

e.max[®] CAD

IPS



INSTRUCTIONS FOR USE
LABSIDE

CE 0123

ivoclar
vivadent
technical

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IPS e.max[®] System – ALL YOU NEED

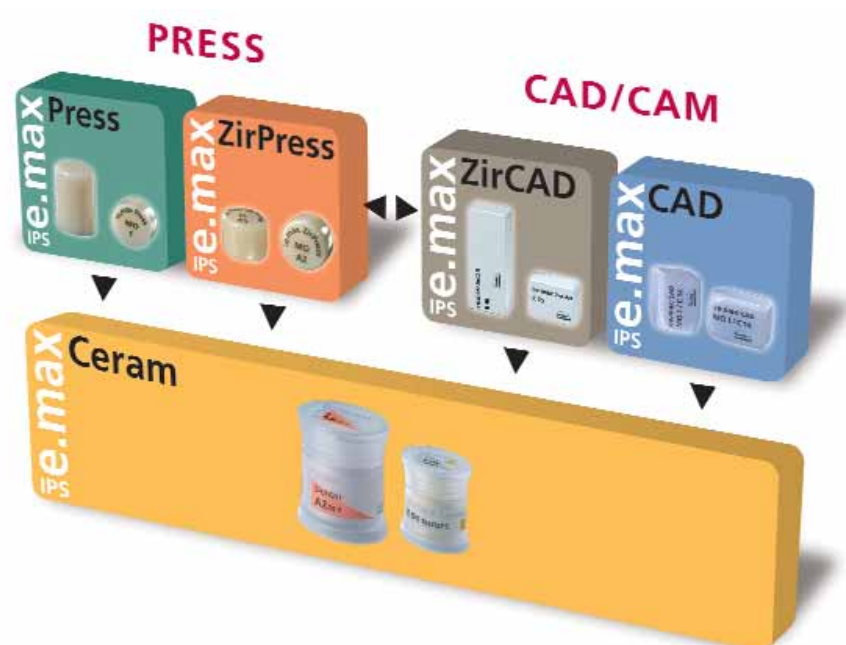
Your purchase of IPS e.max means you have chosen more than simply an all-ceramic system. You have taken the decision to benefit from the unlimited possibilities of all-ceramic. IPS e.max delivers high strength and highly aesthetic materials for the PRESS and the CAD/CAM technology.

The IPS e.max products are unique. They are recognized for their outstanding properties as well as exceptional versatility and flexibility – and they produce results with maximum aesthetics.

The components for the PRESS technique include the highly aesthetic glass-ceramic IPS e.max Press ingots and the glass-ceramic IPS e.max ZirPress ingots for pressing onto zirconium oxide. Depending on the case requirements, two types of materials are available for CAD/CAM techniques: the innovative IPS e.max CAD glass-ceramic blocks and the high-strength zirconium oxide IPS e.max ZirCAD.

The IPS e.max System is further enhanced by the nano-fluorapatite layering ceramic IPS e.max Ceram, which is used as a veneering material for all the IPS e.max components – either glass-ceramics or zirconium oxide ceramics.

This proves that really exceptional all-ceramic systems are well designed. The system allows you to take advantage of a single, standardized layering scheme to offer your dentists and their patients restorations with maximum individuality and naturalness.

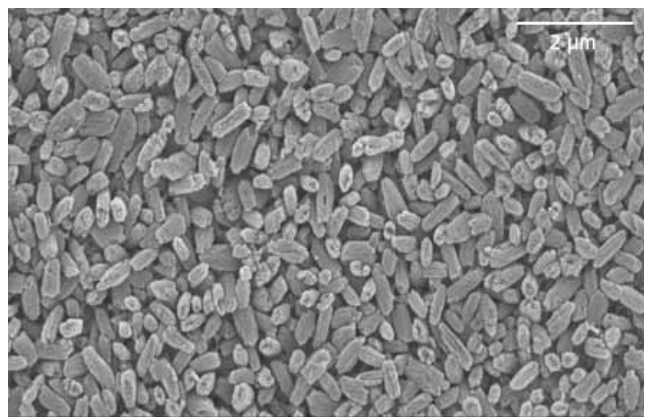


IPS e.max[®] CAD – PRODUCT INFORMATION

MATERIAL

IPS e.max CAD is a lithium silicate glass-ceramic block for the CAD/CAM Technology. It is manufactured in an innovative process, which results in the exceptional homogeneity of the material. In its crystalline intermediate state, the block can be easily milled with CAD/CAM equipment. The unusual colouring of IPS e.max CAD ranges between white, blue and bluish grey. This colour is created by the composition and microstructure of the glass-ceramic. The strength of the material at this machinable intermediary stage is 130–150 MPa. It is, therefore, comparable to other commercially available glass-ceramic blocks. After the IPS e.max CAD blocks have been milled, the material is crystallized in one of the Ivoclar Vivadent ceramic furnaces (eg P300, P500, P700). The crystallization process is easy to conduct and takes approx. 25–35 minutes. In contrast to some other CAD/CAM ceramics, the blocks do not shrink significantly and they do not require complicated infiltration processes.

The crystallization process at 840–850 °C (1544–1562 °F) causes the microstructure to change through controlled growth of lithium disilicate crystals. The milling software takes the resulting densification of 0.2% into account in the milling process. The transformation of the microstructure produces the final physical properties including 360 MPa flexural strength and the suitable optical characteristics, such as shade, translucency and brightness.



IPS e.max CAD Lithium-Disilicate

CTE (100–400°C) [10 ⁻⁶ /K]	10.2
CTE (100–500°C) [10 ⁻⁶ /K]	10.5
Flexural strength (biaxial) [MPa]*	360
Fracture toughness [MPa m ^{0.5}]	2.25
Modulus of elasticity [GPa]	95
Vickers Hardness [MPa]	5800
Chemical solubility [μg/cm ²]*	40
Crystallization temperature [°C]	840–850

*according to ISO 6872

USAGE

Indications

- Veneers
- Partial crowns
- Anterior and posterior crowns
- Primary telescope crowns

Contraindications

- Full veneers on molar crowns
- Very deep subgingival preparations
- Patients with severely reduced residual dentitions
- Bruxism

Important processing restrictions

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

- The blocks must not be milled in a non-compatible CAD/CAM system
- Crystallization must not be conducted in a ceramic furnace that has not been calibrated
- Crystallization must not be conducted in a ceramic furnace that has not been approved and/or recommended.
- Crystallization must not be conducted in a high-temperature furnace (eg Sinramat)
- IPS e.max CAD Crystall./Glaze, Shades, Stains, and Add-On must not be used on other dental ceramics.
- Do not mix IPS e.max CAD Crystall./Glaze, Shades, Stains, and Add-On with other dental ceramics (e.g. IPS e.max Ceram Glaze, Stains, and Essence).
- The frameworks must not fall below the required minimum thickness
- Veneering ceramics other than IPS e.max Ceram must not be used

Side effects

If the patient is known to be allergic to any of the components of IPS e.max CAD, the product should not be used to fabricate restorations.

COMPOSITION




- **IPS e.max CAD Blocks**
Components: SiO₂
Additional contents : Li₂O, K₂O, MgO, ZnO₂, Al₂O₃, P₂O₅ and other oxides
- **IPS e.max CAD Crystall./Glaze, Shades and Stains**
Components: Oxides, glycols
- **IPS e.max CAD Crystall./Glaze Spray**
Components: Oxides, propyl alcohol; Propellant: Isobutane
- **IPS e.max CAD Crystall./Glaze Liquid**
Components: Butandiole
- **IPS e.max CAD Crystall./Add-On**
Components: Oxides
- **IPS e.max CAD Crystall./Add-On Liquid**
Components : Water, propylene glycol, butandiol, and chloride
- **IPS Object Fix Putty / Flow**
Components: Oxides, water, thickening agent
- **IPS Contrast Spray Labside**
Components: Pigment suspension in ethanol; the propellant is a propane/butane mixture
- **IPS Natural Die Material**
Components: Polyester urethane dimethacrylate, paraffin oil, SiO₂ and copolymer
- **IPS Natural Die Material Separator**
Components: Wax dissolved in hexane
- **IPS Ceramic Etching Gel**
Components: Hydrofluoric acid

Warnings

- Hexane is highly flammable and detrimental to health. Avoid contact with skin and eyes. Do not inhale the vapours and keep away from sources of ignition.
- Do not inhale ceramic grinding dust during processing – use suction equipment and a face mask.
- Etching gel contains hydrofluoric acid. Avoid contact with skin, eyes, and clothing at any time, since the material is highly toxic and corrosive. The etching gel is intended for professional use only and must not be applied intra-orally (in the oral cavity).
- IPS Contrast Spray Labside must not be applied intra-orally.

BLOCK CONCEPT

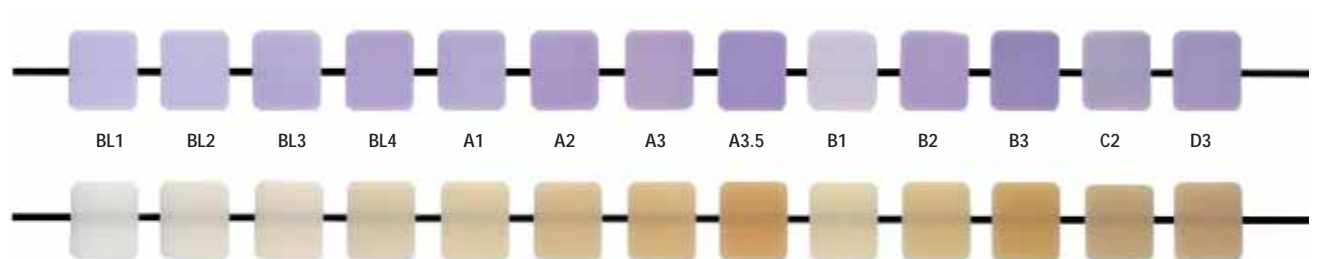
The shading and opacity control of the IPS e.max CAD blocks is based on a unique translucency/opacity concept. The system offers flexibility and can be used with A–D, Chromascop and Bleach BL shades. IPS e.max CAD blocks are available in 2 degrees of translucency. The individual levels of the concept are determined by processing techniques and indications. Consequently, maximum flexibility and application variety can be achieved. The individual degrees of opacity and translucency are distinguished by means of a colour code, which facilitates the selection of the proper ingot.

Translucency level	Processing technique			Indications			
	Staining technique	Cut-back technique	Layering technique	Veneers	Partial crowns	Anterior crowns	Posterior crowns
Low Translucency				✓	✓	✓	✓
Medium Opacity						✓	✓*

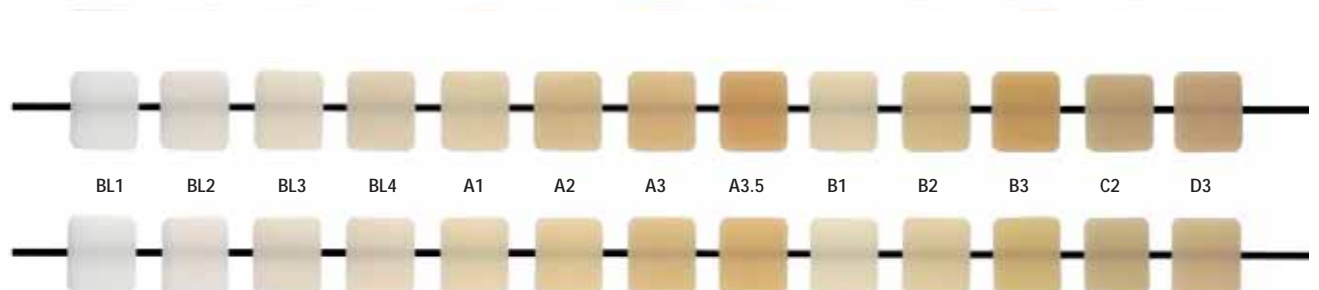
* up to the second premolar

IPS e.max CAD LT (Low Translucency)

The blocks are available in 9 A–D and 4 Bleach BL shades. Due to their translucency, they are ideal for fabricating restorations in the staining and cut-back technique. The blocks are shaded according to the tooth shade. Thus, staining and veneering is reduced to a minimum.



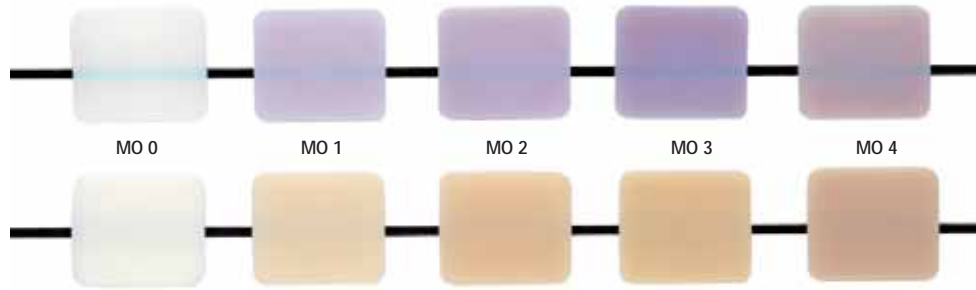
Comparison: IPS e.max CAD LT before and after crystallization



IPS e.max CAD LT (above) compared to IPS Empress CAD LT (below)

IPS e.max CAD MO (Medium Opacity)

Because of their opacity, these blocks in shades MO 0– MO 4 are ideal for fabricating frameworks for restoring devitalized or lightly discolored teeth. Furthermore, they offer an ideal base for producing natural-looking restorations in A–D and Chromascop shades. The blocks are shaded according to specific shade groups. The fluorescence of the blocks decreases with the intensity of the shading.



Comparison: IPS e.max CAD MO before and after crystallization

PRODUCT OVERVIEW AND DESCRIPTIONS

for inLab®

IPS e.max CAD for inLab® Basic Kit MO (Medium Opacity)



The IPS e.max CAD for inLab Basic Kit MO comprises all the blocks for the Sirona inLab system as well as the necessary working accessories for fabricating frameworks in the layering technique. The Basic Kit is supplied in a materials cabinet and can be expanded as desired with other IPS e.max Kits.

Delivery form:

IPS e.max CAD for inLab Basic Kit MO (Medium Opacity)

- 5x 5 IPS e.max CAD for inLab Blocks C14;
Shades: MO 0, MO 1, MO 2, MO 3, MO 4
- 1x 200 ml IPS Contrast Spray Labside
- 1x IPS e.max CAD Crystallization Tray
- 1x 10 ml IPS Object Fix Flow
- 1x IPS e.max CAD MO Materials shade guide

IPS e.max CAD for inLab® Basic Kit LT (Low Translucency)



The IPS e.max CAD for inLab Basic Kit LT comprises all the blocks for the Sirona inLab system as well as the necessary working accessories for fabricating restorations in the staining and cut-back technique. The Basic Kit is supplied in a materials cabinet and can be expanded as desired with other IPS e.max Kits.

Delivery form:

IPS e.max CAD for inLab Basic Kit LT (Low Translucency)

- 6x 5 IPS e.max CAD for inLab Blocks C14;
Shades: LT BL2, LT A1, LT A2, LT A3, LT A3,5, LT B1
- 5x 3 g IPS e.max CAD Crystall./Shades;
Shades: 0, 1, 2, 3, 4
- 2x 3 g IPS e.max CAD Crystall./Shades Incisal;
Shades: I1, I2
- 7x 1 g IPS e.max CAD Crystall./Stains;
Shades: white, crème, sunset, copper, olive, khaki, mahogany
- 1x 3 g IPS e.max CAD Crystall./Glaze Paste
- 1x 270 ml IPS e.max CAD Crystall./Glaze Spray
- 1x IPS e.max CAD Crystallization Tray
- 1x 10 ml IPS Object Fix Flow
- 1x 10 g IPS Object Fix Putty
- 1x 200 ml IPS Contrast Spray Labside
- 1x IPS Ceramic Etching Gel Kit
- 1x IPS e.max Press / CAD LT Materials shade guide
- 1x Bleach BL Module
- var. accessories

IPS e.max CAD for inLab® MO (Medium Opacity) Blocks



IPS e.max CAD for inLab MO Blocks for the layering technique are available in one size (C14) and in 5 shades (MO 0, MO 1, MO 2, MO 3, MO 4).

Delivery form:

IPS e.max CAD for inLab MO Blocks Refill

- 5x 5 IPS e.max CAD for inLab Blocks C14;
Shades: MO 0, MO 1, MO 2, MO 3, MO 4

IPS e.max CAD for CEREC® and inLab LT (Low Translucency) Blocks



The Blocks for the staining and cut-back technique are available in 2 sizes (I12 and C14) and in 9 A-D shades as well as in 4 Bleach BL shades.

