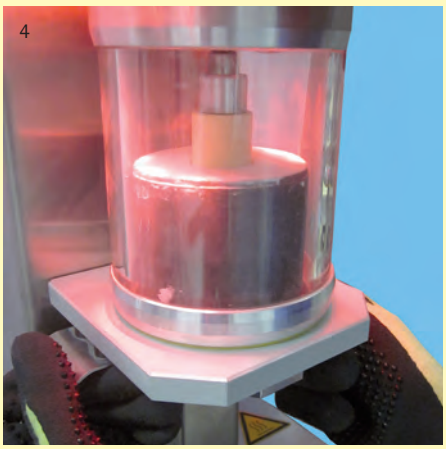
Attaching the press plunger

Inlet pressure: 4.5–6 bar
Vacuum time (BioHPP): 3 minutes (preset) *for*2press
5 minutes (preset) *for*2press 2

Force:

Mould size	Press plunger diameter in mm	Force in bar
Size 3	16	2.5
Size 9	26	4–5
Size 10	26	4–5





The mould assembled for the pressing process is placed on the pressing table of the *for*2press unit. Manually closing the pressing chamber by moving the pressing table upwards **with both hands** starts the pressing process, which runs automatically for 40 minutes, including the cooling phase.

The vacuum chamber is automatically evacuated before the pressing chamber is closed. The status light changes from blue to red and the pressing process begins once the maximum vacuum has been reached.

Push the pressing table firmly upwards until the silicon seal fits all the way round and the LED status light changes from blue to red.

Once the pre-set vacuum time has finished, the pressing table will automatically lower into the cooling position and the cooling phase will start, while maintaining the pressing force.

The cooling phase under pressure lasts for 40 min.

The whole pressing process finishes with an acoustic signal, the LED display changes from red to blue and the press plunger is automatically raised into the stand-by position.

The pressed mould can now be removed from the unit.

The unit is ready for the next pressing process.

Interrupting the programme while it is running using the 'Stop programme' button, just to save time, should always be avoided. This button stops the whole programme. Prematurely interrupting the pressing time would have a negative effect on the pressed material's physical properties. The 'Stop programme' button should only be used if, for example, the mould in the unit is not straight or a vacuum cannot be generated due to dirt on the silicone seal.

Removing the investment material

Soaking

Soaking the mould for approx. 10 min. in a water bath makes the devesting process easier and significantly reduces the amount of dust generated.

Devesting process

The mould can be roughly devested using a hammer. The remaining investment material must be removed with a pneumatic devesting chisel. No distortion takes place, such as with dental casting alloys, due to the elastic material properties of BioHPP.

The rest of the investment material is sandblasted with 110 µm aluminium oxide grit at 2.5 bar. During the sandblasting process, the distance between the object and the jet nozzle must be at least 3 cm (Fig. 2). If the distance is any smaller, parts of the resin could become heated and damaged.

Caution!
When using titanium bases that can be over-pressed (elegance abutment) for individual abutments, the remaining investment material must be removed using 50 µm polishing beads instead of 110 µm Al_2O_3 at a sandblasting pressure of 2.5 bar (Fig. 3).
Abrasives must not be used on the abutment joints. A cover can be made for this section using a bolted-on laboratory analogue. It is recommended that the remaining investment material is loosened in an ultrasound bath.

The mould rings do not fit into the normal devesting presses but can be easily removed from the mould.

Fitting and finishing

For wide-span objects, it may be beneficial if the sprues are not removed during the fitting process. These can provide an extremely firm hold. After fitting, the sprues can be most easily removed with cross-toothed mills.

Generally, the object is fitted to the stumps without using occlusal spray or similar aids, as these chemical substances are difficult to remove from the objects.

A perfect high gloss polish ensures optimum surface quality.

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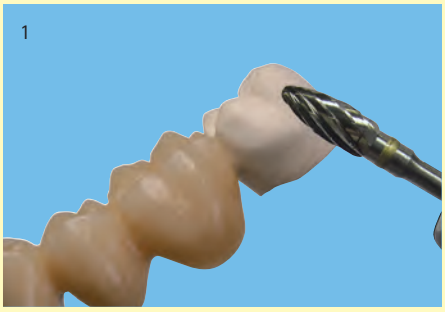
Fitting and finishing

The following five steps using selected rotating tools will lead to optimum results:

Step 1

Carbide cutter, coarse serration, light contact pressure, 6–8000 rpm.

