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IPS e.max® Press

Monolithic Solutions

Instructions for Use





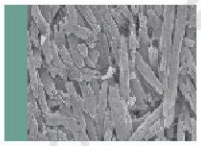
ivoclar vivadent technical

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Product Information

IPS e.max® System

Given its versatility, its clinical long-term success and its wide range of indications, the IPS e.max® System is the most successful and most widely used all-ceramic system throughout the world.

It consists of the reliable lithium disilicate glass-ceramic (IPS e.max Press and CAD), the innovative zirconium oxide ceramic (IPS e.max ZirCAD) and a coordinated veneering ceramic (IPS e.max Ceram); the press-on ceramic IPS e.max ZirPress supplements the versatile system.

With the highly esthetic high-strength IPS e.max materials, all indications for fixed restorations, ranging from thin veneers to multi-unit bridges, can be realized. Hybrid restorations are also possible.

The coordinated shade concept within the system and the individual products enables flexible working procedures from the shade determination up to the material selection.
The ideal restoration shade is optimally reproduced by means of the IPS e.max Shade Navigation App. It facilitates the material selection, leads to results that feature optimum shade match and thus provides efficiency and reliability.

IPS e.max is the comprehensive high-quality all-ceramic system for all indications, esthetic requirements and patient cases: it is **all ceramic – all you need**.

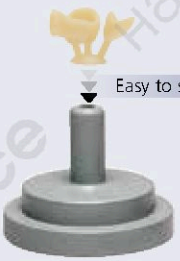


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IPS e.max® Press

Three ways for maximum flexibility

	Digital		Manual
Design	**CAD software**  **IPS e.max Digital Press Design – Press Multi** Automatic positioning and sprueing of the wax patterns for IPS e.max Press Multi restorations.	**CAD software**  **IPS e.max Digital Press Design – Wax Tree** Automatic sprueing of several single-tooth restorations to a wax tree.	**Model and die preparation** 
Producing	**Milling**  **ProArt CAD Wax yellow** Millable wax, particularly for the Press technology with IPS e.max Press.	**3D printing** 	**Contouring** 
Sprueing	**Securing**  Easy to secure	**Securing**  Easy to secure	**Positioning and securing** 
Investing	**IPS PressVest Premium** Universal investment material for press ceramic. 		
Pressing	**IPS e.max Press** Lithium disilicate glass-ceramic (LS_2) ingots for the press technology. 	**Programat® EP 3010/EP 5010** Press furnaces coordinated with Ivoclar Vivadent press ceramic materials, e.g. IPS e.max Press. 	

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Product Information

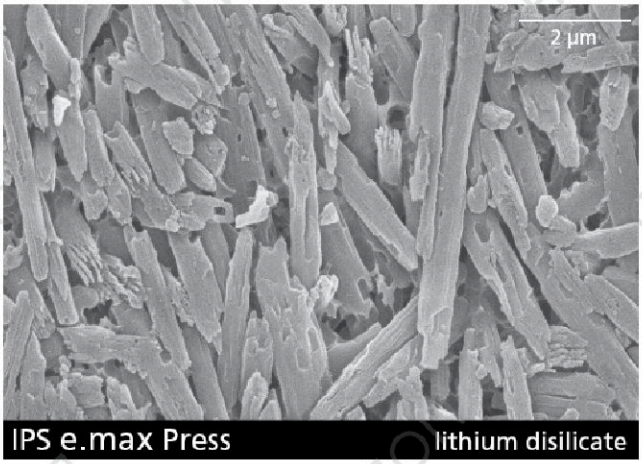
IPS e.max® Press Monolithic Solutions

Material

IPS e.max® Press

IPS e.max Press are lithium disilicate glass-ceramic ingots for the Press technology. The industrial production process creates absolutely homogeneous ingots in different translucency levels. They demonstrate a strength of 470 MPa (typical average value). The ingots are pressed to restorations with outstanding accuracy of fit in Ivoclar Vivadent press furnaces. The pressed, tooth-coloured, highly esthetic restorations are stained and glazed with IPS Ivocolor or veneered with IPS e.max Ceram and the stained and glazed with IPS Ivocolor.





Property	Specification	Typical average value
CTE (25–100°C) [10^{-6}/K]	10.5 ± 0.5	–
Flexural strength (biaxial) [MPa]	≥ 360	470
Chemical solubility [µg/cm²]	< 100	–
Type/Class	Type II / Class 3	–

According to ISO 6872:2015

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Uses

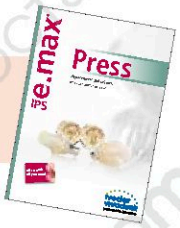
Indications

- Occlusal veneers (table tops)
- Thin veneers
- Veneers
- Inlays
- Onlays
- Partial crowns
- Minimally invasive crowns in the anterior and posterior region
- 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
- Implant superstructures for single-tooth restorations (anterior and posterior region)
- Implant superstructures for 3-unit bridges up to the second premolar as the terminal abutment

IPS e.max Press Abutment Solutions

- Hybrid abutments for single-tooth restorations in the anterior and posterior region
- Hybrid abutment crowns in the anterior and posterior region

For more detailed information about the fabrication of hybrid abutments and hybrid abutment crowns, please refer to the IPS e.max Press Abutment Solution Instructions for Use.



Contraindications

- Inlay-retained bridges
- Cantilever bridges
- Adhesive bridges
- Anterior region bridge unit width > 11 mm
- Premolar region bridge unit width > 9 mm
- Temporary seating of IPS e.max Press restorations
- Very deep subgingival preparations
- Patients with severely reduced residual dentition
- Bruxism
- Any other uses not listed in the indications

Additional contraindications for minimally invasive anterior and posterior crowns:

- Layer thicknesses below 1 mm
- Preparations with sharp edges
- Preparations that do not provide anatomical support and with irregular layering thicknesses
- Conventional and self-adhesive cementation
- Build-up materials other than composite
- Lack of canine guidance
- Bridges
- Crowns on implants

Important processing restrictions

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

- The necessary preparation requirements must be observed.
- No extension units
- Layering with a veneering ceramic other than IPS e.max Ceram
- Pressing of IPS e.max Press in the IPS Investment Ring System 300 g

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Warning

- IPS Natural Die Material Separator contains hexane. 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 suction equipment and a face mask.
- Observe the Safety Data Sheet (SDS).

Scientific data

Since the beginning of the development, the IPS e.max System has been monitored by the scientific community. Many renowned experts have contributed to an excellent data base with their studies. The worldwide success story, the ever growing demand, as well as over 100 million fabricated restorations are testament to the success and the reliability of the system. More than 20 clinical *in-vivo* studies to date and even more *in-vitro* studies, as well as the continuously rising number of clinical studies throughout the world show the long-term success of the IPS e.max System in the oral cavities of the patients. The most important study results are compiled in the "IPS e.max Scientific Report Vol. 02". Further scientific data (i.e. strength, wear, biocompatibility) are contained in the Scientific Documentations of the IPS e.max products. They can be obtained from Ivoclar Vivadent.

For further information about all-ceramics and IPS e.max, please refer to the Ivoclar Vivadent Report No. 16 and 17. Detailed information about the cementation composite Variolink® Esthetic can be found in the "Ivoclar Vivadent Report No. 22" and the Scientific Documentation. Multilink® Automix is covered in the "Scientific Report Vol. 02".



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Ingot concept

IPS e.max Press ingots are offered as **polychromatic Multi ingots** in one size, and as **monochromatic ingots** in **five levels of translucency (HO, MO, LT, MT, HT)** and in **special Impulse shades** in **two sizes**.
From a processing point of view, basically all restorations can be fabricated of any ingot. For reasons of esthetics and the dental-lab protocol, however, the following processing techniques and indications are recommended for the individual ingots (polychromatic, monochromatic, translucency levels):

Translucency	Processing technique			Indications								
	Staining technique	Cut-back technique	Layering technique	Occlusal veneer [1]	Thin veneer [1]	Veneer	Inlay and onlay	Partial crown	Anterior and posterior crown	3-unit bridge[2]	Hybrid abutment	Hybrid abutment crown
												
Multi	✓	✓				✓			✓			✓
HT High Translucency	✓	✓		✓	✓	✓	✓	✓				
MT Medium Translucency	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
LT Low Translucency	✓	✓				✓		✓	✓	✓	✓	✓
MO Medium Opacity			✓						✓	✓	✓	
HO High Opacity			✓						✓	✓		
I Impulse	✓	✓		✓	✓	✓						

[1] The cut-back technique must not be used for the fabrication of thin veneers and occlusal veneers
[2] Only up to the second premolar as the distal abutment

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IPS e.max Press Multi (polychromatic ingot)

The Multi ingots are available in **A–D** and **Bleach BL** shades. The ingots are used for the fabrication of highly esthetic veneers, anterior and posterior crowns as well as hybrid abutment crowns with a lifelike shade gradation from the dentin to the incisal. The ingots are ideally suitable for processing in the "staining technique".



IPS e.max Press HT (High Translucency)

The HT ingots are available in **A–D** and **Bleach BL** shades. Given their high translucency, which is similar to that of natural enamel, they are ideally suitable for the fabrication of smaller restorations (e.g. inlays and onlays). Restorations made of HT ingots convince users with their true-to-nature chameleon effect and the exceptional adaptation to the residual tooth structure. Restorations made of HT ingots are ideally suitable for the "staining technique", but also for the "cut-back technique".



IPS e.max Press MT (Medium Translucency)

The MT ingots are available in selected **A–D** and **Bleach BL** shades. They demonstrate medium translucency and are used for restorations that require more brightness than HT restorations and more translucency than LT restorations. Restorations made of MT ingots are ideally suitable for the "staining technique", but also for the "cut-back technique".



IPS e.max Press LT (Low Translucency)

The LT ingots are available in **A–D** and **Bleach BL** shades. Given their low translucency, which is similar to that of natural dentin, they are ideally suitable for the fabrication of larger restorations (e.g. posterior crowns). Restorations made of LT ingots convince users with their lifelike brightness value and chroma. This prevents the incorporated restorations from greying. LT ingots are ideally suitable for processing in the "cut-back technique", but they can also be used in the "staining technique".



IPS e.max Press MO (Medium Opacity)

The MO ingots are available in **group shades MO 0 – MO 4**. Given their opacity, they are ideally suitable for the fabrication of frameworks on slightly discoloured preparations. The anatomical shape is subsequently individually supplemented using IPS e.max Ceram.



IPS e.max Press HO (High Opacity)

The ingots are available in **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 supplemented using IPS e.max Ceram.



IPS e.max Press Impulse

The Impulse ingots enable the fabrication of restorations with pronounced opalescent properties. The **opalescent ingots** are available in **two versions with different brightness values (Opal 1, Opal 2)**. The ingots are suitable for veneers in light tooth shades, for which an opalescent effect is needed.

You can find more detailed information about the available ingot sizes and shades in the "Press Ingot Overview" at www.ivoclarvivadent.com!



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Ingot sizes

In general, IPS e.max Press ingots are available in three different sizes. The monochromatic ingots (HT, MT, LT, MO, HO and Impulse) are available as small ingots and "L" ingots. The polychromatic IPS e.max Press Multi ingot is only available in one ingot size.

Please note:
Only one ingot per investment ring may be used for pressing. Therefore, the ingot size suitable for the respective wax weight must be selected for pressing.

Polychromatic



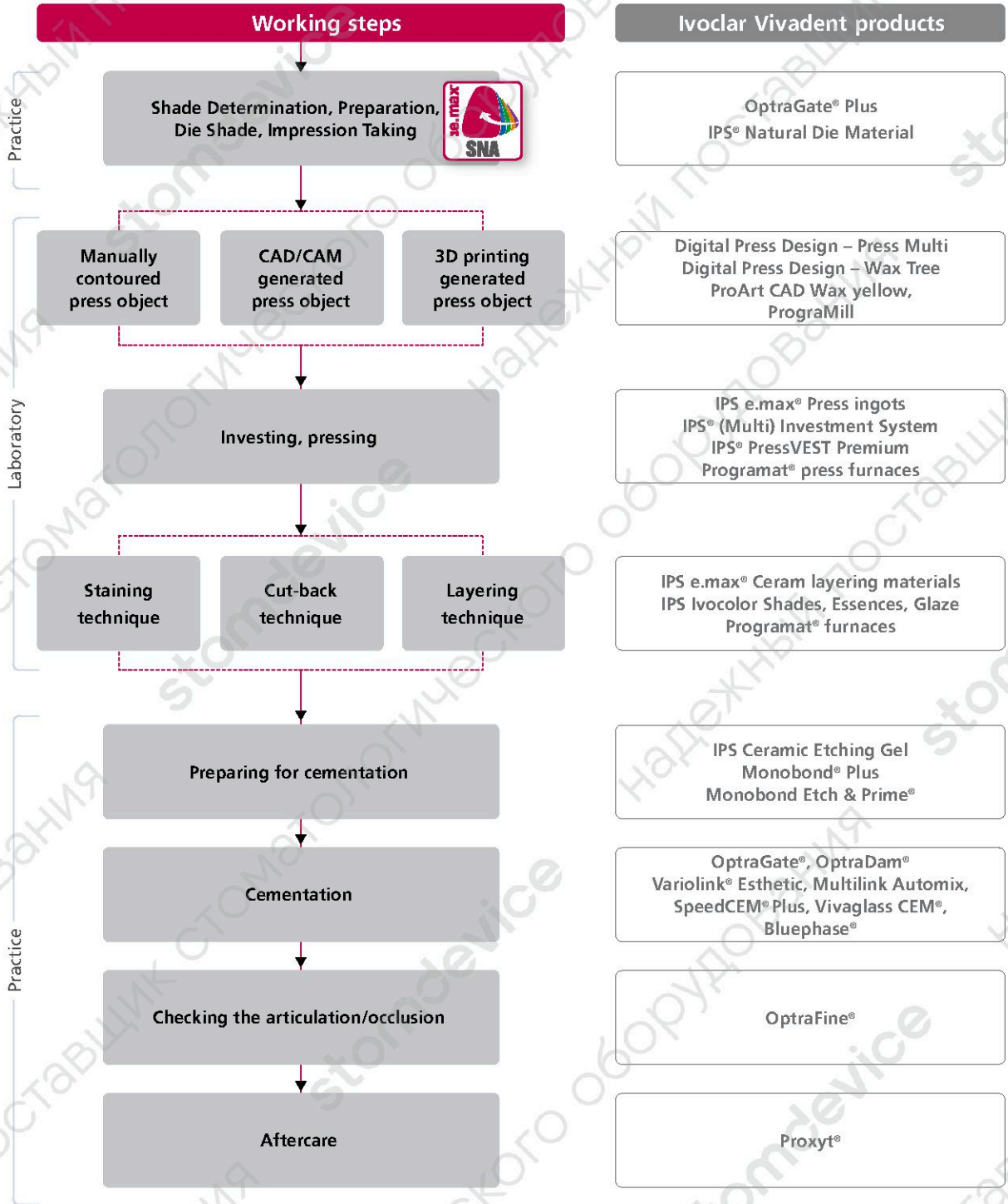
Monochromatic



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Practical Procedure

Overview of the Clinical Working Steps, Fabrication Process



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Processing techniques



Staining technique

In the staining technique, the full-contour wax-up is invested and subsequently pressed. The restoration is completed with the help of the Stain and Glaze firing.
The use of translucent IPS e.max Press ingots enables the fabrication of very esthetic restorations on only slightly or non-discoloured preparations with minimum effort.



