

# IPS e.max® Ceram

## [en] Instructions for Use

- Fluorapatite layering ceramic
- Stains and Glazes
- Ceramic mixing liquid

Rx ONLY

CE 0123

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**ivoclar**

English

### 1 Intended use

#### Intended purpose

- All-ceramic materials for the veneering of IPS e.max lithium disilicate and zirconium oxide restorations (CTE range of 10.5–11.0 x 10<sup>-6</sup>/K (25–500 °C))
- layering of veneers

#### Patient target group

- Patients with permanent teeth

#### Intended users

- Dentists (clinical procedure)
- Dental laboratory technicians (fabrication of restorations in the laboratory)

#### Special training

No further special training is needed.

#### Usage

For dental use only.

#### Description

The IPS e.max® Ceram group of products consists of a wide range of different layering, characterization and glazing materials for the veneering and characterization of IPS e.max lithium disilicate and zirconium oxide restorations (CTE range of 10.5–11.0 x 10<sup>-6</sup>/K (25–500 °C)) and for the layering of veneers.

Product name	Product description
IPS e.max Ceram ZirLiner	Characterization of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region
IPS e.max Ceram Margin	Fabrication of ceramic margins on zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region
IPS e.max Ceram Cervical Transpa	Characterization of the cervical area of IPS e.max Ceram veneers in the anterior and posterior region
IPS e.max Ceram Deep Dentin IPS e.max Ceram Dentin IPS e.max Ceram Power Dentin	Veneering of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region; veneering of IPS e.max lithium disilicate frameworks in the anterior and posterior region; layering of veneers in the anterior region

IPS e.max Ceram Gingiva IPS e.max Ceram Intensive Gingiva	Veneering of the gingival area of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region; veneering of the gingival area of IPS e.max lithium disilicate frameworks in the anterior and posterior region
IPS e.max Ceram Inter Incisal IPS e.max Ceram Incisal IPS e.max Ceram Incisal Edge IPS e.max Ceram Special Incisal IPS e.max Ceram Mamelon IPS e.max Ceram Opal Effect	Characterization of the incisal area of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior region; characterization of the incisal area of IPS e.max lithium disilicate frameworks in the anterior region; characterization of layered veneers in the anterior region
IPS e.max Ceram Occlusal Dentin	Characterization of the occlusal area of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the posterior region; characterization of the occlusal area of IPS e.max lithium disilicate frameworks in the posterior region
IPS e.max Ceram Power Incisal	Veneering of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region in combination with IPS e.max Ceram Power Dentin; veneering of IPS e.max lithium disilicate frameworks in the anterior and posterior region in combination with IPS e.max Ceram Power Dentin; layering of veneers in the anterior region in combination with IPS e.max Ceram Power Dentin
IPS e.max Ceram Selection: - IPS e.max Ceram Special Enamel - IPS e.max Ceram Light Reflector - IPS e.max Ceram Light Absorber	Veneering of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior region; veneering of IPS e.max lithium disilicate frameworks in the anterior region; layering of veneers in the anterior region
IPS e.max Ceram Transpa IPS e.max Ceram Transpa Incisal	Characterization of zirconium oxide frameworks (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region; characterization of IPS e.max lithium disilicate frameworks in the anterior and posterior region; characterization of layered veneers in the anterior region
IPS e.max Ceram Add-On IPS e.max Ceram Add-On Margin	Adjustment of all-ceramic IPS e.max Ceram restorations in the anterior and posterior region
IPS e.max Ceram Glaze Paste IPS e.max Ceram Glaze Powder IPS e.max Ceram Glaze Spray	Glazing of all-ceramic IPS e.max Ceram restorations in the anterior and posterior region, in particular glazing of full-contour zirconium oxide restorations (CTE range of 10.5–11.0 x 10 <sup>-6</sup> /K (25–500 °C)) in the anterior and posterior region; glazing of full-contour IPS e.max lithium disilicate restorations in the anterior and posterior region