Delivery form:

IPS e.max CAD for CEREC and inLab LT Blocks Refill

- 13x 5 IPS e.max CAD for CEREC and inLab LT I12;
Shades: LT BL1, LT BL2, LT BL3, LT BL4, LT A1, LT A2, LT A3, LT A3,5, LT B1, LT B2, LT B3, LT C2, LT D3
- 13x 5 IPS e.max CAD for CEREC and inLab LT C14;
Shades: LT BL1, LT BL2, LT BL3, LT BL4, LT A1, LT A2, LT A3, LT A3,5, LT B1, LT B2, LT B3, LT C2, LT D3



For information about the inLab® System,
please contact:

Sirona Dental Systems GmbH

Fabrikstrasse 31

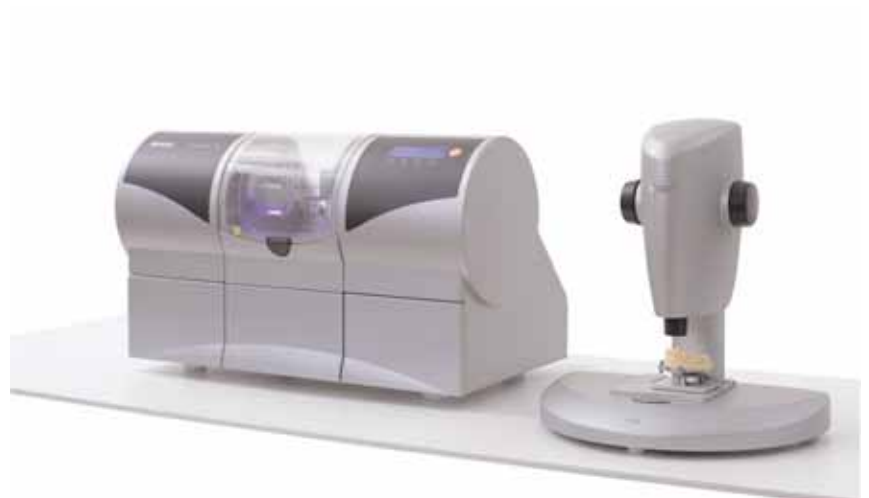
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inLab® is a registered trademark of Sirona Dental Systems GmbH



for Everest®

IPS e.max CAD for Everest® Basic Kit MO (Medium Opacity)



The IPS e.max CAD for Everest Basic Kit MO comprises all the blocks for the KaVo Everest system as well as the necessary working accessories for fabricating frameworks in the layering technique. The Basic Kit is supplied in a materials cabinet and can be expanded as desired with other IPS e.max Kits.

Delivery form:

IPS e.max CAD for Everest Basic Kit MO (Medium Opacity)

- 5x 5 IPS e.max CAD for Everest Blocks C14;
Shades: MO 0, MO 1, MO 2, MO 3, MO 4
- 1x 200 ml IPS Contrast Spray Labside
- 1x IPS e.max CAD Crystallization Tray
- 1x 10 ml IPS Object Fix Flow
- 1x IPS e.max MO Materials shade guide

IPS e.max CAD for Everest® Basic Kit LT (Low Translucency)



The IPS e.max CAD for Everest Basic Kit LT comprises all the blocks for the KaVo Everest system as well as the necessary working accessories for fabricating restorations in the staining and cut-back technique. The Basic Kit is supplied in a materials cabinet and can be expanded as desired with other IPS e.max Kits.

Delivery form:

IPS e.max CAD for Everest Basic Kit LT (Low Translucency)

- 6x 5 IPS e.max CAD for Everest Blocks C14;
Shades: LT BL2, LT A1, LT A2, LT A3, LT A3,5, LT B1
- 5x 3 g IPS e.max CAD Crystall./Shades;
Shades: 0, 1, 2, 3, 4
- 2x 3 g IPS e.max CAD Crystall./Shades Incisal;
Shades: I1, I2
- 7x 1 g IPS e.max CAD Crystall./Stains;
Shades: white, crème, sunset, copper, olive, khaki, mahogany
- 1x 3 g IPS e.max CAD Crystall./Glaze Paste
- 1x 270 ml IPS e.max CAD Crystall./Glaze Spray
- 1x IPS e.max CAD Crystallization Tray
- 1x 10 ml IPS Object Fix Flow
- 1x 10 g IPS Object Fix Putty
- 1x IPS Ceramic Etching Gel Kit
- 1x IPS e.max Press / CAD LT Materials shade guide
- 1x Bleach BL Module
- var. accessories

IPS e.max CAD for Everest® MO (Medium Opacity) Blocks



IPS e.max CAD for Everest MO Blocks for the layering technique are available in one size (C14) and in 5 shades (MO 0, MO 1, MO 2, MO 3, MO 4).

Delivery form:

IPS e.max CAD for Everest MO Blocks Refill

- 5x 5 IPS e.max CAD for Everest Blocks C14;
- Shades: MO 0, MO 1, MO 2, MO 3, MO 4

IPS e.max CAD for Everest® LT (Low Translucency) Blocks



The Blocks for the staining and cut-back technique are available in 2 sizes (I12 and C14) and in 9 A–D shades as well as in 4 Bleach BL shades.

Delivery form:

IPS e.max CAD for Everest LT Blocks Refill

- 13x 5 IPS e.max CAD for Everest LT I12;
- Shades: LT BL1, LT BL2, LT BL3, LT BL4, LT A1, LT A2, LT A3, LT A3.5, LT B1, LT B2, LT B3, LT C2, LT D3
- 13x 5 IPS e.max CAD for Everest LT C14;
- Shades : LT BL1, LT BL2, LT BL3, LT BL4, LT A1, LT A2, LT A3, LT A3.5, LT B1, LT B2, LT B3, LT C2, LT D3



KaVo. Dental Excellence.

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Everest® is a registered trademark of KaVo Dental GmbH

**IPS e.max CAD MO Materials shade guide
IPS e.max Press/CAD LT Materials shade guide**



The Materials shade guides permit the shade determination of the blocks before crystallization. Additionally, the shade samples show the colour of the different blocks after crystallization and can therefore be used to check the shade and quality of the crystallization process.

Delivery form:

IPS e.max CAD MO Materials shade guide

- 1x IPS e.max CAD MO Materials shade guide

IPS e.max Press/CAD LT Materials shade guide

- 1x IPS e.max Press/CAD LT Materials shade guide

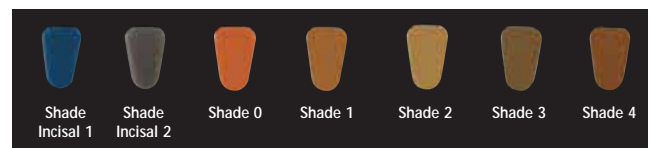
IPS e.max CAD Crystall./ – Materials and accessories for IPS e.max CAD LT

When processing IPS e.max CAD LT in its blue state, individual characterizations are applied by means of newly developed stains and glaze materials. They are applied on the blue restorations immediately before crystallization. This offers the possibility of fabricating aesthetically appealing restorations very efficiently with one firing. The blue packaging follows the example of the blue blocks in order to emphasize the product affiliation and prevent a mix-up with other stains.

IPS e.max CAD Crystall./Shade



Shades in paste form available in 5 Dentin shades for shade modifications on restorations. With the 2 Shades Incisal, the optical translucency and in-depth effect of the incisal third can be enhanced.



Delivery form:

IPS e.max CAD Crystall./Shade

- 7x 3 g IPS e.max CAD Crystall./Shade;
- Shades: I1, I2, 0, 1, 2, 3, 4

IPS e.max CAD Crystall./Stains



Seven intensive stains in paste form for the reproduction of natural characteristics. They are optimally coordinated for processing in conjunction with IPS e.max CAD and can be applied both on "blue" and crystallized restorations.



Delivery form:

IPS e.max CAD Crystall./Stains

- 7x 1 g IPS e.max CAD Crystall./Stains;
- Shades: white, crème, sunset, copper, olive, khaki, mahogany

IPS e.max CAD Crystall./Glaze Paste



Special glaze paste that has been especially developed for the application on fully anatomical IPS e.max CAD LT restorations. The paste can be applied on the "blue" crown prior to crystallization or for any subsequent corrective firing.

Delivery form:

IPS e.max CAD Crystall./Glaze Paste

- 1x 3 g IPS e.max CAD Crystall./Glaze Paste

IPS e.max CAD Crystall./Glaze Spray



Glaze spray that has been especially developed for the application on fully anatomical IPS e.max CAD LT restorations. After the application of IPS e.max CAD Crystall./Shades and Stains, the spray is sprayed onto the restoration. After that, a combined crystallization and glaze (Crystall./Glaze) firing is conducted. The Glaze Spray can also be used for the corrective firing after crystallization.

Delivery form:

IPS e.max CAD Crystall./Glaze Spray

- 1x 270 ml IPS e.max CAD Crystall./Glaze Spray

IPS e.max CAD Crystall./Glaze Liquid



Special liquid to thin the IPS e.max Crystall./Shades and Stains, as well as the IPS e.max CAD Crystall./Glaze paste.

Delivery form:

IPS e.max CAD Crystall./Glaze Liquid

- 1x 15 ml IPS e.max CAD Crystall./Glaze Liquid

IPS e.max CAD Crystall./Add-On IPS e.max CAD Crystall./Add-On Liquid



The IPS e.max CAD Crystall./Add-On material can be used for corrections of the proximal or occlusal contact points. The IPS e.max CAD Crystall./Add-On liquid is used for mixing the material. Corrections with IPS e.max CAD Crystall./Add-On can be applied directly with the crystallization firing or with a subsequent corrective firing.

Delivery form:

IPS e.max CAD Crystall./Add-On, Add-On Liquid

- 1x 5 g IPS e.max CAD Crystall./Add-On
- 1x 15 ml IPS e.max CAD Crystall./Add-On Liquid

IPS e.max CAD Crystallization Tray
IPS e.max CAD Crystallization Pin



For the crystallization of IPS e.max CAD, the IPS e.max CAD Crystallization Tray is always used. The firing tray and the pins store the heat and thus ensure slow and above all tension-free cooling of the glass-ceramic material.

Delivery form:

IPS e.max CAD Crystallization Tray

- 1x IPS e.max CAD Crystallization Tray
- 3x 3 IPS e.max CAD Crystallization Pin;
- Sizes: S, M, L

IPS e.max CAD Crystallization Pin Refill

- 3x 6 IPS e.max CAD Crystallization Pin;
- Sizes: S, M, L

IPS® Contrast Spray Labside



The Contrast Spray Labside is used to achieve optimum scans for CAD/CAM restorations. IPS Contrast Spray Labside balances out the different optical properties of the stone model, thus enabling an excellent scan. With the atomizing nozzle, an optimum covering layer with a detailed representation of the edges is achieved easily and efficiently with only a short spray discharge.

Delivery form:

IPS Contrast Spray Labside

- 1x 200 ml [275 ml] IPS Contrast Spray Labside

IPS® Object Fix Putty / IPS® Object Fix Flow



IPS Object Fix Putty / Flow are auxiliary firing pastes to support all-ceramic restorations during firing. The paste is used for easier securing of the restorations on the metal pins of the honey-comb firing tray. Due to its consistency, IPS Object Fix Putty / Flow are easy to apply and convenient to remove after firing.

Delivery form:

IPS Object Fix Putty

- 1x 10 g IPS Object Fix Putty

IPS Object Fix Flow

- 1x 10 ml IPS Object Fix Flow

IPS Natural Die Material



The light-curing IPS Natural Die Material simulates the shade of the prepared tooth and thus represents the optimum basis for natural shade reproduction of the given oral situation when fabricating all-ceramic restorations. IPS Natural Die Material is available in 9 shades. The shades were newly arranged and the assortment now contains all the shade variations necessary for the fabrication of lifelike all-ceramic restorations:

- 1 shade to imitate bleached preparations (ND 1)
- 1 shade to imitate secondary dentin that demonstrates an intensive shade (ND 6)
- 1 shade to imitate severely discoloured / devitalized preparations (ND 9)

Delivery form:

IPS Natural Die Material Kit

- 9x 8 g IPS Natural Die Material;
Shades: ND 1, ND 2, ND 3, ND 4, ND 5, ND 6, ND 7, ND 8, ND 9
- 1x 20 ml IPS Natural Die Material Separator
- 8x 10 IPS Condensors
- 8x 10 IPS Die Holders
- 2x Universal Holders
- 1x IPS Natural Die Material Shade Guide

IPS® Ceramic Etching Gel



IPS Ceramic Etching Gel is used to produce retentive bonding surfaces on ceramic restorations in the composite cementation technique. It enhances the bonding effect between the luting composite and the ceramic surface. IPS Ceramic Etching Gel is exclusively intended for laboratory or extra-oral use and must not be applied in the oral cavity.

Delivery form:

IPS Ceramic Etching Gel Kit

- 1x 5 ml IPS Ceramic Etching Gel
- 1x 30 g Neutralization Powder
- 1 Measuring Spoon

Programat® P300



The Programat P300, which is reduced to the essentials, is an inspiration due to its cost-effectiveness. Furthermore, it features a convincing and easy operating concept. A simple menu structure with clearly arranged symbols guides the user during the application of the programs. The furnace is equipped in the factory with preset programs for IPS e.max, IPS d.SIGN, IPS InLine, and the IPS Empress System and it convinces users with its modern, timeless design.

Delivery form:

Programat P300 Basic Equipment

- Programat P300
- Power Cord, Vacuum Hose, Calibration Test Package, Programat Firing Tray Kit

Programat® P500



Optimum firing results for glazing materials, stains, and ceramic materials can be achieved with the user-friendly Programat P500 ceramic furnace. This new ceramic furnace combines high-tech and design. The combination of the membrane-sealed keypad and the large, clearly-arranged graphic display with touch screen function facilitate operation. The homogeneous heat emission due to the new muffle technology, the easy, precise and automatic temperature calibration, as well as the 300 firing programs make the P500 and indispensable companion in the laboratory.

Delivery form:

Programat P500 Basic Equipment

- Programat P500
- Power Cord, Vacuum Hose, Calibration Test Package (ATK2), Programat Firing Tray Kit, USB Download Cable, USB Stick Programat

Programat® P700



The Programat P700 features a large high-resolution graphic colour display with touch screen function, which is used to show digital colour images of patients and teeth. The OSD (Optical Status Display) uses different colours to inform you about the current operating status of the furnace. Hence, the current process of the furnace can be observed, even from a distance. The furnace is equipped with the QTK heating muffle technology, which enables optimum firing results.

Delivery form :

Programat P700 Basic Equipment

- Programat P700
- Power Cord, Vacuum Hose, Calibration Test Package, Programat Firing Tray Kit, Multimedia USB Stick

IPS e.max® CAD – PRACTICAL USE

SHADE DETERMINATION

The correct tooth shade is the basis for a restoration with a life-like appearance. After tooth cleaning, the tooth shade of the non-prepared tooth and/or the adjacent teeth is determined. Individual characteristics have to be taken into consideration when determining the tooth shade. If a crown preparation is planned, for example, the cervical shade should also be determined. In order to achieve the best possible true-to-nature results, shade determination should be carried out at daylight.

Furthermore, the patient should not wear clothes of intensive colours and/or lipstick. Basically, it has to be kept in mind that the final shade of the restoration is the result of the following individual shades:

- Die shade
- Shade of the block
- Shade of the layering ceramic
- Shade of the cementation material

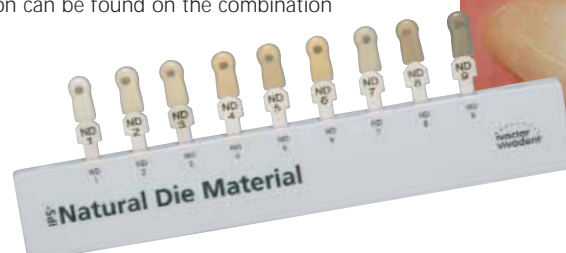
IPS e.max Press/CAD LT Materials shade guide IPS e.max CAD MO Materials shade guide

Since the IPS e.max CAD blocks demonstrate a bluish shade prior to crystallization, they cannot be used for the selection of the block shades. For that purpose, the materials shade guide is used, which shows the shade of all the available IPS e.max CAD blocks after crystallization.



IPS Natural Die Material Shade guide

In order to facilitate the reproduction of the tooth shade, dentists have the possibility of communicating the shade of the preparation of the given clinical situation to the dental laboratory using the IPS Natural die material shade guide. With the help of the die shade and the desired tooth shade, the corresponding block can be selected. Further information regarding the influence of the die shade on the final shade of the restoration can be found on the combination tables.



PREPARATION GUIDELINES AND MINIMUM THICKNESSES

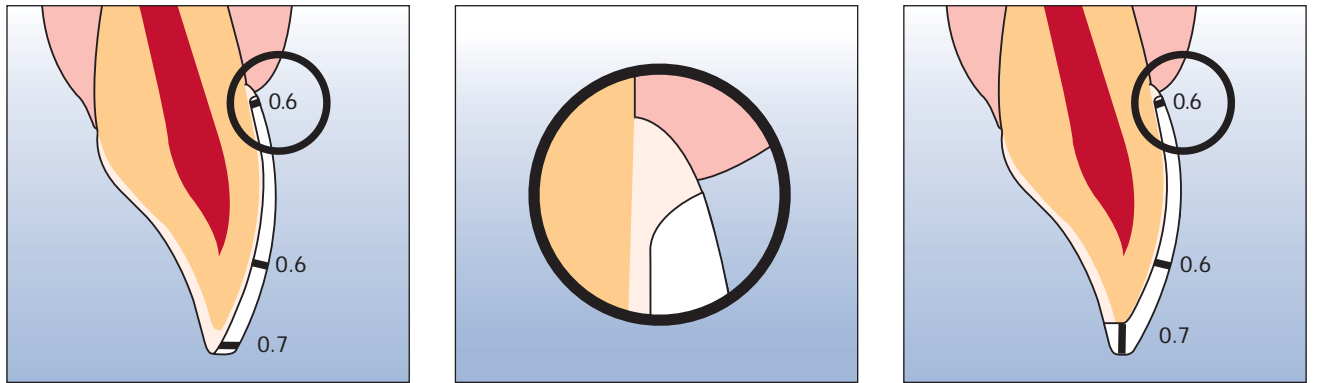
Successful results can only be achieved with IPS e.max CAD if the guidelines and framework thicknesses are strictly observed.