Cut-back technique

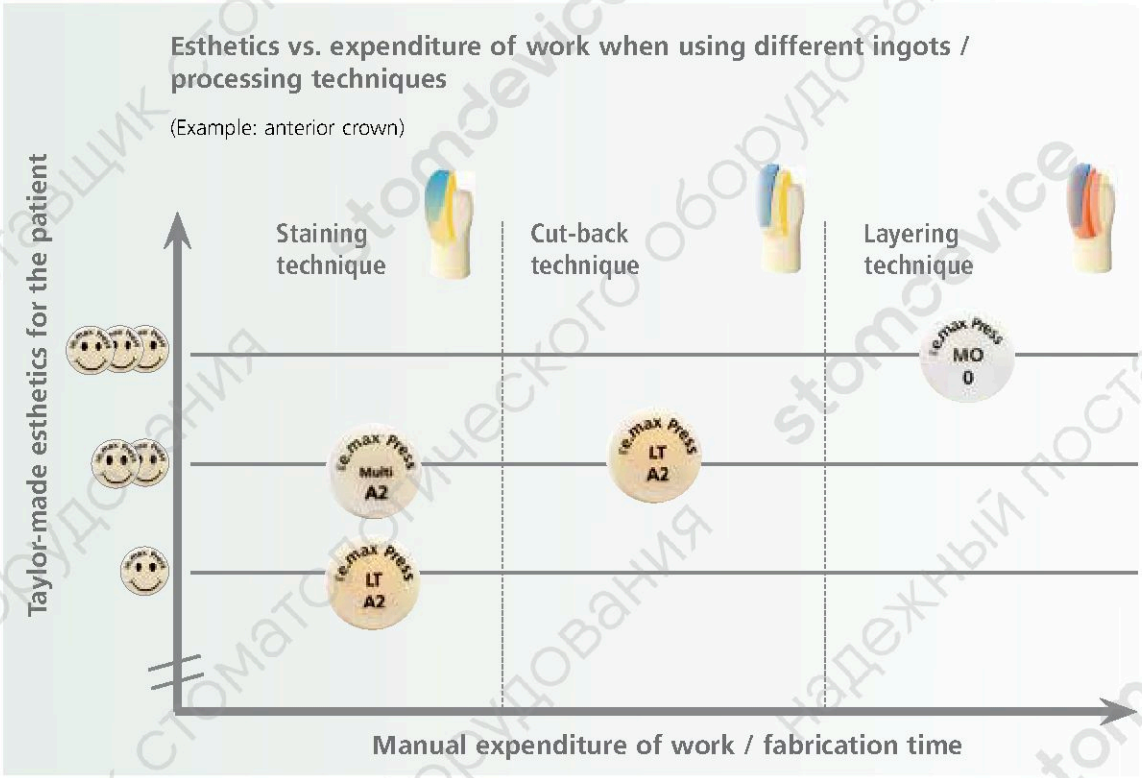
In the cut-back technique, the wax-up is reduced in the incisal / occlusal area, invested and subsequently pressed. The reduced restoration is completed with the IPS e.max Ceram layering ceramic. Finally, Stain and Glaze firing is conducted.



Layering technique

In the layering technique, a tooth-shape supporting framework wax-up is invested and subsequently pressed. The restoration is completed by supplementing the anatomical shape with IPS e.max Ceram layering ceramic. Finally, Stain and Glaze firing is conducted.





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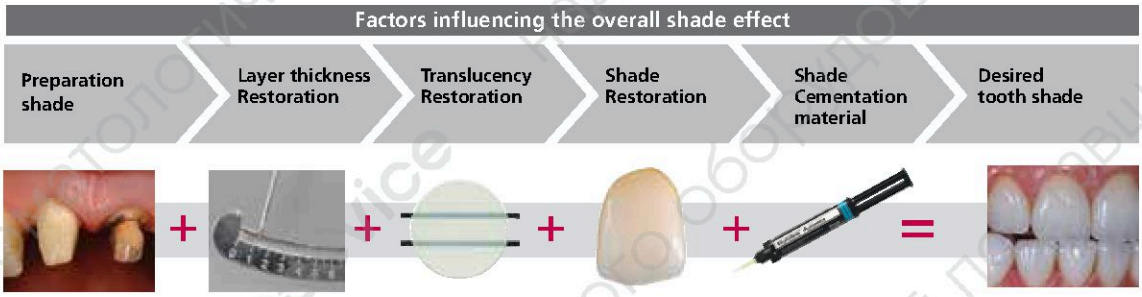
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Ingot selection using the IPS e.max® Shade Navigation App

Optimum shade and shape integration in the oral cavity of the patient is the prerequisite for a true-to-nature all-ceramic restoration. Shade differences between the restoration and the natural residual dentition in particular, disturb the esthetic appearance. To achieve optimum shade integration, the following guidelines and notes must be observed.

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

- **Shade of the prepared tooth** (natural tooth structure, die build-up, abutment, implant)
- **Shade, translucency** and **layer thickness of the restoration** (A1, A2, A3…, HT, MT, LT…, veneer, characterization)
- **Shade of the cementation material**.



Upon the fabrication of high-quality esthetic restorations, these influencing factors must be taken into consideration. After all, only their interplay results in the overall shade effect. As the shade of the preparation and the layer thickness are usually difficult of control, and the shade of the cementation material only minimally affects the overall shade effect, the selection of the suitable translucency and shade of the IPS e.max ingot is of critical important.

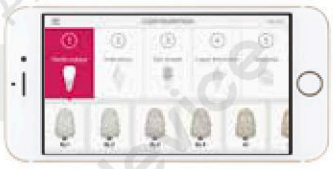
The **IPS e.max Shade Navigation App** is used to determine the suitable ingots.

The IPS e.max Shade Navigation App is the intelligent block/ingot/disc selection app for Android or iOS smartphones and tablets. The app takes all the important influential factors into account and thus enables a very precise translucency and shade recommendation.

5 steps to find the suitable IPS e.max ingot:

1 Enter the tooth shade

(Determined/desired tooth shade according to the A-D Shade Guide)



Tips on shade determination:

The tooth shade is determined on the non-prepared tooth or adjacent teeth after cleaning. Individual characteristics have to be considered when determining the tooth shade. In order to achieve as lifelike results as possible, shade determination should be carried out at daylight. Furthermore, the patient should not wear clothes with intensive colours and/or lipstick. For a flawless reproduction of the determined tooth shade, taking an additional digital photograph of the starting situation is recommended.



Another option for shade determination is provided by the Programat® furnaces equipped with DSA function (Digital Shade Assistant). The integrated image processing software compares three preselected shade guide teeth with the tooth to be analyzed and automatically indicates the closest matching tooth shade. You can find additional information about this topic in the corresponding Programat Operating Instructions.

Digital Shade Assistant

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2 Enter the indication

(Veneer, inlay, etc.)



Tips on selecting the indication:
Not all possible indications are listed in the app. However, the following alternative indications can be used to define a suitable ingot:

Non-listed indications	Alternative indications
Bridge	Crown
Partial crown	Onlay
Occlusal veneer (table top)	Onlay

There are no alternative indications available for hybrid abutment and hybrid abutment crown. The material to be selected can be found in the corresponding Instructions for Use.

3 Enter the die shade

(Shade of the preparation defined with the IPS Natural Die Material shade guide)



Tips on determining the die shade:
The die shade is determined with the IPS Natural Die Material shade guide at the largest, most discoloured area of the tooth stump. If you are torn between two shades, always choose the darker one.



The IPS Natural Die Material enables the fabrication of 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 die shade effect



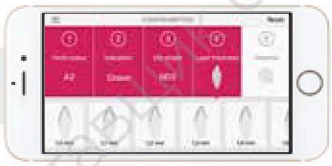
Restoration: Veneer (0.5 mm, IPS e.max® CAD HT B1)
Cementation material: Variolink® Esthetic neutral
Preparation shade: IPS® Natural Die Material, ND 1 – ND 9

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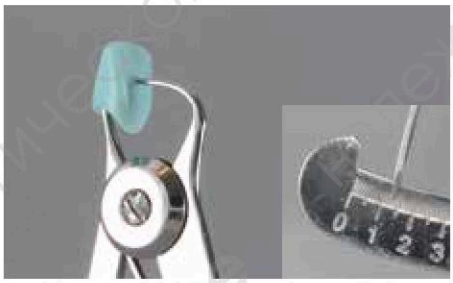
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4 Enter the layer thickness

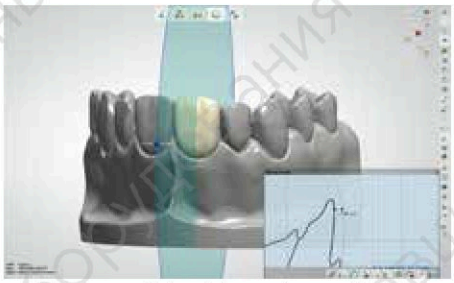
(Preparation depth and/or wall thickness of the restoration to be fabricated)



Tips on determining the layer thickness:
Determine the layer thickness either manually with calipers or digitally with of the CAD software. Crowns, veneers and copings are measured in the centre of the thinnest vestibular point. Inlays and onlays at the thinnest occlusal point.



Manual determination of the layer thickness, in the centre of the thinnest, vestibular area



Digital determination of the layer thickness, in the centre of the thinnest, vestibular area

Example - Influence of layer thickness and translucency:



Restoration: left: Veneer (0.5 mm, IPS e.max® CAD HT B1);
right: Crown (1.5 mm, IPS e.max® CAD LT B1)
Cementation material: Variolink® Esthetic neutral
Preparation shade: IPS® Natural Die Material, ND 6

5 Enter the material

(IPS e.max CAD, IPS e.max Press, IPS e.max ZirCAD)



Tips on material selection:
If a field is highlighted in grey in the material selection, the material is not suitable for the respective indication or layer thickness.

= Result for the suitable ingot





Tips on the result:
The visual presentation of the result, permits the comparison of the restoration shade with the A–D shade guide to recognize any necessary shade adjustments well in advance.

More detailed information on the function and the procedure can be found under **www.ipsemax.com/sna** or directly in the app.

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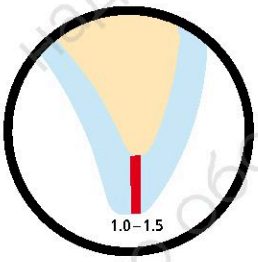
Preparation guidelines

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

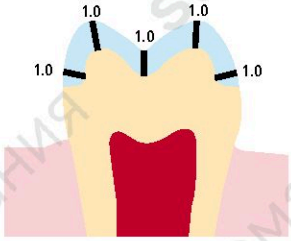
Basic preparation guidelines for all-ceramic restorations

- No angles or edges
- Shoulder preparation with rounded inner edges and/or chamfer preparation
- The indicated dimensions reflect the minimum thickness for IPS e.max Press restorations.



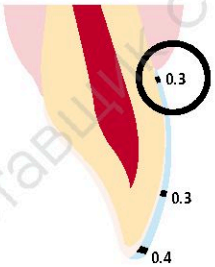


Occlusal veneer (table top)



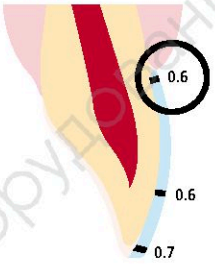
- Reduce the anatomical shape and observe the stipulated minimum thickness.
- Prepare a circular shoulder with rounded inner edges or a chamfer at an angle of approximately 10°– 30°. Width of the circular shoulder/chamfer at least 1.0 mm.
- Reduce the crown third – in the occlusal area – by approx. 1.0 mm.

Thin veneers



- If possible, the preparation should be located in the enamel.
- The incisal preparation margins should not be located in the area of the abrasion surfaces and dynamic occlusal surfaces.
- 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.

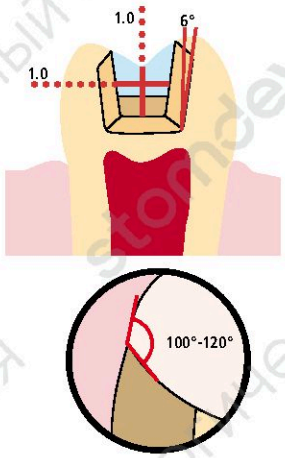
Veneer



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

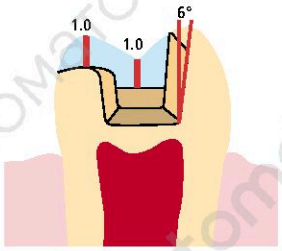
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Inlay



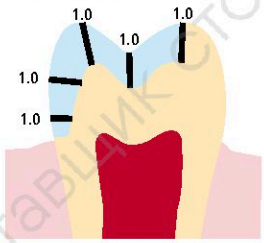
- Static and dynamic antagonist contacts must be taken into consideration.
- The preparation margins must not be located on centric antagonist contacts.
- A preparation depth of at least 1.0 mm and an isthmus width of at least 1.0 mm must be observed in the fissure area.
- Prepare the proximal box with slightly diverging walls (preparation angle 6°) and observe an angle of 100°–120° between the proximal cavity walls and the prospective proximal surfaces of the inlay. For inlays with pronounced convex proximal surfaces without adequate support by the proximal shoulder, marginal ridge contacts should be avoided.
- Round out internal edges and transitions in order to prevent stress concentration within the ceramic material.
- Do not prepare slice-cuts or feather edges.

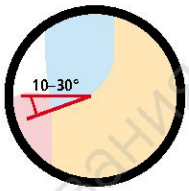
Onlay



- Static and dynamic antagonist contacts must be taken into consideration.
- The preparation margins must not be located on centric antagonist 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 (preparation angle 6°) and observe an angle of 100°–120° between the proximal cavity walls and the prospective proximal surfaces of the onlay. For onlays with pronounced convex proximal surfaces without adequate support by the proximal shoulder, marginal ridge contacts should be avoided.
- Round out internal edges and transitions in order to prevent stress concentration within the ceramic material.
- Do not prepare slice-cuts or feather edges.
- Provide at least 1.0 mm of space in the cusp areas.

Partial crown

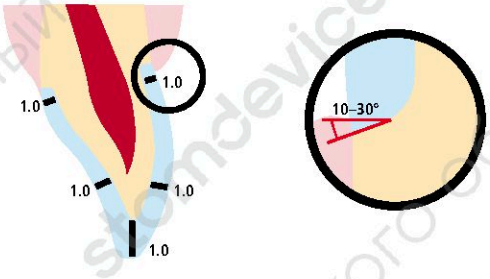




- Static and dynamic antagonist contacts must be taken into consideration.
- The preparation margins must not be located on centric antagonist contacts.
- Provide at least 1.0 mm of space in the cusp areas.
- Prepare a circular shoulder with rounded inner edges or a chamfer at an angle of approximately 10°– 30°. Width of the shoulder/chamfer at least 1.0 mm.