IPS e.max Ceram Glaze Paste FLUO IPS e.max Ceram Glaze Powder FLUO	Fluorescent glazing of all-ceramic IPS e.max Ceram restorations in the anterior and posterior region, in particular glazing of full-contour zirconium oxide restorations (CTE range of $10.5\text{--}11.0 \times 10^{-6}/\text{K}$ ( $25\text{--}500\text{ }^{\circ}\text{C}$ )) in the anterior and posterior region; glazing of full-contour IPS e.max lithium disilicate restorations in the anterior and posterior region
IPS e.max Ceram Essence IPS e.max Ceram Shade	Characterization of IPS e.max Ceram veneers in the anterior and posterior region; characterization of layered veneers in anterior teeth; characterization of zirconium oxide frameworks (CTE range of $10.5\text{--}11.0 \times 10^{-6}/\text{K}$ ( $25\text{--}500\text{ }^{\circ}\text{C}$ )) in the anterior and posterior region; characterization of IPS e.max lithium disilicate frameworks in the anterior and posterior region

#### Accessories of the medical product:

Product name	Product description
IPS e.max Glaze and Stain Liquid longlife IPS e.max Ceram Glaze and Stain Liquid allround	Mixing of IPS e.max Ceram Stains and Glazes for all-ceramic restorations in the anterior and posterior region
IPS e.max Ceram ZirLiner Build-Up Liquid allround	Mixing of IPS e.max Ceram ZirLiner layering materials for all-ceramic restorations in the anterior and posterior region
IPS e.max Ceram Margin Build-Up Liquid allround	Mixing of IPS e.max Ceram Margin layering materials for all-ceramic restorations in the anterior and posterior region
IPS Build-Up Liquid soft	Mixing of IPS e.max Ceram layering materials in the anterior and posterior region
IPS Build-Up Liquid allround	Mixing of IPS e.max Ceram layering materials in the anterior and posterior region

#### Technical data

Property	Specification	Typical mean value
CTE ( $25\text{--}400\text{ }^{\circ}\text{C}$ )	$9.4 \pm 0.5 \times 10^{-6}/\text{K}$	–
Flexural strength (biaxial)	$\geq 50\text{ MPa}$	90 MPa
Chemical solubility	$< 100\text{ }\mu\text{g}/\text{cm}^2$	–
Type / Class	Type I / Class 1	–

The performance criteria defined in ISO 6872:2015 Dentistry – Ceramic materials are met.

#### Indications

- Missing tooth structure in the anterior and posterior region
- Partial edentulousness in the anterior and posterior region

#### Areas of application:

- Characterization and veneering of: IPS e.max Press / IPS e.max CAD (crystallized) / IPS e.max ZirCAD (sintered), except IPS e.max ZirCAD MT Multi
- Veneers on refractory dies
- Characterization and veneering of  $\text{ZrO}_2$  frameworks made of competitive materials in a CTE range of  $10.5\text{--}11.0 \times 10^{-6}/\text{K}$  ( $25\text{--}500\text{ }^{\circ}\text{C}$ )

#### Contraindications

The use of this product is contraindicated if the patient is known to be allergic to any of the ingredients.

#### Restrictions of use

- Untreated bruxism (a splint is indicated after incorporation)
- Patients with severely reduced residual dentition
- Veneering of metal frameworks
- Any other use not listed in the indications
- Failure to observe the indicated veneering layer thicknesses
- Failure to observe the layer thickness ratio between the framework and layering ceramic
- Mixing and processing with other dental ceramics
- Zirconium oxide frameworks with a CTE other than the one required must not be veneered.
- Veneering of zirconium oxide frameworks which were not conditioned according to the stipulations for IPS e.max ZirCAD, e.g. blasted with  $\text{Al}_2\text{O}_3$ .
- Veneering of IPS e.max ZirCAD MT Multi
- IPS e.max Ceram ZirLiner and Margin materials should not be used on IPS e.max Press and IPS e.max CAD.
- The final restoration must not be reused.

#### Side effects

There are no known side effects to date.

#### Interactions

There are no known Interactions to date.