REF	Designation
H200 M8 23	Carbide cutter 2.3 mm Ø – rounded conical
H272 M8 14	Carbide cutter 1.4 mm Ø – garnet
H274 M8 40	Carbide cutter 4.0 mm Ø – garnet
H237 M8 23	Carbide cutter 2.3 mm Ø – garnet
350 00M2 5	Diamond disc 0.25 mm Ø Giflex-TR Master x-tray



Step 2

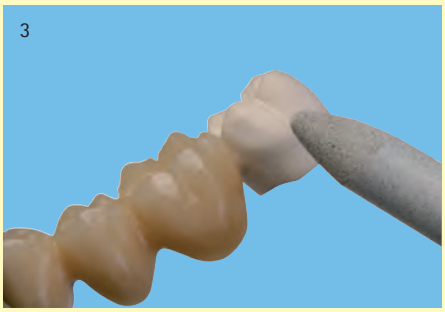
Diagen-Turbo-Grinder, green, light contact pressure, 6–8000 rpm.

REF	Designation
34000200	Diagen-Turbo-Grinder

Step 3

Ceragum rubber polishing cylinder, light contact pressure, 6–8000 rpm.
Caution: very light contact pressure.

REF	Designation
PWKG0650	Ceragum coarse cylinder, 6 x 19 mm
PLKG2250	Ceragum coarse lens, 22 x 4 mm
PRKG2250	Ceragum coarse wheel, 22 x 4 mm



Step 4

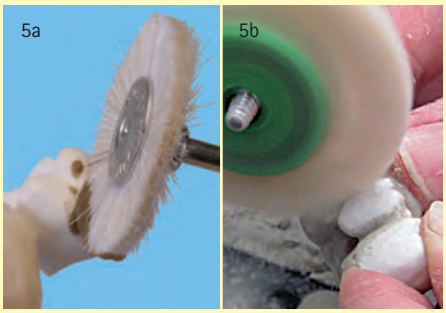
Goat-hair brush with pumice stone powder, at the dental technician's workplace, approx. 5000 rpm, or on the polishing lathe with pumice stone powder level II.

REF	Designation
35000610	Goat-hair brush

Step 5

Goat-hair brush with Abraso-Starglanz and then cotton buffing wheel without polish 6–8000 rpm on the handpiece (Image 5a) or wool buffing wheel without polish on the polishing lathe level II (Image 5b).

REF	Designation
52000163	Abraso-Starglanz



Important:
To achieve an optimum surface when making primary telescopes, the use of special parallel cutters for BioHPP (REF H 137 M 823) is recommended. After that, immediately polish the contact surface with the high-gloss polish using a short-haired goat-hair brush (REF 350 0061 0) and the high-gloss polishing paste *Zi*-polish (REF 360 1002 5).

Veneering with composites

Only composite veneers that harden without additional thermal treatment may be used. The bredent composite veneer with all the visio.lign system components has proven to be most suitable. This has been shown by numerous scientific studies.

Mechanical retentions in the form of beads or splinters have been proven to improve the bond strength between BioHPP and the composite veneer (Fig. 1).

The following order must be followed when conditioning the BioHPP surface.

1. Blast with 2.5 bar and 110 µm Al_2O_3

2. **Do not steam off!**

3. Thinly apply the visio.link bonding agent according to the UM* and polymerise (Fig. 2)

4. Apply opaquer according to the UM* and polymerise

5. Apply the composite veneer according to the UM*; potentially use the visio.lign system veneers.

In order to prevent undesired stresses or warpage in the framework, it is advisable to separate the individual veneers up to the opaquer and only combine them after polymerisation (e.g. with crea.lign). When using novo.lign veneers, it is also important to separate these and only add the crea.lign after final polymerisation.