Veneer

If possible, the preparation should be entirely located in the enamel. The incisal preparation margins should not be located in the area of the abrasion surfaces or dynamic occlusal surfaces. By preparing orientation grooves using a depth marker, controlled enamel reduction can be achieved. Dissolution of the proximal contacts is not required.

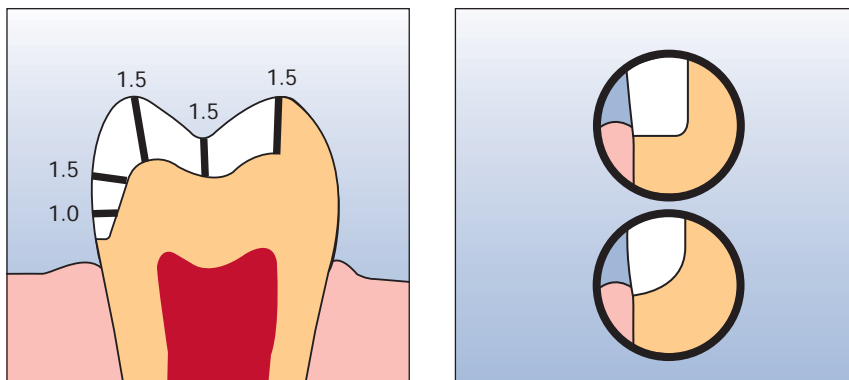
For **preparation without involving reduction of the incisal edge (only labial reduction)**, the preparation depth in the labial area should be at least 0.6 mm.

For **preparation involving reduction of the incisal edge (labial/incisal reduction)**, the preparation depth in the cervical and labial area should be at least 0.6 mm. The incisal edge must be reduced by 0.7 mm. The extent of the incisal reduction depends on the desired translucency of the incisal area to be built up. The more transparent the incisal edge of the intended veneer, the more pronounced the reduction should be. Discoloured teeth may require more preparation.



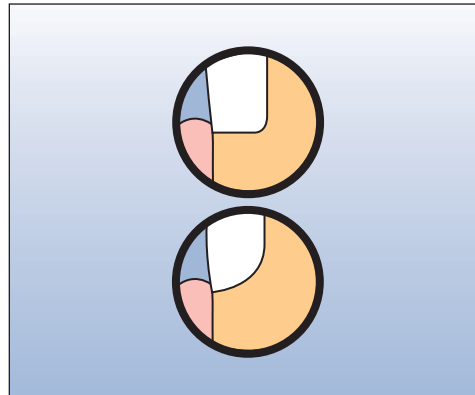
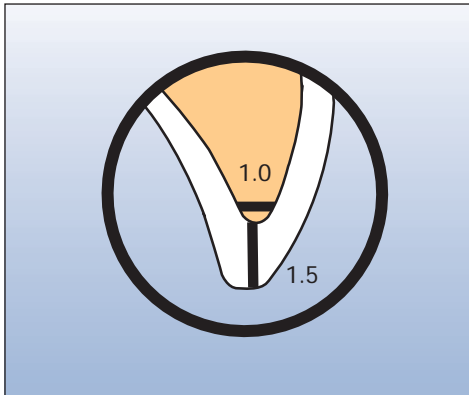
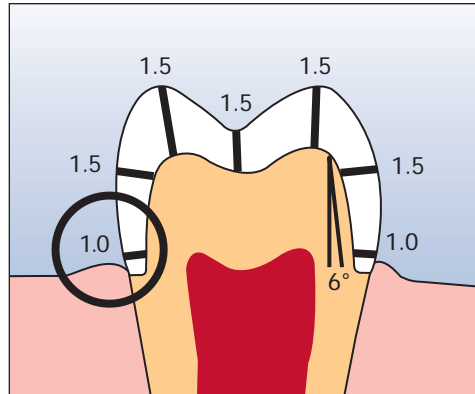
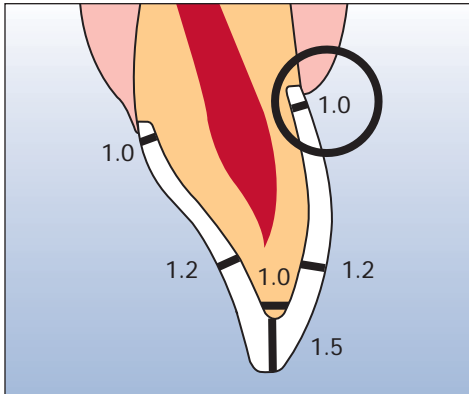
Partial crown

Provide at least 1.5 mm of space in the cusp areas. Partial crowns are indicated if the preparation margin is less than approx. 0.5 mm away from the cusp tip, or if the enamel is severely undermined. The shoulder should be prepared without a chamfer, i.e. in a 90° angle to the residual tooth structure.



Anterior and posterior crowns

The anatomic shape is evenly reduced while observing the given minimum framework thickness. A circular shoulder is prepared with rounded inner edges or a chamfer at an angle of 10-30°: The width of the circular shoulder/chamfer is approx. 1.0 mm. Reduction incisal or occlusal by approx. 1.5 mm. The vestibular or lingual reduction is approximately 1.2 mm for anterior teeth and approximately 1.5 mm for posterior teeth. The incisal edge of the preparation should be at least 1.0 mm (milling tool geometry) in order to permit optimum milling of the incisal edge during CAD/CAM processing.






RESTORATION DESIGN CRITERIA

The restoration design is the 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 basic guidelines have to be observed:

- **IPS e.max CAD is the high-strength component of your restoration and must, therefore, always make up at least 50 % of the total layer thickness of the restoration.**
- **In large preparations, the excess in available space must be compensated by the design of the framework and not by the layering material.**
- The design of the restoration generated by the software is a suggestion and has to be individually adjusted using the design tools in accordance with the clinical situation.
- The areas that support and reinforce the shape and cusps of the restoration are constructed with the design tools of the different types of software used.
- In partially veneered restorations, the transition between the layering material and IPS e.max CAD must not be located in the area of the functional contact points.

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

		Veneer	Partial crowns	Crowns			
				Anterior	Premolar	Molar	
	Material thickness IPS e.max CAD LT	circular	0,6	1,5	1,2	1,5	1,5
	Staining technique	incisal/occlusal	0,7	1,5	1,5	1,5	1,5
	Material thickness IPS e.max CAD LT	circular	0,6	1,5	1,2	1,5	1,5
	Cut-back technique (after reduction)	incisal/occlusal	0,4	1,3	0,4	1,0	1,3
	Material thickness IPS e.max CAD	circular	–	–	0,8	0,8	–
	MO	incisal/occlusal	–	–	0,8	1,0	–
	Layering technique	Design type	–	–	supporting the tooth shape		–

dimensions in mm

If IPS e.max Ceram is used to veneer IPS e.max CAD, the following layering thicknesses as well as the relationship of layering thickness of the veneering material and the press material regarding the total layering thickness have to be observed:

Maximum layer thickness of the veneering ceramic in mm	0.7	0.8	0.9	1.2	1.4
Minimum layer thickness of the framework ceramic in mm	0.8	1.0	1.1	1.3	1.6
Total layer thickness of the restoration in mm	1.5	1.8	2.0	2.5	3.0

If the above design criteria and minimum framework thickness are not observed, clinical failure of the restoration may occur, for example, in the form of cracks, delamination and fractures.

Restoration design criteria:

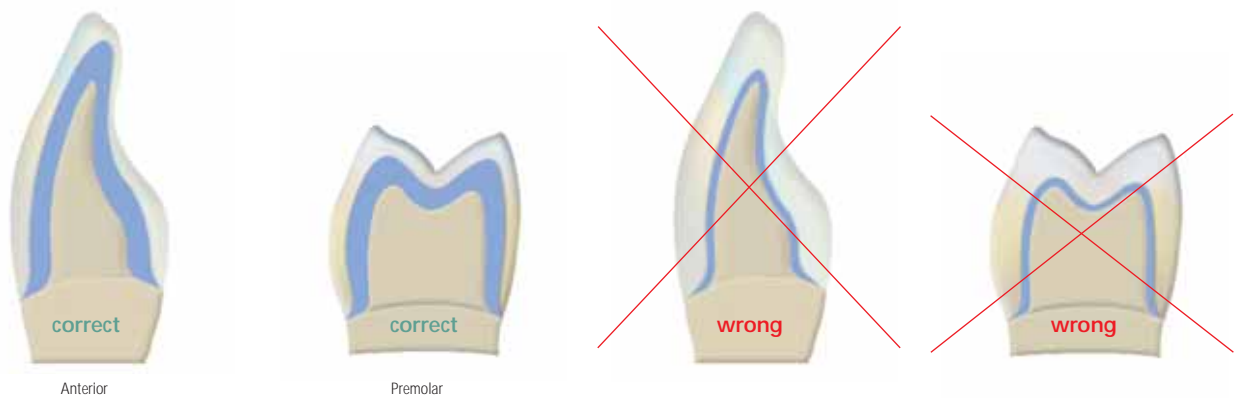
- For the IPS e.max CAD LT staining technique



- For the IPS e.max CAD LT cut-back technique



- For the IPS e.max CAD MO layering technique



CEMENTATION

For the cementation of the IPS e.max restorations, you may select between adhesive and self-adhesive luting composites from the coordinated assortment of Ivoclar Vivadent.

Variolink® II / Variolink Veneer

The dual-curing, highly aesthetic luting composite Variolink II has been successfully used for more than 10 years and offers excellent clinical results. The light-curing Variolink Veneer is especially indicated for the adhesive cementation of veneers, so enhanced shade and translucency effects can be achieved.

Multilink® Automix

The universal dual-curing luting composite offers a wide range of indications. Furthermore, it generates a very strong bond on all material surfaces.

Multilink® Sprint

The new self-adhesive, dual-curing universal resin cement is even easier to use than a conventional cement. It offers the additional advantages of a luting composite, such as higher bond strength and translucency, as well as lower water solubility.



	Variolink® Esthetic Resin Cements		Multilink® Universal Resin Cements	
	Variolink II	Variolink Veneer	Multilink Automix	Multilink Sprint
IPS e.max Press	✓	✓	✓	✓
IPS e.max ZirPress Veneers	✓	✓	–	–
IPS e.max ZirCAD	–	–	✓	✓
IPS e.max CAD	✓	✓	✓	✓
IPS e.max Ceram Veneers	✓	✓	–	–

✓ recommended product combination
 – not recommended product combination

IPS e.max[®] CAD LT – STAINING TECHNIQUE

Model and die preparation

A model with detachable segments is fabricated as usual. The directions of the manufacturers of the different CAD/CAM systems regarding the plaster to be used must be observed. Attention must be paid to the following points during the preparation of the die:

- Especially check the radius of the incisal/occlusal edge on the prepared die (maxilla and mandible).
- The prepared incisal edge should be at least as thick as the diameter of the bur used in the cavity.
- If the incisal edge of the prepared die is thinner than the diameter of the bur, the incisal edge has to be blocked out accordingly.



CAD/CAM processing

As densification of about 0.2% takes place in IPS e.max CAD during the crystallization process, this factor has been taken into account in the software. Consequently, the milled IPS e.max CAD restorations demonstrate precision fit after crystallization. The fabrication steps are described in the directions for use and user manuals of the different CAD/CAM systems. The instructions of the manufacturers must be followed.



Sirona – inLab[®] und inLab MCXL



KaVo – Everest[®]

Finishing

It is of critical importance to use the correct grinding instruments for finishing and adjusting IPS e.max CAD. If unsuitable grinding instruments are used chipping of the edges and local overheating may occur (please see the corresponding recommendations from Ivoclar Vivadent).

The following procedure is recommended to finish IPS e.max CAD restorations:

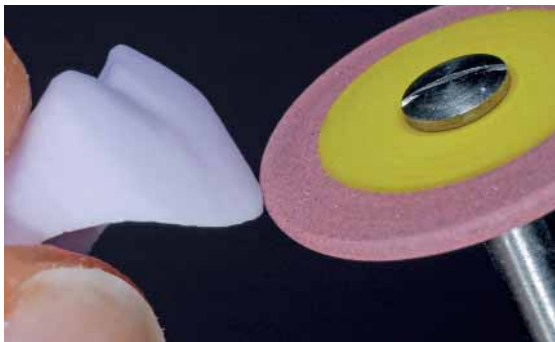
- Grinding adjustments of milled IPS e.max CAD frameworks must be made in the precrystallized (blue) state if possible.
- Only use suitable grinding instruments, low rpms and light pressure to prevent delamination and chipping at the edges in particular.
- Overheating of the glass-ceramic must be avoided.
- The restorations are tried in on the dies and carefully finished.
- Check proximal and occlusal contact points.
- Make sure that the minimum thickness of the restoration is maintained during finishing.
- Do not finish the crown margins too thinly, since these margins may round out during crystallization.
- Prior to crystallization, always clean the framework with ultrasound in a water bath and/or the steam jet.
- Make sure that the restorations are thoroughly cleaned before further processing and that any residue of the milling additive of the CAD/CAM milling unit has been removed. Residue of the milling additive remaining on the surface may result in bonding problems and discolouration during the speed crystallization/glaze firing.
- Restorations **must not** be blasted with Al_2O_3 or glass polishing beads



Try in the milled restoration on the model and check fit.



Finish the restoration surface with suitable grinding instruments.



Finish margins with suitable polishers.



Finished restoration on the model

Preparing for crystallization and Glaze firing

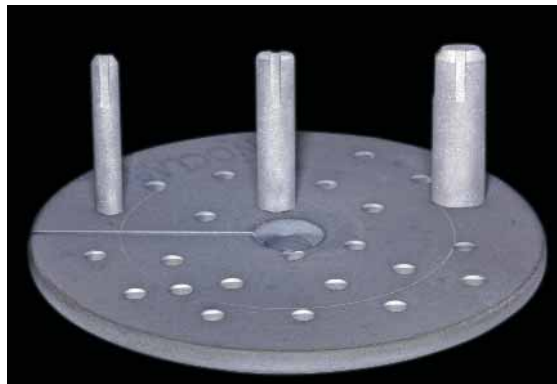
For crystallization, the restoration has to be placed on the IPS e.max CAD Crystallization Pin with the help of IPS Object Fix Putty or Flow auxiliary firing pastes.

To prepare for the combination firing (crystallization/glaze) please observe the following procedure:

- Select the largest possible IPS e.max CAD Crystallization Pin (S, M, L) that best "fills" the inside of the restoration, but does not come into contact with the crown walls.
- Fill the inside of crowns with IPS Object Fix Putty / Flow up to the restoration margin.
- Press the selected IPS e.max CAD Crystallization Pin deeply into the Putty / Flow material so that it is adequately secured.
- Smooth out displaced Putty / Flow using a plastic spatula so that the pin is securely in place and the restoration margins optimally supported.
- Avoid contamination of the outer side of the restoration. Clean off any possible residue adhering to the outer surface of the restoration with a brush dampened with water and dry.



IPS Object Fix Putty and IPS Object Fix Flow



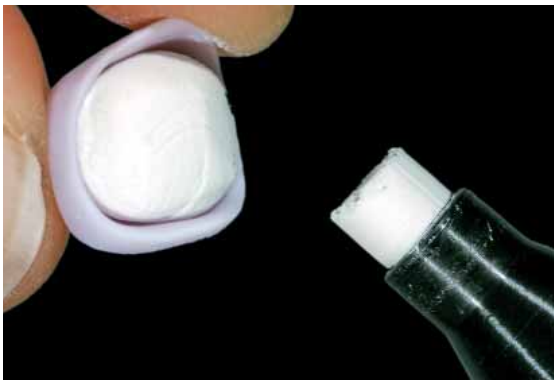
IPS e.max CAD Crystallization Pins in three sizes S, M, L on the IPS e.max CAD Crystallization Tray



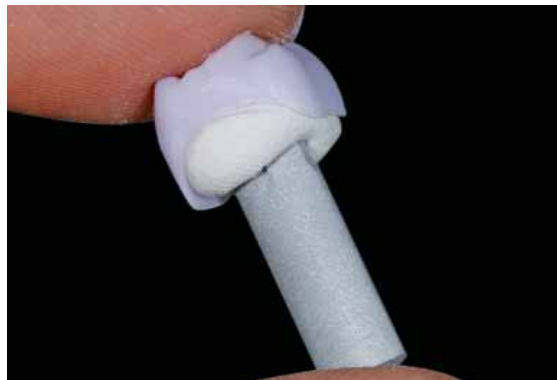
Select the largest possible IPS e.max CAD Crystallization Pin



This IPS e.max CAD Crystallization Pin is too small and thus unsuitable



Fill the inside of the crown with IPS Object Fix Putty or Flow



Press the IPS e.max CAD Crystallization Pin deeply into the IPS Object Fix Putty



Smooth out forced IPS Object Fix or Putty between the margin and the support pin using a plastic spatula so that the pin is securely in place in the paste and the crown margin is optimally supported.