#### Clinical benefit

- Restoration of the chewing function
- Restoration of esthetics

#### Composition

Product components	Composition
Layering materials: IPS e.max Ceram, IPS e.max Ceram Impuls, IPS e.max Ceram Selection	– Dental ceramic – Glass – Pigments
IPS Model Sealer	– Ethylacetate – Nitro-cellulose – Acetyltri-n-butylcitrate
IPS Ceramic Separating Liquid	– Paraffin oil
IPS Margin Sealer	– Hexane – Polyvinyl ether
IPS e.max Ceram Shade	– Glass – Butane-1,3-diol – Glycerine – Polyvinyl pyrrolidone – Pigments
IPS e.max Ceram Essence	– Glass – Pigments
IPS e.max Ceram Glaze Powder - FLUO	– Glass – Pigments
IPS e.max Ceram Glaze Paste - FLUO	– Glass – Butane-1,3-diol – Glycerine – Polyvinyl pyrrolidone – Pigments
IPS e.max Ceram Glaze Spray	– Glass – 2-propanol – Isobutane

#### Accessories of the medical product:

Product components	Composition
IPS Build-Up Liquid (allround)	– Water – Butane-1,3-diol – Zinc chloride
IPS Build-Up Liquid (soft)	– Water – Propane-1,2-diol – Zinc chloride
IPS e.max Ceram Glaze and Stain Liquid (allround)	– Butane-1,3-diol
IPS e.max Ceram Glaze and Stain Liquid (longlife)	– Pentane-1,5-diol
IPS e.max Ceram Margin Build-Up Liquid	– Water – Hydroxyethyl cellulose – Zinc chloride
IPS e.max Ceram ZirLiner Build-Up Liquid	– Water – Butane-1,3-diol – Zinc chloride

**Designation/explanation of the materials**

*IPS e.max Ceram layering materials:*


- ZirLiner (only for ZrO<sub>2</sub>)  
IPS e.max Ceram ZirLiner are special ceramic materials that achieve a reliable bond with zirconium oxide. They are used to match the desired tooth shade and produce a true-to-nature in-depth fluorescence.
- Margin (only for ZrO<sub>2</sub>)  
The IPS e.max Ceram Margin materials demonstrate a somewhat higher opacity and fluorescence than the IPS Style Ceram Dentin materials and thus enable the design of ceramic shoulders.
- Deep Dentin  
IPS e.max Ceram Deep Dentin are opaque Dentin materials used in areas with limited layer thicknesses and in incisal areas.
- Dentin  
The shade and translucency of the IPS e.max Ceram Dentin materials have been adjusted to simulate natural dentin. They permit the correct reproduction of the selected dentin shade on opaque framework structures.
- Power Dentin  
IPS e.max Ceram Power Dentin materials demonstrate increased opacity and brightness compared to the conventional Dentin materials. They are particularly recommended for the use on translucent framework structures.
- Transpa Incisal  
The IPS e.max Ceram Incisal materials are modelled according to the natural incisal material. In combination with the Dentin materials, they help achieve the correct A-D shade on opaque framework structures.
- Power Incisal  
The IPS e.max Ceram Power Incisal materials are modelled according to the natural incisal material. In combination with the Power Dentin materials, they help achieve the correct A-D shade on translucent framework structures.
- Gingiva  
The IPS e.max Ceram Gingiva materials are specially shaded ceramic materials for the lifelike reconstruction of gingiva components. They are adjusted to the Gingiva Solution shade concept of Ivoclar.
- Add-On  
The IPS e.max Ceram Add-On materials are used for the adjustment of e.g. contact points, pontic rests or the accuracy of fit of shoulders. Adjustments can be made together with the Glaze firing or after Glaze firing. There are four IPS e.max Ceram Add-On materials available for the various requirements.