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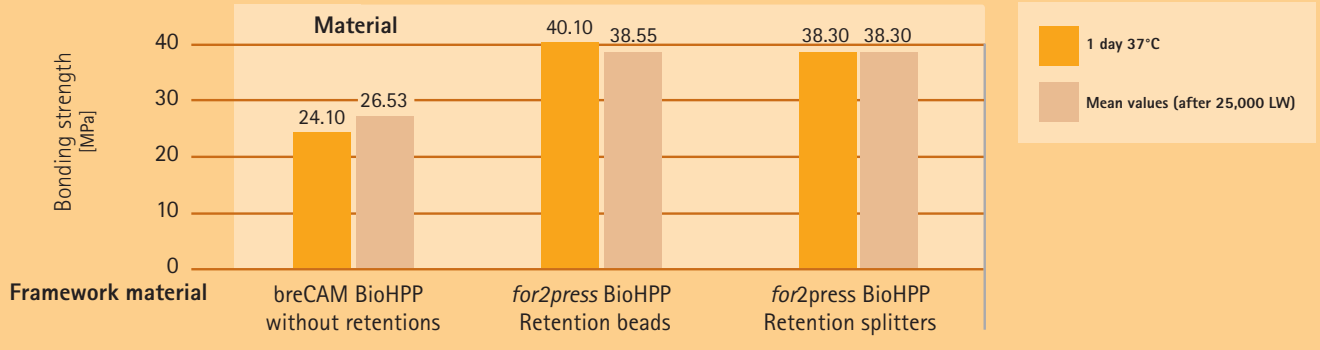
* UM = visio.lign user manual

2

Bond strength according to DIN EN ISO 10477/University of Jena



Studies by University of Jena, University of Cologne, University of Zurich, University of Munich

We recommend coating the exposed areas of the framework and scalloped sections with a thin layer of crea.lign Transpa so that intraoral cleaning is more convenient.

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Cleaning

A steam blaster may only be used briefly and with a large clearance between the nozzle and the BioHPP surface for final cleaning. Cleaning is best done using ultrasound baths and pin cleaning units (e.g. Sympro by Renfert) with a bath temperature of max. 40°C. Highly corrosive solutions may not be used.

Recommended preparation of over-pressed elegance abutments

The preparation of customised elegance abutments can be done using steam sterilisation (autoclave) and the vacuum process. To do so, a triple fractionated pre-vacuum can be generated with a sterilisation time of 4 minutes and a temperature of 134°C +/- 1°C.

Intraoral cleaning

The surfaces made from BioHPP may only be cleaned mechanically using an ultrasound scaler if the resin tips approved for the implant technique are used. The use of abrasives such as Air-Flow with gentle Air-Flow Plus or Perio abrasives is possible but the surface must be mechanically polished, as with composite veneers. The Super Snap Set from Shofu is a suitable polishing material.
It is best if the patient cleans their teeth using a soft to medium toothbrush.

Extraoral cleaning

Cleaning is best done mechanically, with a soft to medium toothbrush, using an ultrasound bath or a pin cleaning unit. When using an ultrasound bath for 1 minute, the temperature must not exceed 40°C.
Steaming off delicate, removable frameworks made from BioHPP can put parts of them under thermal stress and pressure.
Cleaning solutions should only be added in very small concentrations.

Do not steam off!

Framework insertion

Summary of potential bonding and fixing materials

Fixing type	Fixing systems**	BioHPP crowns and bridges to...				
		Metal/alloy abutments	Zirconium dioxide abutments	BioHPP abutments	Tooth structure (dentine, enamel)	use visio.link on BioHPP
permanent	Adhesive – with conditioning/primer using composite fixing cement, e.g. Panavia F 2.0 (Kuraray), VarioLink II (Ivoclar), NX-3 (Kerr)	✓	✓	✓	X	✓
	Self-adhesive composite fixing cement 110 µm jet, e.g. Rely X Unicem (3M Espe)	✓	✓	✓	X	●
	Glass ionomer cement, e.g. Ketac Cem (3M Espe)	●*	●*	●	X	X
	Zinc phosphate cement (e.g. Harvard)	●	●	●	X	X
temporary	Zinc oxide, eugenol-free cement (Tempbond by Kerr)	✓	✓	✓	●*	X
	A-Silicone-based fixing cement (Tempsil 2 by Coltène Whaledent)	✓	✓	✓	✓	X