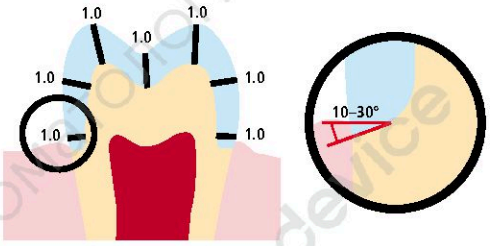
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Minimally invasive anterior crown (adhesive cementation is mandatory)



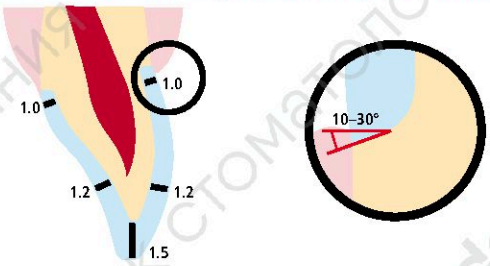
- Reduce the anatomical shape and observe the stipulated minimum layer thickness. Circular shoulder preparation with rounded inner edges and/or pronounced chamfer preparation. Width of the circular shoulder/chamfer at least 1.0 mm.
- Reduce the incisal crown third by at least 1.0 mm.
- Reduce the vestibular and/or oral area by approx. 1.0 mm.

Minimally invasive posterior crown (adhesive cementation is mandatory)



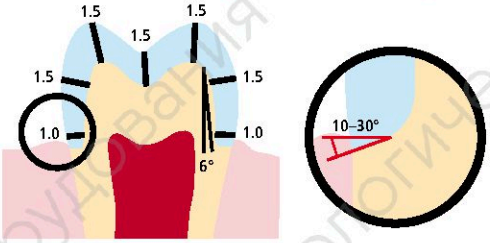
- Reduce the anatomical shape and observe the stipulated minimum layer thickness. Circular shoulder preparation with rounded inner edges and/or pronounced chamfer preparation Width of the circular shoulder/chamfer at least 1.0 mm.
- Reduce the occlusal crown third by at least 1.0 mm.
- Reduce the vestibular and/or oral area by at least 1.0 mm.

Anterior crown / bridge abutment in the anterior region



- Reduce the anatomical shape and observe the stipulated minimum layer thickness. Prepare a circular shoulder with rounded inner edges or a pronounced chamfer at an angle of approximately 10°– 30°. Width of the circular shoulder/chamfer at least 1.0 mm.
- Reduce the incisal crown third by at least 1.5 mm.
- Reduce the vestibular and/or oral area by at least 1.2 mm.
- For conventional and/or self-adhesive cementation, the preparation must demonstrate retentive surfaces and sufficient preparation height.

Posterior crown / bridge abutment in the premolar region

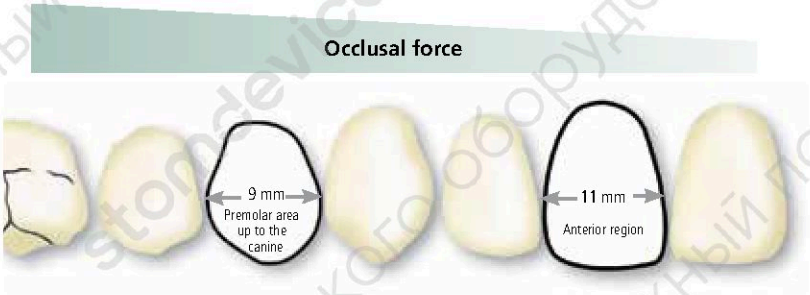


- Reduce the anatomical shape and observe the stipulated minimum layer thickness. Prepare a circular shoulder with rounded inner edges or a pronounced chamfer at an angle of approximately 10°– 30°. Width of the circular shoulder/chamfer at least 1.0 mm. Preparation angle 6°.
- Reduce the occlusal crown third by at least 1.5 mm.
- Reduce the vestibular and/or oral area by approx. 1.5 mm.
- For conventional and/or self-adhesive cementation, the preparation must demonstrate retentive surfaces and sufficient preparation height.

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Maximum width of bridge pontics in the anterior and premolar region



Given the different masticatory forces, the maximum acceptable pontic width is different in the anterior and premolar region.
The pontic width is determined on the unprepared tooth:
– In the anterior region the bridge pontic width should not exceed 11 mm.
– In the premolar region (canine up to the second premolar), the bridge pontic width should not exceed 9 mm.

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Minimum layer thicknesses

The restoration design is key to the success of durable all-ceramic restorations. The more attention given to the design, the better the final results and the clinical success will turn out to be.
The following **minimum layer thicknesses** for the **staining, cut-back** as well as the **layering technique** must be observed to achieve the tooth shade of the shade guide and meet the **requirements put forth in the preparation guidelines** (page 16 – 19).

When using the IPS e.max Press Multi ingot, the minimum wall thickness should at least 1.0 mm, so that the course of the layering (dentin/incisal) is visible in the restoration.

Staining technique

In the staining technique, no layering materials are applied on the IPS e.max Press restoration. The minimum thicknesses thus refer to the layer thickness of IPS e.max Press.

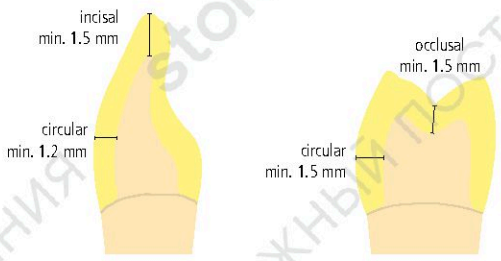
The connector design for bridges should be extended in the vertical direction, rather than in the horizontal direction. Especially in anterior bridges, it is not always possible to establish the necessary connector dimensions in the sagittal (lingual-vestibular) direction. In such cases, the connector dimensions must always be extended in the vertical (incisal-cervical) direction.

Minimum layer thickness of the IPS e.max® Press restoration in the staining technique (depending on the indication)

Cementation	Adhesive cementation is mandatory							Adhesive, self-adhesive or conventional cementation are optional.			
								Crown		Bridge	
Indication	Occlusal veneer	Thin veneer	Veneer	Inlay	Onlay	Partial crown	Minimally invasive crown in the anterior and posterior region	Anterior region	Posterior region	Anterior region	Premolar region
Minimum layer thickness of IPS e.max Press – **staining technique**											
incisal/occlusal	1.0	0.4	0.7	1.0 fissure depth	1.0 fissure depth	1.0	1.0	1.5	1.5	1.5	1.5
circular	1.0	0.3	0.8	1.0 isthmus width	1.0 isthmus width	1.0	1.0	1.2	1.5	1.2	1.5
Connector dimensions	–	–	–	–	–	–	–	–	–	16 mm² In general, the following applies: Height ≥ Width	

Dimensions in mm

Example:
Minimum layer thicknesses for anterior and posterior crowns in the staining technique



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.

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Cut-back and layering technique

In the cut-back technique or the layering technique, a reduced tooth shape-supporting framework is built-up to the full tooth shape by means of IPS e.max Ceram layering materials. When designing the restoration, the following guidelines regarding the IPS e.max Press framework and the IPS e.max Ceram veneer have to be observed:

– **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. In particular in anterior bridges, it is not always possible to establish the necessary connector dimensions in the sagittal (lingual-vestibular) direction. In such cases, the connector dimensions must always be extended in the vertical (incisal-cervical) direction.

Minimum thicknesses of the ISP e.max Press framework (depending on the indication) in the cut-back and staining technique

Cementation	**Adhesive cementation** is mandatory						**Adhesive, self-adhesive or conventional cementation** are optional.			
Indication	**Occlusal veneer**	**Thin veneer**	**Veneer**	**Inlay**	**Onlay**	**Partial crown**	**Crown**		**Bridge**	
							Anterior region	**Posterior region**	**Anterior region**	**Premolar region**
Minimum layer thickness of IPS e.max Press – **cut-back technique**										
incisal/occlusal	–	–	0.4	–	–	0.8	0.4	0.8	0.8	0.8
circular	–	–	0.6	–	–	1.5	1.2	1.5	1.2	1.5
Minimum layer thickness of IPS e.max Press – **layering technique**										
incisal/occlusal	–	–	–	–	–	–	0.6	0.8	0.8	0.8
circular	–	–	–	–	–	–	0.6	0.8	0.8	0.8
Design type	–	–	–	–	–	–	supporting the tooth shape lingual/palatal fully anatomic design			
Connector dimensions	–	–	–	–	–	–	–	–	16 mm² In general, the following applies: Height ≥ Width	

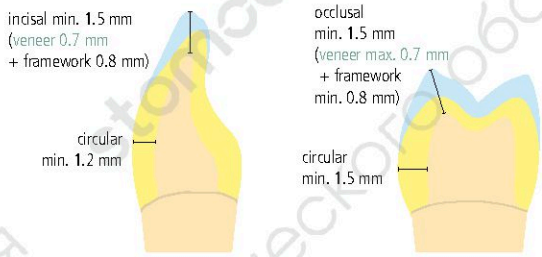
IPS e.max Press is the high-strength component of your restoration and must therefore always make up at least 50 % of the total layer thickness of the restoration. The overall thickness of the restoration (depending on the indication) is derived as follows:

Overall thickness of the restoration	**0.8**	**1.0**	**1.2**	**1.5**	**1.8**	**2.0**	**2.5**	**3.0**
Minimum **framework thickness** IPS e.max Press	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	0.4	0.5	0.6	0.7	0.8	0.9	1.2	1.4

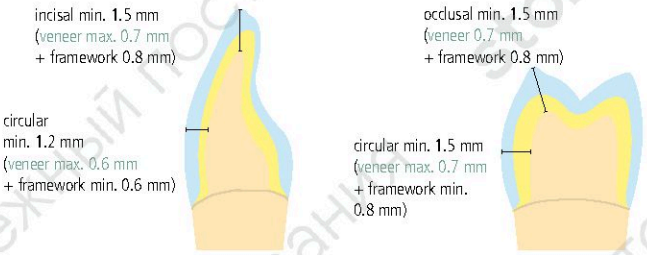
Dimensions in mm

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Example:
Minimum layer thicknesses for anterior and posterior crowns in the cut-back technique



Example:
Minimum layer thicknesses for anterior and posterior crowns in the layering technique



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.

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Model and die preparation

Fabricate a working model with removable segments as usual. It is advisable to apply a sealer to hard the surface and to protect the stone die, whereas 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**, **occlusal veneers (table tops)**, **partial crowns**, as well as **single 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 constructions. Apply an additional layer at the intercoronal surfaces of the abutments (towards the pontic). This measure helps prevent undesired friction.
- For restorations on abutments, the procedure is the same as that on natural preparations.

Marking the application/number of spacer layers to be applied:

single application | double application | tripple application

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 region, posterior region)



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.

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Practical Procedure

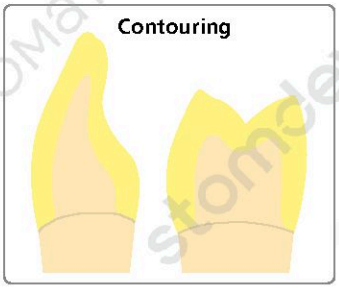
Contouring

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.

A. Contouring for the staining technique

Design the restoration to full anatomical contour so that it only requires characterization and glazing after pressing. The further procedure depends on the choice of ingot.



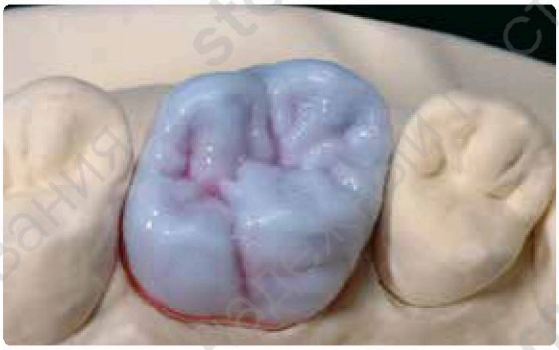
Using the polychromatic Multi ingots
continue on page 27

Using the monochromatic ingots
continue on page 42


Full-contour anterior mandibular crown


Full-contour anterior maxillary crown

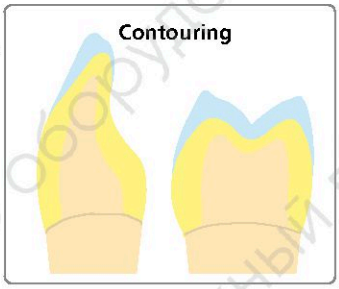

Full-contour inlay and onlay


Full-contour posterior crown

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B. 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.



Next working step
continue on page 62



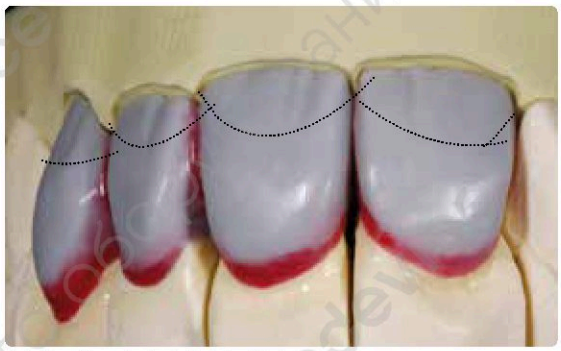


Fully anatomical wax-up. To better check the layer thickness, the use of a basic wax of another colour is recommended.

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 material, layering material) must be observed



Fabricate a silicone key for the fully anatomical restoration



Reduction of the contouring in the incisal third



Refrain from designing extreme contours in mamelons.

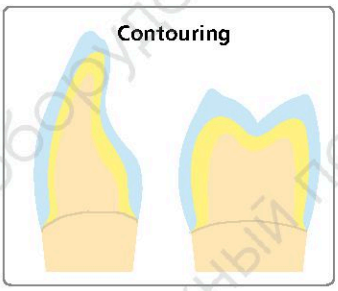


Reduction of the oral surfaces is not required.

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C. 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.



Next working step
continue on page 69

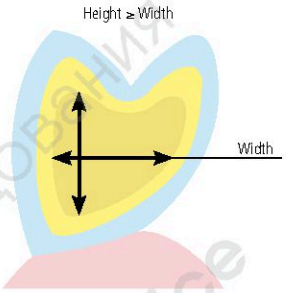
Single crowns



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.

In general, the following applies: Height ≥ 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.

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Practical Procedure

Using the polychromatic ingots

IPS e.max Press Multi provides the possibility to fabricate monolithic, polychromatic restorations in an efficient way. The newly developed and patented processing technique with special wax-up method enables the "transfer" of the shade gradation of the ingot to the restoration.

This chapter will describe the processing technique of the IPS e.max Press Multi from the available wax-up to the pressed object.

To process the IPS e.max Press Multi, the respective processing accessories as well as the special press program of the Ivoclar Vivadent Programat® furnaces are to be used.

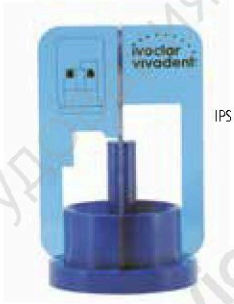
IPS Multi Wax Pattern Form A and Form B
Prefabricated precision wax patterns for sprueing the wax-up in the IPS Multi Investment Ring Base 200 g
The special shape of the IPS Multi Wax Pattern is decisive for the correct press procedure of the IPS e.max Press Multi. Form A or Form B is used depending on the restoration.



IPS Multi Investment Ring Base 200 g
Investment ring base for the processing of IPS e.max Press Multi.
To complete the investment ring, the IPS Ring Gauge 200 g and the IPS Silicone Ring 200 g are used.



