

e.max[®] Press IPS



INSTRUCTIONS FOR USE

CE 0123

ivoclar[®]
vivadent[®]
technical

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IPS e.max® System – all you need

IPS e.max – one system for every indication

IPS e.max is an innovative all-ceramic system which covers the entire all-ceramic indication range – from Thin Veneers to 10-unit bridges.

IPS e.max delivers high-strength and highly esthetic materials for the Press and the CAD/CAM technologies. The system consists of innovative lithium disilicate glass-ceramics used mainly for single-tooth restorations and high-strength zirconium oxide for large-span bridges.

Every patient situation presents its own requirements and objectives. IPS e.max meets these requirements. Due to the system components you obtain exactly what you need.

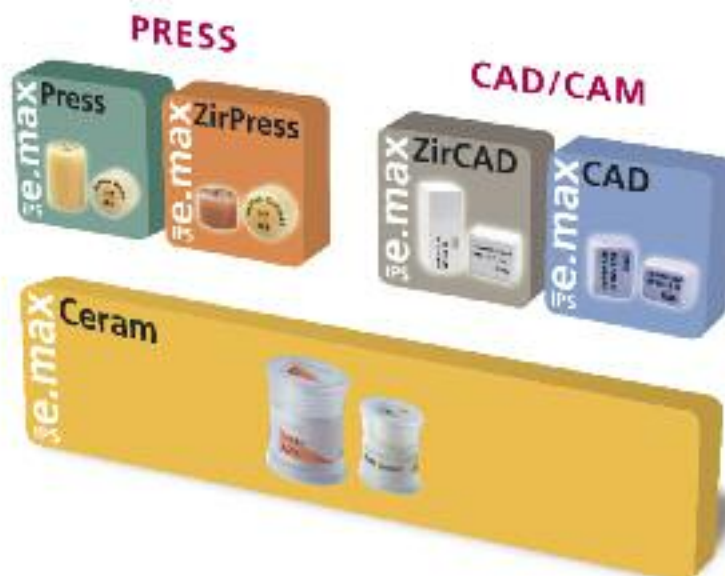
- The components for the Press technology include the highly esthetic IPS e.max Press lithium disilicate glass-ceramic ingots and the IPS e.max ZirPress fluorapatite glass-ceramic ingots for the fast and efficient press-on-zirconia technique.
- Depending on the case requirements, two types of materials are available for the CAD/CAM technique: the innovative IPS e.max CAD lithium disilicate glass-ceramic blocks and the IPS e.max ZirCAD high-strength zirconium oxide.
- The nano-fluorapatite layering ceramic IPS e.max Ceram, which is used to characterize/veneer all IPS e.max components – both glass or oxide ceramics – completes the IPS e.max system.

IPS e.max Press

The shades and translucency levels of the IPS e.max Press ingots are based on the overarching IPS e.max shade system. The system has a flexible designs and can be used in conjunction with the A-D, Chromascop as well as Bleach BL shade guides.

The shades of the Press ingots and CAD/CAM blocks offered in the IPS e.max System are all coordinated with each other. They are available in different degrees of opacity and/or translucency. The selection of the translucency level is based on the clinical requirements (shade of the prepared tooth, desired tooth shade) presented by the patient, as well as the desired processing technique (layering, cut-back, staining technique).

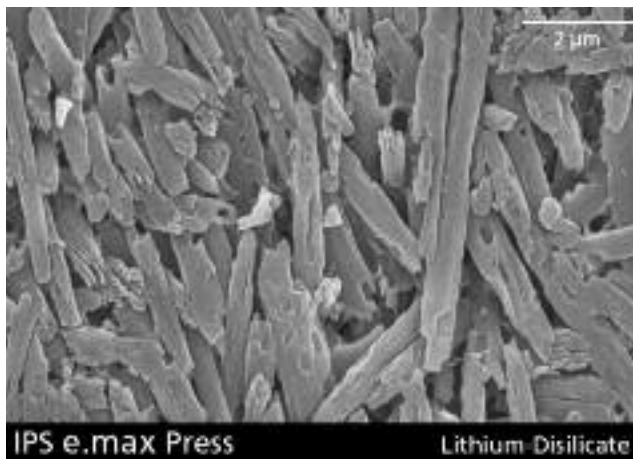
The more opaque HO and MO ingots are predominantly suitable for the layering technique, while the more translucent LT and HT ingots are used for the cut-back and also the staining technique.



IPS e.max[®] Press – Product Information

Material

IPS e.max Press is a lithium disilicate glass-ceramic ingot for the PRESS technology. The production process creates absolutely homogeneous ingots in different translucency levels. These ingots feature a strength of 400 MPa and are thus the pressed ceramic ingots with the highest strength. They are pressed in Ivoclar Vivadent press furnaces to produce restorations with outstanding accuracy of fit. The pressed, tooth-coloured, highly esthetic restorations are stained and/or veneered with IPS e.max Ceram and glazed.



CTE (100-400°C) [10 ⁻⁶ /K]	10.2
CTE (100-500°C) [10 ⁻⁶ /K]	10.5
Flexural strength (biaxial) [MPa]*	400
Fracture toughness [MPa m ^{0.5}]	2.75
Modulus of elasticity [GPa]	95
Vickers hardness [MPa]	5800
Chem. solubility [μg/cm ²]*	40
Press temperature [°C/°F]	915-920/1679-1688
*according to ISO 6872	

Uses

Indications

- Table tops (occlusal veneers)
- Thin Veneers
- Veneers
- Inlays
- Onlays
- Partial crowns
- Crowns in the anterior and posterior region
- 3-unit bridges in the anterior region
- 3-unit bridges in the premolar region up to the second premolar as the terminal abutment
- Pressing over electroplated single-crown frameworks
- Implant superstructures for single-tooth restorations (anterior and posterior regions)
- Implant superstructures for 3-unit bridges up to the second premolar as the terminal abutment
- Primary telescope crowns

Contraindications

- Posterior bridges reaching into the molar region
- 4- and more-unit bridges
- Inlay-retained bridges
- Very deep sub gingival preparations
- Patients with substantially reduced residual dentition
- Bruxism
- Cantilever bridges / extension units
- Maryland bridges
- Any other use not listed in the indications

Important processing restrictions

Failure to observe the following restrictions may compromise the results achieved with IPS e.max Press:

- Failure to observe the necessary minimum connector and layer thicknesses
- Layering with a veneering ceramic other than IPS e.max Ceram
- Pressing of two or more IPS e.max Press ingots in one investment ring
- Pressing of IPS e.max Press in the IPS Investment System 300 g
- Use of metal-ceramic opaquers for pressing over electroplated frameworks

Side effects

If the patient is known to be allergic to any of the components of IPS e.max Press, the material must not be used to fabricate restorations.

Composition

The IPS e.max Press ingots and the corresponding processing accessories consist of the following main components:

- **IPS e.max Press Ingots**
Components: SiO_2
Additional components: Li_2O , K_2O , MgO , ZnO , Al_2O_3 , P_2O_5 and other oxides
- **IPS e.max Press Opaquer**
Components: ceramic materials and glycols
- **IPS Alox Plunger**
Components: Al_2O_3
- **IPS Alox Plunger Separator**
Components: boron nitride
- **IPS e.max Press Invex Liquid**
Components: hydrofluoric acid and sulphuric acid in water
- **IPS Natural Die Material**
Components: polymethacrylate, paraffin oil, SiO_2 and copolymer
- **IPS Natural Die Material Separator**
Components: wax dissolved in hexane
- **IPS PressVEST Powder**
Components: SiO_2 , MgO and $\text{NH}_4\text{H}_2\text{PO}_4$
- **IPS PressVEST Liquid**
Components: colloidal silicic acid in water
- **IPS PressVEST Speed Powder**
Components: SiO_2 , MgO and $\text{NH}_4\text{H}_2\text{PO}_4$
- **IPS PressVEST Speed Liquid**
Components: colloidal silicic acid in water
- **IPS Object Fix Flow**
Components: oxides, water, thickening agent
- **IPS Ceramic Etching Gel**
Components: hydrofluoric acid (approx. 5%)

Warning

- Hexane is highly flammable and detrimental to health. Avoid contact of the material with skin and eyes. Do not inhale vapours and keep away from sources of ignition.
- Do not inhale ceramic dust during finishing — use exhaust air discharge and mouth protection.
- IPS Ceramic Etching Gel contains hydrofluoric acid. Contact with skin, eyes and clothing must be prevented at all costs, since the material is extremely toxic and corrosive. The etching gel is intended for professional use only and must not be applied intraorally (inside the mouth).

Scientific Data

Further scientific data (e.g. strength, wear, biocompatibility) are contained in the "Scientific Documentation IPS e.max Press". The Documentation also provides a set of studies that describe the clinical performance of IPS e.max Press.

This Scientific Documentation can be obtained from Ivoclar Vivadent.











For further information about all-ceramics and IPS e.max in general, please refer to the Ivoclar Vivadent Report No. 16 and No. 17.



Ingot Concept

IPS e.max Press is available in **four levels of translucency (HT, LT, MO, HO)** and **two sizes**. From a processing point of view, basically all restorations can be fabricated of any ingot.

For reasons of esthetics, however, the following processing technique and indication are recommended for the individual ingots (translucency levels):

Translucency Levels	Processing Technique			Indications								
	Staining Technique	Cut-Back Technique	Layering Technique	Table Tops	Thin Veneers	Veneers	Inlays	Onlays	Partial Crowns	Anterior Crowns	Posterior Crowns	3-Unit Bridges ¹
High Translucency 				✓*	✓*	✓	✓	✓	✓	✓	✓	✓
Low Translucency 					✓*	✓			✓	✓	✓	✓
Medium Opacity 										✓	✓	✓
High Opacity 										✓	✓	✓

CR %

* the cut-back technique must not be applied for thin veneers and table tops.

¹ only up to the second premolar as the distal abutment



IPS e.max Press HT (High Translucency)

The HT Ingots are available in **16 A-D** and **4 Bleach BL shades**. Given their high translucency they are ideally suitable for the fabrication of smaller restorations (e.g. inlays and onlays). Restorations made of HT ingots offer true-to-nature chameleon effect and the exceptional adaption to the remaining tooth structure.

Given their translucency, HT ingots are particularly suitable for the staining technique and also the cut-back technique. The Stain and Characterization firing, as well as the Glaze firing are conducted using IPS e.max Ceram Shades, Essence and Glaze materials. If adjustments are required, the IPS e.max Ceram layering materials can be used.



IPS e.max Press LT (Low Translucency)

The LT Ingots are available in **16 A-D** and **4 Bleach BL shades**. Given their lower translucency they are ideally suitable for the fabrication of larger restorations (e.g. posterior crowns). Restorations made of LT ingots create lifelike brightness value and chroma. This prevents the incorporated restorations from graying. Given their translucency, LT ingots are particularly suitable for the cut-back technique, but they can also be used in the staining technique. The cut-back is subsequently supplemented with IPS e.max Ceram Incisal and/or Impulse and characterized using IPS e.max Ceram Essence and Shades.



IPS e.max Press MO (Medium Opacity)

The MO Ingots are available in **5 group shades (MO 0 - MO 4)**. Given their opacity, they are ideally suitable for the fabrication of frameworks on vital, slightly discoloured preparations. The anatomical shape is subsequently individually layered using IPS e.max Ceram. Finally, the Stain and Glaze firing with IPS e.max Ceram is conducted.

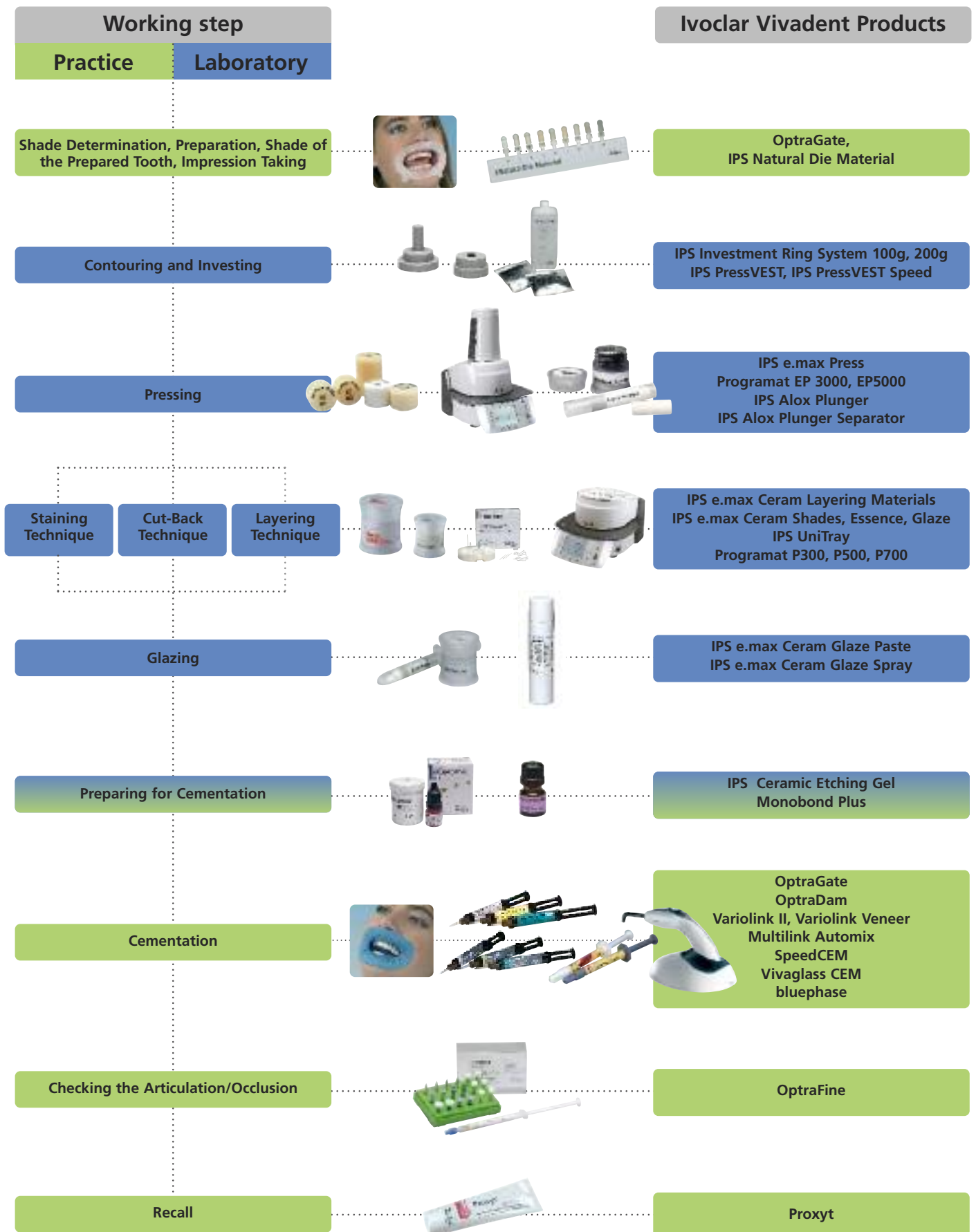


IPS e.max Press HO (High Opacity)