Fixing type	Fixing systems**	BioHPP abutment with framework materials made from...				
		use visio.link on BioHPP	Dental alloys	Zirconium dioxide	BioHPP	e.max (lithium disilicate/lithium silicate) silanised
permanent	Adhesive – with conditioning/primer using composite fixing cement, e.g. Panavia F 2.0 (Kuraray), VarioLink II (Ivoclar), NX-3 (Kerr)	✓	✓	✓	✓	K
	Self-adhesive composite fixing cement 110 µm jet, e.g. Rely X Unicem (3M Espe)	●	✓	✓	✓	X
	Glass ionomer cement, e.g. Ketac Cem (3M Espe)	X	●*	●*	●	X
	Zinc phosphate cement (e.g. Harvard)	X	●	●	●	X
temporary	Zinc oxide, eugenol-free cement (Tempbond by Kerr)	X	✓*	✓*	●	X
	A-Silicone-based fixing cement (Tempsil 2 by Coltène Whaledent)	X	✓	✓	✓	X

* Only use with a preparation angle up to 5°

✓ = optimum K = only to be used for crowns ● = generally possible X = not recommended X = not released

**BioHPP TU, BioHPP ds 2 TU, breCAM.BioHPP TU, breCAM.BioHPP TU dentin shade 2 are officially released to be used for

- the fabrication of temporary crowns and bridge structures with max. 2 pontics (max. 6 month wearing time).
- for removable denture indications in conjunction with telescopic crowns and/or implants for the usual life-span of those appliances (5-10 years).
- Fully anatomical temporary crowns and bridges (max. 2 pontics, connector cross-section in the anterior tooth min. 12 mm², posterior tooth min.14 mm²)
- Temporary Crowns copings and bridges substructures cemented for composite veneering (max.2 pontics)
- Removable telescopic primary and secondary crowns and frameworks
- Secondary bar structures on primary bars made of titanium alloy, CoCr alloys, zirconium dioxide
- Fabrication of implant-supported, screw-retained restorations, wearing period of up to 180 days (recall interval), veneered with or without composite or resign.

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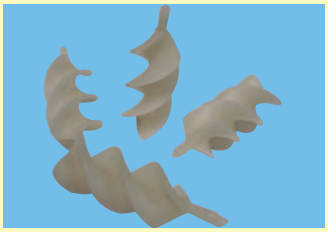
Order information

BioHPP (granules)	dentine shade 1 (white)	dentine shade 2 (tooth-coloured)
20 g	REF 54TF2PB2	REF 54TF2P22
100 g	REF 54TF2PB3	REF 54TF2P23

BioHPP pellets		dentine shade 1 (white)	dentine shade 2 (tooth-coloured)
Ø 25 mm	75 g (5 x15 g)	REF 54TF2PB4	REF 54TF2P24
Ø 25 mm	150 g (10 x 15 g)	REF 54TF2PB5	REF 54TF2P25
Ø 15 mm	20 g (5 x 4 g)	REF 54TF2PB6	REF 54TF2P26
Ø 15 mm	40 g (10 x 4 g)	REF 54TF2PB7	REF 54TF2P27

*perfect*2press sprue	
	REF 430F2P30



Brevest *for*2press	
Carton with approx. 7.35 kg incl. 1000 ml of Bresol *for*2press	REF 570F2PV3

Bresol *for*2press liquid	
1000 ml liquid for the investment material *for*2press	REF 520F2PL2

Mould system *for*2press Mould Set	
Size 3	REF 360F2P16
Size 9	REF 360F2P26
Size 10	REF 360F2P27

Disposable press plunger *for*2press filler	
16 mm	REF 570F2P16
26 mm	REF 570F2P26