IPS Multi Sprue Guide 200 g
The IPS Multi Sprue Guide 200 g helps to check the correct sprueing of the objects to be pressed on the IPS Multi Investment Ring Base 200 g.



IPS Multi One-Way Plunger 200 g
Special one-way plunger, which is used in addition to the IPS Alox plunger for pressing the IPS e.max Press Multi.



Press program for Programat® EP 3000/5000, EP 3010/5010
A specifically developed press program or the Fully automatic Press Function (FPF) for IPS e.max Press has to be used to press IPS e.max Press Multi ingots.
More information on software updates can be found at www.ivoclarvivadent.com/downloadcenter



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Sprueing

In contrast to the procedure for pressing monochromatic ingots, the waxed-up objects are laterally sprued on the investment ring base. Please observe the following procedure for sprueing the wax-up:

- Select the suitable IPS Multi Wax Pattern depending on the restoration:
  - **IPS Multi Wax Pattern Form A (green)** = for larger restorations, such as maxillary anterior crowns, premolar crowns, molar crowns as well as hybrid abutment crowns.
  - **IPS Multi Wax Pattern Form B (pink)** = for delicate restorations or in very narrow preparations, such as mandibular anterior crowns
- Leave the wax-up on the model die while sprueing the restoration to avoid damaging the restoration margins.
- **Important:** In principle, do not alter the geometry of the IPS Multi Wax Pattern by removing or adding wax.
- Apply a small drop of (soft) positioning wax on the side of the IPS Multi Wax Pattern.
- Align the IPS Multi Wax Pattern with its small, conical side towards the occlusal and/or incisal area and press against the wax object. The Wax Pattern can be secured in the mesial or distal area of the restoration. Observe the following guidelines for further alignment of the IPS Multi Wax Pattern with the wax-up:
  - Align the wax-up vertically with the centre of the IPS Multi Wax Pattern.
  - Align the longitudinal axes of the restoration and the IPS Multi Wax Pattern in such a way that they are parallel.
  - Align the sprueing of anteriors and premolars with the labial or buccal surface so that the shade gradation in the visible area is optimal.
  - To achieve a true-to-nature shade gradation for molar crowns, place the sprue on the mesio-buccal surface.
  - Use the pink IPS Multi Wax Pattern Form B for delicate restorations and align it with the labial or buccal surface so that the inflowing ceramic does not impact the die directly.
- After aligning the IPS Multi Wax Pattern, the gap to the wax-up is closed with a little modelling wax in such a way that no "thickened" area results. Attention must be paid to the restoration margin so as not to damage it.
- **Important:** The basal transition between the IPS Multi Wax Pattern and the wax-up is given a rounded design so that no sharp investment material edges are produced during investment. The sharp edges may break when the ceramic flows into the wax-up.

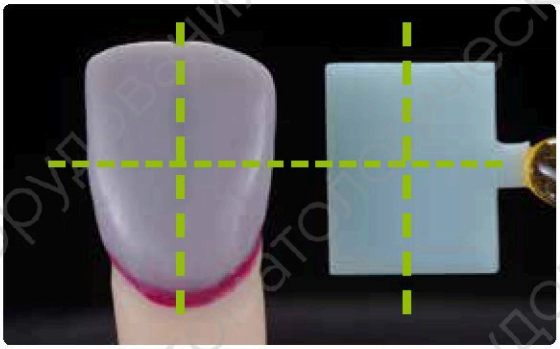
Basic notes on sprueing



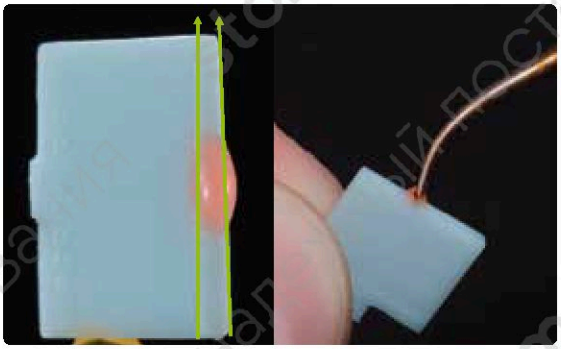
Use the IPS Multi Wax Pattern Form A for veneers, anterior and posterior crowns as well as for hybrid abutment crowns.



Use the IPS Multi Wax Pattern Form B for delicate crowns on very narrow preparations, e.g. mandibular anterior crowns.



Align the wax-up vertically with the centre of the IPS Multi Wax Pattern, irrespective of the size and type. Align the longitudinal axes of the wax-up and the IPS Multi Wax Pattern in such a way that they are parallel.



Align the IPS Multi Wax Pattern with its more narrow, conical side with the occlusal and/or incisal area. Apply a small drop of (soft) positioning wax on the side of the IPS Multi Wax Pattern.

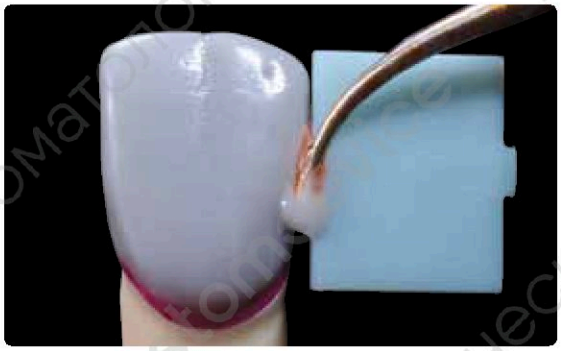
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Sprueing may basically be performed from the mesial or distal. Apply a small drop of (soft) positioning wax on the side of the IPS Multi Wax Pattern. Press the restoration slightly against the soft wax.



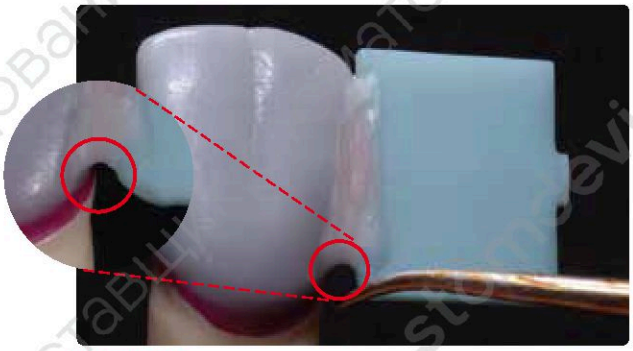
Align the IPS Multi Wax Pattern with the labial surface in such a way that the inflowing ceramic does not impact the die directly.



After aligning the IPS Multi Wax Pattern, close the gap to the wax-up with a little modelling wax in such a way that no "thickened" area results.



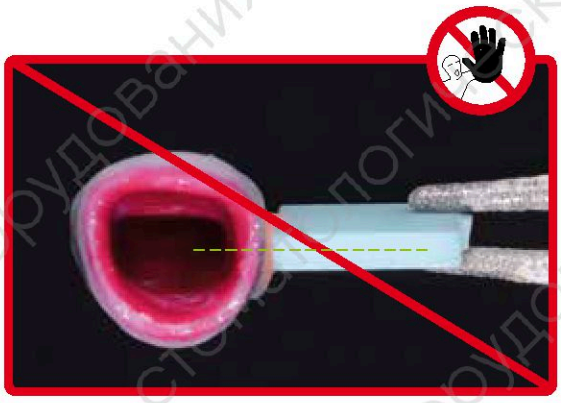
Attention must be paid to the restoration margin so as not to damage it.

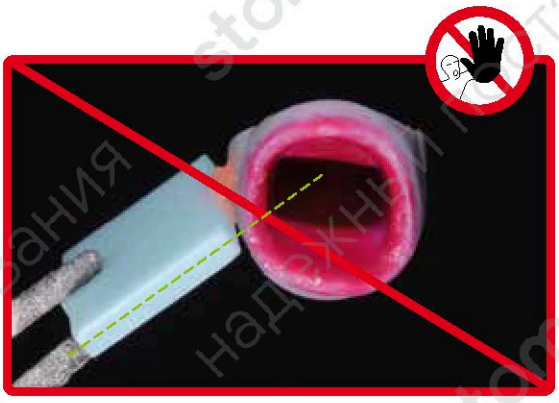


Important note: Give the basal transition between the IPS Multi Wax Pattern and the wax-up a rounded design so that no sharp investment material edges are produced during investment. The sharp edges may break when the ceramic flows into the wax-up.



Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results. In exceptional cases, this area of the Wax Pattern may be rounded out.





Do not place the IPS Multi Wax Pattern in such a way that the imagined extension points directly onto the die.

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Sprueing an anterior tooth



Attach the **IPS Multi Wax Pattern Form A** with its tapered side towards the incisal as an "extension" of the labial surface of the wax-up. Pay attention to the crown margin.

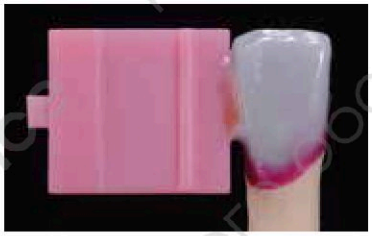


Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results. If necessary, round out the basal corner of the Wax Pattern.

Sprueing an anterior tooth with a "delicate die"



Attach the **IPS Multi Wax Pattern Form B** with its tapered side towards the incisal as an "extension" of the labial surface of the wax-up. Pay attention to the crown margin.

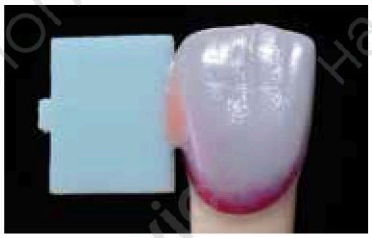


Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results.

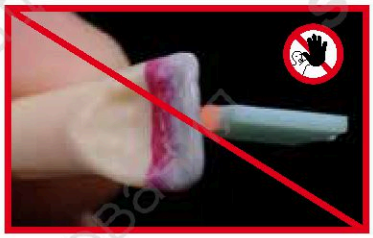
Sprueing a veneer



Attach the **IPS Multi Wax Pattern Form A** with its tapered side towards the incisal as an "extension" of the labial surface of the wax-up. Pay attention to the preparation margin.

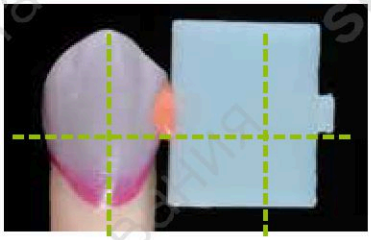


Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results.



Do not sprue the veneer from the labial side.

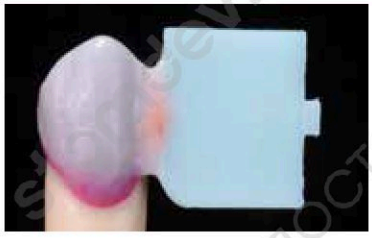
Sprueing a premolar



Align the wax-up vertically with the centre of the **IPS Multi Wax Pattern Form A**. Align the longitudinal axes of the restoration and the IPS Multi Wax Pattern in such a way that they are parallel.



Attach the IPS Multi Wax Pattern to the proximal area from the mesial in alignment with the labial surface.

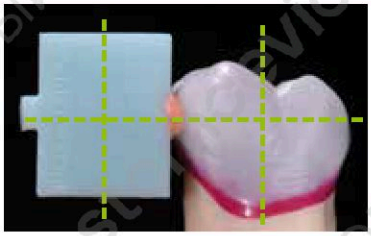


Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results. In exceptional cases, this area of the Wax Pattern may be rounded out.

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Sprueing a molar



Attach the **IPS Multi Wax Pattern Form A** vertically to the centre of the crown. The narrower side of the Wax Pattern points toward the occlusal.

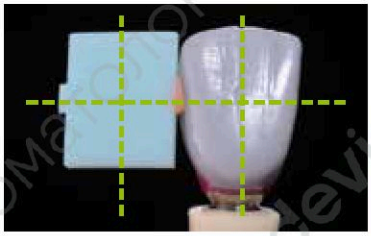


To achieve a lifelike shade gradation of the buccal surface, attach the IPS Multi Wax Pattern Form A to the mesio-buccal side.

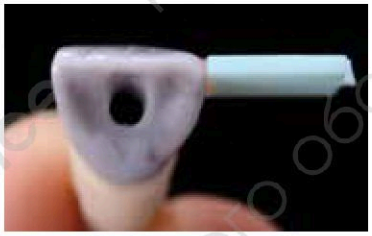


Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results. If necessary, round out the basal corner of the Wax Pattern.

Sprueing a hybrid abutment crown



Attach the **IPS Multi Wax Pattern Form A** vertically to the centre of the crown. The narrower side of the Wax Pattern points toward the occlusal.



To achieve a lifelike shade gradation of the buccal or labial surface, attach the IPS Multi Wax Pattern Form A to the vestibular side.



Close the gap between the IPS Multi Wax Pattern and the wax-up with a little modelling wax in such a way that no "thickened" area results. If necessary, round out the basal corner of the Wax Pattern.

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Preparing for investment



The IPS Multi Investment Ring Base 200 g must be used for investment. Please observe the following notes when attaching the sprued restoration to the IPS Multi Investment Ring Base 200 g with wax:

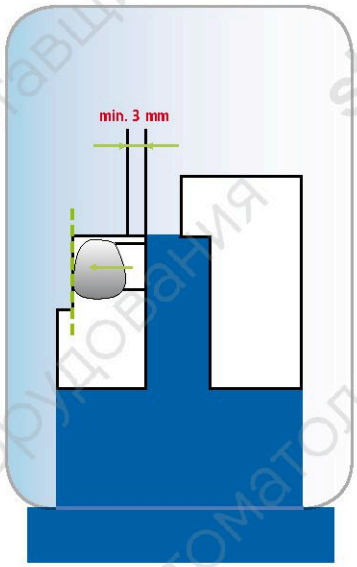
- Seal the unused openings in the investment ring base with wax with excess. If too little wax is used, difficulties (cracks) may develop when removing the investment ring base from the set investment material.
- Determine the weight of the IPS Multi Investment Ring Base and note.
- Apply a small drop of (soft) positioning wax into the openings in the investment ring base to be used.
- Insert the IPS Multi Wax Pattern with the sprued wax-up in the opening of the investment ring base. The incisal edge and/or occlusal surface of the wax-up must face the investment ring base.
- Check the position of the sprueing using the IPS Multi Sprue Guide 200 g. The wax-up must be located within the marked area. With large wax objects, it may be necessary to shorten the IPS Multi Wax Pattern so it is flush with the Sprue Guide (see below). **The length of the IPS Multi Wax Pattern between the wax-up and the IPS Multi Investment Ring Base must be at least 3 mm.**
- **Note:** Restorations with a width of more than 12 mm cannot be positioned in the defined area and may therefore not be pressed using IPS e.max Press Multi.
- Close the gap between the IPS Multi Wax Pattern and the IPS Multi Investment Ring Base with a little wax to prevent the investment material to flow into the gap.
- Weigh the loaded IPS Multi Investment Ring Base again and calculate the wax weight from the difference between the empty and the loaded investment ring base.
- **The maximum wax weight is 1.0 g**.