Remove any contamination from the outer surface of the crown using a brush dampened with water and dry.

Crystallization and Glaze firing

Basically, fully anatomically milled restorations made of IPS e.max CAD LT can be completed in different ways.

Variant A:

Crystallization and Glaze firing with IPS e.max CAD Crystall./Glaze Paste

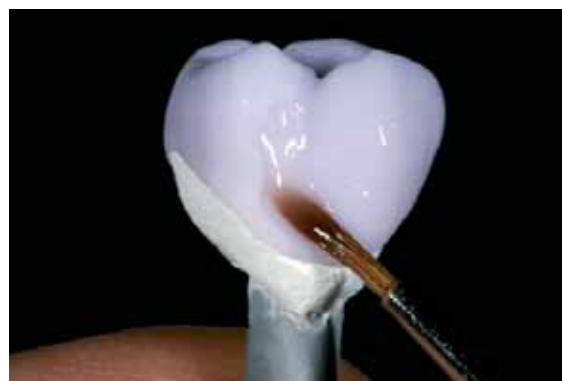
In this processing technique, crystallization and Glaze firing are performed in one step. Characterization may be achieved using IPS e.max CAD Crystall./Shades and IPS e.max CAD Crystall./Stains.

Please observe the following procedure:

- Hold the restoration by the firing pin and apply IPS e.max CAD Crystall./Glaze paste evenly on the entire restoration using a brush. If a slight thinning is desired, the glaze may also be mixed with a little IPS e.max CAD Crystall./Glaze Liquid.
- Avoid to apply too thick glaze layer. Avoid pooling, especially on the occlusal surface.
- A too thin glaze layer may lead to an unsatisfactory gloss.
- If characterizations are desired, the restorations can be individualized using IPS e.max CAD Crystall./Shades and/or IPS e.max CAD Crystall./Stains before crystallization firing.
- Extrude Shades and Stains from the syringe and mix thoroughly.
- The Shades and Stains may be slightly thinned using IPS e.max CAD Crystall./Glaze Liquid. However, the consistency should still remain pasty.
- Apply mixed Shades and Stains directly into the unfired glaze layer using a fine brush.



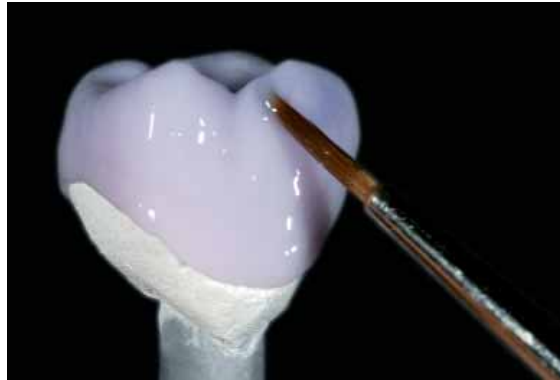
Extrude IPS e.max Crystall./Glaze paste from the syringe and mix thoroughly. If required, slightly thin with the IPS e.max CAD Crystall./Glaze Liquid.



Hold the restoration by the firing pin and evenly apply IPS e.max CAD Crystall./Glaze paste on the blue restoration.



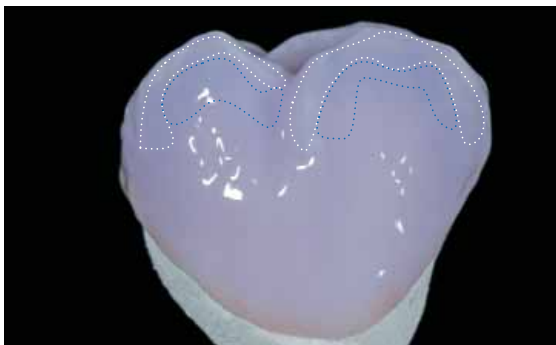
Extrude IPS e.max CAD Crystall./Shades and Stains from the syringe and mix thoroughly. If required, thin with IPS e.max CAD Crystall./Glaze Liquid.



Apply mixed Shades and Stains directly into the unfired IPS e.max CAD Crystall./Glaze paste.

Depending on the individual patient situation, the characterizations may be applied as follows (Example: Shade A2):

Buccal view



Slight characterizations on the buccal surface with IPS e.max CAD Crystall./Shade Incisal and Stains.

Occlusal view



Occlusal characterizations with IPS e.max CAD Crystall./Shades and Stains

- Cusp inclinations: Shade Incisal I1
- Fissures: Stains mahogany
- Cusps, marginal ridges: Stains white/creme
- Enhancing the chroma: Stains sunset/copper

Example of a too thick layer of IPS e.max CAD Crystall./Shades and Stains



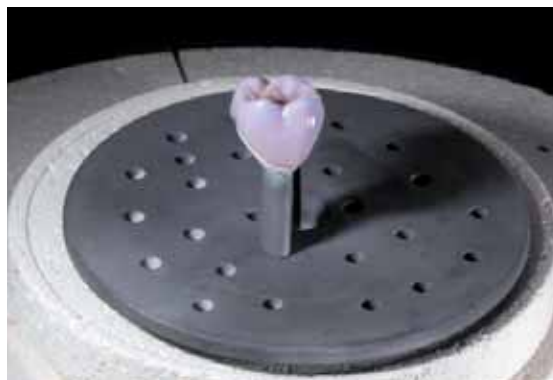
Too thick layer of IPS e.max CAD Crystall./Shades



Too thick layer of IPS e.max CAD Crystall./Shades and Stains

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

- Place the restoration including the pin into the center of the IPS e.max CAD Crystallization Tray.
- A maximum of 6 restorations can be positioned on the firing tray and crystallized using the combination firing with IPS e.max CAD Crystall./Glaze paste.
- Conduct the combination firing (Speed Crystallization/Glaze LT) using the stipulated parameters.



Place the restoration including the pin into the center of the IPS e.max CAD Crystallization Tray and conduct the combination firing using the stipulated parameters.

Speed Crystallization / Glaze LT

Furnace	Stand- by temperature B	Closing time S	Heating rate t ₁	Firing temperature T ₁	Holding time H ₁	Heating rate t ₂	Firing temperature T ₂	Holding time H ₂	Vacuum 1 1 ₁ 1 ₂	Vacuum 2 2 ₁ 2 ₂	Longterm cooling L	Cooling rate t ₁
P300												
P500	403°C	6:00 min	90°C/min	820°C	0:10 min	30°C/min	840°C	7:00 min	550/820°C	820/840°C	700°C	20°C/min
P700	757°F		162°F/min	1508°F		54°F/min	1544°F		1022/1508°F	1508/1544°F	1292°F	36°F/min

Please note:

- Speed crystallization can only be used for IPS e.max CAD LT.
- As an option, restorations fabricated of IPS e.max CAD LT may also be crystallized using the firing parameters for crystallization MO+LT.
- IPS e.max Ceram materials (Essence, Shades, etc.) must not be used in combination with the IPS e.max CAD Crystall./Glaze Shades and Stains. This applies for both the combination firing and any possible subsequent corrective firings.

If additional characterizations or adjustments are required after crystallization, a corrective firing using IPS e.max CAD Crystall./Shades and Stains and Glaze can be conducted.

Firing parameters for the Stain and Correction firing

IPS e.max CAD Crystall./Shades, Stains, Glaze on IPS e.max CAD LT – Staining technique	B	S	t ₁	T	H	V1	V2
Stain and Correction firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F

Variant B:

Crystallization and Glaze firing with IPS e.max CAD Crystall./Glaze Spray

Instead of the IPS e.max CAD Crystall./Glaze Paste, IPS e.max CAD Crystall./Glaze Spray may also be used.

Follow the procedure below for this purpose:

- Secure the restoration on a suitable IPS e.max CAD Crystallization Pin as described above.
- Make sure that the auxiliary firing paste (IPS e.max CAD Object Fix Putty or Flow) is flush with the crown margin.
- Before characterization and glazing, the outer surface of the restoration must be dry and free of auxiliary firing paste.
- If characterizations are desired, the restoration may be individualized using IPS e.max CAD Crystall./Shades and IPS e.max CAD Crystall./Stains before the crystallization firing.
- The Shades and Stains may be slightly thinned using IPS e.max CAD Crystall./Glaze Liquid. However, the consistency should still remain pasty.
- Apply the mixed Shades and Stains directly on the blue restoration using a brush.



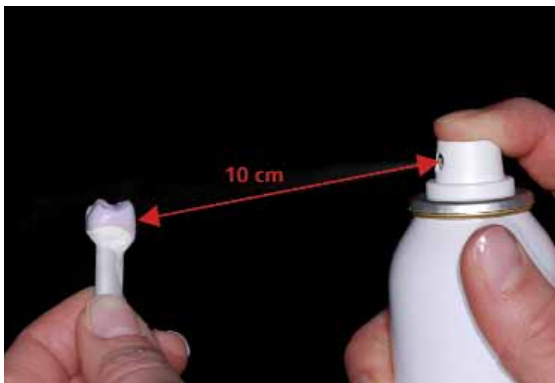
Extrude IPS e.max CAD Crystall./Shades and Stains from the syringe and mix thoroughly. If required, thin with IPS e.max CAD Crystall./Glaze Liquid.



Apply the mixed Shades and Stains directly on the blue restoration.

Please observe the following procedure for the application of the IPS e.max CAD Crystall./Glaze Spray:

- Hold the restoration by the IPS e.max CAD Crystallization Pin.
- Shake the spray can well immediately before use until the mixing ball in the container is moving freely (approximately 20 seconds). If the spray is not sufficiently shaken, mainly the propellant is discharged with a spraying burst. This, in turn, results in the glazing powder in the spray not being entirely used up and a residue remaining in the can.
- Observe a distance of 10 cm between the nozzle and the surface to be sprayed.
- Hold the spray can as upright as possible during spraying.
- Spray the restoration from all sides with short bursts while simultaneously rotating the restoration so that an even, covering layer is created. Shake the spray can again between individual bursts.
- Spray the restoration a second time from all sides with short bursts while simultaneously rotating the restoration. Shake the spray can again between individual bursts.
- Wait until the glaze layer is dry and has assumed a whitish colour.
- Areas that do not show an even layer have to be sprayed again.
- Place the restoration in the center of the IPS e.max CAD Crystallization Tray.
- Conduct the combination firing using the stipulated firing parameters (Speed Crystallization/Glaze LT).



Hold the restoration by the IPS e.max CAD Crystallization Pin



Spray the IPS e.max CAD Crystall./Glaze Spray directly on the unfired IPS e.max CAD Crystall./Shades and Stains. Spray the restoration from all sides while simultaneously rotating it.



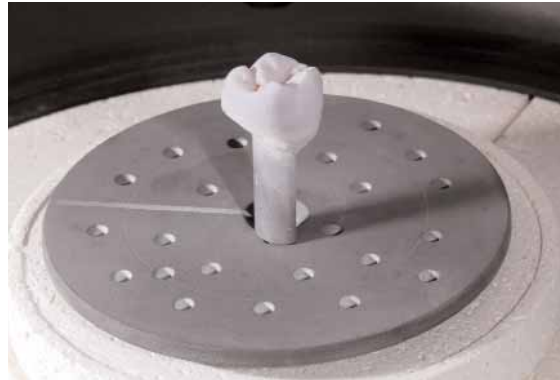
Shake the spray can well between individual bursts.



Spray an even layer onto the restoration.



Allow the IPS e.max CAD Crystall./Glaze Spray to dry briefly until a whitish layer has formed. If required, spray the restoration again to achieve an even Glaze Spray layer on the IPS e.max CAD restoration.



Place the restoration on the IPS e.max CAD Crystallization Tray in the furnace and fire using the stipulated parameters.

Speed Crystallization / Glaze LT

Furnace	Stand- by temperature B	Closing time S	Heating rate t ₁	Firing temperature T ₁	Holding time H ₁	Heating rate t ₂	Firing temperature T ₂	Holding time H ₂	Vacuum 1 1 ₁ 1 ₂	Vacuum 2 2 ₁ 2 ₂	Longterm cooling L	Cooling rate t _i
P300												
P500	403°C 757°F	6:00 min	90°C/min 162°F/min	820°C 1508°F	0:10 min	30°C/min 54°F/min	840°C 1544°F	7:00 min	550/820°C 1022/1508°F	820/840°C 1508/1544°F	700°C 1292°F	20°C/min 36°F/min
P700												

Please note:





- Speed crystallization can only be used for IPS e.max CAD LT.
- As an option, restorations fabricated of IPS e.max CAD LT may also be crystallized using the firing parameters for crystallization MO+LT.
- IPS e.max Ceram materials (Essence, Shades, etc.) must not be used in combination with the IPS e.max CAD Crystall./Glaze Shades and Stains. This applies for both the combination firing and any possible subsequent corrective firings.

If additional characterizations or adjustments are required after crystallization, a corrective firing using IPS e.max CAD Crystall./Shades and Stains and Glaze can be conducted.

Firing parameters for the Stain and Correction firing

IPS e.max CAD Crystall./Shades, Stains, Glaze on IPS e.max CAD LT – Staining technique	B	S	t ₁	T	H	V1	V2
Stain and Correction firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F

Example of incorrect Glaze Spray application

Problem/Cause	Before Firing Application of the Glaze Spray	After Firing Detailed view of the surface
<p>Problem: Not enough Glaze Spray on the restoration</p> <p>Possible cause:</p> <ul style="list-style-type: none"> - Distance between the spray can and the restoration too far - Spraying too short - Spray can not shaken sufficiently - Spray can not held upright during spraying 	 <p data-bbox="673 766 1031 804">Insufficient application of the IPS e.max CAD Crystall./Glaze Spray</p>	 <p data-bbox="1112 766 1370 788">Insufficient gloss or incomplete glossy layer</p>
<p>Problem: Too much Glaze Spray on the restoration</p> <p>Possible cause:</p> <ul style="list-style-type: none"> - Distance between the spray can and the restoration too close - Too much spray applied 	 <p data-bbox="673 1155 999 1178">Too much IPS e.max CAD Crystall./Glaze Spray applied</p>	 <p data-bbox="1112 1155 1339 1178">Loss of texture and too glossy surface</p>

Once the IPS e.max CAD restoration has cooled to room temperature, proceed with the following steps:

- Remove the restoration from the hardened IPS Object Fix Putty or Flow.
- Remove any residue with ultrasound in a water bath and/or with steam.
- Do **not** remove residue with Al_2O_3 or glass polishing beads.
- Place the restoration on the model and check the fit and if necessary make slight adjustments.
- If adjustments by grinding of the restoration are required, make sure that no overheating of the ceramic occurs.
- If the restoration is ground, manually polish the corresponding areas to a high gloss after grinding.



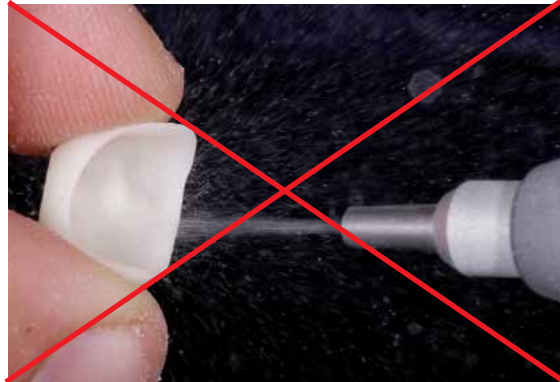
Remove the cooled restoration from the hardened IPS Object Fix Putty or Flow.



Remove residue with ultrasound in a water bath ...



... or with steam.



Do **not** remove residue with Al_2O_3 or glass polishing beads.



IPS e.max CAD LT restoration after combination firing

Optional

Adjustments with IPS e.max CAD Crystall./Add-On

For minor adjustments (e.g. proximal contact points), IPS e.max CAD Crystall./Add-On is available. The adjustments may be made both in the combination firing or in a separate corrective firing.



Processing:

- Mix IPS e.max CAD Crystall./Add-On with IPS e.max Crystall./Add-On to a creamy consistency.
- Make sure that the Add-On material is thoroughly mixed with the liquid so that an optimum firing result can be achieved.
- Apply the mixed Add-On material directly on the areas to be adjusted on the unfired Glaze Paste and/or Shades and Stains using a brush and fire.
- If the Glaze Spray is used, apply the Shades and Stains first. Subsequently, supplement the missing areas using Add-On. Apply the Glaze Spray immediately after the application of the Add-On and fire.



Mixing of IPS e.max CAD Crystall./Add-On with IPS e.max Crystall./Add-On Liquid to a creamy consistency.



Application of the mixed Add-On material on the blue restoration before crystallization.



Application of the mixed Add-On material on the crystallized restoration.

Firing parameters for the Stain and Correction firing

IPS e.max CAD Crystall./Shades, Stains, Glaze on IPS e.max CAD LT – Staining technique	B	S	t	T	H	V1	V2
Stain and Correction firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F

Variant C:

Crystallization and separate Stain and Glaze firing

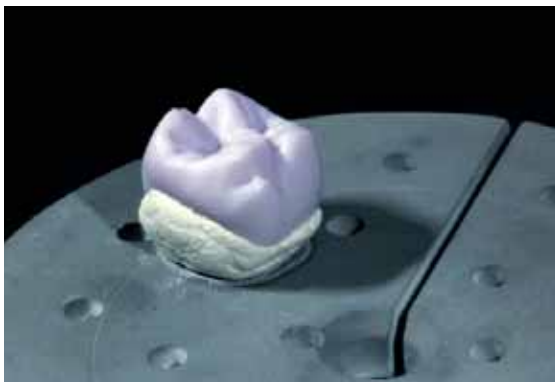
In this processing technique the IPS e.max CAD restorations are crystallized in a first step without application of any stains or glaze materials. Subsequently, a separate Stain and Glaze firing is conducted.