*IPS e.max Ceram Impulse layering materials:*

- Opal Effect  
IPS e.max Ceram Opal Effect materials are specially shade incisal materials. They enable the imitation of the dynamic light-optical abilities of natural teeth.
- Mamelon  
The IPS e.max Ceram Mamelon materials are intensive, opaque effect materials for the accentuation of the incisal third. Depending on the working habits of the user, the materials are applied in thin stripes on reduced dentin.
- Transpa  
The IPS e.max Ceram Transpa materials are available in different shade nuances. They are suitable to reproduce shaded, transparent areas, particularly in the incisal third.
- Special Incisal  
The IPS e.max Ceram Special Incisal materials may either be mixed with the IPS e.max Incisal materials to modify and intensify the shade or applied directly.
- Inter Incisal  
The IPS e.max Ceram Inter Incisal material is used to increase the brightness value of the incisal third. It is applied directly on the dentin in an implied butterfly shape.
- Cervical Transpa  
The IPS e.max Ceram Cervical Transpa materials reproduce the shades with a more intensive translucency and support the lifelike transition from the gingiva to the veneer.
- Incisal Edge  
The IPS e.max Ceram Incisal Edge material is used to achieve what is known as the halo effect, which occurs in natural teeth by the refraction of light at the incisal edge.

- Occlusal Dentin  
The IPS e.max Ceram Occlusal Dentin materials are used to apply characterizations particularly in the occlusal area. They can also be used in the cervical, palatal and lingual areas.
- IPS e.max Ceram Selection layering materials  
IPS e.max Ceram Selection are specially shaded enamel and effect materials. They are used in combination with the existing IPS e.max Ceram materials.

**2 Usage**

-  **Note:**
- The correct preparation of the surface depends on the material of the restoration. Procedure according to the Instructions for Use of the respective material.
  - Avoid contamination of the inner aspects of the restoration.


**I. IPS e.max Ceram layering ceramics**

**Mixing of the layering materials**

Use the IPS Build-Up Liquid allround or soft to mix the layering materials. (ZirLiner layering materials are mixed with IPS e.max Ceram ZirLiner Build-Up Liquid, Margin layering materials with IPS e.max Ceram Margin Build-Up Liquid). Use distilled water to rewet the layering materials.

**Layering diagram**

The layering diagram of IPS e.max Ceram has been designed in such a way that easy and reliable shade reproduction is possible, irrespective of the framework material or framework shade. A proportional framework design that supports both shape and cusps represents the ideal basis. Depending on the pre-shade of the framework, the use of ZirLiner is recommended for zirconium oxide.


 **Important:** When using ZrO<sub>2</sub> materials from other manufacturers, the use of ZirLiner is recommended for both pre-shaded and non-shaded frameworks.

Layering diagram for zirconium oxide (ZrO <sub>2</sub> ) – e.g. IPS e.max ZirCAD	Layering diagram for lithium disilicate (LS <sub>2</sub> ) – e.g. IPS e.max Press, IPS e.max CAD	Layering diagram for veneers made of IPS e.max Ceram on refractive dies
ZrO <sub>2</sub> framework	LS <sub>2</sub> framework	Model fabrication
↓	↓	↓
ZirLiner	Wash firing	Wash firing
↓	↓	↓
Wash firing	Dentin	Cervical
↓	↓	↓
Dentin	Incisal	Dentin/Impuls
↓		↓
Incisal		Incisal

**Veneering of frameworks**

Framework design and preparation (ZrO<sub>2</sub> and LS<sub>2</sub>)

The framework design for the layering technique must always support the shape of the restoration and the cusps in order to obtain an even layer thickness of the veneer with IPS e.max Ceram. Failure to observe the stipulated design criteria and minimum thicknesses for ZrO<sub>2</sub> and LS<sub>2</sub> frameworks may result in clinical failure, such as cracks, delamination and ultimately to fracture of the restoration. Please refer to the Instructions for Use of the respective framework material for further information regarding the framework design and preparation, as well as further processing techniques (e.g. cut-back technique).

 The restoration must be free of dirt and grease prior to every firing procedure. Any contamination after cleaning must be prevented.

ZirLiner firing (ZrO<sub>2</sub>)

Mix the IPS e.max Ceram ZirLiner in the desired shade with the respective IPS e.max Ceram ZirLiner Build-Up Liquid to a creamy consistency and apply in an even, covering layer. After that, conduct the ZirLiner firing (see firing parameters).