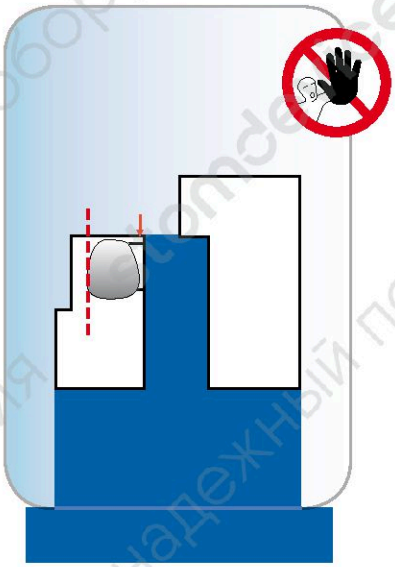
Seal the unused openings in the investment ring base with wax with excess.



Insert the IPS Multi Wax Pattern with the sprued wax-up in the opening of the investment ring base. The incisal edge and/or occlusal surface of the wax-up must face the investment ring base.



Correct positioning
Align the wax-up with the help of the IPS Multi Sprue Guide 200 g. The length of the IPS Multi Wax Pattern between the wax-up and the IPS Multi Investment Ring Base must be at least 3 mm. Check, e.g. with a 3 mm wax wire.



Incorrect positioning.
Wax-up is positioned too close to the investment ring base.

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Attach the wax-up to the IPS Multi Investment Ring Base 200 g using the IPS Multi Wax Pattern. Check the correct positioning with the IPS Sprue Guide 200 g.



Close the gap between the IPS Multi Wax Pattern and the IPS Multi Investment Ring Base with a little wax in such a way that no "thickened" area results.



Prepared investment ring base with sprued wax-up and sealed, unused opening.

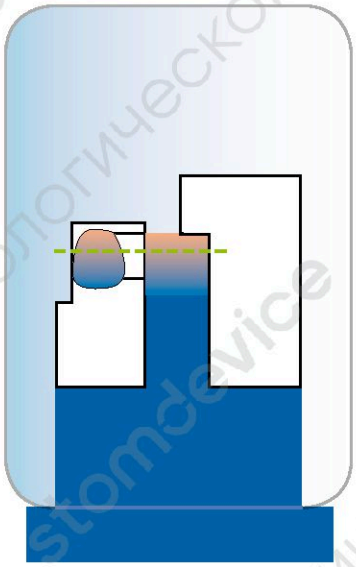
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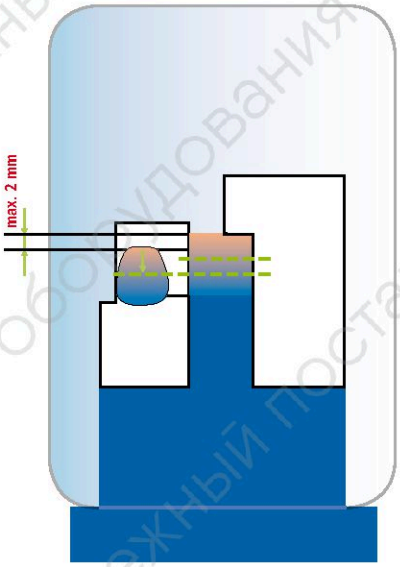
Optional

Shifting the sprueing at the investment ring base to increase the incisal area

By shifting the restoration connected to the IPS Multi Wax Pattern along the IPS Multi Investment Ring Base, the incisal proportion of the pressed restoration can be increased.
Below are explanations with the help of a diagram regarding the "more incisal" procedure:



Neutral position



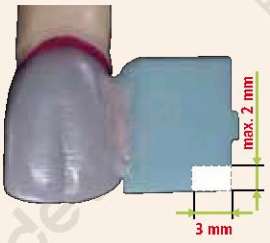
"More incisal"

Neutral position – Course of the incisal/dentin area according to the A–D material shade guide

- Attach the wax-up to the centre of the IPS Multi Wax Pattern.
- Slide the IPS Multi Wax Pattern into the opening of the IPS Multi Investment Ring Base and secure with wax.

Restorations with increased incisal proportion

- Attach the wax-up to the centre of the IPS Multi Wax Pattern.
- Shift the IPS Multi Wax Pattern downward along the IPS Multi Investment Ring Base towards the bottom of the ring. **Maximum shift: 2 mm**.
- The IPS Multi Wax Pattern has to be cut to size according to the shift.



- Seal the openings in the IPS Investment Ring Base above the IPS Multi Wax Pattern with wax.

Note: if all the restorations are shifted, the acceptable wax weight is *reduced*.

Shift [mm]	Max. wax weight [g]
0	1.0
0.5	0.95
1.0	0.9
1.5	0.85
2.0	0.8

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Investing



Investing is carried out with IPS PressVEST Premium. The corresponding IPS Silicone Ring 200 g with the matching IPS Ring Gauge 200 g, together with the IPS Multi Investment Ring Base 200 g are used for investment. For further details on the processing of the investment materials, please refer to page 44 et seq.

Given the position of the secured wax-up in the investment ring base, there is a risk of air being trapped in the occlusal surface as well as in the screw channel of hybrid abutment crowns. Please observe the following procedure:

- Before mounting the IPS Silicone Ring 200 g, carefully apply a little investment material on the occlusal surface and/or the screw channel using a brush.
- Use a suitable instrument for the fine investment of the cavity (e.g. brush). Make sure that the delicate wax margins are not damaged. **Note:** To prevent die fractures during pressing of very delicate dies, the placement of a ZrO_2 pin in the cavity during investment is recommended.
- Carefully place the IPS Silicone Ring 200 g on the IPS Multi Investment Ring Base. Make sure that the ring is flush with the investment ring base. **Note:** The silicone ring must be clean and dry when used. Do not spray with separators, solvents or relaxants that contain oil.
- Pour the investment material slowly into the investment ring, so that the material can continuously fill the investment ring.
- Fill the investment ring up to the marking and position the IPS Ring Gauge with a hinged movement.
- Press the ring gauge on the IPS Silicone Ring until it stops. Excess investment material escapes through the opening.
- Allow the investment ring to set without manipulating it.



Prepared IPS Multi Investment Ring Base with wax-attached wax-up.



Carefully apply a little investment material on the occlusal surface and/or the screw channel of a hybrid abutment crown using a brush.



Carefully fill the cavities with investment material using a suitable instrument (e.g. brush).



Carefully place the IPS Silicone Ring 200 g on the IPS Multi Investment Ring Base 200 g. Make sure that the ring is flush with the investment ring base.



Pour the investment material slowly into the investment ring, so that the material can continuously fill the investment ring.







Fill the investment ring up to the marking and position the IPS Ring Gauge with a hinged movement. Excess investment material escapes through the opening. Allow the investment ring to set without manipulating it.

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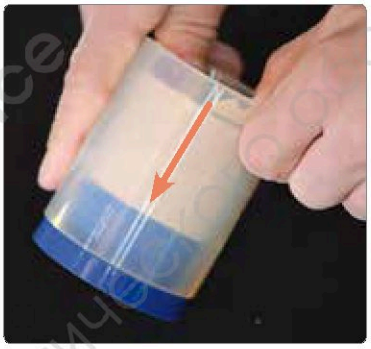
Preheating

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

- Remove the IPS Ring Gauge with a turning movement.
- Carefully push the investment ring out of the IPS Silicone Ring.
- Remove the IPS Investment Ring Base with a turning movement.
- 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 accordingly.
- Place the investment ring in the preheating furnace with the opening facing down.
- Switch on the press furnace in time so that the self-test and preheating phase are completed by the time the press procedure is imminent.



Remove the IPS Ring Gauge with a turning movement.



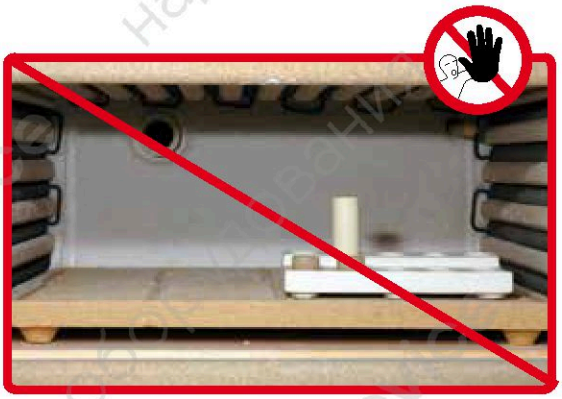
Carefully push the investment ring out of the IPS Silicone Ring.



Remove the IPS Investment Ring Base with a turning movement.



Place the investment ring in the pre-drying furnace with the opening facing down.



Do not preheat the IPS e.max Press Multi ingot, IPS Alox plunger and IPS Multi One-Way Plunger.



Switch on the press furnace (e.g. Programat EP 5010) in time so that the self-test and preheating phase are completed.

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	IPS PressVest Premium Conventional preheating	IPS PressVest Premium Speed procedure
Setting time	min. 30 min, max. 12 hrs	min. 30 min, max. 45 min
Temperature of the preheating furnace when 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	with the opening facing down	with the opening facing down
Final temperature for preheating the investment ring	850°C / 1562°F	850°C / 1562°F
Holding time of the investment ring at final temperature	100-g investment ring: min. 45 min. 200-g investment ring: min. 60 min.	100-g investment ring: min. 45 min. 200-g investment ring: min. 60 min.
IPS e.max Press Multi ingot	**no preheating**	
IPS Multi One-Way Plunger		
IPS Alox Plunger		

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Pressing

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

- Provide a **cold** IPS Multi One-Way Plunger, a **cold** IPS Alox Plunger and a **cold** IPS e.max Press Multi ingot in the desired shade.
- Turn on the press furnace (e.g. Programat EP 5010) in time so that the self-test and preheating phase are completed.
- Select the press program for IPS e.max Press Multi.
- Remove the investment ring from the preheating furnace immediately after completion of the preheating cycle and proceed as follows: This step may take max. 30 seconds to prevent the investment ring from cooling down too much.
- Place the **cold** IPS e.max Press Multi ingot into the **hot** investment ring, with the rounded, non-imprinted side facing forward. The imprinted side faces up to check the ingot shade. Then position the **cold** IPS Multi One-Way Plunger and finally the **cold** IPS Alox plunger in the investment ring.
- Place the loaded investment ring in the centre of the **preheated** press furnace.
- Press START to start the selected IPS e.max Press Multi program.

Press parameters for IPS e.max Press Multi

To press IPS e.max Press Multi ingots, select the Fully automatic Press Function (FPF) or the IPS e.max Press Multi program.



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 blasting with compressed air.

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Provide a **cold** IPS Multi One-Way Plunger, **a cold** IPS Alox Plunger **and a cold** IPS e.max Press Multi ingot in the desired shade and select the press program for IPS e.max Press Multi.



Place the **cold** IPS e.max Press Multi ingot into the **hot** investment ring, with the rounded, non-imprinted side facing forward. The imprinted side faces up to check the ingot shade.



Place the **cold** IPS e.max Press Multi One-Way Plunger into the hot investment ring, with the rounded side facing forward.



Place the **cold** IPS Alox Plunger in the **hot** investment ring.



Place the loaded **hot** investment ring in the centre of the **preheated** press furnace using the investment ring tongs. Press START to start the IPS e.max Press Multi 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.

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Divesting

After cooling to room temperature (approximately 60 minutes), the investment ring may show cracks, which developed during the cooling phase (immediately around the IPS Alox plunger),

Divest the investment ring as follows:

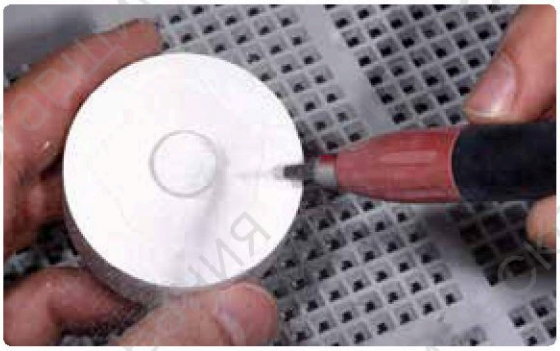
- Mark the cooled-down investment ring at a distance of 30 mm from the bottom surface
- **Note:** If the restorations were invested with a shift towards "more incisal", the marking has to be placed further towards the Alox plunger.
- Separate the investment ring using a separating disc. This predetermined breaking point enables reliable separation of the investment ring.
- Break the investment ring at the predetermined breaking. This step also destroys the IPS Multi One-Way Plunger.
- 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 (58 psi) pressure.
- Fine divestment is carried out with polishing beads at 2 bar (29 psi) pressure.
- Observe the blasting direction and distance to prevent damage to the object margins during divestment.



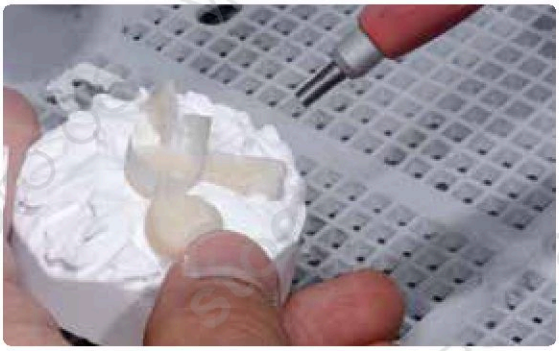
Separate the investment ring at a distance of at least 30 mm from the bottom surface using a separating disc...



... and break it at the predetermined breaking point.



Rough divesting with polishing jet medium at 4 bar pressure until the objects become visible.



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Fine divestment is carried out with polishing beads at 2 bar (29 psi) pressure.



Completely divested IPS e.max Press Multi objects

Next working step … **Removing the reaction layer page 50**

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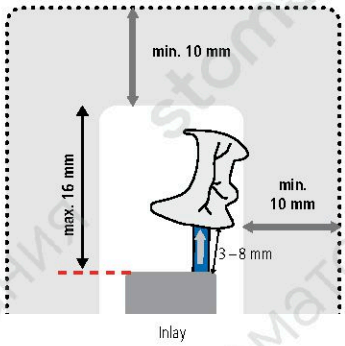
Using the monochromatic ingots

Sprueing

Please observe the following notes when attaching the sprues to the wax-up:

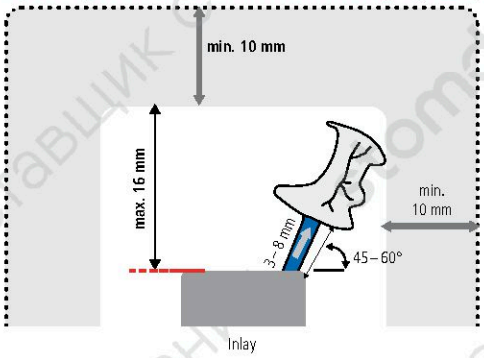
- Depending on the number of objects to be invested, either the 100-g or 200-g IPS Investment Ring System is selected. Bridges must only be pressed in the 200 g IPS Investment Ring System. Before sprueing, weigh the ring base and record the weight (seal the opening of the ring base with wax).
- Please note that the mixing ratio of the investment material is different for the various restoration types, e.g. inlays, crowns). For that reason, not all restorations may be sprued and invested with each other.
- Always attach the sprues in the direction of flow of the ceramic and at the thickest part of the wax-up so that smooth flowing of the viscous ceramic during pressing is enabled.
- Observe a distance of at least 10 mm between the wax objects and silicone ring.
- The maximum length (wax objects + sprue) of 16 mm must not be exceeded.
- Attach the sprued restoration at the "edge" of the investment ring base.
- If the 100 g IPS Investment Ring System is used, a somewhat steeper sprueing angle to the ring base must be observed.
- Correct sprueing is checked using the IPS Sprue Guide.
- If only one object is invested and pressed in an EP500 furnace, 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.