1 mm inserts	
Size 3	REF 360F2PV3
Size 9	REF 360F2PV9
Size 10	REF 360F2PV1

Troubleshooting

Problem	Cause	Remedy
Shrinkage cavity in the object	a) Pressure too low b) Drop in pressure during pressing process caused by other devices c) Incorrect spruing d) Objects not outside the heat centre	a) Adjust pressure as per the processing instructions b) Switch off other pressure devices during the pressing process c) Make one or two air escape ducts from the mould to the mould plate d) Place the object outside the heat centre Work needs to be repeated!
Bridge or crown sections have not flowed out	a) Pressure too low b) Melting temperature too low c) Melting time too short d) Too little material e) Press plunger tilted or was inserted the wrong way	a) Adjust the pressure as per the processing instructions b) Check the furnace temperature with the separate digital thermometer c) Maintain the exact melting time at 400°C d) Stick to the material quantity according to the filling capacity summary e) Pay attention to the orientation of the press plunger Work needs to be repeated!
Brown areas on the surface	a) Sandblasting pressure too high, distance to the jet nozzle too small b) Some granules rolled into the mould and burned up	a) Sand down the surface, or b) use *perfect*2press channels c) Pay attention to the sprue technique! d) Follow the instructions!
Mould burst during the pressing process	a) Mould cooled to the required pressing temperature too quickly. b) Preheating temperature too low or preheating time too short c) Mould plates were removed from the investment material mould with too much force d) Mould tore in the pressing unit	a) Limit cooling speed when the furnace door is closed to max. 8°C/min. b) Follow the investment material temperature instructions! c) Use more Vaseline to grease the mould plate d) Use a metal mould ring Work needs to be repeated!
Problems with fit	a) Mould removed too soon from the pressing unit b) Incorrect mixing quantities of investment materials c) Task delayed during removal procedure	a) Cooling process must not be manually interrupted before the 40 min. have passed b) Follow the investment material instructions regarding expansion c) For larger frameworks, base the mould on an investment material duplicate model and invest them together Work needs to be repeated!
After devesting, there are visible brown streaks on the surface	a) Material overheated b) Melting time too long c) Use BioHPP as granulate for mould size 9 with 26 mm press plunger diameter	a) Check the melting temperature of the preheating furnace with the digital thermometer when it has reached 400°C b) Do not exceed the melting time of 20 min. c) For larger moulds with more than 8 g of BioHPP, the use of BioHPP pellets is recommended Work can still be used!
Pressing not successful	a) No contact pressure, or too low b) Mould is crooked in the pressing unit d) Too little material. Mould was not preheated to the recommended temperature d) Mould is too cold	a) Check the contact pressure b) Mould needs to be placed vertically on the pressing table in the vacuum pressing unit c) Watch the manometer for any drop in pressure, use up the compressed air d) Work needs to be repeated!
Broken bridge.	a) Shrinkage cavities in the connector, see point 1. b) Incorrect connector diameter	Work needs to be repeated!

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FAQ

Question	Answer
Can used material be re-used?	No. It is too great a task to clean the material correctly. Risk of impurities becoming embedded.
Which veneering materials can I use?	The visio.lign veneering system is the most suitable, as its mechanical properties are compatible with each other. It is important to use the visio.link bonding agent; it is also essential that this is used when veneering composites from other manufacturers are used.
A bridge doesn't fit; can it be removed and re-bonded?	Generally no, but allowing for specific geometric adhesive bonds, BioHPP can be affixed using the visio.link bonding agent and combo.lign.
What about biofilm formation?	That is generally caused by surface roughness. Compared with similar surface qualities, the formation of biofilm on high-performance polymers occurs less than on metal alloys but more than on ceramics.
What is the shrinkage level of BioHPP?	≈ 1.3% (volume).
What are the advantages compared to non-precious metal restorations?	- White framework material (white and dentine-coloured) and therefore ideal for aesthetic veneers, with no black crown margins - metal-free - shock-absorbing (off-peak properties) - does not release ions so no metallic taste - does not conduct electricity - corrosion-resistant - biocompatible - less tool wear on the rotating instruments - very good polishing properties - clean to work with (no dirt) - very light and therefore very comfortable to wear
On bridges, how many pontics are possible?	Max. 2 pontics in the posterior region. This corresponds to a bridge span of approx. 16 mm on unprepared teeth.
Can the material be milled? When will milling blanks be available?	**BioHPP is extremely well-suited for milling. The material can be processed much quicker than metal or ceramics, significantly increasing the durability of the milling tools.** **The bre.CAM BioHPP milling blanks are already available for many milling systems!**

BioHPP in *for*2press system

Processing instructions

bredent

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