### Margin firing (optional) (ZrO<sub>2</sub>)

Before the ceramic margin is designed, cover the model die with IPS Margin Sealer and allow it to dry. Subsequently isolate with IPS Ceramic Separating Liquid. Mix IPS e.max Ceram Margin with the respective IPS e.max Margin Build-Up Liquid. Apply the material, allow it to dry and carefully lift it from the dies. Then, conduct the 1<sup>st</sup> Margin firing (see firing parameters).

Fit the shoulder and adjust, if necessary. Isolate the die.

Then, conduct the 2<sup>nd</sup> Margin firing (see firing parameters).

### Wash firing (Foundation) (ZrO<sub>2</sub> and LS<sub>2</sub>)

The Wash firing is conducted with IPS Ivocolor Stains and Glazes and/or IPS e.max Ceram layering materials.

- ZrO<sub>2</sub> frameworks, pre-shaded and non-shaded  
The low heat conductivity of zirconium oxide always requires a Wash firing, even if a ZirLiner firing was conducted beforehand. The Wash firing ensures controlled sintering of the ceramic onto the framework surface and thus enables a homogeneous bond.  
Variant A: Wash firing with IPS e.max Ceram  
Mix IPS e.max Ceram layering material (e.g. Deep Dentin, Dentin material) with IPS Build-Up Liquid. Apply wash in a thin coat covering the entire framework. After that, conduct the Wash firing (foundation) (see firing parameters).  
Variant B: Wash firing with IPS Ivocolor and IPS e.max Ceram (sprinkle technique)  
Mix Stains and Glazes (FLUO) with IPS Ivocolor Mixing Liquid allround or longlife (see Instructions for Use) and apply in a thin coat that covers the entire framework. Sprinkle on IPS e.max Ceram layering material with a dry brush and carefully blow off/tap off any excess. After that, conduct the Wash firing (foundation) (see firing parameters).
- LS<sub>2</sub> frameworks  
Variant A: Wash firing with IPS e.max Ceram  
Mix IPS e.max Ceram layering material with IPS Build-Up Liquid. Apply wash in a thin coat covering the entire framework. After that, conduct the Wash firing (foundation) (see firing parameters).  
Variant B: Conduct Wash firing with IPS Ivocolor Stains and Glazes  
Mix Stains and Glazes (FLUO) with IPS Ivocolor Mixing Liquid allround or longlife (see Instructions for Use) and apply in a thin coat that covers the entire framework. After that, conduct the Wash firing (foundation) (see firing parameters).  
Variant C: Wash firing with IPS Ivocolor and IPS e.max Ceram (sprinkle technique)  
Mix and apply Stains and Glazes (FLUO) as described for Variant B. Sprinkle on IPS e.max Ceram layering material using a dry brush and carefully blow off/tap off any excess. After that, conduct the Wash firing (foundation) (see firing parameters).

### Layering and firing the Dentin and Incisal material

- 1<sup>st</sup> Dentin/Incisal firing (ZrO<sub>2</sub> and LS<sub>2</sub>)  
Before the Dentin/Incisal layering, seal the stone die and adjacent model areas with IPS Model Sealer. Additionally, isolate the pontic areas with IPS Ceramic Separating Liquid. Mix the required layering materials with IPS Build-Up Liquid allround or soft. Layer the respective layering materials according to the layering diagram. Then, conduct the 1<sup>st</sup> Dentin/Incisal firing (see firing parameters).
- 2<sup>nd</sup> Dentin/Incisal firing (ZrO<sub>2</sub> and LS<sub>2</sub>)  
Finish the restoration surface with suitable grinding instruments and clean thoroughly. Cleaning is carried out with ultrasound in a water bath or with the steam jet. If there is still superficial contamination after cleaning, blasting the surface with Al<sub>2</sub>O<sub>3</sub> Type 100 at 1 bar (30 psi) pressure is required. Separate adjacent model components (e.g. adjacent teeth, pontic rests) once again with IPS Ceramic Separating Liquid. Thoroughly dry the restoration and complete missing areas using layering materials. Pay particular attention to the proximal and antagonist contacts. Then, conduct the 2<sup>nd</sup> Dentin/Incisal firing (see firing parameters). If additional Dentin/Incisal firing cycles are required, they are conducted using the firing parameters of the 2<sup>nd</sup> Dentin/Incisal firing.