The ingots are available in **3 group shades (HO 0 - HO 2)**. Given their high opacity, they are ideally suitable for the fabrication of frameworks on severely discoloured preparations. The anatomical shape is subsequently individually layered using IPS e.max Ceram. Finally, the Stain and Glaze firing with IPS e.max Ceram is conducted.

The entire IPS e.max delivery program can be found at www.ivoclarvivadent.com!

IPS e.max® Press – Clinical Steps, Model Preparation, Contouring, Pressing Procedure



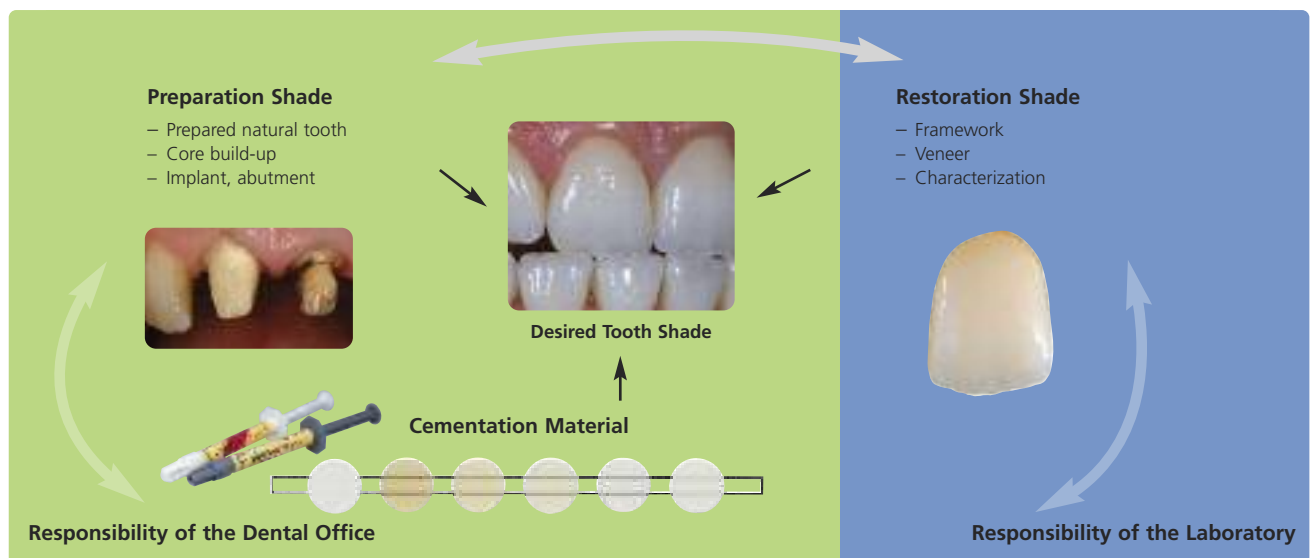
Shade Determination — Tooth Shade, Shade of the Prepared Tooth

Optimum integration in the oral cavity of the patient is the prerequisite for a true-to-nature all-ceramic restoration. To achieve this, the following guidelines and notes must be observed by both the dentist and the laboratory.

The overall esthetic result of an all-ceramic restoration is influenced by the following factors:

- **Shade of the preparation** (natural preparation, core build-up, abutment, implant)
- **Shade of the restoration** (framework shade, veneer, characterization)
- **Shade of the cementation material**

The optical effect of the preparation shade must not be underestimated during the fabrication of highly esthetic restorations. For that reason, the shade of the preparation should be determined together with the desired tooth shade in order to select the suitable block. Especially with severely discoloured preparations or non-tooth-shaded build-ups, this is of utmost importance. Only if the dentist determines the shade of the preparation and its subsequent transmission to the laboratory may the desired esthetics be achieved in a targeted fashion.





Shade determination of the natural tooth

After tooth cleaning, the tooth shade of the non-prepared tooth and/or the adjacent teeth is determined with the help of a shade guide. Individual characteristics have to be considered when determining the tooth shade. If a crown preparation is planned, for example, the cervical shade should also be determined. In order to achieve the best possible true-to-nature results, shade determination should be carried out at daylight. Furthermore, the patient should not wear clothes of intensive colours and/or lipstick.



Die shade selection

In order to facilitate the reproduction of the desired tooth shade, the shade of the preparation is determined with the help of the IPS Natural Die Material shade guide. This enables the technician to fabricate a model die similar to the preparation of the patient, on the basis of which the correct shade and brightness values of the all-ceramic restorations may be selected.



Example of the preparation shade effect

Crown made of IPS e.max Press HT B1 on different preparation shades.



Which ingot to use?

The suitable ingot is selected on the basis of the following criteria:

1. Desired tooth shade
2. Preparation shade or abutment shade
3. Type of restoration
4. Restoration thickness and/or preparation depth
5. Processing technique (staining, cut-back or layering technique)
6. Cementation material



Please refer to the table on page 59 for ingot selection

Preparation guidelines

Successful results can only be achieved with IPS e.max Press if the guidelines and minimum layer thicknesses are strictly observed.

Basic preparation guidelines for all-ceramic restorations

- no angles or sharp edges
- shoulder preparation with rounded inner edges and/or deep chamfer preparation
- the indicated dimensions reflect the minimum thickness for IPS e.max Press restorations

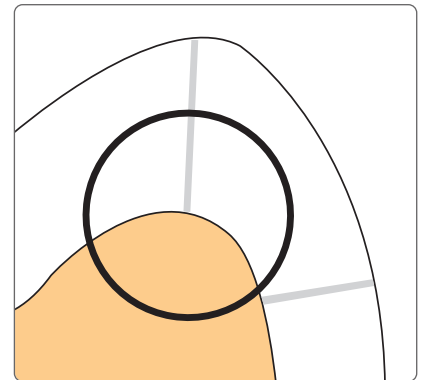
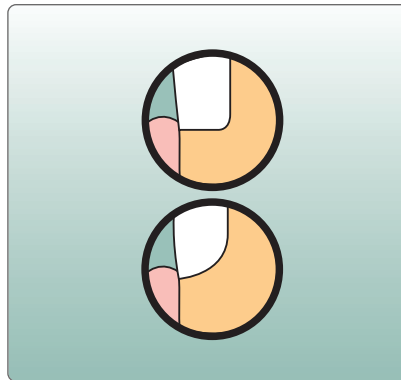
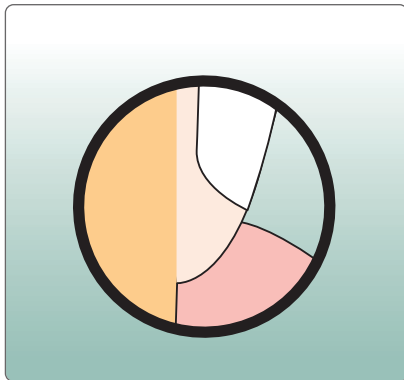
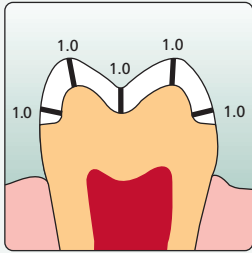
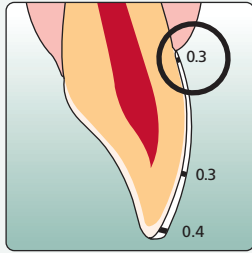
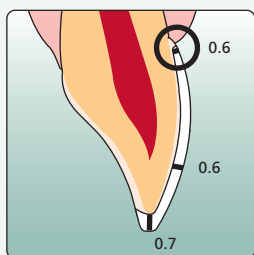


Table Top	Thin Veneer
 <ul style="list-style-type: none"> – Reduce the anatomical shape and observe the stipulated minimum thickness. – Prepare a shoulder with rounded inner edges or a deep chamfer. Width of the shoulder/chamfer at least 1.0 mm. – Reduce the occlusal by approx. 1.0 mm. 	 <ul style="list-style-type: none"> – If possible, the preparation should be located in the enamel. – The incisal preparation margins should not be located in the area of static or dynamic occlusal contact. – The minimum layer thickness of the thin veneer in the cervical and labial area is 0.3 mm. A restoration thickness of 0.4 mm must be planned at the incisal edge. – If there is enough space, preparation is not necessary.

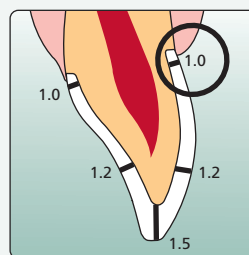


Veneer



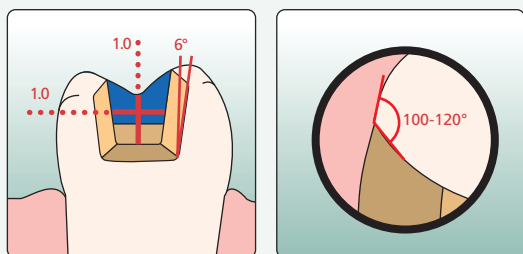
- If possible, the preparation should be located in the enamel.
- The incisal preparation margins should not be located in the area of static or dynamic contacts.
- Reduce the cervical and/or labial area by 0.6 mm, and the incisal edge by 0.7 mm

Anterior Crown



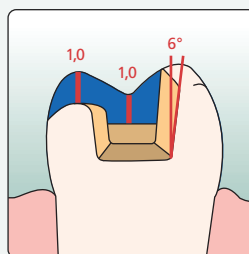
- Reduce the anatomical shape and observe the stipulated minimum thickness. Prepare a shoulder with rounded inner edges or a deep chamfer. Width of the shoulder/chamfer at least 1 mm.
- Reduce the incisal by approx. 1.5 mm.
- Reduce the facial and/or lingual area by approx. 1.2 mm.
- For conventional and/or self-adhesive cementation, the preparation must demonstrate retentive surfaces and sufficient preparation height.

Inlays



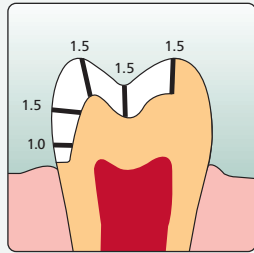
- static and dynamic occlusal contacts must be taken into consideration.
- The preparation margins must not be located on centric occlusal contacts.
- A preparation depth of at least 1.0 mm and an isthmus width of at least 1.0 mm must be observed in the fissure area.
- Prepare the proximal box with slightly diverging walls and observe an angle of 100°-120° between the proximal cavity walls and the prospective proximal inlay surfaces. In case of pronounced convex proximal surfaces without adequate support by the proximal shoulder, marginal ridge contacts on the inlay should be avoided.
- Round out internal edges and transitions in order to prevent stress concentration within the ceramic material.
- Do not prepare slice-cuts/bevels or feather edges.

Onlay



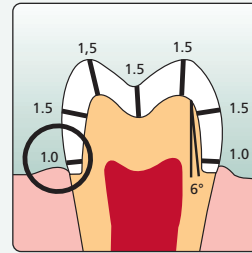
- Static and dynamic occlusal contacts must be taken into consideration.
- The preparation margins must not be located on centric occlusal contacts.
- A preparation depth of at least 1.0 mm and an isthmus width of at least 1.0 mm must be observed in the fissure area.
- Prepare the proximal box with slightly diverging walls and observe an angle of 100°-120° between the proximal cavity walls and the prospective proximal onlay surfaces. For onlays with pronounced convex cavity walls without adequate support by the proximal shoulder, marginal ridge contacts should be avoided.
- Round out internal edges in order to prevent stress concentration within the ceramic material.
- Do not prepare slice-cuts/bevels or feather edges.
- Provide at least 1.0 mm of occlusal clearance.