IPS e.max CAD Crystall./Shades, Stains, Glaze and IPS e.max Ceram Shades, Essence and Glaze must not be mixed with one another.

Crystallization

The following points should be observed for the crystallization of IPS e.max CAD:

- Always clean the restoration with ultrasound in a water bath or the steam jet prior to crystallization.
- The restoration **must not** be blasted with Al₂O₃ or polishing beads..
- Use only IPS Object Fix Putty or Flow as an auxiliary firing paste to place the restoration on the firing tray.
- Slightly overfill the restoration with the auxiliary firing paste so that a reservoir is available.
- Place the restoration in the center of the IPS e.max CAD Crystallization Tray and fire using the stipulated parameters.
- Use only the IPS e.max CAD Crystallization Tray from Ivoclar Vivadent, since it stores the heat necessary for slow and above all tension-free cooling of the restoration.



Fill the entire cavity with IPS Object Fix Putty or Flow and place the restoration on the IPS e.max CAD Crystallization Tray.



After the crystallization program has been completed, remove the firing tray from the furnace and allow the restoration to cool.

Crystallization is conducted in a ceramic furnace using the following parameters:

Speed Crystallization / Glaze LT

Furnace	Stand-by temperature B	Closing time S	Heating rate t ₁	Firing temperature T ₁	Holding time H ₁	Heating rate t ₂	Firing temperature T ₂	Holding time H ₂	Vacuum 1 1 ₁ 1 ₂	Vacuum 2 2 ₁ 2 ₂	Longterm cooling L	Cooling rate t _i
P300												
P500	403°C	6:00 min	90°C/min	820°C	0:10 min	30°C/min	840°C	7:00 min	550/820°C	820/840°C	700°C	20°C/min
P700	757°F		162°F/min	1508°F		54°F/min	1544°F		1022/1508°F	1508/1544°F	1292°F	36°F/min

Please note:

- Speed crystallization can only be used for IPS e.max CAD LT.
- As an option, restorations fabricated of IPS e.max CAD LT may also be crystallized using the firing parameters for crystallization MO+LT.
- IPS e.max Ceram materials (Essence, Shades, etc.) must not be used in combination with the IPS e.max CAD Crystall./Glaze Shades and Stains. This applies for both the combination firing and any possible subsequent corrective firings.

Once the IPS e.max CAD restoration has cooled to room temperature, proceed with the following steps:

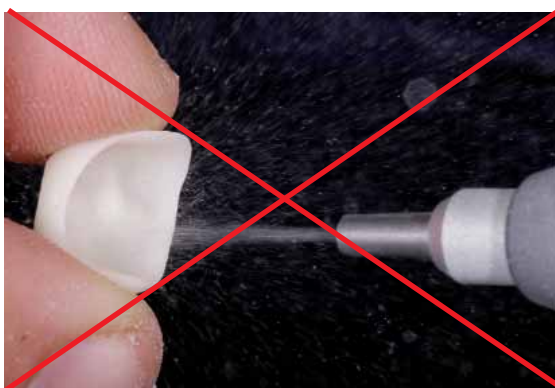
- Remove the restoration from the hardened IPS Object Fix Putty / Flow.
- Remove any residue with ultrasound in a water bath and/or with steam.
- Do **not** remove residue with Al₂O₃ or glass polishing beads.
- Place the restoration on the model and check the fit and if necessary make slight adjustments.
- If adjustments by grinding of the restoration are required, make sure that no overheating of the ceramic occurs.
- As an option, an individual, tooth-coloured die can be fabricated of IPS Natural Die Material (Fabrication of an individual die, see page 44).



Remove residue with ultrasound in a water bath ...



... or with steam.



Do **not** remove residue with Al₂O₃ or glass polishing beads.



To ideally check the tooth shade, and individual, tooth-coloured die can be fabricated of IPS Natural Die Material.

Stain and Glaze firing


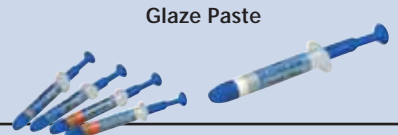
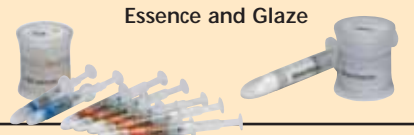






After the restoration has been cleaned, the Stains and Glaze firing is conducted. The firing procedure may be carried out either with IPS e.max CAD Crystall./Shades, Stains and Glaze or IPS e.max Ceram Shades, Essence, and Glaze.

IPS e.max CAD Crystall./Shades, Stains, Glaze and IPS e.max Ceram Shades, Essence and Glaze must not be mixed with one another.

Please observe the following procedure:

- Depending on the situation, the Stains and Glaze firing may be conducted together or separately one after the other.
- If more pronounced characterizations are required, a separate Stains and Characterization firing is recommended, rather than the application of a thicker stains layer.
- If the IPS e.max CAD Crystall./Glaze Spray is used, cover the cavity side of the restoration during spraying (e.g. place the restoration on a die fabricated of IPS Natural Die Material) so that no spray may reach the inner aspects of the restoration.
- Conduct the Stains and Glaze firing on a honey-comb firing tray.

First, the Stains firing is conducted. The Glaze is applied in a second firing. The separate Stains firing enables a very exact shade match with the respective clinical situation.

<p>Stains and Glaze firing with IPS e.max CAD Crystall./Stains, Shades, Glaze Spray</p> 	<p>Stains and Glaze firing with IPS e.max CAD Crystall./Stains, Shades, Glaze Paste</p> 	<p>Stains and Glaze firing with IPS e.max Ceram Shades, Essence and Glaze</p> 
 <p style="font-size: small;">Application of IPS e.max CAD Crystall./Stains, Shades, Glaze Spray</p>	 <p style="font-size: small;">Application of IPS e.max CAD Crystall./Stains, Shades, Glaze Paste</p>	 <p style="font-size: small;">Application of IPS e.max Ceram Essence and Stains</p>
<p>Stains firing / corrective firing IPS e.max CAD Crystall./Stains, Shades, Glaze on IPS e.max CAD LT</p>		<p>Stains/Characterization firing IPS e.max Ceram on IPS e.max CAD LT</p>
 <p style="font-size: small;">Application of IPS e.max CAD Crystall./Glaze Spray</p>	 <p style="font-size: small;">Application of IPS e.max CAD Crystall./Glaze Paste</p>	 <p style="font-size: small;">Application of IPS e.max Ceram Glaze</p>
<p>Glaze firing IPS e.max CAD Crystall./Stains, Shades, Glaze on IPS e.max CAD LT</p>		<p>Glaze firing IPS e.max Ceram on IPS e.max CAD LT</p>



Conduct the Stains and Glaze firing on a honey-comb tray

Firing parameters for the Stain / Correction / Glaze firing

IPS e.max CAD Crystall./Shade, Stains, Glaze on IPS e.max CAD LT – <i>Staining technique</i>	B	S	t↗	T	H	V1	V2
Stain and Correction firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F

Firing parameters for the Stain and Characterization firing, Glaze firing

IPS e.max Ceram on IPS e.max CAD LT <i>Staining technique</i>	B	S	t↗	T	H	V1	V2
Stain and Characterization firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	770°C 1418°F	1:30 min 1:30 min	450°C 842°F	769°C 1416°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	770°C 1418°F	1:30 min 1:30 min	450°C 842°F	769 °C 1416°F



Finished restoration after Glaze firing

IPS e.max[®] CAD LT – CUT-BACK TECHNIQUE

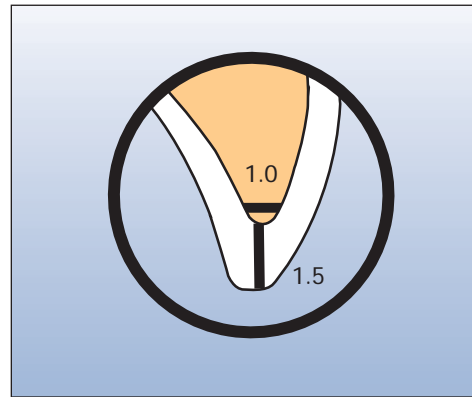
The IPS e.max CAD LT material may also be completed using cut-back technique. By individually veneering with IPS e.max Ceram in the incisal or occlusal areas, highly aesthetic restorations can be achieved in an efficient manner.

Model and die preparation

A model with detachable segments is fabricated as usual. The directions of the manufacturers of the different CAD/CAM systems regarding the plaster to be used must be observed.

Attention must be paid to the following points during the preparation of the die:

- Check the radius of the incisal edge on the prepared anterior teeth (maxilla and mandible).
- The prepared incisal edge should be at least as thick as the diameter of the bur used in the cavity.
- If the incisal edge of the prepared die is thinner than the diameter of the bur, the incisal edge has to be blocked out accordingly.



CAD/CAM processing

As densification of about 0.2% takes place in IPS e.max CAD during the crystallization process, this factor has been taken into account in the software. Consequently, the milled IPS e.max CAD restorations demonstrate precision fit after crystallization. The fabrication steps are described in the directions for use and user manuals of the different CAD/CAM systems. The instructions of the manufacturers must be followed.



Sirona – inLab[®] and inLab MCXL

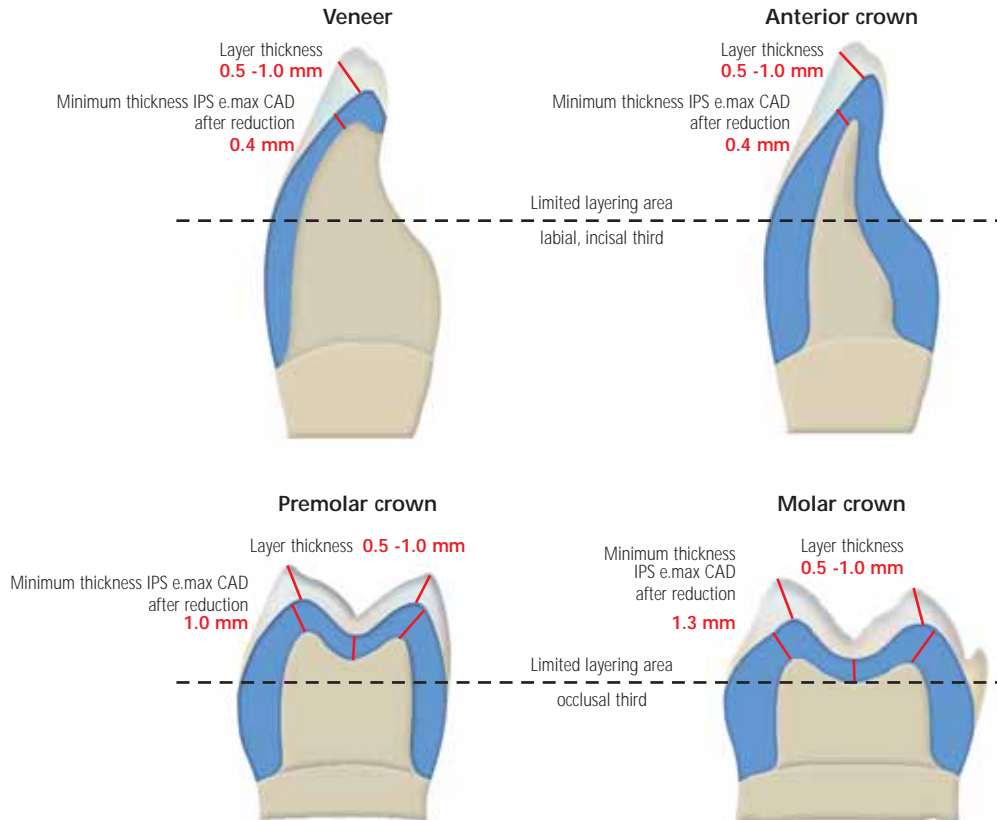


KaVo – Everest[®]

Wall and layer thicknesses

In order to individualize restorations in the incisal and occlusal areas so that they blend in the oral environment, the IPS e.max CAD restoration is veneered using IPS e.max Ceram layering materials. Therefore, the cut-back technique is a very efficient method for fabricating highly aesthetic restorations.

The following wall and layer thicknesses have to be observed:



The cut-back of IPS e.max CAD can be achieved as follows:

- Corresponding construction in the CAD software by using the "Reduce" function
- Scanning of a partially reduced wax-up
- Manual cut-back before crystallization

Finishing and preparing for crystallization

It is of critical importance to use the correct grinding instruments for finishing and adjusting glass-ceramics. If unsuitable grinding instruments are used chipping of the edges and local overheating may occur (please see the corresponding recommendations from Ivoclar Vivadent).

The following procedure is recommended to finish IPS e.max CAD restorations:

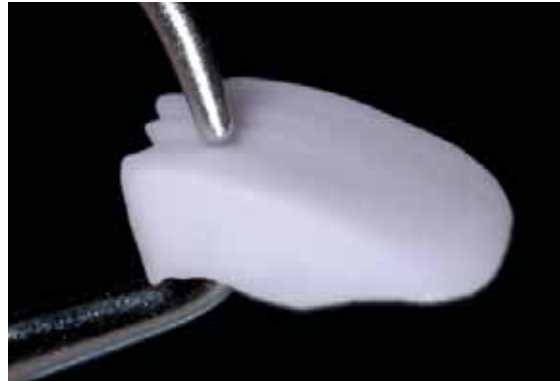
- Grinding adjustments of milled IPS e.max CAD frameworks must be made in the precrystallized (blue) state if possible.
- Only use suitable grinding instruments, low rpms and light pressure to prevent chipping at the edges in particular.



- Overheating of the glass-ceramic must be avoided.
- The frameworks are tried in on the dies and carefully finished.
- Depending on the design of the reduction, check contact points and the occlusion and grind in according to the individual clinical situation.
- Make sure that the minimum thickness of the restoration is maintained during finishing.
- Refrain from designing extreme contours in mamelons (points and edges).
- Do not finish the restoration margins too thinly, since underdimensioned margins may round out during crystallization.
- Frameworks must always be cleaned with steam or in a water bath with ultrasound prior to crystallization.
- Frameworks **must not** be blasted with Al₂O₃ or glass polishing beads



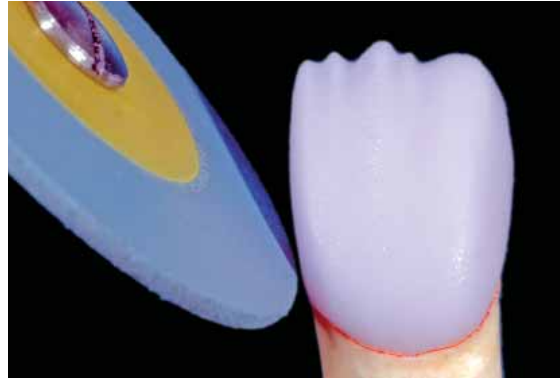
Place the finished restorations on the model
Tooth 11: anterior crown with cut-back
Tooth 12: fully anatomical veneer



Make sure that the minimum thickness of the restoration is maintained during finishing.



Finish the framework surface with suitable grinding instruments.



Finish margins with suitable polishers.



Refrain from designing extreme contours in mamelons

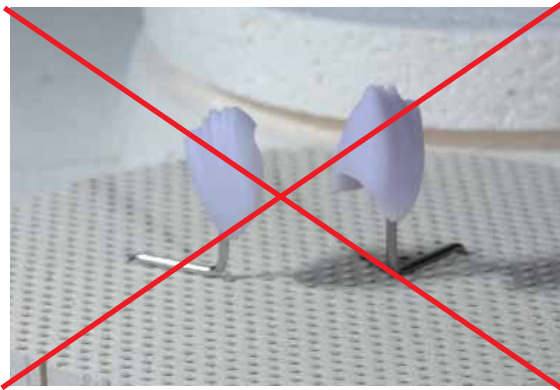


Prepared restoration with cut-back after finishing

Crystallization

The following points should be observed for the crystallization of IPS e.max CAD:

- Crystallization should be carried out in an Ivoclar Vivadent furnace (eg Programat P300, P500 or P700).
- Exclusively use IPS Object Fix Putty or Flow as an auxiliary firing paste to ideally place the restoration on the firing tray.
- Slightly overfill the restoration with the auxiliary firing paste so that a reservoir is available.
- Exclusively use the IPS e.max CAD Crystallization Tray from Ivoclar Vivadent, since it stores the heat necessary for slow and above all tension-free cooling of the glass-ceramic.



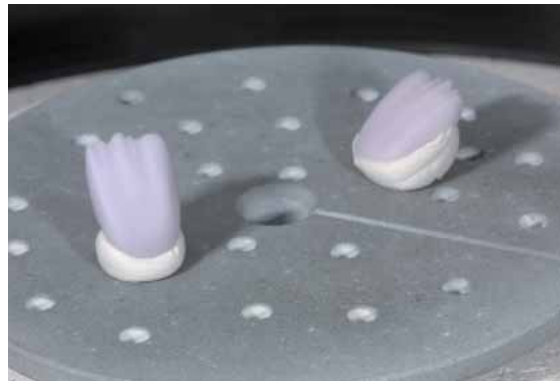
Do not place IPS e.max CAD restorations on firing pins and do not use "honeycomb" trays.