### Stain / Glaze firing (ZrO<sub>2</sub> and LS<sub>2</sub>)

- Finishing and preparation for the Stain and Glaze firing (ZrO<sub>2</sub> und LS<sub>2</sub>)  
Finish the restoration with suitable grinding instruments. Areas which should exhibit a higher gloss after Glaze firing can be smoothed out and prepolished using silicone polishers. Thoroughly clean the restoration with the steam jet and dry with oil-free air.
- Stain and Glaze firing (ZrO<sub>2</sub> and LS<sub>2</sub>)  
The Stain and Glaze firing is conducted with IPS Ivocolor Stains and Glazes. Detailed information on processing and the corresponding firing parameters can be found in the respective Instructions for Use.

### Add-On firing (ZrO<sub>2</sub> and LS<sub>2</sub>)

- Variant A: Add-On with Glaze firing  
For minor adjustments applied together with the Glaze firing, mix IPS e.max Ceram Add-On Margin pure with IPS Margin Build-Up Liquid and supplement the missing margin areas after the Glaze has been applied. Mix IPS e.max Ceram Add-On Dentin and Incisal in a 50:50 ratio with Dentin and Transpa Incisal. After the Glaze has been applied, apply the Add-On material on the respective areas. Subsequently, conduct the Add-On with Glaze firing (see firing parameters).
- Variant B: Add-On after Glaze firing  
For necessary adjustments after completion and try-in on the patient, apply IPS e.max Ceram Add-On Dentin and Incisal pure to the corresponding areas. Subsequently, conduct the Add-On after Glaze firing (see firing parameters).



- After the corrective firing, polish the supplemented areas to a high gloss using suitable polishing instruments (e.g. rubber polishers).
- Polish the restoration using suitable polishing instruments after any adjustment.

### **Fabrication of veneers on refractory dies**

#### Model fabrication

Duplicate the working model, or the individual dies, respectively, and subsequently cast using a commercial refractory die material, e.g. BegoForm® from Bego, Cosmotech VEST from GC (the instructions of the respective manufacturer must be observed).



The refractory die model must be soaked in distilled water for approximately 5–10 minutes before each working step.

#### Wash firing

Soak and degas the dies after firing. Mix IPS e.max Ceram materials (preferable Add-On materials) with IPS Build-Up Liquid. Apply the wash in a very thin coat entirely covering the prepared areas. Then, conduct the Veneer Wash firing (see firing parameters).

#### Cervical firing

The cervical areas are built-up using IPS e.max Ceram Deep Dentin. Then, conduct the Veneer Cervical firing (see firing parameters).

#### Dentin/Impuls firing

Internal layering is modelled following the natural characteristics and consists of a dentin build-up and various individual effects. Then, conduct the Veneer Dentin/Impuls firing (see firing parameters).

#### Incisal firing

Build-up the outer enamel layer using Incisal and Transpa materials. If necessary, additional corrective firing cycles using the same parameters may be conducted. Then, conduct the Veneer Incisal firing (see firing parameters).

#### Stain and Glaze firing

Conduct the Stain and Glaze firing using IPS Ivocolor Stains and Glazes. Detailed information on processing can be found in the respective Instructions for Use. After that, conduct the Veneer Stain and Glaze firing with IPS Ivocolor (see firing parameters).

#### Divesting the veneer

Remove large amounts of die with a grinding disk. After that, blast the inner aspect of the veneer with polishing jet medium at max. 1 bar (30 psi) pressure to remove all traces of die material.

## Firing parameters – IPS e.max Ceram layering ceramic


### General important notes on firing

- If a non-Ivoclar furnace is used, temperature adjustments may be necessary.
- At the beginning of the firing procedure, open the furnace and wait for the acoustic signal. Subsequently, place the firing tray with the objects in the centre of the firing table and start the program.  
With the infrared technology active, position the objects in such a way that the infrared camera has a wide view of the objects.
- Remove IPS e.max objects from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs/tweezers.
- Do not blast or quench the objects.