Sprueing with the IPS Investment Ring System, 100 g

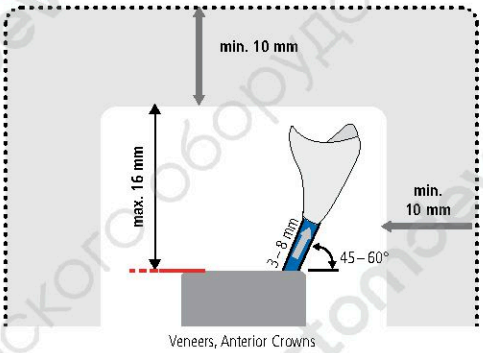


Inlay

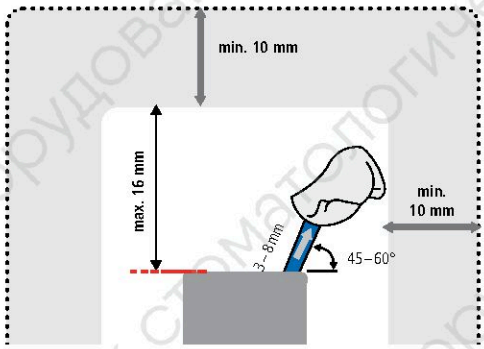
Sprueing with the IPS Investment Ring System, 200 g



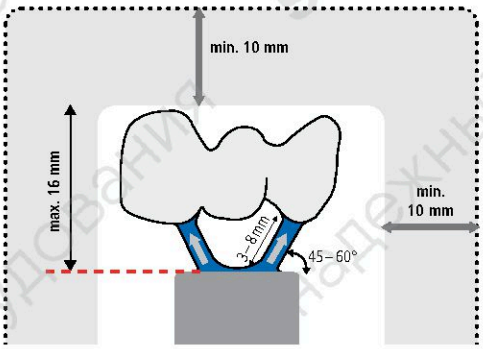
Inlay



Veneers, Anterior Crowns



Onlays, Molar Crowns



Anterior Bridges

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	Single tooth restorations	3-unit bridges
Investment ring base	100 g and 200 g	only 200 g
Wax wire Ø	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 bridge 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	rounded and slightly tapered, no angles or edges	rounded and slightly tapered, no 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 (applies to the EP 500)	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.	

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Investing

Investment is carried out with IPS PressVEST Premium (conventional or speed procedure). The corresponding IPS Silicone Ring with the matching ring gauge is used for investment.
Determine the weight of the object 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. 1.7 g
Investment Ring System	100 g and 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– max. 23 °C / 64 °F – max. 73 °F. 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. **Note:** The silicone ring must be clean and dry when used. Do not spray with separators, solvents or debubblizers that contain oil.
- 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 manipulating it.
- The invested ring must be further processed after a setting time of 12 hours at the latest to prevent crystallization of the IPS PressVEST Premium investment material.
- If IPS PressVEST Premium is used in the speed procedure, make sure that the investment ring is placed in the preheating furnace after a setting time of at least 30 and a maximum of 45 minutes after beginning of mixing (from first powder/ liquid contact).

Investment material: Liquid concentration and quantity

Indication	IPS PressVEST Premium	
	100 g powder Liquid: dist. water	200 g powder Liquid: dist. water
IPS e.max Press		
Crown, veneer	18 ml : 8 ml	36 ml : 16 ml
Inlay/onlay	16 ml : 10 ml	31 ml : 21 ml
3-unit bridge	–	36 ml : 16 ml
Hybrid abutments, hybrid abutment crowns	22 ml : 4 ml	44 ml : 8 ml
Mixing time (under vacuum at approx. 350 rpm)	90 seconds	

Liquid concentration: The data contained in the table are approximative values. Depending on the geometry of the Ti base and the materials used for the wax-up, these values may be individually changed. However, the concentrated Liquid content must not be lower than 50% in relation to distilled water.
Important: The total quantity of liquid (Liquid + dist. water) must not be altered.

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Preheating

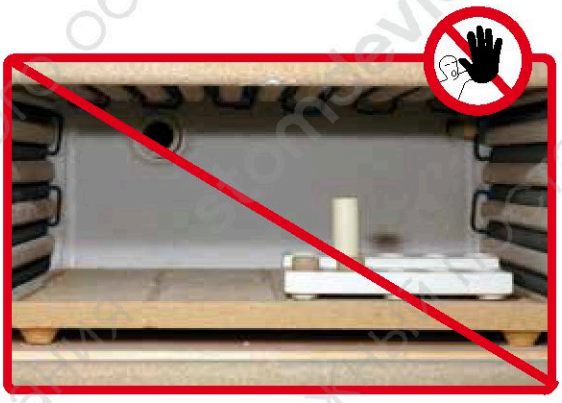
After the stipulated setting time of the investment material (IPS PressVEST Premium), the investment ring is prepared for preheating as follows:

- 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 Premium Conventional preheating	IPS PressVest Premium Speed procedure
Setting time	min. 30 min, max. 12 hrs	min. 30 min, max. 45 min
Temperature of the preheating furnace when 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 for preheating the investment ring	850 °C / 1562 °F	850 °C / 1562 °F
Holding time of the investment ring at final temperature	100-g investment ring: min. 45 min. 200-g investment ring: min. 60 min.	100-g investment ring: min. 45 min. 200-g investment ring: min. 60 min.
IPS e.max Press ingots	no preheating	
IPS Alox Plunger		
Important		If several Speed investments are to be conducted (e.g. 2 x 200g investment rings), they should be invested consecutively and placed into the preheating furnace at an interval of approx. 20 minutes. When placing the investment rings in the preheating furnace, make sure that the furnace temperature does not drop substantially. The stipulated holding time counts from the point when the preheating temperature has been reached again.



Place the investment ring 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.

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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 (observe the IPS e.max Shade Navigation App).
- 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 (e.g. Programat EP 5010) in time so that the self-test and preheating phase are completed.
- Select the press program for IPS e.max Press with the desired level of translucency 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 rounded, 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 powder into the **hot** investment ring.
- Use the investment ring tongs to place the loaded investment ring in the centre 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 blasting with compressed air.

	100 g Investment Ring	200 g Investment Ring
Single tooth restorations	1 small ingot	1 small ingot or 1 large ingot
3-unit bridges	✗	max. 1 large ingot
IPS e.max Press ingots	cold plunger	
IPS Alox Plunger		
IPS Alox Plunger Separator	✓	✓

Select one large or one 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.

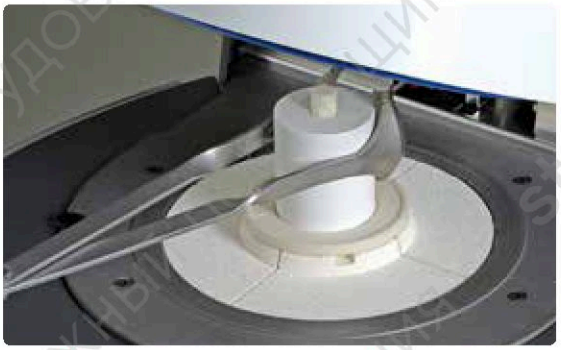


Place the **cold** IPS e.max Press ingot into the **hot** investment ring, with the shade imprint facing upward.

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



Place the **hot** and loaded investment ring in the centre 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.

Select the press program in accordance with the desired ingot to be pressed and the investment ring size for the respective furnace. Press parameters see page 82.



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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 CTEs of the various materials (Alox plunger, investment material, press ingot). They do not compromise the press results.



Mark the length of the Alox Plunger.

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 disc. 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 (58 psi) pressure.
- Fine divestment is carried out with polishing beads at 2 bar (29 psi) pressure.
- Observe the blasting direction and distance to prevent damage to the object margins during divestment.
- Remove possible ceramic residue from the Alox Plunger with type 100 Al_2O_3.

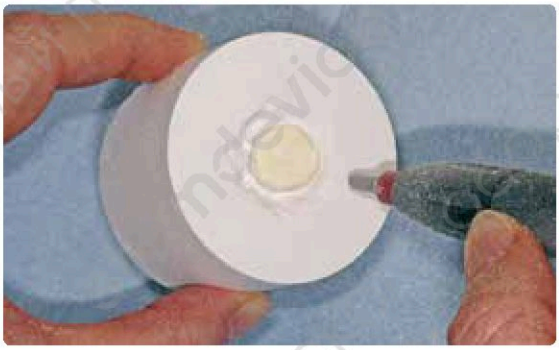


Separate the investment ring using a separating disc and break it at the predetermined breaking point.

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.



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Rough divesting with polishing jet medium at 4 bar pressure until the objects become visible.





Fine divestment is carried out with polishing beads at 2 bar (29 psi) pressure.



Completely divested IPS e.max Press objects

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Removing the reaction layer

When IPS PressVEST Premium is used, the reaction layer is usually easy to remove with a polishing jet medium. Use IPS e.max Press Invex Liquid to remove the remaining reaction layer. The procedure is 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 min and at most 30 min. Make sure that the objects are completely covered with Invex Liquid.
- Use the sieve insert to 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 between the framework and the layering/glazing materials.
- Replace the IPS e.max Press 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.



Completely remove the reaction layer from the contact surfaces using Al_2O_3 at 1–2 bar (15–30 psi) pressure.

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Note:

Contains: 0.5% hydrofluoric acid

Harmful to health when swallowed. Harmful to health upon skin contact. Causes severe irritation of the eyes. Wear protective gloves/protective clothing/eye protection/face protection. In case of indisposition, call the POISON INFORMATION CENTER or a physician. Targeted measures: After skin contact: Immediately rub with Ca-gluconate solution or Ca-gluconate gel. Wash contaminated clothes before wearing them again. UPON SKIN CONTACT: Wash with soap and copious amounts of water. UPON EYE CONTACT: Carefully rinse with water for several minutes. Remove any contact lenses, if possible. Continue rinsing.

Disposal

- Neutralize the Invex Liquid before disposal!
- Use the IPS Ceramic Neutralization Powder to neutralize the Invex Liquid.
- For 50 ml Invex Liquid, approx. 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 of, 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.

Next working step …

Staining technique page 52
Cut-back technique page 62

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Staining technique

Finishing

Suitable grinding instruments are imperative for adjusting and finishing high-strength glass-ceramic materials (please observe the Ivoclar Vivadent Flow Chart "Recommended grinding tools for IPS e.max glass-ceramics"). If unsuitable grinding instruments are used, chipping of the edges and local overheating may occur.

The following procedure is recommended for finishing IPS e.max Press restorations:

- Adjustment by grinding of pressed IPS e.max Press restorations should be kept to a minimum.
- Overheating of the ceramic must be avoided. Low speed and light pressure must be observed.
- Separate the sprue using a suitable separating disc. Avoid overheating. Pay attention to the proximal contacts when working on polychromatic restorations.
- Make sure that the minimum layer thickness of the restoration is maintained during finishing.
- Smooth out the attachment point of the sprue.
- Remove the spacer from the die. The restorations are tried in on the dies and carefully finished.
- Do not 'post-separate' the bridge connectors with separating discs. This may result in undesired predetermined breaking points, which will subsequently compromise the stability of the all-ceramic restoration.
- Check the occlusion and articulation and grind in the appropriate adjustments, if necessary.
- Design surface textures.
- To clean the outer side of the restoration, briefly blast with type 100 Al_2O_3 at 1 bar (15 psi) pressure and clean with the steam cleaner. Some blasting devices may require different pressure settings to accomplish this procedure.



Separating the sprues in polychromatic restorations using a separating disc



Separating the sprues in monochromatic restorations using a separating disc



Examining the fit of the restoration on the model



Apply surface structures with suitable grinding instruments.

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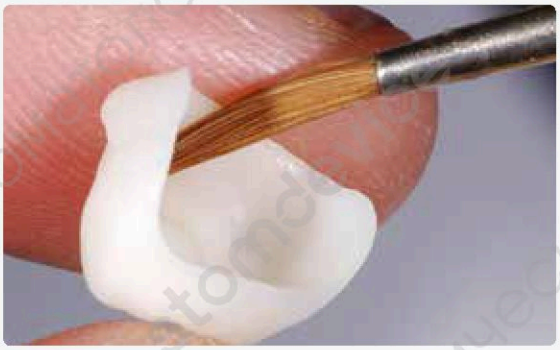
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Die fabrication with IPS Natural Die Material

The light-curing IPS Natural Die Material simulates the shade of the preparation. With the shade information provided by the dentist (shade determination), a control die is fabricated that serves as the optimum basis for lifelike shade reproduction of the given oral situation.

The following procedure must be observed:

- 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. Make sure that the entire inner aspect is embraced and filled.
- Insert the IPS Die Holder into the material and adapt excess around the die holder. Make sure that there is no gap at the restoration margins.
- Cure the IPS Natural Die Material die in a customary light curing device 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.



Apply IPS Natural Die Material in the restoration and insert the die holder.



Cure in a customary light curing device.



A die made of IPS Natural Die Material provides the optimum basis for true-to-nature all-ceramic restorations.

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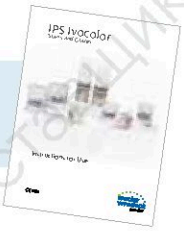
Stain firing

The following paragraphs will explain the steps of optional staining and characterizing with IPS Ivocolor Shades and Essences. The procedure is the same for both polychromatic and monochromatic restorations.

Required materials

- **IPS Ivocolor Essences** are intensively shaded stains in powder form.
- **IPS Ivocolor Shades** are ready-to-use stains in jars.
- **IPS Ivocolor Glaze Paste/FLUO, Glaze Powder/FLUO** are glazing material in paste and powder form.
- **IPS Ivoclar Mixing Liquids** (allround, longlife) to mix the materials in powder form (Essences, Glaze), as well as to thin paste materials (Shades, Glaze).
- **IPS Ivocolor Essence Fluid** to mix the Essences in powder form to a pasty consistency.





Detailed information on the processing of IPS Ivocolor Shade, Essence and Glaze can be found in the IPS Ivocolor Instructions for Use.

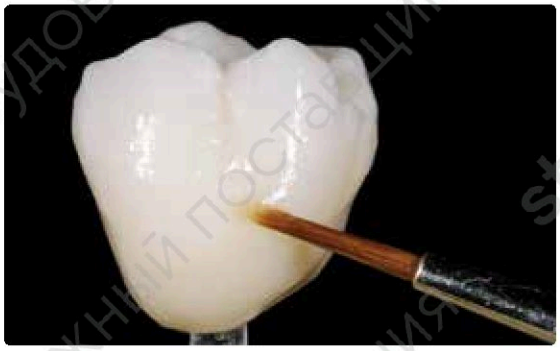
The following procedure must be observed:

- Clean the pressed object with a steam cleaner to remove any contaminations and grease residue. Any contamination after cleaning must be prevented.
- To improve the wettability of the stains, a small quantity of IPS Ivocolor Mixing Liquid may be slightly rubbed into the area that needs to be characterized.
- Mix IPS Ivocolor Shades and Essences with the corresponding IPS Ivocolor Liquids 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 of the crown in the incisal and/or occlusal third, IPS Ivocolor Shade Incisal may be used. The cusps and fissures can be individualized using Essences.
- Conduct the Stain firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Additional Stain firings can be conducted with the same firing parameters.
- Remove the 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.