Partial crown



- Static and dynamic occlusal contacts must be taken into consideration.
- The preparation margins must not be located on centric occlusal contacts.
- Provide at least 1.5 mm of reduction in the cusp areas.
- Prepare a shoulder with rounded inner edges or a deep chamfer. Width of the shoulder/chamfer should be at least 1.0 mm.

Posterior crown



- Reduce the anatomical shape and observe the stipulated minimum thickness. Prepare a shoulder with rounded inner edges or a deep chamfer. Width of the circular shoulder/chamfer should be at least 1.0 mm.
- Reduce the occlusal by approx. 1.5 mm.
- Reduce the buccal and/or lingual area by approx. 1.5 mm.
- For conventional and/or self-adhesive cementation, the preparation must demonstrate retentive surfaces and sufficient preparation height

3-Unit Bridge



Given the different masticatory forces, the maximum acceptable pontic width is different in the anterior and posterior region.

The pontic width is determined on the unprepared tooth.

- In the anterior region (up to the canine) the pontic width should not exceed 11 mm.
- In the premolar region (canine to the 2nd premolar), the pontic width should not exceed 9 mm.

For conventional and/or self-adhesive cementation, the preparation must demonstrate retentive surfaces and sufficient preparation height.

Model Preparation

Fabricate a working model with removable segments as usual. It is advisable to apply a sealer to harden the surface and to protect the stone die, but the sealer must not cause volume changes to the stone die. After that, apply a spacer. Please be aware of the fact that the expansion of the Ivoclar Vivadent investment materials is coordinated with the following procedure.

- For thin veneers, veneers, table tops, and partial crowns as well as single-tooth crowns, the spacer is applied in two layers up to max. 1 mm from the preparation margin (spacer application 9-11 μm).
- For inlays and onlays, the spacer is applied in up to 3 layers and up to the preparation margin.
- Also apply two layers for bridge reconstructions. Apply an additional layer at the intercoronal surfaces of the abutments (towards the pontic). This measure helps prevent undesired friction.
- For IPS e.max Press restorations on abutments or implants, the procedure is the same as that on natural preparations.

Thin Veneer, Veneer



Two layers of spacer are applied up to max. 1 mm from the preparation margin

**Partial Crown, Single Crown
(Anterior Tooth, Posterior Tooth)**



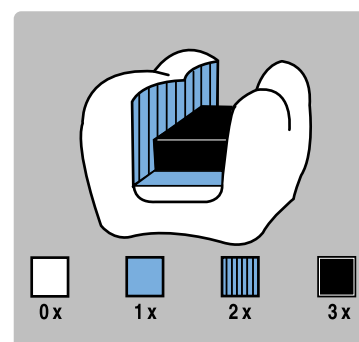
Two layers of spacer are applied up to max. 1 mm from the preparation margin

**Bridges
(Anterior Tooth, Posterior Tooth)**



Apply two layers of spacer up to 1 mm to the preparation margin and a third layer on the intercoronal surfaces

Inlays, Onlays






For inlays and onlays, the spacer is applied in up to 3 layers.

Layer Thicknesses

The restoration design is key to the success of durable all-ceramic restorations. The more attention is given to the design, the better the final results and the clinical success will turn out to be. The following basic guidelines have to be observed:

- The pressed materials is the high-strength component of your restoration and must, therefore, always make up at least 50% of the total layer thickness of the restoration.
- In large preparations and for veneered or partially veneered restorations, the excess available space must be compensated by the corresponding dimensions of the high-strength IPS e.max Press component and not by the IPS e.max Ceram layering material.
- If possible, the connector design should be extended in the vertical direction, rather than in the horizontal direction.
- Especially in anterior bridges, it is not always possible to establish the necessary connector dimensions. In such cases, the connector dimensions must always be extended in the vertical (incisal-cervical) direction

The following minimum thicknesses have to be observed to match the tooth colour of the shade guide and to fulfil the requirements of the preparation guidelines:

			Table Tops	Thin Veneers	Veneers	Inlays	Onlays	Partial Crowns	Crowns		Bridges	
									Anterior Tooth	Posterior tooth	Anterior Region	Premolar Region
	Minimum Thickness IPS e.max Press Staining Technique	circular	1.0	0.3-0.6	1.0 isthmus width	1.0 isthmus width	1.5	1.2	1.5	1.2	1.5	
		incisal/occlusal	1.0	0.4-0.7	1.0 fissure area	1.0 fissure area	1.5	1.5	1.5	1.5	1.5	
	Minimum Thickness IPS e.max Press Cut-Back Technique (after reduction)	circular	—	—	0.6	—	—	1.5	1.2	1.5	1.2	1.5
		labial/occlusal	—	—	0.4	—	—	0.8	0.4	0.8	0.8	0.8
	Minimum Thickness IPS e.max Press Layering Technique	circular	—	—	—	—	—	—	0.6	0.8	0.8	0.8
		incisal/occlusal	—	—	—	—	—	—	0.6	0.8	0.8	0.8
		design type	—	—	—	—	—	—	supporting the tooth shape lingual/palatinal fully anatomic design			
		connector dimensions	—	—	—	—	—	—	—	—	16mm ²	16mm ²

Dimensions in mm

For the **cut-back** and **layering techniques**, the relationship of the layer thickness between IPS e.max Press (framework) and IPS e.max Ceram (veneer) must also be observed:

Overall Thickness of the Restoration in mm	0.8	1.0	1.2	1.5	1.8	2.0	2.5	3.0
Minimum Framework Thickness of IPS e.max Press in mm	0.4	0.5	0.6	0.8	1.0	1.1	1.3	1.6
Maximum Layer Thickness of the Veneer with IPS e.max Ceram in mm	0.4	0.5	0.6	0.7	0.8	0.9	1.2	1.4

Failure to observe the stipulated framework design criteria and minimum thicknesses may result in clinical failures, such as cracks, delamination and fracture of the restoration.



Contouring

After the fabrication of the model with detachable segments and the preparation of the dies, the restoration is contoured. Use only organic waxes for contouring, since they fire without leaving residue.

Contour the restoration in accordance with the desired processing technique (staining, cut-back or layering technique).

Please observe the following general notes for contouring:

- Observe the stipulated minimum layer thicknesses and connector dimensions of the respective indication and processing technique.
- Exactly contour the restoration, particularly in the area of the preparation margins. Do not over-contour the preparation margins, since this would require time-consuming and risky fitting procedures after pressing.
- For fully anatomical restorations, the possible occlusal relief must be taken into consideration as early as during the wax-up, since the application of the Stains and Glaze results in slight increase in vertical dimensions.

1. Contouring for the staining technique

Design the restoration to full anatomical contour so that it only requires glazing and, if necessary, characterization after pressing.



Fully anatomical waxed-up thin veneer



Fully anatomical, waxed-up inlay and onlay



Fully anatomical waxed-up posterior crown

2. Contouring for the (wax) cut-back technique

In a first step, the restoration is given fully anatomical contours. Then, the cut-back of the wax-up (before investment) is carried out. In this way, the cut-back technique enables the fabrication of highly esthetic restorations in a very efficient manner.



Fully anatomical wax-up. To better check the layer thickness, the use of a basic wax of another colour is recommended.

The following points should be observed for the reduction of the wax-up:

- Reduce the contouring in the incisal third.
- Do not design extreme mamelons (points and edges).
- Check the cut-back with a silicone key.
- The minimum thicknesses (pressed materials, layering material) must be observed.



Fabricate a silicone key for the fully anatomical restoration



Reduce the contouring in the incisal third



Refrain from designing extreme contours in mamelons



Reduction of the oral surfaces is not required



3. Contouring for the layering technique

Design the frameworks in accordance with the available space. The design must support the shape and the cusps in order to ensure even layer thickness of the veneering ceramic.



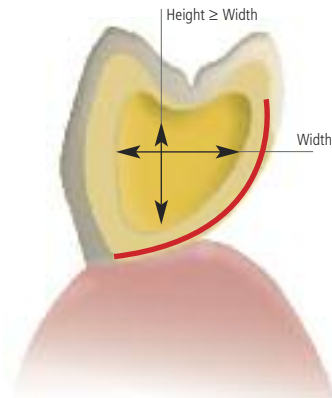
Single Crowns



The contouring must always support the shape and cusps. Always observe minimum thicknesses.

Always observe the relation between width and height as well as the suitable dimensions when designing the connectors.

Basically, the following applies: $\text{Height} \geq \text{Width}$



The contouring must always support the shape and cusps. Observe minimum framework thicknesses. The palatal/lingual area of the framework is given a fully anatomical design.

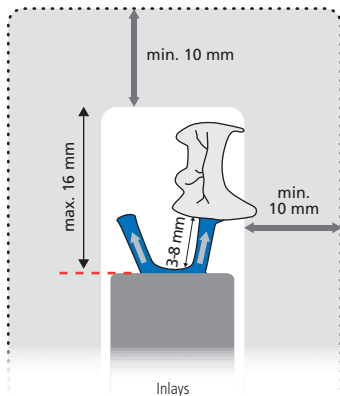
Sprueing

Always attach the sprues in the direction of flow of the ceramic and at the thick part of the wax-up so that smooth flowing of the viscous ceramic during pressing is enabled. Depending on the number of objects to be invested, either the 100g or 200g IPS Investment Ring System is selected. Bridges must only be pressed in the 200 g IPS Investment Ring System. Before sprueing, weigh the ring base and record the weight (seal the opening of the ring base with wax).

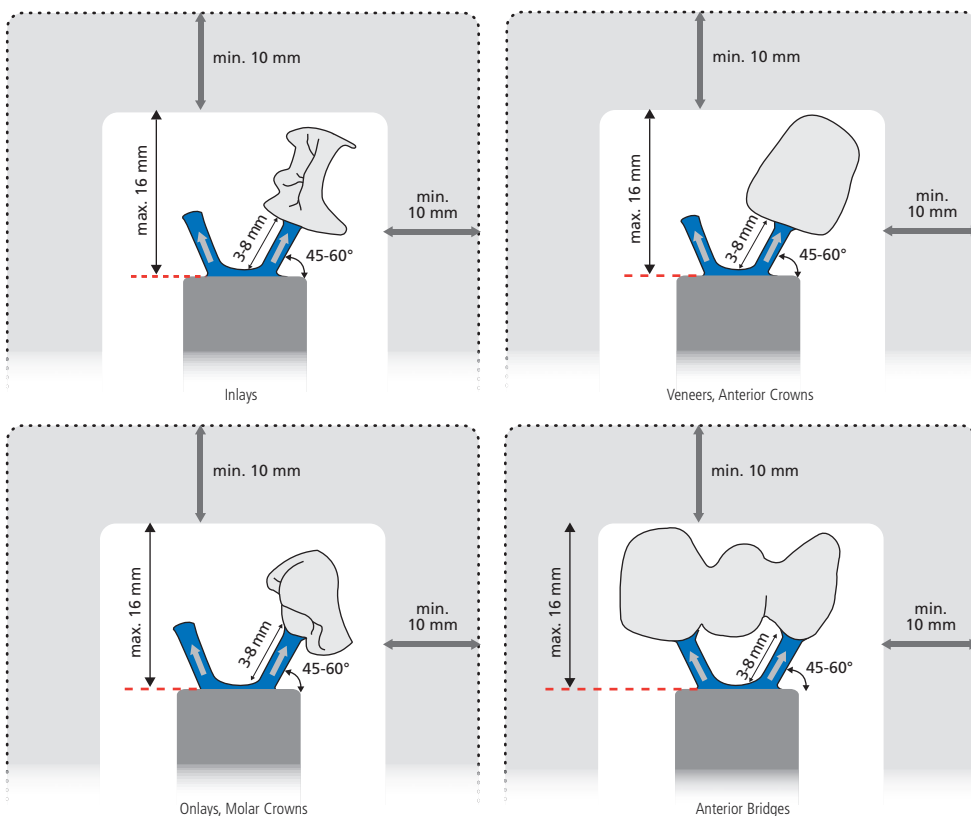
The following sprueing guidelines must be observed:

- The different restorations might require different mixing ratios of the investment material. For that reason, not all restorations may be sprued and investment with each other.
- Observe a distance of at least 10 mm between the waxed-up objects and silicone ring.
- The maximum height (wax objects + sprue) of 16 mm must not be exceeded.
- If only one object is invested, a second short (blind) sprue must be placed. This ensures that the switch-off function of the furnace works properly at the end of the pressing procedure.
- If the 100 g IPS Investment Ring System is used, a somewhat steep sprueing angle to the ring base must be observed.

Sprueing with the IPS Investment Ring System, 100g

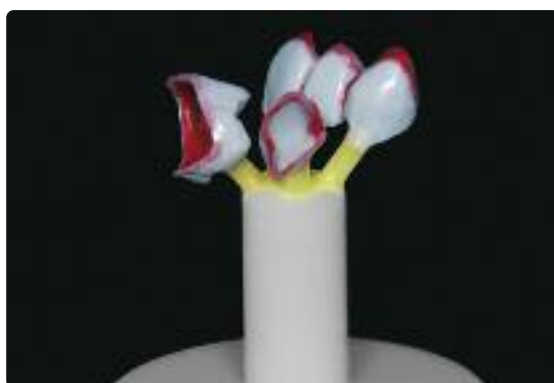


Sprueing with the IPS Investment Ring System, 200g





	Single-Tooth Restorations	3-Unit Bridges
Ring base	100 g and 200 g	only 200 g
Diameter of wax wire	2.5 – 3 mm	2.5 – 3 mm
Length of the wax wire	min. 3 mm, max. 8 mm	min. 3 mm, max. 8 mm
Length of the wax wire including waxed-up object	max. 15–16 mm	max. 15–16 mm
Sprue attachment point at the waxed-up object	thickest part of the wax-up	on both bridge abutments, no sprue at the pontic
Sprue angle to the waxed-up object	axial	axial
Sprue angle to the ring base	45°-60°	45°-60°
Design of the attachment points	round and slightly tapered, no sharp angles or edges	round and slightly tapered, no sharp angles or edges
Distance between the objects	min. 3 mm	min. 3 mm
Distance to the silicone ring	min. 10 mm	min. 10 mm
Important	If only one object is invested, a second short (blind) sprue must be placed. This ensures that the switch-off function of the furnace works properly at the end of the pressing procedure.	