### IPS e.max Ceram on IPS e.max Press or IPS e.max CAD (cut-back and layering technique)

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

\* IRT standard mode

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

### Firing of lithium disilicate glass-ceramic (LS<sub>2</sub>)-supported restorations

- Use the honey-comb firing tray and support pins that belong to the furnace to fire the restorations.
- Ceramic pins must not be used, since they may fuse to the restoration.
- The processing temperatures must be observed.  
An increase in the firing temperature results in severe vitrification between the framework and the veneering ceramic, which may lead to delayed cracks. A decrease in the firing temperature causes the ceramic to be underfired and very brittle, which may lead to delamination.
- The parameters stipulated in the Instructions for Use are coordinated with Ivoclar furnaces (tolerance range ± 10°C / 18°F).

## IPS e.max Ceram on IPS e.max ZirCAD, IPS e.max ZirPress or Zenostar (cut-back and layering technique)

	ZirLiner firing 1)	1 <sup>st</sup> and 2 <sup>nd</sup> Margin firing 2)	Wash firing (Foundation) 3)	1 <sup>st</sup> Dentin/Incisal firing 3)	2 <sup>nd</sup> Dentin/Incisal firing 3)	Stain firing with IPS Ivocolor	Glaze firing with IPS Ivocolor 4)	Add-On with Glaze firing	Add-On after Glaze firing
Stand-by temperature B [°C/°F]	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757
Closing time* S [min]	IRT / 04:00	IRT / 04:00	IRT / 04:00	IRT / 04:00	IRT / 04:00	IRT / 06:00	IRT / 06:00	IRT / 06:00	IRT / 06:00
Heating rate t <sub>r</sub> [°C/°F/min]	40 / 72	40 / 72	90 / 162	90 / 162	90 / 162	60 / 108	60 / 108	60 / 108	50 / 90
Firing temperature T <sub>1</sub> [°C/°F]	960 / 1760	800 / 1472	650 / 1202	650 / 1202	650 / 1202	710 / 1310	710 / 1310	710 / 1310	700 / 1292
Holding time H <sub>1</sub> [min]	01:00	01:00	00:00	00:00	00:00	01:00	01:00	01:00	01:00
Heating rate t <sub>r</sub> [°C/°F/min]	-	-	20 / 36	20 / 36	20 / 36	-	-	-	-
Firing temperature T <sub>2</sub> [°C/°F]	-	-	730 / 1346	730 / 1346	730 / 1346	-	-	-	-
Holding time H <sub>2</sub> [min]	-	-	02:00	02:00	02:00	-	-	-	-
Vacuum 1 1 <sub>1</sub> [°C/°F] 1 <sub>2</sub> [°C/°F]	450/842	450/842	400/752 650/1202	400/752 650/1202	400/752 650/1202	450/842	450/842	450/842	450/842
Vacuum 2 2 <sub>1</sub> [°C/°F] 2 <sub>2</sub> [°C/°F]	959/1758	799/1470	650/1202 729/1344	650/1202 729/1344	650/1202 729/1344	709/1308	709/1308	709/1308	699/1290
Long-term cooling** L [°C/°F]	0	0	0	0	0	450 / 842	450 / 842	450 / 842	450 / 842
Cooling rate t <sub>c</sub> [°C/°F/min]	0	0	0	0	0	0	0	0	0


\* IRT standard mode \*\* Long-term cooling for the last firing

1) before wax-up and pressing with IPS e.max ZirPress

2) not for use with IPS e.max ZirPress

3) For an optimum firing result for multi-unit bridges (4–14 units), the holding time H<sub>2</sub> should be increased to 3 min.

4) For multi-unit ZrO<sub>2</sub> bridges with massive pontics, the heating rate must be reduced to 45°C/min (81°F/min) for the Glaze firing with IPS Ivocolor.