Fill the cavity completely with IPS Object Fix Putty or Flow



Place the restoration on the IPS e.max CAD Crystallization Tray



Place the firing tray in the furnace and start the crystallization with the respective parameters

Speed Crystallization / Glaze LT

Furnace	Stand-by temperature B	Closing time S	Heating rate t ₁	Firing temperature T ₁	Holding time H ₁	Heating rate t ₂	Firing temperature T ₂	Holding time H ₂	Vacuum 1 1 ₁ 1 ₂	Vacuum 2 2 ₁ 2 ₂	Longterm cooling L	Cooling rate t _i
P300												
P500	403°C	6:00 min	90°C/min	820°C	0:10 min	30°C/min	840°C	7:00 min	550/820°C 1022/1508°F	820/840°C 1508/1544°F	700°C 1292°F	20°C/min 36°F/min
	757°F		162°F/min	1508°F		54°F/min	1544°F					
P700												

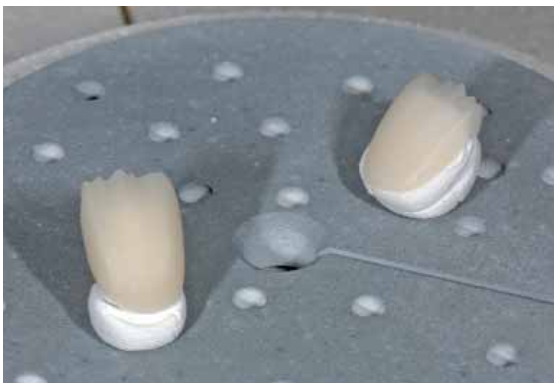
Please note:

- Speed crystallization can only be used for IPS e.max CAD LT.
- As an option, restorations fabricated of IPS e.max CAD LT may also be crystallized using the firing parameters for crystallization MO+LT.

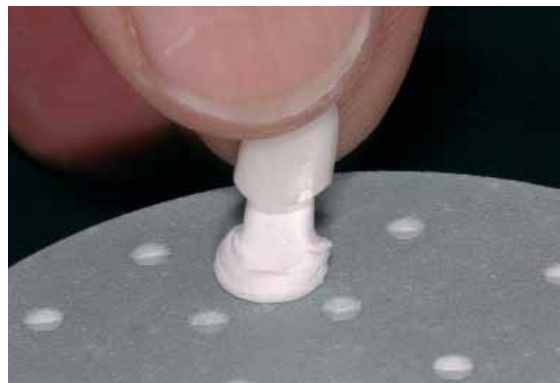
Preparing for veneering

Once the IPS e.max CAD restoration has cooled to room temperature, proceed with the following steps:

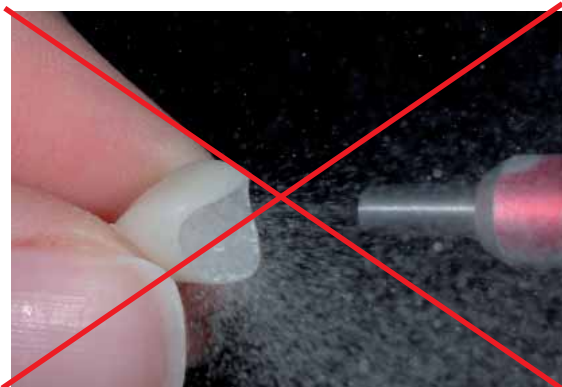
- Remove the restoration from the hardened IPS Object Fix Putty / Flow.
- Remove any residue with ultrasound in a water bath and/or with steam
- Do **not** remove residue with Al₂O₃ or glass polishing beads.
- Place the restoration on the model and check the fit and if necessary make slight adjustments.
- Check margins and make small adjustments if necessary.
- Make sure that the minimum thickness of the restoration is maintained during finishing.
- Before veneering clean the restoration under running water or with steam.
- The framework must **not** be blasted with Al₂O₃ or glass polishing beads.



After the crystallization program, remove the firing tray from the furnace and allow the IPS e.max CAD restoration to cool to room temperature.



Remove restoration from the hardened auxiliary firing paste



Do **not** remove residue with Al₂O₃ or glass polishing beads.



Remove residue with ultrasound in a water bath



...or with steam.



Reduced IPS e.max CAD LT framework prepared for veneering

Optional

Die fabrication with IPS Natural Die Material

The light-curing IPS Natural Die Material simulates the shade of the prepared tooth. A control die is fabricated using the shade information provided by the dentist (shade determination). This control die represents the optimum basis for a true-to-nature shade reproduction of the given oral situation.

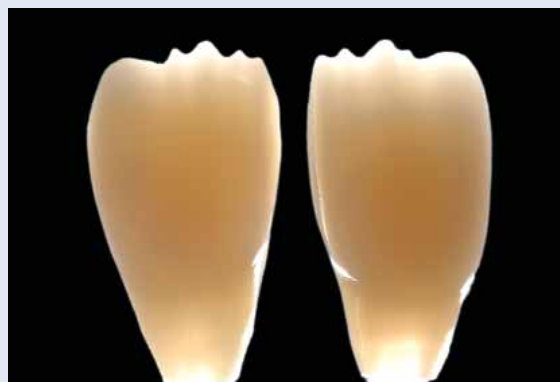
- Coat the inner surfaces of the ceramic restorations with IPS Natural Die Material Separator and allow it to react for a short time.
- Apply die IPS Natural Die Material in the corresponding shade to the inner surfaces of the restoration using the IPS Condenser and adapt so that the entire inner surface is coated and filled.
- Completely fill the restoration cavity and insert an IPS Die Holder into the material and adapt excess material around the holder. Make sure that the Die Material is well adapted to the restoration margins and that no gaps are present.
- Polymerize the IPS Natural Die Material die with a commercial polymerization light, e.g. Lumamat 100, for 60 seconds.
- After polymerization, the die can be finished and or smoothed, if required.



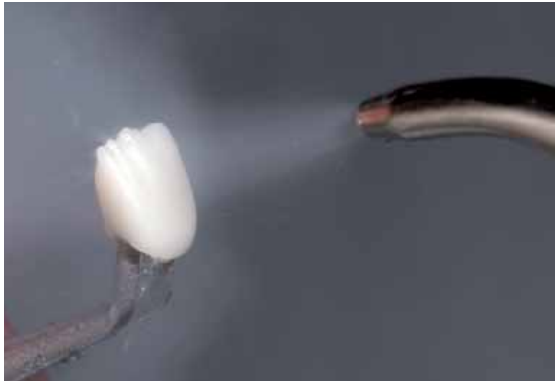
Coat the inner surfaces of the ceramic restoration with IPS Natural Die Material Separator and allow it to react for a short time.



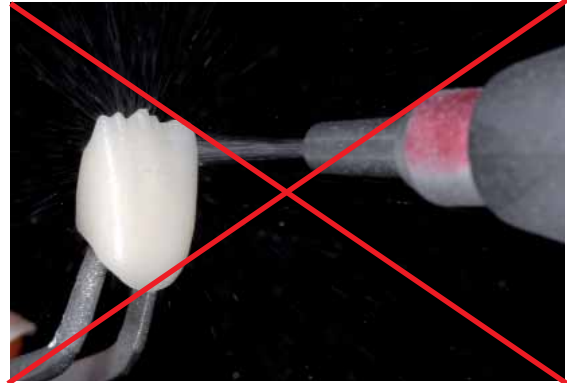
Completely fill the restoration cavity and insert an IPS Die Holder into the material and adapt excess material around the holder. Then, polymerize with a commercial polymerization light.



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



Clean the framework under running water or with the steam jet before veneering.



Do **not** blast the framework with Al₂O₃ or polishing beads.

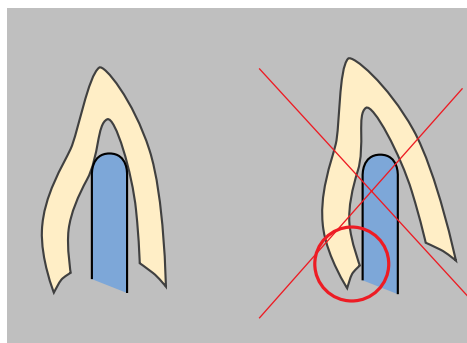
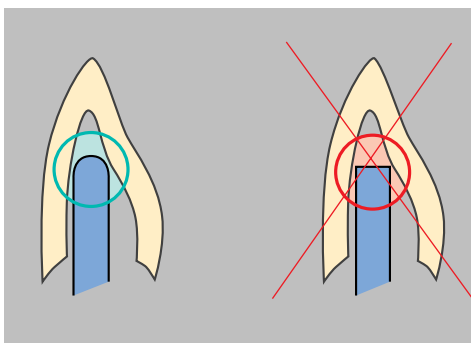
Veneering with IPS e.max Ceram

The following paragraphs will explain the most important veneering steps. Detailed information about the nano-fluorapatite ceramic and its processing are contained in the IPS e.max Ceram Instructions for Use.



Firing tray and pins

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



Wash firing (foundation firing)

The framework must be free of dirt and grease before the wash firing is done. Any contamination of the framework after cleaning must be prevented. Wash firing (Foundation) is carried out with IPS e.max Ceram Incisal and Impulse or Shades and Essence materials. IPS e.max Ceram ZirLiner may not be used. Because of its firing temperature of 960 °C/1760°F it only works on zirconium oxide.

In order not to obtain a gloss on non-veneered areas at this point, it is recommended to apply Glaze (paste or powder) on these areas and fire it with the wash firing. Do not mix paste and powder materials.

Variant A : Powder

Conduct the wash firing (foundation) with the required IPS e.max Ceram Incisal and/or Impulse material. Use the IPS e.max Ceram Build-Up Liquids (allround or soft) to mix the materials. If a more plastic consistency is desired, IPS e.max Ceram Glaze and Stain Liquids (allround or longlife) can be used. Apply the wash in a thin coat on the entire framework.



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



... and fire using the indicated firing parameters.

Variant B : Glaze, Shades and Essence

To enhance the in-depth chroma effect or for individual internal characterizations, the wash firing can be conducted with Glaze, Shades, and Essence. Mix the paste or powder with the IPS e.max Ceram Glaze and Stain Liquids (allround or longlife) to the desired consistency. Apply the wash in a thin coat on the entire framework.



Apply the wash using Glaze, Shades and Essence ...



... and fire using the indicated firing parameters.

Firing parameters for the Wash firing (foundation firing)

IPS e.max Ceram on IPS e.max CAD LT <i>Cut-back technique</i>	B	S	t↗	T	H	V ₁	V ₂
Wash firing (Foundation)	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F

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.

Incisal firing

The IPS e.max Ceram layering materials (Transpa, Impulse) are used to complete the anatomical shape and to achieve the individual aesthetic appearance. The materials are mixed using the IPS e.max Ceram Build-Up Liquids allround or soft. If a different consistency is desired, the liquids can also be mixed in any ratio.



Design the incisal edge using Impulse and Transpa materials



Complete the restoration, e.g. with Incisal and Transpa material



Fire with the firing parameters for Incisal firing

Firing parameters for the Incisal firing

IPS e.max Ceram on IPS e.max CAD LT <i>Cut-back technique</i>	B	S	t↗	T	H	V ₁	V ₂
Incisal firing	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F

Due to the thin material layer and the thus resulting limited shape change during firing, the cut-back technique also allows to complete the restoration with one firing cycle. If a second incisal firing is required, however, it can be conducted using the same firing parameters.

Finishing and preparing for Stain and Glaze firing

Before the Stain and Glaze firing, the restoration has to be finished 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.
- If gold and/or silver dust was used to visualize the surface texture, the restoration has to be thoroughly cleaned with steam. Make sure to remove all gold or silver dust in order to avoid any discolouration.



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

Stain and Glaze firing

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

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

Variant A :

high-gloss appearance

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



Apply IPS e.max Ceram Glaze on the entire restoration

Variant B :

true-to-nature appearance

- Prepolish unlayered areas (IPS e.max CAD LT) using rubber disks.
- Rub the surface with moist ceramic in order to improve the wetting properties of the surface.
- Use Self-Glaze for veneered areas.
- Apply IPS e.max Ceram Glaze only to unlayered areas (IPS e.max CAD LT).



Apply IPS e.max Ceram Glaze only to unlayered areas

Firing parameters for the Stain and Glaze firing

IPS e.max Ceram on IPS e.max CAD LT <i>Cut-back technique</i>	B	S	t↗	T	H	V ₁	V ₂
Stain firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F



IPS e.max CAD LT restoration after Glaze firing

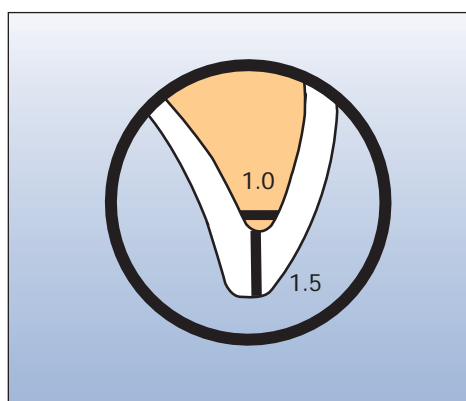
IPS e.max[®] CAD MO – LAYERING TECHNIQUE

Model and die preparation

A model with detachable segments is fabricated as usual. The directions of the manufacturers of the different CAD/CAM systems regarding the plaster to be used must be observed.

Attention must be paid to the following points during the preparation of the die:

- Check the radius of the incisal edge on the prepared anterior teeth (maxilla and mandible).
- The thickness of the incisal edge of prepared anterior teeth (upper and lower) must be checked.
- The prepared incisal edge should be at least as thick as the diameter of the bur used in the cavity.
- If the incisal edge of the prepared die is thinner than the diameter of the bur, the incisal edge has to be blocked out accordingly.



CAD/CAM processing

As densification of about 0.2% takes place in IPS e.max CAD during the crystallization process, this factor has been taken into account in the software. Consequently, the milled IPS e.max CAD restorations demonstrate precision fit after crystallization. The fabrication steps are described in the directions for use and user manuals of the different CAD/CAM systems. The instructions of the manufacturers must be followed.



Milled IPS e.max CAD MO framework



Finishing and preparing for crystallization

It is of critical importance to use the correct grinding instruments for finishing and adjusting glass-ceramics. If unsuitable grinding instruments are used chipping of the edges and local overheating may occur (please see the corresponding recommendations from Ivoclar Vivadent).

The following procedure is recommended to finish IPS e.max CAD restorations:

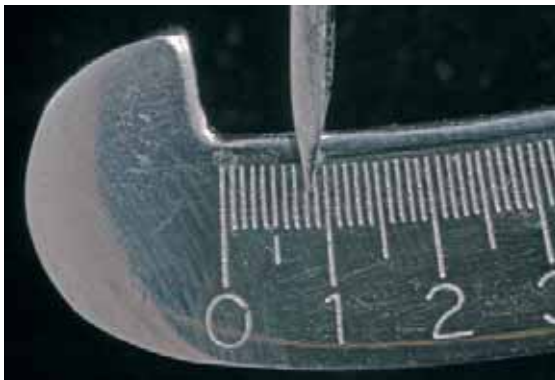
- Grinding adjustments of milled IPS e.max CAD frameworks must be made in the precrystallized (blue) state if possible.
- Only use suitable grinding instruments, low rpms and light pressure to prevent delamination and chipping at the edges in particular.
- Overheating of the glass-ceramic must be avoided.
- The frameworks are tried in on the dies and carefully finished.
- Make sure that the minimum thickness of the restoration is maintained during finishing.
- In the precrystallized (blue) state special attention must be given to marginal areas. Margins that are ground too thin are not suitable for crystallization, as these areas are rounded during this process and therefore become too short.
- Frameworks must always be cleaned with steam or in a water bath with ultrasound prior to crystallization.
- Frameworks **must not** be blasted with Al_2O_3 or glass polishing beads



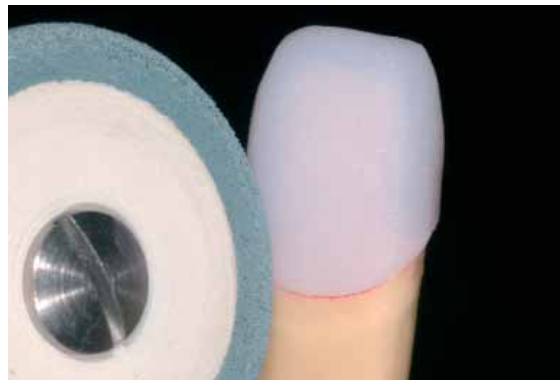
Try in the milled framework on the model and check fit.



Finish the framework surface with suitable grinding instruments.



Make sure that the minimum thickness of the restoration is maintained during finishing.



Finish margins with suitable polishers.

Crystallization

The following points should be observed for the crystallization of IPS e.max CAD:

- Crystallization should be carried out in an Ivoclar Vivadent furnace (eg Programat P300, P500 or P700).
- Use only IPS Object Fix Putty or Flow as an auxiliary firing paste to ideally place the restoration on the firing tray.
- Slightly overfill the restoration with the auxiliary firing paste so that a reservoir is available.
- IPS e.max CAD restorations must neither be placed on metal pins nor on a honey-comb tray for crystallization.
- Use only the IPS e.max CAD Crystallization Tray from Ivoclar Vivadent, since it stores the heat necessary for slow and above all tension-free cooling of the glass-ceramic.
- Always allow the restoration to cool to room temperature after the crystallization process and before it is finished.