On the IPS investment ring base, attach sprues in the direction of flow of the ceramic and to the thickest part of the restorations

Investing

Investing is carried out with either IPS PressVEST (conventional) or IPS PressVEST Speed (speed investment). The corresponding IPS Silicone Rings with the matching ring gauge is used for investment.

Determine the weight of the wax-up before investing.

- Position the wax objects on the ring base and attach them with wax and weigh.
- The difference between the empty and the loaded ring base is the definitive wax weight.

	Small Ingot	Large Ingot (L)
Wax Weight	up to max. 0.75 g	up to max. 2 g
Investment Ring System	100 g or 200 g	only 200 g

Please refer to the Instructions for Use of the corresponding investment material for the detailed processing parameters.

The following basic procedure is recommended:

- Do not use a debubblizer on the wax objects.
- The processing temperature of the investment material is 18-23 °C. Higher or lower processing temperatures substantially affect the setting behaviour.
- Mix the investment material. Note: The investment material contains quartz powder. Therefore, avoid the inhalation of dust.
- Use a suitable instrument for the fine investment of the cavity (e.g. a small brush). Make sure that the delicate wax margins are not damaged.
- Carefully place the IPS Silicone Ring on the ring base without damaging the wax objects. The silicone ring must sit flush on the ring base.
- Carefully fill the investment ring with investment material up to the marking and position the ring gauge with a hinged movement.
- Allow the investment ring to set without manipulation for the time stipulated in the investment instructions for use.
- To prevent crystallization of the IPS PressVEST investment material, the invested ring must be processed within 24 hours.

Indication	IPS PressVEST		IPS PressVEST Speed	
	100 g Investment Ring Liquid : Dist. Water	200 g Investment Ring Liquid : Dist. Water	100 g Investment Ring Liquid : Dist. Water	200 g Investment Ring Liquid : Dist. Water
IPS e.max Press				
Single crowns, partial crowns, (thin) veneers	13 ml : 9 ml 15.5 ml : 6.5 ml	26 ml : 18 ml 31 ml : 13 ml	16 ml : 11 ml	32 ml : 22 ml
Inlays	11 ml : 11 ml	22 ml : 22 ml	14 ml : 13 ml	27 ml : 27 ml
3-Unit Bridges	—	26 ml : 18 ml 31 ml : 13 ml	—	27 ml : 27 ml
Pressing Over Electroplated Frameworks	13 ml : 9 ml 15.5 ml : 6.5 ml	26 ml : 18 ml 31 ml : 13 ml	16 ml : 11 ml	32 ml : 22 ml
Mixing Time (under vacuum at approx. 350 rpm)	60 seconds		2.5 minutes If a high-speed mixer is used, the mixing time under vacuum has to be reduced.	



Use the IPS Silicone Ring for investment. Slowly and carefully fill in the investment material. Fill the investment ring up to the marking and position the IPS Ring Gauge with a hinged movement.

Preheating

After the stipulated setting time of the respective investment material (IPS PressVEST or IPS PressVEST Speed), the investment ring is prepared for preheating as follows:

- Remove the ring gauge and ring base with a turning movement.
- Carefully push the investment ring out of the IPS Silicone Ring.
- Remove rough spots on the bottom surface of the investment ring with a plaster knife. Check the 90° angle. Investment material residue must not enter the sprues. Blow into the sprues if necessary.
- If several investment rings are preheated together, mark them with the respective ingot shade.

	IPS PressVEST	IPS PressVEST Speed
Setting time	min. 60 min., max. 24 h	min. 30 min., max. 45 min.
Preheating furnace temperature upon placing the investment ring	Room temperature	850°C (1562°F); Switch on the preheating furnace in time
Position of the investment ring in the preheating furnace	Towards the rear wall, tipped with the opening facing down	Towards the rear wall, tipped with the opening facing down
Final temperature upon preheating the investment ring	850°C/1562°F	850°C/1562°F
Holding time of the investment ring at the final temperature	min. 60 min.	100 g investment ring – min. 45 min. 200 g investment ring – min. 60 min.
IPS e.max Press Ingots	no preheating	no preheating
IPS Alox Plunger	no preheating	no preheating
Important	If several Speed investments are to be conducted, they should be invested consecutively and placed into the preheating furnace at an interval of approx. 20 minutes. Make sure that the furnace temperature does not drop too much when placing the investment rings into the preheating furnace. The stipulated holding time counts from the point when the preheating temperature has been reached again.	



Towards the rear wall, tipped with the opening facing down



Do not preheat the IPS e.max Press ingot and Alox plunger

In order to ensure smooth working procedures in the laboratory on a daily basis, impeccable functioning of the infrastructure, particularly the preheating furnaces, is essential. This includes their maintenance, cleaning with a vacuum cleaner in a cool state as well as regular checks of the temperature controls and heating elements etc. by the manufacturer.

Pressing

Carry out the following preparatory steps for pressing before the preheating cycle for the investment ring has been completed:

- Provide a **cold** IPS Alox-Plunger and a **cold** IPS e.max Press ingot in the desired shade.
- Dip the **cold** IPS Alox Plunger into the opening of the IPS Alox Plunger Separator and keep it ready for use.
- Turn on the press furnace in time so that the self-test and preheating phase are completed.
- Select the press program for IPS e.max Press and the desired investment ring size.

Remove the investment ring from the preheating furnace immediately after completion of the preheating cycle. This step may take max. 30 seconds to prevent the investment ring from cooling down too much.

- Place the **cold** IPS e.max Press ingot into the **hot** investment ring.
- Insert the ingots in the investment ring with the non-imprinted side facing down. The imprinted side faces up to check the ingot shade.
- Place the side of the **cold** IPS Alox Plunger which has been coated with IPS Alox Plunger Separator into the **hot** investment ring.
- Place the completed investment ring in the center of the **hot** press furnace.
- The selected press program is started by pressing START.

After the end of the press cycle (optical and/or acoustic signal) proceed as follows:

- Remove the investment ring from the press furnace using the investment ring tongs immediately after pressing.
- Place the investment ring on a cooling grid to cool in a place protected from draft.
- Do not speed up cooling, e.g. by blowing compressed air.

	100 g Investment Ring	200 g Investment Ring
Single-Tooth Restorations	1 small ingot	1 large ingot or 1 small ingot
3-Unit Bridges		max. 1 large ingot
IPS e.max Press Ingots	cold ingot	cold ingot
IPS Alox Plunger	cold plunger	cold plunger
IPS Alox Plunger Separator	✓	✓

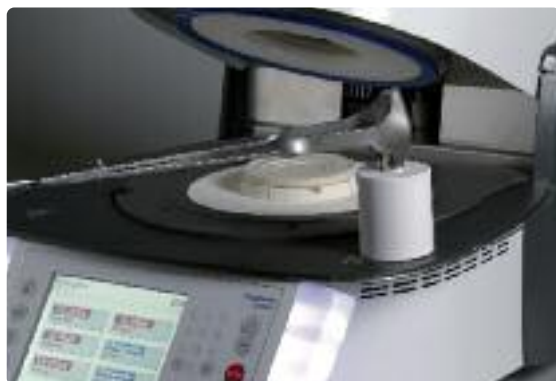
Exclusively press single ingots! Select a large or small ingot according to the determined wax weight!



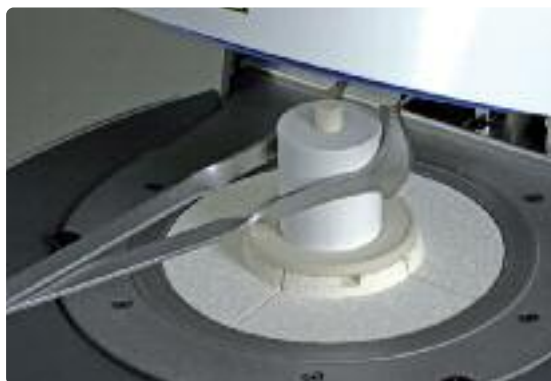
Provide a **cold** isolated IPS Alox-Plunger and a **cold** IPS e.max Press ingot in the desired shade



Place the **cold** IPS e.max Press ingot into the **hot** investment ring, with shade imprint facing upward



Then, place the powder-coated side of the IPS Alox Plunger into **hot** investment ring



Place the **hot** and completed investment ring in the center of the **hot** press furnace using the IPS Investment Ring Tongs



Press START to start the selected program



Once the press program is completed, place the hot investment ring on the cooling grid using the investment ring tongs and allow it to cool to room temperature

Press parameters for IPS e.max Press

Programat EP 3000



Select the press program in accordance with the selected ingot to be pressed and the investment ring size used.



The press parameters for HO, MO, LT and HT are integrated starting with software V 1.3.

Programat EP 5000



Select the press program in accordance with the selected ingot to be pressed and the investment ring size used.



The press parameters for HO, MO, LT and HT are integrated starting with software V 3.3.

The press parameters for older-generation press furnaces are listed on page 60 under Press Parameters.

Divesting

After cooling to room temperature (approximately 60 minutes), the investment ring may show cracks.

These cracks developed during cooling (immediately around the Alox plunger), as a result of the different CTE of the various materials (Alox plunger, investment material and pressed materials). They do not compromise the press results.

Divest the investment ring as follows:

- Mark the length of the Alox plunger on the cooled investment ring.
- Separate the investment ring using a separating disk. This predetermined breaking point enables reliable separation of the Alox plunger and the ceramic material.
- Break the investment ring at the predetermined breaking point using a plaster knife.
- Always use polishing beads to divest the pressed objects (rough and fine divestment). Do not use Al_2O_3 .
- Rough divestment is carried out with polishing beads at 4 bar (60 psi) pressure.
- Fine divestment is carried out with polishing beads at 2 bar (30 psi) pressure.
- Observe the blasting direction and distance to prevent damage to the object margins during divestment.
- Remove possible ceramic residue at the Alox plunger with Type 100 Al_2O_3 .



Mark the length of the Alox plunger



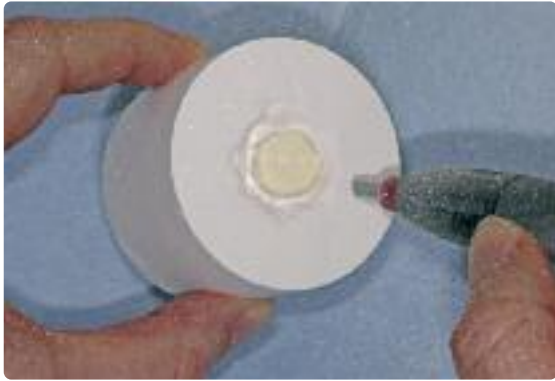
Separate the investment ring using a separating disk and break at the predetermined breaking point



Tip

Pull out the plunger with pliers from the separated segment using a rotating movement. This also removes any possible ceramic residue from the Alox plunger.





Rough divesting with polishing jet medium at 4 bar (60 psi) pressure until the objects become visible



Fine divestment is carried out with polishing beads at 2 bar (30 psi) pressure



Completely divested IPS e.max Press objects

Removing the reaction layer

After fine divestment, the reaction layer formed during the press procedure is removed using IPS e.max Press Invex Liquid.

The procedure is carried out as follows:

- Pour the Invex Liquid into a plastic cup.
- Immerse the pressed object in the Invex Liquid and clean in an ultrasonic cleaner for at least 10 minutes and a maximum of 30 minutes. Make sure that the objects are completely covered with Invex Liquid.
- Remove the restoration from the Invex Liquid and clean the object under running water and blow dry.
- Carefully remove the white reaction layer with type 100 Al_2O_3 at max. 1-2 bar (15-30 psi) pressure.
- Make sure that the reaction layer is completely removed, both on the cavity side and on the outer side of the object (repeat the procedure, if necessary).
- If the reaction layer is not completely removed, bubbles may develop, which subsequently may lead to bonding problems and cracks in the layering ceramic.
- Replace the IPS e.max Invex Liquid after 20 applications or after sedimentation of the liquid.



Remove the reaction layer formed on the pressed objects using the Invex Liquid in an ultrasonic bath



Carefully remove the white reaction layer from the contact surfaces using Al_2O_3 at 1-2 bar (15-30 psi) pressure

Warning

- The Invex liquid contains < 1% hydrofluoric acid.
- It is harmful when inhaled, swallowed and when it comes into contact with the skin. Furthermore, it is corrosive.
- Keep the container tightly sealed and store it in a well-ventilated place (acid cabinet).
- If the material comes into contact with the eyes, immediately rinse with copious amounts of water and see a physician immediately.
- In case of accidental contact with skin, immediately wash with plenty of water.
- Use suitable protective clothing, gloves and goggles when working.
- In case of an accident or physical discomfort, see a physician immediately. Bring the Invex label, if possible.