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Apply IPS Ivocolor Shade Incisal to imitate the incisal area.



Enhancing the chroma of the buccal surface.



Occlusal characterization with IPS Ivocolor Essences



Conduct the Stain firing on a honey-comb firing tray belonging to the ceramic furnace.

Conduct the **Stain firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**

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Glaze firing

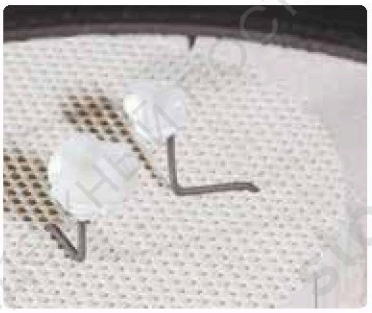
Glaze firing is conducted with IPS Ivocolor Glaze paste or powder. The following procedure is recommended:

- Mix the glazing material (IPS Ivocolor Glaze paste or powder) with the IPS Ivocolor Mixing Liquid allround or longlife to the desired consistency.
- Apply the glazing material in an evenly covering layer on the restoration.
- In the staining technique on full-contour restorations, the application of a fluorescent glazing material (paste or powder) is recommended.
- Conduct the Glaze firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Remove the 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.
- IPS e.max Ceram Add-On materials can be used for further adjustments (see IPS e.max Ceram Instructions for Use).





Apply the Glaze evenly on the surface.



Conduct the Glaze firing on a honey-comb firing tray using the corresponding parameters.

Conduct the **Glaze firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**

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Optional

Combined Stain 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.

Step 1 – Application of the glaze material



- Then remove a little IPS Ivocolor Glaze paste or powder and mix with IPS Ivocolor Mixing Liquid allround or longlife to the desired consistency.
- Apply the Glaze 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.

Step 2 – Application of stains (Essences, Shades)



- Mix IPS Ivocolor Shades and Essences with the corresponding IPS Ivocolor Liquids to the desired consistency.
- Apply mixed Shades and Essences directly into the unfired Glaze material.
- Intensify the corresponding dentin shade in the cervical and medium crown third using Shades.
- To imitate the incisal area and translucency in the incisal third, IPS Ivocolor Shade Incisal is to be used.

After glazing and staining, Glaze firing is conducted. When placing the objects into the furnace and setting the firing parameters, please observe the following points:

- Conduct the Glaze firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Additional firing cycles can be conducted with the same firing parameters.
- Remove the 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 hot object with metal tongs.
- IPS e.max Ceram Add-On materials can be used for further adjustments (see IPS e.max Ceram Instructions for Use).



Completed restoration after the combined Stain and Glaze firing.

Conduct the **Stain/Glaze firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**

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Thin veneers, occlusal veneers (table tops)

Thin veneers



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, e.g. a malposition or differences in length of the incisors. Thin veneers provide the advantage that they allow tooth structure-preserving preparation. If the clinical situation allows it, no preparation at all is required to preserve the tooth structure.

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.

Use the following procedure for the fabrication of thin veneers:

- Apply the spacer to the preparation or the tooth to be treated according to the veneer preparation guidelines (see page 23).
- 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 veneer.
- Sprue, invest, press, divest and remove the reaction layer according to the stipulations on page 42 et seq.
- As an option, IPS e.max Ceram layering materials may be applied (do not perform a cut-back).
- Conduct the Stain and Glaze firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Remove the 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.
- IPS e.max Ceram Add-On materials can be used for further adjustments (see IPS e.max Ceram Instructions for Use).
- 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.

Conduct the **Stain/Glaze firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**

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Occlusal veneers (table tops)

If the clinical situation requires an increase in vertical dimensions or the reconstruction of function, occlusal veneers maybe fabricated of IPS e.max Press may be fabricated for the posterior region. 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 very gentle to the tooth structure.

Occlusal veneers 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 23).
- Observe the minimum thickness of the occlusal veneer.
- Sprue, invest, press, divest and remove the reaction layer according to the stipulations on page 42 et seq.
- The application of IPS e.max Ceram Incisal or Transpa is possible (do not perform a cut-back).
- Conduct the Stain and Glaze firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Remove the 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.
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- IPS e.max Ceram Add-On materials can be used for further adjustments (see IPS e.max Ceram Instructions for Use).
- Occlusal veneers must be placed by means of adhesive cementation.



Starting situation



Minimally invasive preparation for occlusal veneers



Image of occlusal veneers in transmitted light



In situ: occlusal veneers after adhesive cementation

Conduct the **Stain/Glaze firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**

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Completed IPS e.max Press® restorations after Glaze firing.



Molar crowns made of IPS e.max Press LT



Inlay, onlay made of IPS e.max Press HT



Mandibular anterior crown made of IPS e.max Press Multi



Premolar crown made of IPS e.max Press Multi

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Thin veneers made of IPS e.max Press HT



Hybrid abutment crown (before cementation on the Ti base) made of IPS e.max Press Multi



Table tops (occlusal veneers) made of IPS e.max Press HT



Veneer made of IPS e.max Press Multi

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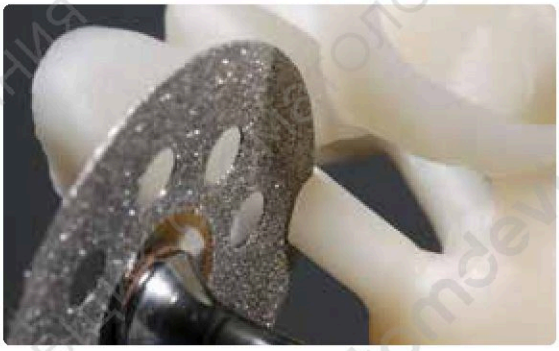
Cut-back technique

In the cut-back technique, IPS e.max Ceram Impulse and Incisal materials are applied in the incisal and/or occlusal area of the reduced IPS e.max Press restoration. The minimal amount of layering materials required means that highly esthetic restorations can be fabricated within only a few working steps.

Finishing

Suitable grinding instruments are imperative for adjusting and finishing high-strength glass-ceramic materials (please observe the Ivoclar Vivadent Flow Chart "Recommended grinding tools for IPS e.max glass-ceramics"). If unsuitable grinding instruments are used, chipping of the edges and local overheating may occur.

- Adjustment by grinding of pressed IPS e.max Press restorations should be kept to a minimum.
- Overheating of the ceramic must be avoided. Low speed and light pressure must be observed.
- Separate the sprue using a suitable separating disc. Avoid overheating. Pay attention to the proximal contacts when working on polychromatic restorations.
- Make sure that the minimum layer thickness of the restoration is maintained during finishing.
- Smooth out the attachment point of the sprue.
- Remove the spacer from the die. The restorations are tried in on the dies and carefully finished.
- Do not 'post-separate' the bridge connectors with separating discs. 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.
- Before veneering, clean the restoration with Al_2O_3 (type 100) at 1–2 bar (15–30 psi) pressure. Some blasting devices may require different pressure settings to accomplish this procedure.
- Thoroughly clean the restoration with a steam jet prior to the Wash firing.



Separate the sprues with a thin diamond disc and provide permanent water cooling to the grinding area.



Separated restorations fitted on the model die.



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



Refrain from designing extreme morphologies with undercuts for mamelons.

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




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




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

Die fabrication with IPS Natural Die Material

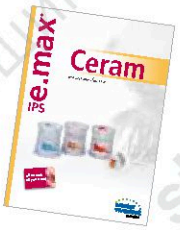
The light-curing IPS Natural Die Material simulates the shade of the preparation. Fabricate a die according to the shade information supplied by the dentist (shade selection), which serves as the optimum basis for a true-to-nature shade reproduction of the given oral situation.

Please refer to page 53 for further details about the fabrication procedure.

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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.

The cut-back is supplemented in three processing steps:

Wash firing | **Incisal firing** | **Stain and Glaze firing**



Required materials

- **IPS e.max Ceram layering materials** (z.B. Transpa, Incisal, Impulse, Selection)
- **IPS Build-Up Liquid** (allround, soft) to mix the layering materials
- **IPS Ivocolor Essences** are intensively shaded stains in powder form.
- **IPS Ivocolor Shades** are ready-to-use stains in jars.
- **IPS Ivocolor Glaze Paste/FLUO, Glaze Powder/FLUO** are glazing material in paste and powder form.
- **IPS Ivoclor Mixing Liquids** (allround, longlife) to mix the materials in powder form (Essences, Glaze), as well as to thin paste materials (Shades, Glaze).
- **IPS Ivocolor Essence Fluid** to mix the Essences in powder form to a pasty consistency.

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Wash firing (foundation)

The restoration must be free from dirt and grease before the Wash firing is done. Any contamination after cleaning must be prevented. Conduct the Wash firing with IPS e.max Ceram or IPS Ivocolor materials.

Variant A: Wash firing with IPS e.max Ceram

If there is an ideal amount of space available, conduct the Wash firing with the required IPS e.max Ceram Deep Dentin, Dentin, Transpa Incisal and/or Impulse materials. Use the IPS Build-Up Liquids allround or soft to mix the materials. Apply the Wash in a thin, covering coat on the entire framework.





Conduct the **Wash firing (foundation)** on a honey-comb firing tray belonging to the furnace (see firing parameters on page 83).

Variant B: Wash firing with IPS Ivocolor

With limited space or to enhance the in-depth chroma effect, the Wash firing can be conducted with IPS Ivocolor Shade, Essence and Glaze. Mix the paste or powder with the IPS Ivocolor Mixing Liquid allround or longlife to the desired consistency and apply the material in a thin, covering layer on the entire framework.





Conduct the **Wash firing (foundation)** on a honey-comb firing tray belonging to the furnace (see firing parameters on page 83).

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.

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Incisal firing

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



Apply Impulse materials, e.g. Opal Effect 1



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



Place the restoration on the firing tray and fire with the firing parameters for the Incisal firing.



Restoration after Incisal firing

Conduct the **Incisal firing** on a honey-comb firing tray suitable for the ceramic furnace.
Firing parameters see page 83.

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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 discs.
- 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.



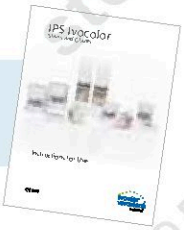


Finish the restoration with diamonds and give it a true-to-nature shape and surface structure.

Stain and Glaze firing

The Stain firing is conducted with IPS Ivocolor Shades and/or Essences and the Glaze firing with IPS Ivocolor Glaze Powder/FLUO or Paste/FLUO. Depending on the situation, the firing cycles may be conducted together or separately.
The firing parameters are identical.

Detailed information on the processing of IPS Ivocolor Shade, Essence and Glaze can be found in the IPS Ivocolor Instructions for Use.



- Thoroughly clean the restoration with the steam jet and dry with oil-free air.
- Mix IPS Ivocolor Shades and Essences with the corresponding IPS Ivocolor Liquids to the desired consistency.
- For better wettability of the stains and glazing materials, the surface can be wetted with a little IPS Ivocolor Mixing Liquid.
- Apply the glazing material in an even layer on the entire restoration.
- The cusps and fissures can be individualized using IPS Ivocolor Essence.
- If minor shade modifications are necessary, they can be applied with IPS Ivocolor Shades on the glazing material already in place.
- Conduct the Stain and Glaze firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Remove the 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.
- IPS e.max Ceram Add-On materials can be used for further adjustments (see IPS e.max Ceram Instructions for Use).

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– More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
– The degree of gloss of the glazed surface is controlled via the consistency of the glazing material and the applied quantity, not by means of the firing temperature. For a higher degree of gloss, use less liquid for mixing the glazing material and/or increase the quantity of glazing material.

Conduct the **Stain/Glaze firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**



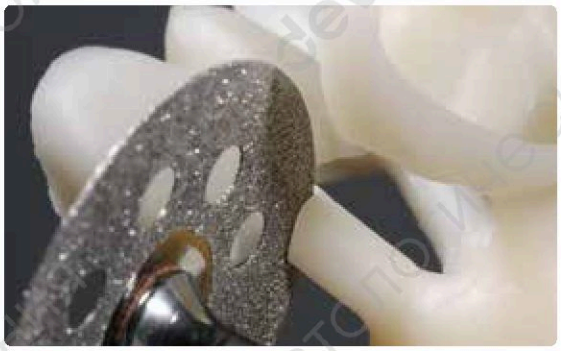
Completed IPS e.max Press LT restoration partially cut back and pressed and veneered with IPS e.max Ceram

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Finishing

Suitable grinding instruments are imperative for adjusting and finishing high-strength glass-ceramic materials (please observe the Ivoclar Vivadent Flow Chart "Recommended grinding tools for IPS e.max glass-ceramics"). If unsuitable grinding instruments are used, chipping of the edges and local overheating may occur.

- Adjustment by grinding of pressed IPS e.max Press restorations should be kept to a minimum.
- Overheating of the ceramic must be avoided. Low speed and light pressure must be observed.
- Separate the sprue using a suitable separating disc. Avoid overheating.
- Make sure that the minimum layer thickness of the restoration is maintained during finishing.
- Smooth out the attachment point of the sprue.
- Remove the spacer from the die. The restorations are tried in on the dies and carefully finished.
- Do not 'post-separate' the connectors with separating discs. 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.
- Before veneering, clean the restoration with Al_2O_3 (type 100) at 1–2 bar (15–30 psi) pressure. Some blasting devices may require different pressure settings to accomplish this procedure.
- Thoroughly clean the restoration with a steam jet prior to the Wash firing



Separate the sprues with a thin diamond disc and provide permanent water cooling to the grinding area.



Try in the framework on the model.





After try-in, excellent accuracy of fit is achieved.

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



Do not "post-separate" the framework connectors with the separating disc and finish the surface.



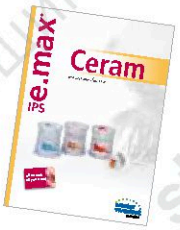


Blast the restoration with Al_2O_3 (type 100) at 1 bar (15 psi) pressure. Thoroughly clean the surface with a steam jet prior to the Wash firing and subsequently dry.

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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.

Veneering requires four process steps:

Wash firing	1st Dentin/Incisal firing	2nd Dentin/Incisal firing	Stain and Glaze firing



Required materials

- **IPS e.max Ceram layering materials** (z.B. Dentin, Transpa, Incisal, Impulse, Selection)
- **IPS Build-Up Liquid** (allround, soft) to mix the layering materials
- **IPS Ivocolor Essences** are intensively shaded stains in powder form.
- **IPS Ivocolor Shades** are ready-to-use stains in jars.
- **IPS Ivocolor Glaze Paste/FLUO, Glaze Powder/FLUO** are glazing material in paste and powder form.
- **IPS Ivoclor Mixing Liquids** (allround, longlife) to mix the materials in powder form (Essences, Glaze), as well as to thin paste materials (Shades, Glaze).
- **IPS Ivocolor Essence Fluid** to mix the Essences in powder form to a pasty consistency.

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Wash firing (foundation)

The restoration must be free from dirt and grease before the Wash firing is done. Any contamination after cleaning must be prevented.