Do not place IPS e.max CAD restorations on firing pins and do not use "honeycomb" trays.



Fill the cavity completely with IPS Object Fix Putty or Flow and attach a base.



Place the restoration which is supported by IPS Object Fix Putty/Flow on the IPS e.max CAD Crystallization Tray.



Place the firing tray in the furnace and start the crystallization program.

Crystallization MO and LT

Furnace	Stand-by temperature B	Closing time S	Heating rate t ₁	Firing temperature T ₁	Holding time H ₁	Heating rate t ₂	Firing temperature T ₂	Holding time H ₂	Vacuum 1 1 ₁ 1 ₂	Vacuum 2 2 ₁ 2 ₂	Longterm cooling L	Cooling rate t _l
P300												
P500	403°C	2:00 min	60°C/min	770°C	5:00 min	30°C/min	850°C	10:00 min	550/770°C	770/850°C	700°C	20°C/min
P700	757°F		108°F/min	1418°F		54°F/min	1562°F		1022/1418°F	1418/1562°F	1292°F	36°F/min

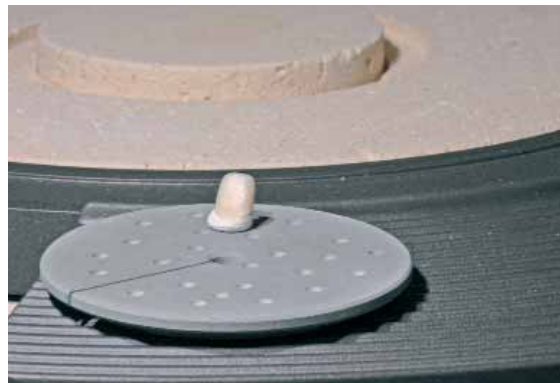
Please note:

- Speed Crystallization LT *cannot* be used for IPS e.max CAD MO!

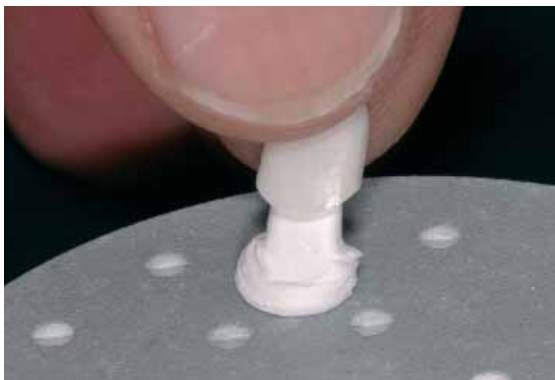
Preparing for veneering

Once the IPS e.max CAD restoration has cooled to room temperature, proceed with the following steps:

- Remove the restoration from the hardened IPS Object Fix Putty / Flow.
- Remove any residue with ultrasound in a water bath and/or with steam
- Do **not** remove residue with Al₂O₃ or glass polishing beads.
- Place the restoration on the model and check the fit and if necessary make slight adjustments.
- Check margins and make small adjustments if necessary.
- Make sure that the minimum thickness of the restoration is maintained during finishing.
- Before veneering clean the restoration under running water or with steam.
- The framework must **not** be blasted with Al₂O₃ or glass polishing beads, as this would damage its surface.



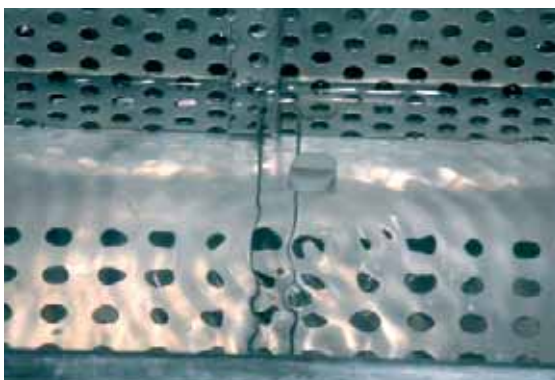
After the crystallization program, remove the firing tray from the furnace and allow the IPS e.max CAD restoration to cool to room temperature.



Remove restoration from the hardened IPS Object Fix Putty or Flow

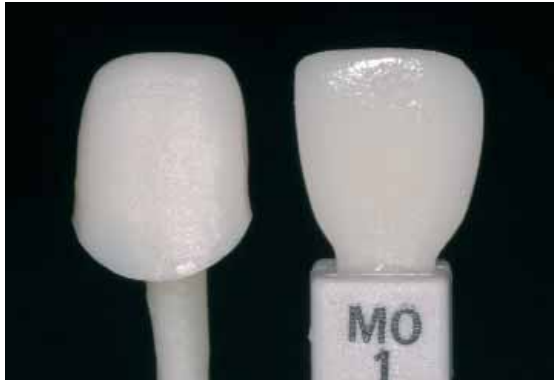


Do **not** remove residue with Al₂O₃ or glass polishing beads.

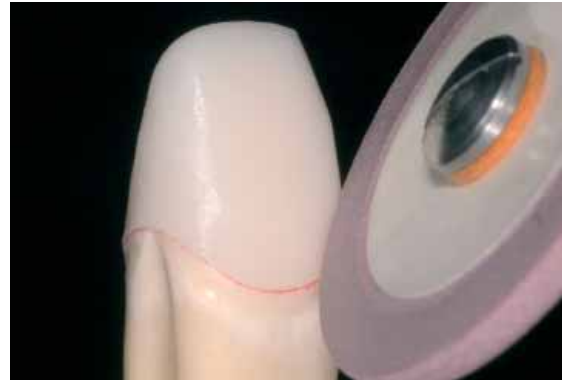


Remove residue with ultrasound in a water bath or with steam.

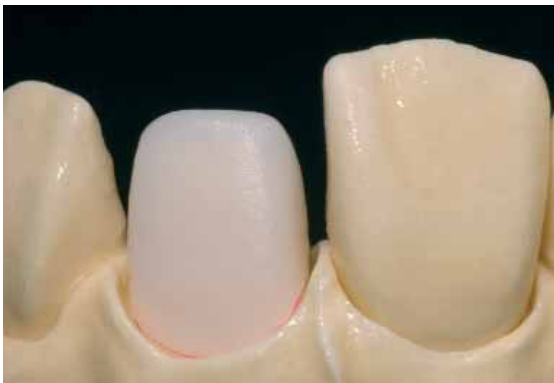




Conduct an optical inspection of the crystallization result using the IPS e.max CAD shade samples.



Place restoration on the model and check the fit and if necessary adjust slightly.



Finished IPS e.max CAD MO framework

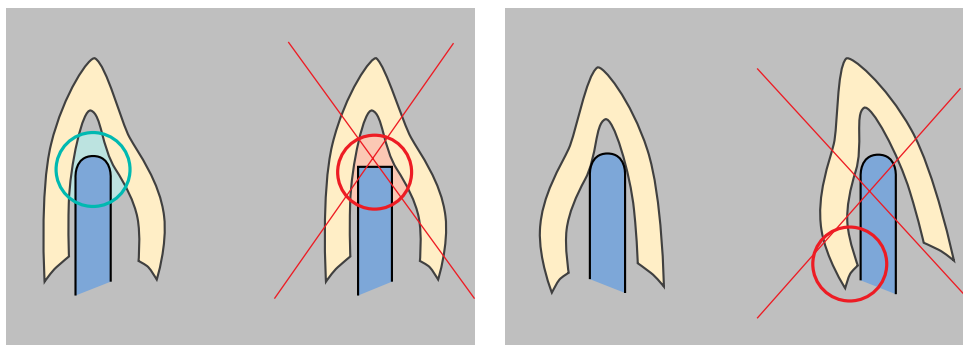
Veneering with IPS e.max Ceram

The following paragraphs will explain the most important veneering steps. Detailed information about the nano-fluorapatite ceramic and its processing are contained in the IPS e.max Ceram Instructions for Use.



Firing tray and pins

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





Wash firing (foundation firing)

The framework must be free of dirt and grease before the wash firing is done. Any contamination of the framework after cleaning must be prevented. Wash firing (Foundation) is carried out with Deep Dentin, Dentin or Shade and Essence materials (ZirLiner may not be used. Because of its firing temperature of 960 °C/1760°F it only works on zirconium oxide).

Variant A: Powder

With ideal space, conduct the wash firing (foundation) with the required Dentin or Deep Dentin material. Use the IPS e.max Ceram Build-Up Liquids (allround or soft) to mix the materials. If a more plastic consistency is desired, IPS e.max Ceram Glaze and Stain Liquids (allround or longlife) can be used. Apply the wash in a thin coat on the entire framework.



Apply the wash using Dentin or Deep Dentin material.....



...and fire using the indicated firing parameters.

Variant B: Paste

With limited space or to increase the in-depth chroma, the wash firing can be conducted using IPS e.max Ceram Shades and Essence. Mix the paste or powder with the IPS e.max Ceram Glaze and Stain Liquids (allround or longlife) to the desired consistency. Apply the wash in a thin coat on the entire framework.



Apply the wash using Shades and Essence materials.....



... and fire using the indicated firing parameters.

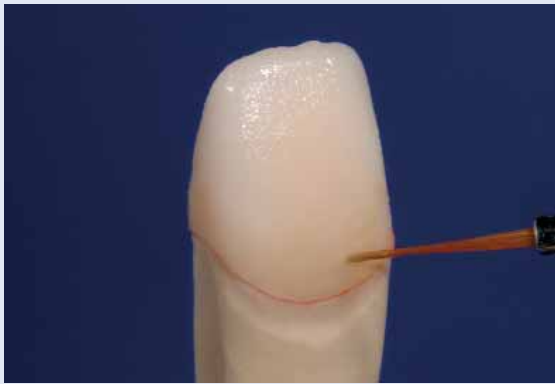
Firing parameters for the Wash firing (foundation firing)

IPS e.max Ceram on IPS e.max CAD MO Layering technique	B	S	t [↗]	T	H	V ₁	V ₂
Wash firing (Foundation)	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F

Optional

Wash firing (foundation firing) characterization

Intensively characterized areas may be designed with IPS e.max Ceram Essence. These materials are ideally suited to apply individualized characterizations. When space is limited, the fully anatomical areas of the framework may be given a true-to-nature design at the beginning of the veneering procedure. These areas are covered with a fluorescent glaze (paste or powder).



Apply individualized characterizations using Essene ...



... and fire in a separate characterization firing.

Firing parameters for the Wash firing (foundation firing) characterization

IPS e.max Ceram on IPS e.max CAD MO <i>Layering technique</i>	B	S	t↗	T	H	V1	V2
Wash firing (Foundation) characterization	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F

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.

1st dentin and incisal firing

Carry out the layering according to the layering diagram. In order to achieve the desired consistency of the ceramic material, the IPS e.max Ceram Build-Up Liquids allround or soft can be used. If another consistency is required, the Liquids may also be mixed with each other using any mixing ratio.



Build-up the tooth shape using Dentin materials



Cut-back and build-up of the incisal area and incisal extension



Design the incisal third using Impulse materials



Complete the layering with Incisal and Transpa materials



Fire using the parameters for the 1st Dentin and Incisal firing

Firing parameters for the 1st dentin and incisal firing

IPS e.max Ceram on IPS e.max CAD MO <i>Layering technique</i>	B	S	t↗	T	H	V ₁	V ₂
1 st Dentin/Incisal firing	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F

2nd dentin and incisal firing (corrective firing)

Complete the missing areas and compensate for the shrinkage.



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



Fire using the indicated firing parameters for the 2nd dentin and incisal firing

Firing parameters for the 2nd dentin and incisal firing

IPS e.max Ceram on IPS e.max CAD MO <i>Layering technique</i>	B	S	t↗	T	H	V ₁	V ₂
2 nd Dentin/Incisal firing	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F

Stain and Glaze firing

Stain firing is conducted with Essence and Shades, while glaze firing is carried out with glaze powder or paste. Depending on the situation, the firings may be conducted together or separately. The firing parameters are identical.



Stained and glazed IPS e.max CAD MO restoration

Firing parameters for the Stain and Glaze firing

IPS e.max Ceram on IPS e.max CAD MO <i>Layering technique</i>	B	S	t↗	T	H	V ₁	V ₂
Stain firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F

GENERAL INFORMATION

PREPARING FOR CEMENTATION

Conditioning of the ceramic surface in preparation for cementation is decisive for generating a sound bond between the luting material and the all-ceramic restoration.

The following steps must be observed:

- Glass-ceramics must **not** be blasted with Al₂O₃ or glass polishing beads.
- High-strength glass-ceramics are generally etched with hydrofluoric acid gel (IPS Ceramic Etching Gel)
- In order to further increase the bond strength (restoration/cementation material), silanize the surface with Monobond-S.



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



Etch for 20 sec. with IPS Ceramic Etching Gel



Let react Monobond-S for 60 sec. and blow dry

IPS e.max CAD			
Indications	Veneers, partial crowns*	Anterior and posterior crowns	
Cementation method	Adhesive Cementation	Adhesive Cementation	Self-adhesive Cementation
Etching	20 sec. with IPS Ceramic Etching Gel		
Conditioning / Silanating	Monobond-S let react for 60 sec. and blow dry		
Cementation system	Variolink Veneer Variolink II	Variolink II Multilink Automix	Multilink Sprint

*Partial crowns can also be cemented with Multilink Automix

For the cementation of IPS e.max CAD restorations, you may choose between the tried-and-tested luting composites of the coordinated assortment from Ivoclar Vivadent.

Please observe the IPS Ceramic Etching Gel Instructions for Use.

CARE INSTRUCTIONS

Proxyl® – Professional care

Like natural teeth, high-quality IPS e.max CAD restorations require regular professional care. This is not only beneficial to the health of the gingiva and teeth but also to the overall aesthetic appearance. You can care for valuable surfaces without abrasion using the pumice-free polishing paste Proxyl pink. The low RDA* value = 7 gives you peace of mind of cleaning with a low-abrasion paste. Scientific investigations and longstanding practical experience confirm the gentle effect compared to other pastes.

*Relative Dentin Abrasion



Application of Proxyl



CRYSTALLIZATION PARAMETERS

For **furnaces** to be used for the crystallization of IPS e.max CAD LT and IPS e.max CAD MO, the following aspects have to be observed:

- Conduct the crystallization in an Ivoclar Vivadent ceramic furnace (e.g. Programat P300, P500, P700).
- If other, non-tested ceramic furnaces are used, inquire from Ivoclar Vivadent regarding the compatibility with IPS e.max CAD.
- Basically, the following points apply:
Ceramic furnaces **without**
 - a function for controlled (long-term) cooling
 - a programming option for a two-stage firing process
 - vacuum functioncannot be used.
- The ceramic furnace must be calibrated before the first crystallization procedure and then once every six months.
- Depending on the operating mode, more frequent calibration may be required. The instructions of the respective manufacturer must be observed.

For **conducting the crystallization**, the following aspects have to be observed:

- Exclusively use the IPS Object Fix Putty or Flow as an auxiliary firing paste to place the restoration directly on the IPS e.max CAD Crystallization Tray or the IPS e.max CAD Crystallization Pin.
- IPS e.max CAD restorations must not be placed directly, i.e. without auxiliary firing paste, on the IPS e.max CAD Crystallization Pin for crystallization.
- The cavity of the restoration must always be filled up to the restoration margins with IPS Object Fix Putty or Flow for crystallization.
- Exclusively use the enclosed IPS e.max CAD Crystallization Tray and the respective IPS e.max CAD Crystallization Pins, since it stores the heat required for slow and above all tension-free cooling of the glass-ceramic.
- Always conduct the crystallization under vacuum.
- After the crystallization procedure, always allow the restoration to cool to room temperature before further processing.

Crystallization parameters IPS e.max CAD MO /LT

Furnace	Closing time S min	Stand-by temperature B °C / °F	Heating rate t ₁ °C / °F	Firing temperature T ₁ °C / °F	Holding time H ₁ min	Heating rate t ₂ °C / °F/min	Firing temperature T ₂ °C / °F	Holding time H ₂ min	Longterm cooling L °C / °F	Cooling rate t ₁ °C / °F/min	Vacuum 1 1 ₁ 1 ₂ °C / °F	Vacuum 2 2 ₁ 2 ₂ °C / °F
P80	6:00	403 / 757	–	–	–	30 / 54	850 / 1562	10:00	700 / 1292	–	–	550 / 1022 850 / 1562
P100 P200	6:00	403 / 757	60 / 108	770 / 1418	5:00	30 / 54	850 / 1562	10:00	700 / 1292	–	550 / 1022 770 / 1418	770 / 1418 850 / 1562
P300 P500 P700	6:00	403 / 757	60 / 108	770 / 1418	5:00	30 / 54	850 / 1562	10:00	700 / 1292	20 / 36	550 / 1022 770 / 1418	770 / 1418 850 / 1562
PX1	6:00	403 / 757	60 / 108	770 / 1418	5:00	30 / 54	850 / 1562	10:00	775 / 1427	–	550 / 1022 770 / 1418	770 / 1418 850 / 1562
EP 600	6:00	403 / 757	60 / 108	770 / 1418	5:00	30 / 54	850 / 1562	10:00	700 / 1292	–	550 / 1022 770 / 1418	770 / 1418 850 / 1562
EP 5000	6:00	403 / 757	60 / 108	770 / 1418	5:00	30 / 54	850 / 1562	10:00	700 / 1292	20 / 36	550 / 1022 770 / 1418	770 / 1418 850 / 1562

With the Programat P100, only programs 65–69 can be used!