Disposal

- Neutralized the Invex Liquid before disposal!
- Use the IPS Ceramic Neutralization Powder to neutralize the Invex Liquid.
- For 50 ml Invex Liquid, approximately 3-4 g of IPS Ceramic Neutralization Powder are required
- Note: strong foam development during neutralization.
- Carefully add the neutralization powder to the Invex Liquid in small portions until foam is no longer formed; then allow a reaction time of 5 minutes.
- If larger quantities are disposed, check the liquid with litmus paper (must show an alkaline reaction).
- After the reaction time, pour the neutralized solution into the sink, flushing it with running water.



IPS e.max® Press

Staining Technique

In the staining technique, the pressed restorations are completed by the application of stains (IPS e.max Ceramic Shades, Essence) and glazing materials. In this way, the use of translucent IPS e.max Press ingots permit the fabrication of very esthetic restorations on only slightly or non-discoloured preparation with minimum effort.



Finishing

It is of critical importance to use the correct grinding instruments for finishing and adjusting high-strength glass-ceramics. If unsuitable grinding instruments are used, chipping of the edges and local overheating may occur (please observe the Ivoclar Vivadent Flow Chart "Recommended grinding tools for IPS e.max glass-ceramics").

Observe the following procedure for finishing IPS e.max Press restorations:

- Even though adjustment by grinding of pressed IPS e.max Press restoration is possible, it should be kept to a minimum.
- Wet the area to be ground and use a fine diamond disk to cut the sprues.
- Overheating of the ceramic must be avoided. Low speed and light pressure is recommended.
- Smooth out the attachment points of the sprues.
- Remove the spacer from the die. The restorations are tried in on the dies and carefully finished.
- Do not "post-separate" the framework connectors with separating disks. This may result in undesired predetermined breaking points, which will subsequently compromise the stability of the all-ceramic restoration.
- Make sure that the minimum thicknesses are maintained even after the minor adjustments.
- Check the occlusion and articulation and grind in the appropriate adjustments, if necessary.
- Design surface textures.
- To clean the restoration, briefly blast with Al_2O_3 at 1 bar (15 psi) pressure and clean with the steam jet.
- Some blasting devices may require different pressure settings to accomplish this procedure.



Wet the area to be ground and use a fine diamond disk to cut the sprues



After fitting, excellent accuracy of fit is achieved. The anatomical, functionally waxed-up restoration is accurately reproduced in ceramic



Fitted inlay after separation



Apply surface structures with suitable grinders

Die fabrication with IPS Natural Die Material

The light-curing IPS Natural Die Material simulates the shade of the preparation. Fabricate a die according to the shade information supplied by the dentist (shade selection), which serves as the optimum basis for a true-to-nature shade reproduction of the given oral situation.

- Coat the inner surfaces of the ceramic restoration with IPS Natural Die Material Separator and allow it to react for a short time.
- Apply the IPS Natural Die Material in the appropriate shade on the inner aspects of the restoration using the IPS Condenser so that the entire inner aspect is covered and filled.
- Completely fill the inside of the restoration, insert the IPS Die Holder into the material and adapt excess around the die holder. Make sure that the die material is well adapted along the restoration margins and that there is no gap.
- Cure the IPS Natural Die Material die in a customary light polymerization device, e.g. Lumamat 100, for 60 seconds.
- If necessary, the die can be further finished and smoothed after polymerization.



Coat the inner surfaces of the ceramic restoration with IPS Natural Die Material Separator and allow it to react for a short time



Completely fill the restoration, insert the IPS Die Holder into the material, adapt excess around the die holder, and cure in a customary light polymerization device



Stain and Characterization Firing

The following paragraphs will explain the most important steps for staining and characterizing with IPS e.max Ceram Essence and Shade. For further information on the nano-fluorapatite layering ceramic and its processing, please refer to the IPS e.max Ceram Instructions for Use.

- IPS e.max Ceram Shades are ready-to-use stains in syringes.
- IPS e.max Ceram Essence are intensively shaded powdered stains which are mixed with IPS e.max Ceram Glaze and Stain Liquid.
- IPS e.max Ceram Glaze Paste is a ready-to-use glaze paste supplied in a syringe.
- IPS e.max Ceram Glaze Spray is a ready-to-use glaze spray.
- IPS e.max Ceram Glaze Powder is a powdered glaze which is mixed with IPS e.max Ceram Glaze and Stain Liquid.



Before the Stain and Characterization firing, the restoration must be free of dirt and grease.

Any contamination after cleaning must be prevented. The following steps must be observed:

- For better wetting of the stains, a small quantity of IPS e.max Ceram Glaze and Stain Liquid may be slightly rubbed into the restoration surface.
- Mix the paste or powder with the IPS e.max Ceram Glaze and Stain Liquids allround or longlife to the desired consistency.
- More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
- To imitate the incisal area and translucency in the incisal third, IPS e.max Ceram Shade Incisal may be used.
- The cusps and fissures can be individualized using Essence.
- Conduct the Stain and Characterization firing using the indicated firing parameters.



Apply IPS e.max Ceram Shade Incisal to imitate the incisal area



Enhance the chroma on the buccal surface



Occlusal characterization with IPS e.max Ceram Essence



Conduct the Stain and Glaze firing on a honey-combed firing tray

Firing parameters for the Stain and Characterization firing

IPS e.max Ceram on IPS e.max Press Staining technique	B °C/°F	S min.	t ^r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Stain and Characterization firing	403/757	6:00	60/108	770/1418	1:00	450/842	769/1416

Additional Stain and Characterization firing cycles can be conducted with the same firing parameters.



Glaze Firing

Glaze firing is conducted with powder, paste or spray glaze. The following procedure is recommended:

- Mix the glazing material (IPS e.max Ceram Glaze Paste or Powder) with the IPS e.max Ceram Glaze and Stain Liquids all-around or longlife to the desired consistency.
- Apply the glazing material in an evenly covering layer on the restoration in the usual manner.
- In the staining technique on fully anatomical restoration the application of a fluorescent glazing material (paste or powder) is recommended.
- If IPS e.max Ceram Glaze Spray is used, make sure that the inner aspects of the restoration are not sprayed with glaze material. Please observe the Instructions for Use of the IPS e.max Ceram Glaze Spray!
- Conduct the Glaze firing on a honey-combed firing tray using the stipulated firing parameters.
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- If adjustments are required after Glaze firing (e.g. contact points), they may be applied using IPS e.max Ceram Add-On (see page 49).



Apply the glaze evenly on the surface



As an alternative to the glaze paste, the IPS e.max Ceram Glaze Spray can be used. Evenly spray on the IPS e.max Ceram Glaze Spray. Protect the inner aspects.



Conduct the Glaze firing on a honey-combed tray with the corresponding parameters

Firing parameters for the Glaze firing

IPS e.max Ceram on IPS e.max Press <i>Staining technique</i>	B °C/°F	S min.	t [↗] °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Glaze firing	403/757	6:00	60/108	770/1418	1:00-2:00	450/842	769/1416



If the gloss is unsatisfactory after the first Glaze firing, further Glaze firing procedures may be conducted using the same firing parameters.



Completed crown made of IPS e.max Press LT



Completed inlays and onlay made of IPS e.max Press HT

Optional

Combined Stain/Characterization and Glaze firing

If only minor characterizations of the restoration are desired, a combined firing cycle can be conducted.

First, the glaze paste is applied, followed by the characterizations, which are applied directly on the unfired glaze layer.

1st Step 1 — Application of the glaze material

- Extrude IPS e.max Ceram Glaze from the syringe and thin the material to the desired consistency using IPS e.max Ceram Glaze and Stain Liquid.
- Apply the glazing material evenly on the restoration in the usual manner.
- Make sure that no Glaze material reaches the inner aspects of the restoration.
- Too thin a glaze layer may lead to an unsatisfactory gloss.
- Avoid pooling and excessively thick glazing material layers.



2nd Step 2 — Application of Essence/Shades

- Mix IPS e.max Ceram Essences with IPS e.max Ceram Glaze and Stain Liquid.
- Extrude IPS e.max Ceram Shades from the syringe and thin the material to the desired consistency using IPS e.max Ceram Glaze and Stain Liquid, if required.
- Apply mixed Shades and Essences directly into the unfired Glaze material.
- Intensify the corresponding dentin shade in the cervical and occlusal areas using Shades .
- To imitate the incisal area and translucency in the incisal third, IPS e.max Ceram Shades Incisal are used.



After glazing and staining, the Glaze firing is conducted in a compatible ceramic furnace (e.g. Programat® P700). When placing the objects into the furnace and setting the firing parameters, please observe the following points:

- Conduct the Glaze firing on a honey-combed firing tray using the stipulated firing parameters.
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- If adjustments are required after Glaze firing (e.g. contact points), they may be applied using IPS e.max Ceram Add-On (see page 49).

Firing parameters for the Glaze firing

IPS e.max Ceram on IPS e.max Press Staining technique	B °C/°F	S min.	t _r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Glaze firing	403/757	6:00	60/108	770/1418	1:00 - 2:00	450/842	769/1416



Completed restoration after the combined Stain and Glaze firing.

Thin Veneers, Table Tops (Occlusal Veneers)

Thin Veneer

Thin Veneers are very thin ceramic veneers (0.3 mm), which are seated using the adhesive technique. Thin Veneers are indicated from an esthetic point of view if there is, for example, a malposition or differences in length of the incisors. Thin Veneers provide the advantage that they allow preparation that is minimal invasive to the tooth structure. If the clinical situation allows it, no preparation at all is required.



Thin Veneers are fabricated using the staining technique.

Please note: Minimum application of IPS e.max Ceram layering materials (e.g. Impulse) in the incisal area is possible. However, no cut-back must be performed on the restoration, due to the risk of fracturing the pressed veneer.

Use the following procedure for the fabrication of Thin Veneers:

- Apply the spacer to the preparation or tooth to be treated according to the veneer preparation guidelines (see page 15).
- With Thin Veneers without preparation of the tooth, the restoration margins should be located in the proximal area as well as along the gingival margin.
- Observe the minimum thickness of the veneers.
- Sprue, invest, press, divest, and remove the reaction layer according to the stipulations on pages 20-28.
- As an option, IPS e.max Ceram layering materials may be applied (do not perform a cut-back). Firing parameters see page 40.
- Conduct the Stain and Glaze firing with IPS e.max Ceram (see pages 31-34).
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- If adjustments are required after Glaze firing (e.g. contact points), they may be applied using IPS e.max Ceram Add-On (see page 49).
- Thin Veneers must be placed by means of adhesive cementation.



Use the press technology to transform the wax-up into the thin ceramic veneer made of IPS e.max Press

Firing parameters for Thin Veneers

IPS e.max Ceram on IPS e.max Press Staining technique	B °C/°F	S min.	t _r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Stain and Characterization firing	403/757	6:00	60/108	770/1418	1:00	450/842	769/1416
Glaze firing	403/757	6:00	60/108	770/1418	1:00-2:00	450/842	769/1416
Add-On after Glaze Firing	403/757	6:00	50/90	700/1292	1:00	450/842	699/1290



Adhesively cemented Thin Veneer

Table Top (occlusal veneer)

If the clinical situation requires an increase in vertical dimensions or the reconstruction of function, Table Tops of IPS e.max Press may be fabricated for the posterior region. **Table Tops** are thin "occlusal" veneers that must be adhesively cemented. The high strength of IPS e.max Press allows the fabrication of such thin restorations. Therefore, the tooth can be prepared in a minimally invasive manner that is minimal invasive to the tooth structure.

Table Tops are fabricated using the staining technique.

Use the following procedure for the fabrication of Table Tops:

- Apply the spacer to the preparation or tooth to be treated according to the partial crowns preparation guidelines (see page 15).
- Observe the minimum thickness of the Table Tops.
- Sprue, invest, press, divest, and remove the reaction layer according to the stipulations on pages 20-28.
- The application of IPS e.max Ceram Incisal or Transpa is possible (do not perform a cut-back). Firing parameters see page 40.
- Conduct the Stain and Glaze firing with IPS e.max Ceram (see pages 31–34).
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace) and allow it to cool to room temperature.
- Do not touch the hot objects with metal tongs.
- If adjustments are required after Glaze firing (e.g. contact points), they may be applied using IPS e.max Ceram Add-On (see page 49).
- Table Tops must be placed by means of adhesive cementation.



Starting situation



Minimally invasive preparation for Table Tops



Table Tops in transmitted light



in situ: Table Tops after adhesive cementation

Firing parameters for Table Tops

IPS e.max Ceram on IPS e.max Press Staining technique	B °C/°F	S min.	t _r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Stain and Characterization firing	403/757	6:00	60/108	770/1418	1:00	450/842	769/1416
Glaze firing	403/757	6:00	60/108	770/1418	1:00-2:00	450/842	769/1416
Add-On after Glaze Firing	403/757	6:00	50/90	700/1292	1:00	450/842	699/1290



IPS e.max® Press

Cut-Back Technique

In the cut-back technique, IPS e.max Ceram Impulse and Incisal materials are applied in the incisal and/or occlusal area of the pressed IPS e.max Press. The limited application of layering material permits achieving highly esthetic restoration in an efficient manner.



Finishing

It is of critical importance to use the correct grinding instruments for finishing and adjusting high-strength glass-ceramics. If unsuitable grinding instruments are used, chipping of the edges and local overheating may occur (please observe the Ivoclar Vivadent Flow Chart "Recommended grinding tools for IPS e.max glass-ceramics").