Please observe the following procedure for the Wash firing:

- Clean the framework (free of dirt and grease).
- Conduct the Wash firing with Deep Dentin or Dentin materials.
- Use the IPS Build-Up Liquids allround or soft to mix the materials.
- If a more plastic consistency is desired, the IPS Ivocolor Liquids allround or 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-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters.
- Remove the 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.



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



…and fire using the indicated firing parameters.

Conduct the **Wash firing (foundation)** on a honey-comb firing tray suitable for the ceramic furnace.
Firing parameters see page 83.

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1st Dentin/Incisal firing

Perform the layering in accordance with the layering diagram (see IPS e.max Ceram Instructions for Use). Use the IPS 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.

Observe the following notes for the Dentin and Incisal firing:

- Conduct the Dentin and Incisal firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters.
- Remove the 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.



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



Complete the layering procedure with Incisal and Transpa materials.



Completely separate the interdental area down to the IPS e.max Press framework.



Subsequently, the restoration is fired using the firing parameters for the 1st Dentin/Incisal firing.

Conduct the **1st Dentin/Incisal firing** on a honey-comb firing tray suitable for the ceramic furnace.
Firing parameters see page 83.

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2nd Dentin/Incisal firing (Corrective firing)

Complete the missing areas and compensate for the shrinkage.

Observe the following notes for the Dentin and Incisal firing:
- Conduct the 2nd Dentin and Incisal firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters.
- Remove the 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.



Compensate for the shrinkage using Dentin, Transpa and Incisal materials.



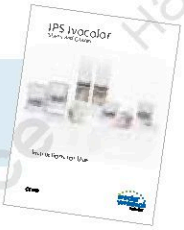
Subsequently, the restoration is fired using the firing parameters for the 2nd Dentin/Incisal firing.

Conduct the **2nd Dentin/Incisal firing** on a honey-comb firing tray suitable for the ceramic furnace.
Firing parameters see page 83.

Stain and Glaze firing

The Stain firing is conducted with IPS Ivocolor Shades and/or Essences and the Glaze firing with IPS Ivocolor Glaze Powder/FLUO or Paste/FLUO. Depending on the situation, the firing cycles may be conducted together or separately.
The firing parameters are identical.

Detailed information on the processing of IPS Ivocolor Shade, Essence and Glaze can be found in the IPS Ivocolor Instructions for Use.



- Thoroughly clean the restoration with the steam jet and dry with oil-free air.
- Mix IPS Ivocolor Shades and Essences with the corresponding IPS Ivocolor Liquids to the desired consistency.
- For better wettability of the stains and glazing materials, the surface can be wetted with a little IPS Ivocolor Mixing Liquid.
- Apply the glazing material in an even layer on the entire restoration.
- The cusps and fissures can be individualized using IPS Ivocolor Essence.
- If minor shade modifications are necessary, they can be applied with IPS Ivocolor Shades on the glazing material already in place.
- Conduct the Stain and Glaze firing on a honey-comb firing tray, an accessory of the ceramic furnace, using the stipulated firing parameters (see page 83).
- Remove the 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.
- IPS e.max Ceram Add-On materials can be used for further adjustments (see IPS e.max Ceram Instructions for Use).

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– More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
– The degree of gloss of the glazed surface is controlled via the consistency of the glazing material and the applied quantity, not by means of the firing temperature. For a higher degree of gloss, use less liquid for mixing the glazing material and/or increase the quantity of glazing material.

Conduct the **Stain/Glaze firing** with **IPS Ivocolor** on the honey-comb firing tray suitable for the corresponding furnace. **Firing parameters see page 83.**

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.

Variant 1 – Add-On with Glaze firing
This variant is used if minor adjustments are made with the Glaze firing.
The procedure is carried out as follows:
– Mix IPS e.max Ceram Add-On Dentin and Incisal with Dentin and Transpa Incisal in a 1:1 ratio.
– Mix IPS e.max Ceram Add-On with IPS Build-Up Liuid 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.

Variant 2 – Add-On after Glaze firing
After completion and try-in with the patient, further adjustments (e.g. contact points) might be necessary.
The procedure is carried out as follows:
– Mix IPS e.max Ceram Add-On Dentin or Incisal with IPS 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.

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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 Ivocolor Shades and Essences to adjust the framework shade.

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 Ivocolor Shades and Essences	

Please observe the following procedure:

Step 1: Wash firing with Deep Dentin

- Clean the framework (free of dirt and grease).
- Apply the wash using Deep Dentin materials
- Use the IPS Build-Up Liquids allround or soft to mix the materials.
- If a more plastic consistency is desired, IPS Ivocolor Mixing Liquid allround or 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

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Step 2: Characterization with IPS Ivocolor Shade and Essences

- Apply the characterizations using IPS Ivocolor Shades and Essences.
- Mix Essences with IPS Ivocolor Mixing Liquid 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 Characterization firing on a honey-combed tray with the corresponding 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.



Characterization with Essences to achieve the (final) Dentin shade



Individualized, shade-adjusted framework after Characterization firing

Step 3: Layering, completion

- The further procedure corresponds to that of the layering technique described on pages 69–75.



Layer and complete the restoration in the usual manner.



Completed IPS e.max Press HO restoration in situ.

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IPS e.max Press Monolithic Solutions

Frequently Asked Question

How are the suitable translucency and shade of the ingot determined?

*The **IPS e.max Shade Navigation App** is used to determine the suitable ingot. The app takes all the important factors (layer thickness, preparation thickness, etc.) into account that influence the overall esthetic appearance and thus enables a very precise translucency and shade recommendation. The app, which is suitable for Android or iOS smart phones and tables, can be downloaded in the App Store free of charge.*

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.

What is the difference between monochromatic and polychromatic ingots?

Monochromatic ingots are single-shaded and with a defined translucency, e.g. HT, LT, MO. IPS e.max Press Multi is a polychromatic ingot. It demonstrates a shade and translucency gradation.

What is horizontal pressing?

With the patented processing procedure for the IPS e.max Press Multi, the restoration is attached with wax to the special IPS Multi Investing Ring Base using prefabricated IPS Multi Wax Patterns. Upon the subsequent press procedure, namely horizontal press procedure, the ceramic is pressed into the restoration from the side, with the Dentin/Incisal gradation of the ingot being transferred to the restoration,

For what indications can the IPS e.max Press Multi ingot be used?

The Multi ingot can be used for the fabrication of anterior and posterior crowns, hybrid abutment crowns and veneers. Given the processing technique, the Multi cannot be used for bridges. Inlays, onlays and thin veneers would be technically feasible, but given the limited layer thickness (0.3 mm) the incisal/dentin transition is not visible.

Why does a IPS Wax Pattern have to be used for the investment before pressing the IPS e.max Press Multi.

The IPS Multi Wax Pattern was specifically developed for pressing the IPS e.max Press Multi. Its special geometry enables the controlled flow of the polychromatic IPS e.max Press Multi and is thus essential for successful pressing.

What must be observed when fabricating very delicate mandibular anterior crowns using IPS e.max Press Multi?

The IPS Multi Wax Pattern Form B must be used for restorations with delicate dies. The special shape reduces the flow speed of the ceramic and minimizes the risk of the die fracturing during pressing. To prevent die fractures during pressing of very delicate dies, a placement of a ZrO_2 pins in the cavity during investment is recommended.

Can the incisal proportion be varied when using IPS e.max Press Multi?

By shifting the restoration connected to the IPS Multi Wax Pattern along the IPS Multi Investment Ring Base, the incisal proportion can be increased. The dentin remains in the "dead space" above the sprueing and is not pressed into the restoration.

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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 Essences.

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.

How does the Fully automatic Press Function (FPF) work?

The Fully automatic Press Function was specifically developed for IPS e.max Press ingots and is based on the determination of the consistency of the press ceramic. The furnace chamber loaded with the investment ring is continuously heated up after the start of the FPF program. At the same time, the press furnace detects the consistency of the press ceramic and automatically recognizes the optimum softening point of the respective ingot (HO, MO, LT etc.). Once this point is reached, the furnace automatically initiates the press process. The post-pressing time and the cooling process are also automatically controlled by the press furnace.

What are the advantages of the Fully automatic Press Function (FPF)?

The Fully automatic Press Function offers the following advantages:
- *Easy operation - one press program for all IPS e.max Press translucency levels*
- *Efficient, safe press process - short pressing time, no confusion of programs or incorrect pressing parameters, always the optimum consistency for pressing*
- *Excellent press results - less pronounce reaction layer and enhanced surface quality.*

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.

What firing tray should be used for the firing of IPS e.max Press restorations?

A honey-combed tray and the corresponding pins, accessories for Programat ceramic furnaces, must be used for firing. The use of any other firing trays may require an adjustment of the firing parameters. Moreover, it cannot be ensured that all furnace functions (e.g. infrared technology of the Programat EP 5010) work flawlessly.

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 of the shoulder would weaken the restoration. Margin materials are exclusively used on ZrO_2.

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Cementation and aftercare

Cementation options

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

- For the adhesive cementation of IPS e.max restorations, Multilink® Automix or Variolink® Esthetic are the ideal composite cements.
- For the self-adhesive cementation of IPS e.max restorations, SpeedCEM® Plus is available.
- The glass ionomer cement Vivaglass® CEM is recommended for the conventional cementation of IPS e.max restorations.

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 micromechanical 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. Depending on 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-adhesive properties on 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 (preparation angle 4 – 8°, preparation height at least 4 mm) is recommended. Self-adhesive cementation does not result in enhanced "(overall) strength" of the seated all-ceramic restoration.
- **Conventional cementation**
  With conventional cementation, the bond is almost entirely created by static friction between the cementation material and the restoration, as well as between the cementation material and the preparation. In order to obtain the necessary mechanical friction, a retentive preparation showing a preparation angle of approximately 4 – 8° is required. Conventional cementation does not result in enhanced "(overall) strength" of the seated all-ceramic restoration.

Cementation possibilities for the different indications

		Adhesives Cementation	Self-adhesives Cementation	Conventional Cementation
IPS e.max Press	Occlusal veneers, thin veneers, veneers	✓	–	–
	Inlays, onlays, partial crowns	✓	–	–
	Minimally invasive anterior and posterior crowns	✓	–	–
	Anterior and posterior crowns	✓	✓	✓
	3-unit bridges up to the 2nd premolar	✓	✓	✓

Leave the cementation maze
More information at **www.cementation-navigation.com**

More detailed information on the clinical working steps can be found in the IPS e.max Clinical Guide.

Care Notes





As with natural teeth, high-quality IPS e.max 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 Proxyt® 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 that a low-abrasion cleaning paste is used. Scientific investigations and long-term clinical experience have proved the gentle effect compared to other pastes.

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Shade Combination Table

Individual characterizations and shade adjustments of IPS e.max Press restorations are achieved with IPS Ivocolor Shades, Essence.

IPS Ivocolor Shades, Essence
To be used on IPS e.max Press restorations

A–D tooth shade	BL1	BL2	BL3	BL4	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
IPS Ivocolor Shade			SD 0		SD 1		SD 2		SD 3		SD 4		SD 5		SD 6			SD 7		SD 6
IPS Ivocolor Shade Incisal						SI 1			SI 2			SI 3								
IPS Ivocolor Essence	E 01 white	E 02 cream	E 03 lemon	E 04 sunset	E 05 copper	E 06 hazel	E 07 olive	E 08 khaki	E 09 terracotta	E 10 mahogany	E 11 cappuccino	E 12 espresso	E 13 terra	E 14 profundo	E 15 ocean	E 16 sapphire	E 17 anthracite	E 18 black	E 19 rose	E 20 coral
						E 21 basic red			E 22 basic yellow			E 23 basic blue								

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Press and firing parameters

Programat EP 3000 / EP 5000

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





Programat EP 3010 / EP 5010

Select the Fully automatic Press Function (FPF) or the press program in accordance with the selected ingot to be pressed and the investment ring used.





FPF
IPS e.max® Press

The new Fully automatic Press Function for IPS e.max Press renders pressing even easier and enhances the economic efficiency: simply place the investment ring in the press furnace and press Start. The press furnace does the rest. It selects the program, automatically heats-up the press chamber to the correct temperature and presses the viscous ceramic into the investment ring at the correct time. Even the post-pressing time and the cooling process are regulated – at the push of a button.

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Firing Parameters for IPS e.max® Press

- A a honey-combed tray and the corresponding pins, accessories for Programat ceramic furnaces, must be used for firing.
- The firing parameters have to 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).
- If a non-Ivoclar Vivadent furnace is used, temperature adjustments 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.

Note
Given the geometry of the restorations, the layer thicknesses of the pressed object may vary considerably. When the objects cool after the firing cycle, the different cooling speeds in the areas with different dimensions may result in internal tensions. In the worst case, these cooling stresses may result in fractures in the ceramic restorations. By using slow cooling (long-term cooling L = 500°C for monolithic crowns and 450°C for the layering technique), these tensile stresses can be minimized.
Using long-term cooling for the last firing cycles is particularly recommended with layer thicknesses over 2 mm.

Firing Parameters for the Staining, Cut-Back and Layering Technique *with* **IPS e.max Ceram/IPS Ivocolor Shade, Essences, Glaze**

	Stand-by temperature B [°C/°F]	Closing time * S [min]	Heating rate t [°C/°F/min]	Firing temperature T_1 [°C/°F]	Holding time H_1 [min]	Heating rate t [°C/°F/min]	Firing temperature T_2 [°C/°F]	Holding time H_2 [min]	Vacuum 1 1_1 1_2 [°C/°F]	Vacuum 2 2_1 2_2 [°C/°F]	Long-term cooling L [°C/°F]	Cooling rate t_1 [°C/°F/min]
Wash firing (foundation)	403/757	IRT/ 04:00	90/162	650/1202	00:00	20/36	730/1346	02:00	400/752 650/1202	650/1202 729/1344	0	0
1st Dentin/Incisal firing	403/757	IRT/ 04:00	90/162	650/1202	00:00	20/36	730/1346	02:00	400/752 650/1202	650/1202 729/1344	0	0
2nd Dentin/Incisal firing	403/757	IRT/ 04:00	90/162	650/1202	00:00	20/36	730/1346	02:00	400/752 650/1202	650/1202 729/1344	0	0
Stain firing with IPS Ivocolor	403/757	IRT/ 06:00	60/108	710/1310	01:00	–	–	–	450/842	709/1308	0	0
Glaze firing with IPS Ivocolor	403/757	IRT/ 06:00	60/108	710/1310	01:00	–	–	–	450/842	709/1308	0	0
Add-On with Glaze firing	403/757	IRT/ 06:00	60/108	710/1310	01:00	–	–	–	450/842	709/1308	0	0
Add-On after Glaze firing	403/757	IRT/ 06:00	50/90	700/1292	01:00	–	–	–	450/842	699/1290	0	0

* IRT standard mode

Depending on the furnace type, the firing temperature may be adjusted by ± 5°C/9°F, max. by ± 10°C/18°F.

If the new firing parameters are used, the initial vacuum value must be reduced to 400°C/752°F to ensure sufficient vacuum at the start of the sintering process.

INFRARED TECHNOLOGY

The intelligent infrared technology of the new Programat® furnaces considerably increases process reliability. This leads to high-quality firing results, irrespective of the size and number of restorations in the firing chamber. The infrared camera automatically controls the predrying and closing process. Depending on the type of restoration, the firing time can be reduced by up to 20%.

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