Speed Crystallization / Glaze LT

IPS e.max CAD LT with IPS e.max CAD Crystall./Glaze, Shades, Stains and Add-On

Furnace	Closing time S min	Stand-by temperature B °C / °F	Heating rate t ₁ °C / °F	Firing temperature T ₁ °C / °F	Holding time H ₁ min	Heating rate t ₂ °C / °F/min	Firing temperature T ₂ °C / °F	Holding time H ₂ min	Longterm cooling L °C / °F	Cooling rate t ₁ °C / °F/min	Vacuum 1 1 ₁ 1 ₂ °C / °F	Vacuum 2 2 ₁ 2 ₂ °C / °F
P100 P200	6:00	403 / 757	90 / 162	820 / 1508	0:10	30 / 54	840 / 1544	7:00	700 / 1292	–	550 / 1022 820 / 1508	820 / 1508 840 / 1544
P300 P500 P700	6:00	403 / 757	90 / 162	820 / 1508	0:10	30 / 54	840 / 1544	7:00	700 / 1292	20 / 36	550 / 1022 820 / 1508	820 / 1508 840 / 1544
PX1	6:00	403 / 757	90 / 162	820 / 1508	0:10	30 / 54	840 / 1544	7:00	775 / 1427 1:30 min 700 / 1292 0:20 min	–	550 / 1022 820 / 1508	820 / 1508 840 / 1544
EP 600	6:00	403 / 757	90 / 162	820 / 1508	0:10	30 / 54	840 / 1544	7:00	700 / 1292	–	550 / 1022 820 / 1508	820 / 1508 840 / 1544
EP 5000	6:00	403 / 757	90 / 162	820 / 1508	0:10	30 / 54	840 / 1544	7:00	700 / 1292	20 / 36	550 / 1022 820 / 1508	820 / 1508 840 / 1544

With the Programat P100, only programs 65–69 can be used!

FIRING PARAMETERS

IPS e.max Ceram on IPS e.max CAD LT (Staining technique)

IPS e.max Ceram on IPS e.max CAD LT <i>Staining technique</i>	B	S	t↗	T	H	V1	V2
Stain and Characterization firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	770°C 1418°F	1:30 min 1:30 min	450°C 842°F	769°C 1416°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	770°C 1418°F	1:30 min 1:30 min	450°C 842°F	769 °C 1416°F
Add-On after Glaze firing	403°C 757°F	6' 6'	50°C 90°F	700°C 1292°F	1:00 min 1:00 min	450°C 842°F	699°C 1290°F

IPS e.max CAD Crystall./Shades, Stains, Glaze and Add-On on IPS e.max CAD LT (Staining technique)

IPS e.max CAD Crystall./Shade, Stains, Glaze on IPS e.max CAD LT – <i>Staining technique</i>	B	S	t↗	T	H	V1	V2
Stain and Correction firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C/min 108°F/min	840°C 1544°F	3:00 min 3:00 min	450°C 842°F	839°C 1542°F

IPS e.max Ceram on IPS e.max CAD MO / LT (Cut-back and layering technique)

IPS e.max Ceram on IPS e.max CAD <i>Cut-back and layering technique</i>	B	S	t↗	T	H	V1	V2
Wash firing (foundation)	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F
Wash firing (foundation) characterization	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F
1 st dentin/incisal firing	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F
2 nd dentin and incisal firing	403°C 757°F	4:00 min 4:00 min	50°C 90°F	750°C 1382°F	1:00 min 1:00 min	450°C 842°F	749°C 1380°F
Stain firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F
Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F
Add-On with Glaze firing	403°C 757°F	6:00 min 6:00 min	60°C 108°F	725°C 1337°F	1:00 min 1:00 min	450°C 842°F	724°C 1335°F
Add-On after Glaze firing	403°C 757°F	6:00 min 6:00 min	50°C 90°F	700°C 1292°F	1:00 min 1:00 min	450°C 842°F	699°C 1290°F

- The parameters listed represent standard values and apply to the Ivoclar Vivadent furnaces: P200, P300, P500, P700. The temperatures indicated also apply to furnaces of older generations, such as the P20, P80, P90, P95, P100, P200, PX1 and EP 600 Combi. If one of these furnaces is used, however, the temperatures may deviate by ± 10 °C/18 °F, depending on the age and type of the heating muffle.
- If furnaces other than those from Ivoclar Vivadent are used, temperature adjustments may be necessary.
- Regional differences in the power supply or the operation of several electronic devices by means of the same circuit may render adjustments of the firing and press temperatures necessary.

COMBINATION TABLES

Shade selection of the IPS e.max CAD LT Blocks

In order to determine the required ingot shade, both the desired tooth shade (A–D or Bleach BL) and the shade of the preparation (ND1–ND9) is determined. The selection of the block shade is a combination of the desired tooth shade and the actual shade of the preparation. The shades which are not available as blocks are achieved by characterization and/or intensifying the dentin shade. The recommendations are standard values and have to be adjusted by staining, if required.

Shade of preparation	Desired tooth shade: A–D															
	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
IPS Natural Die Material	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
ND 1	LT A1	LT A2	LT A3	LT A3.5	LT A3.5*	LT B1	LT B2	LT B3	LT B3*	LT B1*	LT C2	LT C2*	LT C2*	LT B1*	LT D3	LT D3*
ND 2	LT A1	LT A2	LT A3	LT A3.5	LT A3.5*	LT B1	LT B2	LT B3	LT B3*	LT B1*	LT C2	LT C2*	LT C2*	LT B1*	LT D3	LT D3*
ND 3	LT BL3*	LT A1*	LT A2*	LT A3.5	LT A3.5*	LT B1	LT B2	LT B3	LT B3*	LT B1*	LT C2	LT C2*	LT C2*	LT B1*	LT D3	LT D3*
ND 4	LT BL2*	LT A1*	LT A2*	LT A3*	LT A3*	LT BL3*	LT B1*	LT B2*	LT B3	LT B1*	LT B2*	LT C2*	LT C2*	LT B1*	LT B2*	LT B2*
ND 5	LT BL2*	LT A1*	LT A2*	LT A3*	LT A3*	LT BL3*	LT BL4*	LT B2*	LT B3	LT B1*	LT B2*	LT C2*	LT C2*	LT B1*	LT B2*	LT B2*
ND 6	LT BL1*	LT A1*	LT A2*	LT A3*	LT A3*	LT BL3*	LT BL4*	LT B2*	LT B3*	LT B1*	LT B2*	LT C2*	LT C2*	LT B1*	LT B2*	LT B2*
ND 7	LT BL1*	LT A1*	LT A2*	LT A3*	LT A3*	LT BL3*	LT BL4*	LT B2*	LT B2*	LT B1*	LT B2*	LT C2*	LT C2*	LT B1*	LT B2*	LT B2*
ND 8	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
ND 9	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**

* as a basis for the Staining Technique

** in order to achieve the desired tooth shade, the preparation has to be lightened

Shade of preparation	Desired tooth shade: Bleach BL			
	BL1	BL2	BL3	BL4
IPS Natural Die Material	LT BL1	LT BL2	LT BL3	LT BL4
ND 1	LT BL1	LT BL2	LT BL3	LT BL4
ND 2	LT BL1	LT BL2	LT BL3	LT BL4
ND 3	**	LT BL1	LT BL2	LT BL4
ND 4	**	LT BL1	LT BL2	LT BL4
ND 5	**	LT BL1	LT BL2	LT BL4
ND 6	**	LT BL1	LT BL2	LT BL4
ND 7	**	LT BL1	LT BL2	LT BL4
ND 8	**	**	**	**
ND 9	**	**	**	**

** in order to achieve the desired tooth shade, the preparation has to be lightened

Characterizations – IPS e.max CAD Crystall./Shades and Stains on IPS e.max CAD LT

Individual characterizations and shade adjustments of IPS e.max CAD LT restorations are achieved with IPS e.max CAD Crystall./Shades and IPS e.max CAD Crystall./Stains.

A-D	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
IPS e.max CAD Crystall./Shade	SH 1	SH 1	SH 1	SH 1	SH 1	SH 2	SH 2	SH 2	SH 2	SH 3	SH 3	SH 3	SH 3	SH 4	SH 4	SH 4
IPS e.max CAD Crystall./Shade Incisal	SH I1	SH I1	SH I1	SH I2	SH I2	SH I1	SH I1	SH I1	SH I1	SH I2	SH I2	SH I2	SH I2	SH I2	SH I2	SH I2
IPS e.max CAD Crystall./Stains	white, creme, sunset, copper, olive, khaki, mahogany															

Bleach BL	BL1	BL2	BL3	BL4
IPS e.max CAD Crystall./Shade	SH 0	SH 0	SH 0	SH 0
IPS e.max CAD Crystall./Shade Incisal	SH I1	SH I1	SH I1	SH I1
IPS e.max CAD Crystall./Stains	white, creme, sunset, copper, olive, khaki, mahogany			

Selection of the IPS e.max CAD MO Blocks

IPS e.max CAD MO is available in 5 shades (MO 0–MO 4). The following combination table shows the allocation of the individual block shades to the shade groups of the A-D and Chromascop shade guides. The listed combinations are approximates.

A-D	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4								
IPS e.max CAD	MO 1	MO 1	MO 2	MO 2	MO 4	MO 1	MO 1	MO 3	MO 3	MO 1	MO 4	MO 4	MO 4	MO 4	MO 4	MO 4								
Chromascop	010	020	030	040	110	120	130	140	210	220	230	240	310	320	330	340	410	420	430	440	510	520	530	540
IPS e.max CAD	MO 0		MO 1		MO 2		MO 3		MO 3		MO 4		MO 4		MO 4		MO 4		MO 4		MO 4		MO 4	

QUESTIONS AND ANSWERS

Which type of plaster should be used to fabricate the models?

The instructions of the manufacturer of the CAD/CAM system in use should be observed in the fabrication of the models. The following basic rule applies: Depending on the CAD/CAM system and equipment, special plasters may have to be used for the fabrication of models and dies to ensure the quality of the scan. If a special scanning plaster is unavailable, models and dies can be fabricated with high-strength stone, which is sprayed with IPS Contrast Spray Labside immediately before the scanning procedure.

What kind of preparation requirements must the die demonstrate in order to produce accurately fitting restorations?

The traditional preparation guidelines for all-ceramic restorations apply to IPS e.max CAD. The thickness of the incisal edge of prepared anterior teeth (upper and lower) requires special attention. The prepared incisal edge should be at least as thick as the diameter of the bur used in the cavity. The corresponding instructions of the manufacturer regarding the dimensions of the grinding instruments must be observed during preparation.

Can an incisal edge, which has become too thin during preparation, be adjusted prior to scanning to avoid complicating the try-in procedure after machining?

In cases such as these, we recommend blocking out the incisal edge of the prepared die until the thickness matches that of the bur. These areas will be filled with luting cement when the restoration is seated.

Can IPS e.max CAD LT be used for the fabrication of frameworks that are subsequently fully veneered with IPS e.max Ceram?

IPS e.max CAD LT has been developed for the staining and cut-back technique. Fully veneered restorations with a framework fabricated of IPS e.max CAD LT appear too grey, demonstrate inadequate brightness, and the tooth shade deviates from that of the shade guide. Therefore, only IPS e.max CAD MO should be used for fully veneered restorations.

When should manual adjustments with grinding instruments be done?

All grinding adjustments of milled IPS e.max CAD restorations should be made in the precrystallized (blue) state. It is important to note that the framework in its precrystallized state should be ground only with suitable grinding instruments at low rpms and light pressure to prevent chipping, particularly at the margins.

Can machined IPS e.max CAD restorations in the pre-crystallized (blue) state be completely finished and then crystallized and veneered?

Milled IPS e.max CAD restorations can be tried in on the die and all areas fully finished in the precrystallized (blue) state. Special attention must be paid to the restoration margins in this state. The margins should be created in relation to the preparation and the thickness of the restoration. Margins that are too thin are not suitable for crystallization, as these areas are rounded during this process and therefore shortened. In these cases, the margins should be thinned out after the crystallization process.

Do IPS e.max CAD restorations shrink during crystallization?

During the crystallization process, the micro-structure becomes transformed and densification of 0.2% takes place. The milling software takes this densification factor into account. Therefore, the milled IPS e.max CAD restorations demonstrate precision fit after crystallization.

Why does the auxiliary firing paste IPS Object Fix Putty or Flow have to be used during the crystallization process?

In order to prevent distortion of the IPS e.max CAD restoration during crystallization, IPS Object Fix Putty or Flow are used. They support the restoration in an optimum manner and thus ensure exact accuracy of fit after crystallization.

Can firing pastes other than IPS Object Fix Putty or Flow be used in the crystallization process?

IPS Object Fix Putty or Flow has been specially developed for the crystallization of IPS e.max CAD restorations. The expansion behaviour has been optimally coordinated with IPS e.max CAD. In other words, the consistency before and after the crystallization allows the paste to be easily applied and cleanly removed. Other pastes must not be used as they are not easy to remove. Destructive blasting with Al₂O₃ or glass polishing beads is necessary to remove these pastes. Furthermore, other pastes may damage glass-ceramic surfaces because of their compositions.

How are contaminations with IPS Object Fix Putty or Flow on the outer surface of the restorations best removed before crystallization?

A (short-hair) brush or cotton swab dampened with water can be used for cleaning. It must be made sure that any residue has been removed before Shades, Stains or Glaze are applied in order to prevent the residue from being burned in.

Can other firing trays, e.g. "honeycomb" trays, be used for the crystallization of IPS e.max CAD?

No other firing trays should be used. The IPS e.max CAD Crystallization Tray contained in the assortment stores the heat necessary for a slow and above all tension-free cooling of the glass-ceramic. The firing trays, e.g. "honeycomb" trays, cannot store heat and therefore cool down too quickly, creating tension in the ceramic.

Can furnaces other than those from Ivoclar Vivadent be used to crystallize IPS e.max CAD restorations?

The crystallization of IPS e.max CAD is specially coordinated with the Ivoclar Vivadent ceramic furnaces (eg Programat P300, P500, P700). If you would like to use other, untested ceramic furnaces, please consult Ivoclar Vivadent about their compatibility with IPS e.max CAD. It is important to note that not any ceramic furnace can be used for crystallization. Ceramic furnaces that do not feature a controlled long-term cooling mode or vacuum cannot be used for this purpose.

Can the crystallization quality of IPS e.max CAD restorations be controlled?

Optical checks can be conducted with the help of the accompanying material shade guide. If the shade and opacity are comparable to that of the material shade guide, the crystallization process has been carried out successfully. The colours must always be compared on a neutral background in incident light. If the colour and opacity of the restorations are different from the shade guide, eg too translucent, a new restoration must be milled. Crystallization cannot be repeated.

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

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

Can IPS Empress Universal Shades, Stains and Glaze be used on IPS e.max CAD?

*IPS Empress Universal Shades, Stains and Glaze have been specially developed for the IPS Empress System. They **cannot** be used with IPS e.max products.*

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

IPS e.max CAD restorations **must not** be blasted with Al₂O₃ or glass polishing beads before veneering and placement, as this would damage the ceramic surface and change the outstanding physical properties.

How must the internal (bonding) surface of IPS e.max CAD restorations be conditioned before cementation?

The internal (bonding) surfaces of IPS e.max CAD restorations must always be etched with hydrofluoric acid etching gel (IPS Ceramic Etching Gel) for 20 seconds, irrespective of whether they are cemented with adhesive, self-adhesive or conventional methods. The resulting retentive pattern enables an enhanced bond both with adhesives and self-adhesives, as well as conventional bonding agents. After etching, the glass-ceramics are silanated using Monobond-S when adhesive or self-adhesive cementation is used. With conventional cementation, silanating is not necessary.

Can IPS e.max CAD restorations be conventionally cemented?

IPS e.max CAD restorations can be cemented adhesively, self-adhesively, or conventionally. If the restoration is to be conventionally cemented, the tooth has to demonstrate adequate retentive preparation. If this is not possible, adhesive luting is preferred, e.g. with Variolink® II or Multilink® Automix. For self-adhesive cementation, Multilink Sprint can be used. Self-adhesive cementation materials combine the properties of adhesive and conventional cementation materials. However, they are easier to use than a conventional cement. It is not advisable to use classical phosphate cements, as they would negatively influence the light transmission of the all-ceramic and therefore compromise the aesthetic appearance of all-ceramic restorations.

Can IPS e.max CAD Crystall./Shades, Stains, Glaze and IPS e.max Ceram Stains and Essence be used together?

No. Since the IPS e.max CAD Crystall. and the IPS e.max Ceram materials have to be fired in a different manner, the materials cannot be mixed or applied at the same time.

Which materials should be used if after combination firing (crystallization and Glaze firing in one step) additional shade adjustments are necessary?

Since the characterizations have already been carried out using the IPS e.max CAD Crystall./Shades and Stains for a combination firing, IPS e.max CAD Crystall./Shades and Stains have to be used again for any corrective firing.

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