Observe the following procedure for finishing IPS e.max Press restorations:

- Even though adjustment by grinding of pressed IPS e.max Press restoration is possible, it should be kept to a minimum.
- Wet the area to be ground and use a fine diamond disk to cut the sprues.
- Overheating of the ceramic must be avoided. Low speed and light pressure is recommended.
- Smooth out the attachment points of the sprues.
- Remove the spacer from the die. The restorations are tried in on the dies and carefully finished.
- Do not "post-separate" the framework connectors with separating disks. This may result in undesired predetermined breaking points, which will subsequently compromise the stability of the all-ceramic restoration.
- Make sure that the minimum thicknesses are maintained even after the minor adjustments.



Wet the area to be ground and use a fine diamond disk to cut the sprues



Separated restorations fitted on the model die

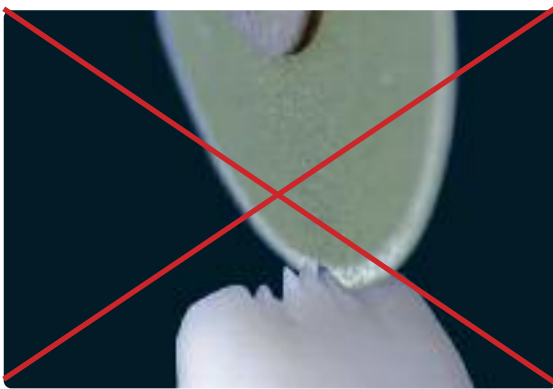


Smooth out the attachment points of the sprue using low speed and light pressure





Check the cut-back with the silicone key and observe the minimum thicknesses. Restrict the cut-back to the incisal third



Refrain from designing extreme morphologies with undercuts for mamelons



Pressed IPS e.max Press restorations with cut-back after finishing

Die fabrication with IPS Natural Die Material

The light-curing IPS Natural Die Material simulates the shade of the preparation. Fabricate a die according to the shade information supplied by the dentist (shade selection), which serves as the optimum basis for a true-to-nature shade reproduction of the given oral situation.

Please refer to page 30 for further details about the fabrication procedure.

Preparing for veneering

- Before veneering, clean the restoration with Type 100 Al_2O_3 (Typ 100) at 1-2 bar (15-30 psi) pressure. Some blasting devices may require different pressure settings to accomplish this procedure.
- Thoroughly clean the surface with a steam jet prior to the wash firing.



Blast the restoration with Type 100 Al_2O_3 at 1 bar (15 psi) pressure. Thoroughly clean the surface with a steam jet prior to the wash firing and subsequently dry.

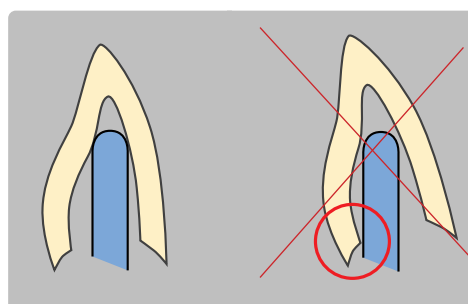
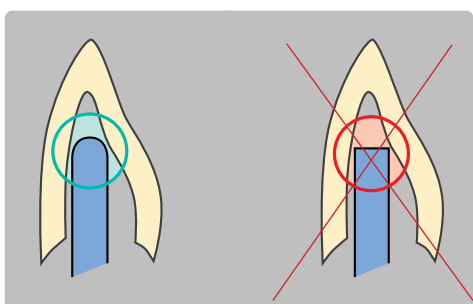
Veneering with IPS e.max Ceram

The following paragraphs will explain the most important veneering steps. For further information on the nano-fluorapatite layering ceramic and its processing, please refer to the IPS e.max Ceram Instructions for Use.



Firing tray and pins

Use a honey-combed firing tray and the corresponding support pins to fire the restorations (do not use IPS e.max CAD Crystallization Tray or IPS e.max CAD Crystallization Pins). Round the top edges of the metal pins to prevent the restoration from sticking to the pin. Another method of reducing this risk is to cover the pins with platinum foil or a small amount of IPS Object Fix Putty or Flow. Regularly clean the support pins. Do not use contaminated pins.



Wash firing (foundation)

The restoration must be free of dirt and grease before the wash firing is done. Any contamination after cleaning must be prevented. Wash firing is carried out with IPS e.max Ceram Transpa Incisal , Impules, or Shades and Essences.

Option A: Powder

With ideal space, conduct the wash firing with the required IPS e.max Ceram Transpa Incisal and/or Impulse material. Use the IPS e.max Ceram Build-Up Liquids all-round or soft to mix the materials. If a more plastic consistency is desired, IPS e.max Ceram Glaze and Stain Liquid allround of longlife can be used. Apply the wash in a thin coat on the reduced (cut-back) areas.



Apply the wash using Transpa Incisal and/or Impulse materials...



...and fire using the indicated firing parameters

Option B: Paste

With limited space or to enhance the in-depth chroma effect, the wash firing can be conducted with IPS e.max Ceram Shades and Essence. Mix the paste or powder with the IPS e.max Ceram Glaze and Stain Liquids allround or longlife to the desired consistency.



Apply the wash using Shades, and Essence...



...and fire using the indicated firing parameters

Layering materials must not be applied on unfired wash layers (powders and pastes), since this will result in a delamination of the layering ceramic. The wash (foundation) must be fired before the actual layering procedure is started.

Firing parameters for the Wash firing (foundation firing)

IPS e.max Ceram on IPS e.max Press <i>Cut-Back Technique</i>	B °C/°F	S min.	t [→] °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Wash firing (foundation)	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

Incisal firing

With the IPS e.max Ceram layering materials (Transpa, Transpa Incisal, Impulse), the anatomical shape is completed and the individual esthetic appearance achieved. Use the IPS e.max Ceram Build-Up Liquids allround or soft to mix the materials. If required, conduct a second Incisal firing using the same firing parameters.



Application of Impulse materials, e.g. Opal Effect 1



Complete the restoration using, e.g. Incisal materials and Opal Effect 3



Place restoration on the firing try and fire with the firing parameters for the Incisal firing



Restoration after Incisal firing

Firing parameters for the Incisal firing

IPS e.max Ceram on IPS e.max Press Cut-Back Technique	B °C/°F	S min.	t [↗] °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Incisal firing	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

Preparing for Stain and Glaze firing

Before the Stain and Glaze firing, the restoration has to be prepared as follows:

- Finish the restoration using diamonds and give it a true-to-nature shape and surface structure, such as growth lines and convex/concave areas.
- Areas which should exhibit a higher gloss after Glaze firing can be smoothed out and prepolished using silicone disks.
- If gold and/or silver dust was used to visualize the surface texture, the restoration has to be thoroughly cleaned with steam. Make sure to remove all gold or silver dust in order to avoid any discolouration.



Finish the restoration with diamonds and give it a true-to-nature shape and surface structure

Stain and Glaze firing

Stain firing is conducted with IPS e.max Ceram Essence and IPS e.max Ceram Shades, while Glaze firing is carried out with IPS e.max Ceram Glaze powder or paste. Depending on the situation, the Stain and Glaze firings may be conducted together or separately one after the other. The firing parameters are identical.

In order to achieve an even gloss during Glaze firing of cut-back restorations veneered with IPS e.max Ceram, two different procedures are possible:

Standard

(high-gloss appearance)

- Prepolish unlayered areas (IPS e.max Press) using rubber wheels.
- Rub the surface with moist ceramic in order to improve the wetting properties of the surface.
- Clean the restoration with steam.
- Apply IPS e.max Ceram Glaze on the entire restoration.



Apply IPS e.max Ceram Glaze on the entire restoration

Option

(true-to-nature appearance)

- Prepolish unlayered areas (IPS e.max Press) using rubber wheels.
- Rub the surface with moist ceramic in order to improve the wetting properties of the surface.
- Clean the restoration with steam.
- Use Self-Glaze for veneered areas.
- Apply IPS e.max Ceram Glaze only on unlayered areas and conduct the Glaze firing.
- Subsequently, adjust the level of gloss by manually polishing the restoration.



Apply IPS e.max Ceram Glaze only on unlayered areas

Observe the following notes for the Stain and Glaze firing:

- Conduct the Stain and Glaze firing on a honey-combed firing tray using the stipulated firing parameters.
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- If adjustments are required after Glaze firing (e.g. contact points), they may be applied using IPS e.max Ceram Add-On (see page 49).



Firing parameters for the Stain and Glaze firing

IPS e.max Ceram on IPS e.max Press <i>Cut-Back Technique</i>	B °C/°F	S min.	t _r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Stain firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Glaze firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Add-On with Glaze Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Add-On after Glaze Firing	403/757	6:00	50/90	700/1292	1:00	450/842	699/1290



Completed IPS e.max Press LT restoration cut-back and pressed and veneered with IPS e.max Ceram

IPS e.max® Press

Layering Technique



In the layering technique, the IPS e.max Ceram layering materials are fired onto the framework made of IPS e.max Press MO or HO. This enables very individualized design possibilities. The opacity of IPS e.max CAD HO ingots permits the design of highly esthetic restorations even on severely discoloured prepared teeth, as well as metal core build-ups or Ti abutments.



Finishing

It is of critical importance to use the correct grinding instruments for finishing and adjusting high-strength glass-ceramics. If unsuitable grinding instruments are used, chipping of the edges and local overheating may occur (please observe the Ivoclar Vivadent Flow Chart "Recommended grinding tools for IPS e.max glass-ceramics").

Observe the following procedure for finishing IPS e.max Press restorations:

- Even though adjustment by grinding of pressed IPS e.max Press restoration is possible, it should be kept to a minimum.
- Wet the area to be ground and use a fine diamond disk to cut the sprues.
- Overheating of the ceramic must be avoided. Low speed and light pressure is recommended.
- Smooth out the attachment points of the sprues.
- Remove the spacer from the die. The restorations are tried in on the dies and carefully finished.
- Do not "post-separate" the framework connectors with separating disks. This may result in undesired predetermined breaking points, which will subsequently compromise the stability of the all-ceramic restoration.
- Make sure that the minimum thicknesses are maintained even after the minor adjustments.



Wet the area to be ground and use a fine diamond disk to cut the sprues



Try in the framework on the model



After try-in, excellent accuracy of fit is achieved



Smooth out the attachment points of the sprue using low speed and light pressure



Do not "post-separate" the framework connectors or finish the surface with the separating disk

Preparing for veneering

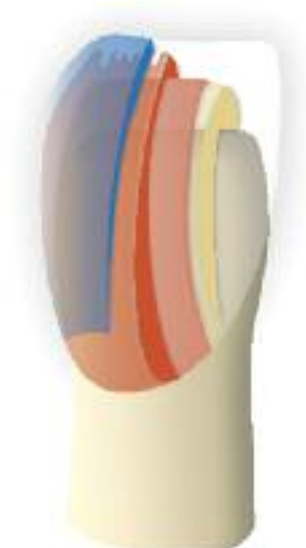
- Before veneering, clean the restoration with Type 100 Al_2O_3 (Typ 100) at 1-2 bar (15-30 psi) pressure. Some blasting devices may require different pressure settings to accomplish this procedure.
- Thoroughly clean the surface with a steam jet or under running water prior to the wash firing.



Blast the restoration with Type 100 Al_2O_3 at 1 bar (15 psi) pressure. Thoroughly clean the surface with a steam jet prior to the wash firing and subsequently dry.

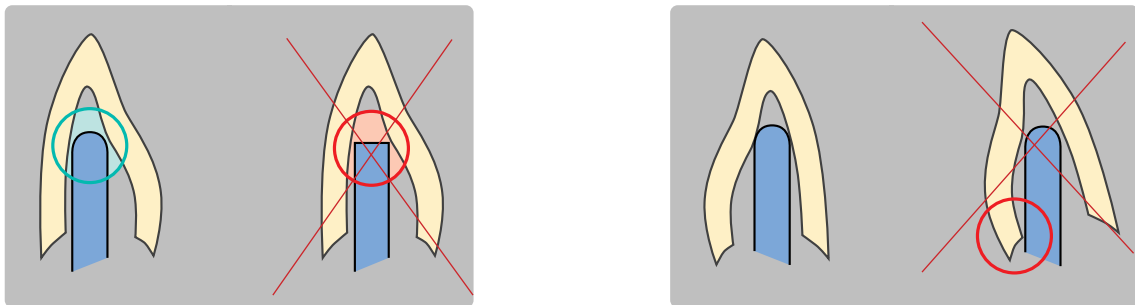
Veneering with IPS e.max Ceram

The following paragraphs will explain the most important veneering steps. For further information on the nano-fluorapatite layering ceramic and its processing, please refer to the IPS e.max Ceram Instructions for Use.



Firing tray and pins

Use a honey-combed firing tray and the corresponding support pins to fire the restorations (do not use IPS e.max CAD Crystallization Tray or IPS e.max CAD Crystallization Pins). Round the top edges of the metal pins to prevent the restoration from sticking to the pin. Another method of reducing this risk is to cover the pins with platinum foil or a small amount of IPS Object Fix Putty or Flow. Regularly clean the support pins. Do not use contaminated pins.



Wash firing (foundation)

The restoration must be free of dirt and grease before the wash firing is done. Any contamination after cleaning must be prevented. The IPS e.max ZirLiner must not be used. Given its firing temperature or 960 °C/1760 °F, it is exclusively suitable for use on zirconium oxide.

Please observe the following procedure for the wash firing:

- Clean the framework (free of dirt and grease).
- Conduct the wash with firing Deep Dentin or Dentin materials.
- Use the IPS e.max Ceram Build-Up Liquids allround or soft to mix the materials.
- If a more plastic consistency is desired, IPS e.max Ceram Glaze and Stain Liquid allround of longlife can be used for mixing the materials.
- Apply the wash in a thin coat on the entire framework.
- Conduct the wash firing on a honey-combed tray with the corresponding parameters.



Apply the wash using Dentin and/or Deep Dentin materials...



...and fire using the indicated firing parameters.

Firing parameters for the Wash firing (foundation firing)

IPS e.max Ceram on IPS e.max Press Layering Technique	B °C/°F	S min.	t _↑ °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Wash firing (foundation)	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

1st Dentin and Incisal firing

Perform the layering in accordance with the layering diagram (see IPS e.max Ceram Instructions for Use). Use the IPS e.max Ceram Build-Up Liquids allround or soft to mix the layering materials. If a different consistency is desired, the liquids can also be mixed with one another in any ratio.



Contour the tooth shape with Dentin material. Design the incisal third using Impulse materials



Complete the layering procedure with Incisal and Transpa materials



Complete separate the interdental area down to the IPS e.max framework



Then the restoration is fired using the firing parameters for the 1st Dentin and Incisal firing

Firing parameters for the 1st Dentin and Incisal firing

IPS e.max Ceram on IPS e.max Press Layering Technique	B °C/°F	S min.	t ₇ °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
1 st Dentin / Incisal firing	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

2nd Dentin and Incisal firing (Corrective firing)

Compensate for the shrinkage and complete the missing areas.



Compensate for the shrinkage with Dentin, Transpa and Incisal materials



Then the restoration is fired using the firing parameters for the 2nd Dentin and Incisal firing

Firing parameters for the 2nd Dentin and Incisal firing

IPS e.max Ceram on IPS e.max Press Layering Technique	B °C/°F	S min.	t _↑ °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
2 nd Dentin / Incisal firing	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

Stain and Glaze firing

Stain firing is conducted with Essence and Shades, while glaze powder, paste or spray is used for Glaze firing. Depending on the situation, the Stain and Glaze firings may be conducted together or separately one after the other. The firing parameters are identical.



Observe the following notes for the Stain and Glaze firing:

- Conduct the Stain and Glaze firing on a honey-combed firing tray using the stipulated firing parameters.
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- If adjustments are required after Glaze firing (e.g. contact points), they may be applied using IPS e.max Ceram Add-On (see page 49).



Completed, fully veneered IPS e.max Press restoration

Firing parameters for the Stain and Glaze firing

IPS e.max Ceram on IPS e.max Press Layering Technique	B °C/°F	S min.	t _↑ °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Stain firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Glaze firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335





Adjustments with IPS e.max Ceram Add-On

There are 3 IPS e.max Ceram Add-On materials available for adjustments, which are processed differently depending on their application.



Option 1: Add-On with Glaze firing

This option is used if minor adjustments are made with Glaze firing. For this option, proceed as follows:

- Mix IPS e.max Ceram Add-On Dentin or Incisal with Dentin or Transpa Incisal in a 1:1 ratio.
- IPS e.max Ceram Add-On Margin is used alone without mixing with other powders.
- Mix IPS e.max Ceram Add-On with IPS e.max Ceram Build-Up Liquid soft or allround.
- Apply the Add-On material on the respective areas.
- Fire with the stipulated parameters for the “Add-On with Glaze firing”.
- Polish the adjusted areas to a high gloss after firing.

Option 2: Add-On after Glaze firing

After completion and try-in with the patient, further adjustments (e.g. contact points) might be necessary. For this option, proceed as follows:

- Mix IPS e.max Ceram Add-On Dentin and Incisal with IPS e.max Ceram Build-Up Liquid soft or allround and apply on the corresponding areas.
- Fire with the stipulated parameters for the “Add-On after Glaze firing”.
- Polish the adjusted areas to a high gloss after firing.

Procedure for HO Ingots

If IPS e.max Press HO ingots are used, the shade of the framework requires adjustment, particularly with darker tooth shades (e.g. A4). Use IPS e.max Ceram Shades and Essences to adjust the framework shade.



Materials combination table

Desired tooth shade	BL1, BL2, BL3, BL4	A1, A2, B1, B2, C1	A3, A3.5	B3, B4	A4, C2, C3, C4, D2, D3, D4
IPS e.max Press HO	HO 0	HO 1	HO 2	HO 1	HO 2
Wash firing	Deep Dentin in the respective tooth shade				
Characterization	–	–	–	IPS e.max Ceram Shades and Essence	

Please observe the following procedure:

1st Step: Wash firing with Deep Dentin

- Clean the framework (free of dirt and grease).
- Apply the wash using Deep Dentin materials.
- Use the IPS e.max Ceram Build-Up Liquids allround or soft to mix the materials.
- If a more plastic consistency is desired, IPS e.max Ceram Glaze and Stain Liquid allround of longlife can be used for mixing the materials.
- Apply the wash in a thin coat on the entire framework.
- Conduct the wash firing on a honey-combed tray with the corresponding parameters.



Clinical situation: severely discoloured preparation



Prepared framework made of IPS e.max Press HO 1



Apply the wash using IPS e.max Ceram Deep Dentin in the respective tooth shade



After wash firing

Firing parameters for the Wash firing (foundation firing)

IPS e.max Ceram on IPS e.max Press Layering Technique	B °C/°F	S min.	t ^r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Wash firing (foundation)	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

2nd Step: Characterization with IPS e.max Ceram Shades and Essences

- Apply the characterizations using IPS e.max Ceram Shades and Essences.
- Mix Essence with IPS e.max Ceram Glaze and Stain Liquids allround or longlife to the desired consistency.
- Apply characterizations so that the tone of the framework shade corresponds with the final Dentin shade.
- Conduct the wash firing on a honey-combed tray with the corresponding parameters.



Characterization with Essence to achieve the final Dentin shade



Individualized, shade-adjusted framework after Characterization firing

Firing parameters for the Wash firing (foundation firing) characterization

IPS e.max Ceram on IPS e.max Press Layering Technique	B °C/°F	S min.	t ^r °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Wash firing (foundation) characterization	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380

Layering materials must not be applied on unfired wash layers (powders and pastes), since this will result in a delamination of the layering ceramic. The wash (foundation) must be fired before the actual layering procedure is started.

3rd Step: Layering, completion

- The further procedure corresponds to that of the layering technique described on pages 47-48.



Layer and complete the restoration in the usual manner

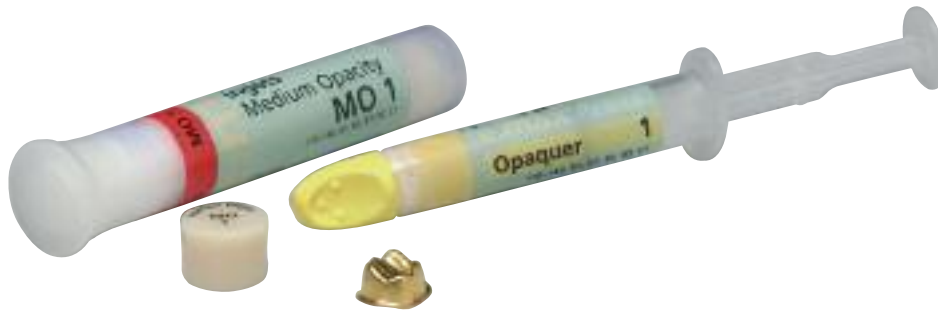


Completed IPS e.max HO restoration in situ

Pressing Over Electroplated Frameworks

Step-by-step description of the procedure

The press-on technique with IPS e.max Press represents an economical and efficient method to fabricate metal-supported restorations.



Proceed as follows:

- Fabricate the electroplated framework according to the manufacturer's instructions of the respective electroplating system.
- Place the electroplated framework on the die and prepare it for firing.
- Condition the electroplated framework according to the instructions of the manufacturer.
- Subsequently, dispense the desired amount of the ready-to-use IPS e.max Press Opaquer from the syringes and mix thoroughly. After that, thinly apply the first opaquer layer as wash on the electroplated framework and fire.

Firing parameters for the 1st Press Opaquer firing

IPS e.max Press Opaquer on electroplated frameworks	B °C	S min.	t [↗] °C/min	T °C	H min.	V ₁ °C	V ₂ °C
1 st Press Opaquer firing	403/757	6:00	100/212	940/1724	2:00	450/842	939/1722

- After the wash wiring, apply the 2nd opaquer layer in such a way that the electroplated framework. Use only as much opaquer so that a covering layer is achieved.

Firing parameters for the 2nd Press Opaquer firing

IPS e.max Press Opaquer on electroplated frameworks	B °C	S min.	t [↗] °C/min	T °C	H min.	V ₁ °C	V ₂ °C
2 nd Press Opaquer firing	403/757	6:00	100/212	930/1706	2:00	450/842	929/1704

- The fired opaquer should have a silky-mat gloss (eggshell gloss).
- Fabricate the wax-up directly on the fired opaquer. Observe the necessary layer thickness of 0.6 mm.
- The wax-up may be designed either as cut-back or fully anatomical.
- Contouring, sprueing, investing, pressing and divesting (see page 17-27).
- Remove the reaction layer with IPS e.max Press Invex Liquid (see page 28) and condition the restoration for the veneer and/or characterization.
- Do not sandblast the restoration prior to veneering. Rather clean it under running water or with steam.
- Veneer, characterize, and finish the restoration as described on page 45-51.



Possibilities for Cementation

Possibilities for esthetic cementation are decisive for the harmonious shade effect of an all-ceramic restoration. Depending on the indication, IPS e.max Press restorations can be seated using either adhesive, self-adhesive or conventional cementation.

- For the adhesive cementation of IPS e.max Press restorations, Variolink® II, Variolink® Veneer or Multilink® Automix are the ideal composites.
- For the self-adhesive cementation of IPS e.max Press restorations, SpeedCEM is available.
- We recommend using the glass ionomer cement Vivaglass® CEM, for the conventional cementation of IPS e.max Press.

Short definition of the different cementation methods

• Adhesive cementation

With adhesive cementation, the bond is also created by static friction, but primarily by the chemical and/or micro-mechanical bond between the luting material and the restoration, as well as between the luting material and the preparation. Given the chemical and/or micromechanical bond, retentive preparation is not required. Irrespective of the cementation material, special adhesive systems are used on the preparation to generate the micromechanical bond with the dentin and/or enamel.

Adhesive cementation results in enhanced "(overall) strength" of the seated all-ceramic restoration.

• Self-Adhesive Cementation

The cementation material features self-etching properties to the tooth, which is why no additional special conditioning of the tooth surface is necessary. Hence, the adhesion of the restoration is partially achieved by a micromechanical and/or chemical bond. In order to achieve sufficient bonding strength values, retentive preparation is recommended. Self-adhesive cementation does not result in enhanced "(overall) strength" of the seated all-ceramic restoration.

• Conventional Cementation

In the conventional cementation technique, the bond is achieved nearly exclusively through mechanical friction between the cementation material and the restoration as well as between the cementation material and the preparation. To achieve the necessary static friction, retentive preparation with a preparation angle of approximately 4-6° is required. Conventional cementation does not result in enhanced "(overall) strength" of the all-ceramic restoration.

Cementation possibilities for the different indications

		Adhesive Cementation	Self-Adhesive Cementation	Conventional Cementation
IPS e.max Press	Table Tops, Thin Veneers, Veneers	✓	—	—
	Inlays, Onlays, Partial Crowns	✓	—	—
	Anterior and Posterior Crowns	✓	✓	✓
	3-Unit Bridges up to the 2 nd Premolar	✓	✓	✓

Preparing for Cementation

Conditioning of the restoration and preparation depends on the cementation method used as well as the cementation material. The following paragraphs describe the basic working steps to prepare for cementation. Please refer to the Instructions for Use of the corresponding cementation material regarding the detailed processing procedure.

a. Conditioning of the restoration

Conditioning of the ceramic surface in preparation for cementation is decisive for generating a sound bond between the cementation material and the all-ceramic restoration. The following steps must be observed:

- Do not blast IPS e.max Press with Al_2O_3 or glass polishing beads before incorporation.
- Ideally, conduct the clinical try-in before etching in order not to contaminate the etched surface.
- Thoroughly clean the restoration with water and blow dry.
 - Generally etch the bonding surface with 5% hydrofluoric acid gel (IPS Ceramic Etching Gel).
 - For adhesive or self-adhesive cementation, silanize the bonding surface of the restoration using Monobond Plus.



Do **not** blast IPS e.max Press restorations



Etch for 20 s with IPS Ceramic Etching Gel



Let Monobond Plus react for 60 seconds and blow dry

Material	IPS e.max Press		
	Lithium disilicate glass-ceramic		
Indication	Thin Veneers, Veneers, Table Tops, inlays, onlays, partial crowns	Anterior and posterior crowns, 3-unit bridges up to the 2 nd premolar	
Cementation method	adhesive	adhesive	self-adhesive / conventional *
Blasting	—		
Etching	20 sec with IPS Ceramic Etching gel		
Conditioning / silanization	60 sec with Monobond® Plus		
Cementation system	Variolink® Veneer, Variolink® II, Multilink® Automix	Variolink® II, Multilink® Automix	SpeedCEM Vivaglass® CEM

* Conventional cementation is done without conditioning

The range of products on offer may vary from country to country



Please observe the corresponding Instructions for Use.

**b. Conditioning of the preparation**

Thoroughly clean the preparation once the temporary has been removed. Before it is conditioned, the restoration is tried-in and the occlusion and articulation checked. If adjustments are required, the restoration may be polished extraorally in these areas before final incorporation.

Conditioning of the restoration and preparation depends on the cementation method used and is carried out according to the respective Instructions for Use.

Care notes

Same as natural teeth, high-quality IPS e.max Press restorations require regular professional care. This is beneficial for both the health of the gingiva and teeth, as well as the overall appearance. The pumice-free Proxyl pink polishing paste is used to care for the surfaces without causing any wear. The low RDA* value = 7 (Relative Dentin Abrasion) is a reliable confirmation to use a cleaning paste that is only a little abrasive. Scientific investigations and long-term clinical experience have proved the gentle effect compared to other pastes.

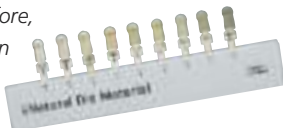


IPS e.max® Press

Frequently Asked Questions

Why is it important to determine the shade of the preparation?

Depending on the translucency level of the block used, the shade of the preparation influences the seated all-ceramic restoration. Therefore, knowing the shade of the preparation is imperative. A corresponding tooth-coloured die is then fabricated with the help of IPS Natural Die Material. It is used to achieve an optimum match of the restoration shade to the given clinical situation.



How can it be determined if a contouring wax is organic or inorganic?

Organic waxes turn transparent during melting. Inorganic waxes, however, remain opaque even when molten.

When is the IPS e.max Press HT ingot used?

The IPS e.max Press HT ingot is particularly suitable for the staining technique and also for the cut-back technique. When used for larger restorations, the brightness level of translucent ingots may decrease. In such cases, an ingot with a lower translucency is required.

What are Thin Veneers?

Thin Veneers are very thin ceramic veneers with a thickness of 0.3-0.4 mm for the adhesive cementation in the anterior region. They are used for cosmetic adjustments (e.g. malposition, extension of the incisal edge). Thin Veneers do not necessarily require preparation.

What are Table Tops?

Table Tops are thin ceramic veneers with a thickness of min. 1.0 mm for occlusal surfaces in the posterior region. They are used for minor adjustments, e.g. malposition, increase in vertical dimensions. Table Tops can be seated using minimally invasive preparation. Table Tops must be seated using the adhesive cementation.

When is the IPS e.max Press LT ingot used?

The IPS e.max Press LT ingot is used for the fabrication of restorations in the staining and cut-back technique. Subsequently, the restorations are completed using IPS e.max Ceram materials. If used for the staining technique, IPS e.max Press LT ingots ensure sufficient brightness (particularly for restorations with larger wall thicknesses).

Can IPS e.max Press LT also be used for the fabrication of frameworks for subsequent veneering?

The shading and translucency of the IPS e.max Press LT material is designed for restorations fabricated in the staining and cut-back technique. If frameworks are made of IPS e.max Press LT and subsequently fully veneered with IPS e.max Ceram (Dentin and Incisal materials), the shade and brightness values are slightly mismatched and the tooth shade might differ from the shade guide.

What is the procedure to achieve the desired tooth shade when IPS e.max Press HO ingots are used?

Deep Dentin must be used for the wash firing. Subsequently, the framework shade is adapted to the (final) dentin shade with a Characterization firing using Shades and Essence.



Can IPS e.max Press also be used to be pressed on Captek or other metal frameworks?

Captek and other metal frameworks **cannot** be pressed over with IPS e.max Press, since the CTE values are not coordinated with each other.

Can IPS Empress Universal Shades, Stains and Glaze used for IPS e.max Press?

IPS Empress Universal Shades, Stains and Glaze were specially developed for and coordinated with the IPS Empress System and are therefore **not** suitable for IPS e.max products.

Can IPS Alox plungers also be used for IPS Empress?

IPS Alox plungers have been exclusively designed for the IPS e.max System and the corresponding investment ring system. Since the diameter was increased, the Alox plunger does not fit into the IPS Empress investment ring system.



Can the IPS Alox Plunger Separator also be used for other pressed ceramics, such as IPS Empress Esthetic?

The IPS Alox Plunger Separator can only be used for IPS e.max Press and IPS e.max ZirPress ingots, since the press temperature of the IPS Empress Esthetic ingots of 1075 °C (1967 °F) is too high and results in the Separator losing its effect.



Can IPS e.max Press also be pressed using the IPS Investment Ring System 300 g?

Since only one single IPS e.max Press ingot (small or large) may be used per press cycle, the IPS Investment Ring System 300 g cannot be used.

Can press furnaces other than the ones from Ivoclar Vivadent be used to press IPS e.max Press ingots?

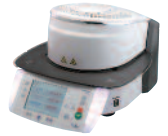
IPS e.max Press has been especially coordinated with the Ivoclar Vivadent press furnaces. If other press furnaces are used, the parameters may have to be adjusted accordingly by the user.

Can IPS e.max Ceram Margin materials be used with IPS e.max Press?

IPS e.max Ceram Margin materials **must not** be used on glass-ceramics (IPS e.max Press and CAD), since the firing temperatures are too high and the reduction for the shoulder would weaken the restoration. Margin materials are used on ZrO₂.

What must be considered after the firing of IPS e.max Press?

In order to prevent tensions within the ceramic, remove the restoration from the furnace only after the firing cycles have been completed (wait for the acoustic signal of the ceramic furnace). Allow the objects to cool to room temperature in a place protected from draft and do not touch them with metal tongs during that time. Do not blast or quench the objects.



Can IPS e.max Press frameworks be blasted with Al₂O₃ before they are veneered or after their completion (on the cavity side)?

IPS e.max Press restorations **must not** be sand-blasted prior to cementation, since this would damage the ceramic surface and alter its properties. The cavity side of the restoration is conditioned by means of surface etching.

How can IPS e.max Press restorations be cemented?

IPS e.max Press restorations can be cemented adhesively, self-adhesively or conventionally, depending on the indication. For conventional and/or self-adhesive cementation, an appropriately retentive preparation design must be observed. If this is not possible, adhesive cementation should be preferred, e.g. Variolink® II and Multilink® Automix.

It is not advisable to use classical phosphate cements, as they would negatively influence the light transmission of the all-ceramic and therefore compromise the esthetic appearance of all-ceramic restorations.

IPS e.max® Press

Ingot Selection Table

The ingots are selected on the basis of the desired tooth shade (Bleach BL or A-D), the determined die shade (ND1-ND9), and/or abutment shade, as well as the desired processing technique. The following procedure results in the selection of the appropriate ingot:



1. Select the column with the desired tooth shade.
2. Select the line with the shade of the preparation.
3. Select the adequate ingot in accordance with the desired processing technique in the intersection field.
4. If a certain combination is not possible (e.g. HT ingot on a dark preparation), select an ingot with a lower translucency.

- The recommendations for the ingot selection correlate with the indications as well as the preparation guidelines and minimum layer thicknesses.
- In case of shade deviations, adjust the restoration shade by means of characterization with IPS e.max Ceram Shades and Essence.
- If (highly) translucent ingots are used, the layer thickness and die shade must be carefully observed.
- With thicker layers, an ingot with a lower translucency must be selected to prevent a loss in brightness (graying).



Shade of the prepared natural tooth	Desired Tooth Shade Bleach BL and A-D Shade Guide																							
	BL1	BL2	BL3	BL4	BL5	BL6	BL7	BL8	BL9	BL10	BL11	BL12	BL13	BL14	BL15	BL16	BL17	BL18	BL19	BL20	BL21	BL22	BL23	BL24
IPS e.max Press	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
20% Montecore	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 1	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 2	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 3	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 4	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 5	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 6	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 7	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 8	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
ND 9	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24
IPS e.max Press	HT BL1	HT BL2	HT BL3	HT BL4	HT BL5	HT BL6	HT BL7	HT BL8	HT BL9	HT BL10	HT BL11	HT BL12	HT BL13	HT BL14	HT BL15	HT BL16	HT BL17	HT BL18	HT BL19	HT BL20	HT BL21	HT BL22	HT BL23	HT BL24



IPS e.max® Press

Press and Firing Parameters

Press Parameters for IPS e.max Press

The press furnace, investment ring size and the selected IPS e.max Press ingot must be considered.

Press Furnace	IPS e.max Press Ingots	IPS Investment Ring System	B °C/°F	t _r °C/°F/min	T °C/°F	H min	V ₁ °C/°F	V ₂ °C/°F	
EP 500	 HO, MO, LT	100 g	700/1292	60/108	925/1697	15	500/932	925/1697	Program 11-20 Software 2.9
		200 g	700/1292	60/108	930/1706	25	500/932	930/1706	Program 11-20 Software 2.9
	 HT	100 g	700/1292	60/108	920/1688	15	500/932	920/1688	Program 11-20 Software 2.9
		200 g	700/1292	60/108	925/1697	25	500/932	925/1697	Program 11-20 Software 2.9

Press Furnace	IPS e.max Press Ingots	IPS Investment Ring System	B °C/°F	t _r °C/°F/min	T °C/°F	H min	A
EP 600 Combi	 HO, MO, LT	100 g	700/1292	60/108	915/1679	15	300 µm/min
		200 g	700/1292	60/108	920/1688	25	300 µm/min
	 HT	100 g	700/1292	60/108	910/1670	15	300 µm/min
		200 g	700/1292	60/108	915/1679	25	300 µm/min

Programat EP 3000



Select the press program in accordance with the selected ingot to be pressed and the investment ring size used.



The press parameters for HO, MO, LT and HT are integrated starting with software V 1.3.

Programat EP 5000



Select the press program in accordance with the selected ingot to be pressed and the investment ring size used.



The press parameters for HO, MO, LT and HT are integrated starting with software V 3.3.

- The firing parameters listed represent standard values and apply to the Ivoclar Vivadent furnaces P300, P500, P700, EP3000 and EP5000. The temperatures indicated also apply to furnaces of older generations. However, the temperatures may deviate by approx. ± 10°C/18°F depending on the age of the heating muffle.
- If a non-Ivoclar Vivadent furnace is used, temperature corrections may be necessary.
- Regional differences in the power supply or the operation of several electronic devices by means of the same circuit may also render adjustments of the temperatures necessary.

Firing Parameters for IPS e.max Press

- Use a honey-combed tray and the corresponding pins for firing.
- Ceramic pins must not be used, since they may fuse to the restoration.
- The processing temperatures must be observed. An increase in the firing temperature results in severe vitrification between the framework and the veneering ceramic, which may lead to cracks later. A decrease in the firing temperature causes the ceramic to be underfired and very brittle, which may lead to delamination.
- The parameters stipulated in the Instructions for Use are coordinated with Ivoclar Vivadent furnaces (tolerance range +/- 10°C/18°F).
- If a non-Ivoclar Vivadent furnace is used, temperature corrections may be necessary.
- Remove IPS e.max Press objects from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- Do not blast or quench the objects.



IPS e.max Press – Staining Technique



IPS e.max Ceram on IPS e.max Press <i>Staining Technique</i>	B °C/°F	S min.	t [↗] °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Stain and Characterization Firing	403/757	6:00	60/108	770/1418	1:00	450/842	769/1416
Glaze Firing	403/757	6:00	60/108	770/1418	1:00-2:00	450/842	769/1416
Add-On after Glaze Firing	403/757	6:00	50/90	700/1292	1:00	450/842	699/1290

IPS e.max Press – Cut-Back Technique



IPS e.max Ceram on IPS e.max Press <i>Cut-Back Technique</i>	B °C/°F	S min.	t [↗] °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Wash Firing (foundation)	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380
Incisal Firing	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380
Stain Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Glaze Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Add-On with Glaze Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Add-On after Glaze Firing	403/757	6:00	50/90	700/1292	1:00	450/842	699/1335

IPS e.max Press HO/MO – Layering Technique



IPS e.max Ceram on IPS e.max Press <i>Layering Technique</i>	B °C/°F	S min.	t [↗] °C/°F/min	T °C/°F	H min.	V ₁ °C/°F	V ₂ °C/°F
Wash firing (foundation)	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380
Wash firing (foundation) characterization	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380
1 st Dentin / Incisal Firing	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380
2 nd Dentin / Incisal Firing	403/757	4:00	50/90	750/1382	1:00	450/842	749/1380
Stain Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Glaze Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Add-On with Glaze Firing	403/757	6:00	60/108	725/1337	1:00	450/842	724/1335
Add-On after Glaze Firing	403/757	6:00	50/90	700/1292	1:00	450/842	699/1290

IPS e.max Press Opaquer on Electroplated Frameworks

IPS e.max Press Opaquer on electroplated frameworks	B °C	S min.	t [↗] °C/min	T °C	H min.	V ₁ °C	V ₂ °C
1 st Press Opaquer firing	403/757	6:00	100	940/1724	2:00	450/842	939/1722
2 nd Press Opaquer firing	403/757	6:00	100	930/1706	2:00	450/842	929/1704

Clinical Pictures:

Unless mentioned otherwise, the depicted cases were fabricated by Jürgen Seger, Liechtenstein.



Table Tops made of IPS e.max Press (Prof. D. Edellhoff / O. Brix) (staining technique)



Crown made of IPS e.max Press HO (layering technique)



Thin Veneers made of IPS e.max Press HT (staining technique)



Inlay, onlay made of IPS e.max Press HT



Crown made of IPS e.max Press LT (staining technique)

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