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


### Firing process for zirconium oxide (ZrO<sub>2</sub>)-supported restorations

- The heating of the firing chamber depends on the type of furnace, as well as on the size of the firing chamber.
- The parameters stipulated in the Instructions for Use are coordinated with Ivoclar furnaces (tolerance range ± 10°C / 18°F).

### IPS e.max Ceram on refractory dies (veneering technique)

	Veneer Wash firing with IPS e.max Ceram Add-On	Veneer Wash firing with IPS e.max Ceram Dentin/Transpa	Veneer Cervical firing	Veneer Dentin/Impulse firing	Veneer Incisal firing	Veneer Stain and Glaze firing with IPS Ivocolor
Stand-by temperature B [°C/°F]	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757	403 / 757
Closing time* S [min]	IRT / 08:00	IRT / 08:00	IRT / 08:00	IRT / 08:00	IRT / 08:00	IRT / 08:00
Heating rate t <sub>r</sub> [°C/°F/min]	50 / 90	50 / 90	50 / 90	50 / 90	50 / 90	50 / 90
Firing temperature T [°C/°F]	720 / 1328	780 / 1436	770 / 1418	770 / 1418	770 / 1418	740 / 1346
Holding time H [min]	01:00	01:00	01:00	01:00	01:00	01:00
Vacuum 1 1 [°C/°F]	450 / 842	450 / 842	450 / 842	450 / 842	450 / 842	450 / 842
Vacuum 2 2 [°C/°F]	719 / 1326	779 / 1434	769 / 1416	769 / 1416	769 / 1416	739 / 1362
Long-term cooling** L [°C/°F]	0	0	0	0	0	0
Cooling rate t <sub>c</sub> [°C/°F/min]	0	0	0	0	0	0

\* IRT standard mode

 Depending on the furnace type, the firing temperature may be adjusted by  $\pm 5^{\circ}\text{C}/9^{\circ}\text{F}$ , max.  $\pm 10^{\circ}\text{C}/18^{\circ}\text{F}$ .

#### Firing of IPS e.max Ceram veneers

- The firing parameters for the fabrication of veneers must be observed.
- The prolonged closing time ensures a gentle and complete drying of the refractory die material and thus enables achieving a homogeneous firing result.

## II. IPS e.max Ceram Stains and Glazes

### Characterization and staining of frameworks

#### IPS e.max Ceram Shades

IPS e.max Ceram Shades for A-D shades are used for the final shade modifications of IPS e.max restorations. IPS e.max Ceram Shades Incisal are particularly suitable for full-contour restorations. They are used to imitate the incisal area and provide the incisal third with an optical translucency and in-depth effect. Mix the ready-to-use pastes with IPS e.max Ceram Glaze and Stain Liquid to the desired consistency, if required. For better wetting of the Stains and Glaze materials, a small amount of Glaze and Stain Liquid can be applied on the surface. IPS Ivocolor is then applied in a thin layer.

#### IPS e.max Ceram Essence

IPS e.max Ceram Essence powders are used for internal characterizations, to mix with other IPS e.max Ceram powders and for final superficial external characterization. Depending on their shading, the very fine powders are more or less fluorescing. The IPS e.max Ceram Glaze and Stain liquids are used for mixing. The final shade is then applied in a thin layer.

#### IPS e.max Ceram Glaze Powder/Paste

IPS e.max Ceram Glaze powders/pastes are intended for glazing the restoration. Mix the powders/pastes with IPS e.max Ceram Glaze and Stain Liquid to the desired consistency. The liquid is mixed with Glaze powder/paste to a homogeneous consistency. The final glaze is applied in an even, covering layer to all areas of the restoration.

#### IPS e.max Ceram Glaze Powder/Paste - FLUO

IPS e.max Ceram Glaze powders/pastes - FLUO are intended for glazing the restoration. Mix the powders/pastes with IPS e.max Ceram Glaze and Stain Liquid to the desired consistency. The liquid is mixed with glaze powder/paste - FLUO to a homogeneous consistency. The final glaze is then applied in an even, covering layer to all areas of the restoration. Fluorescing glazes are particularly suitable for restorations that are not veneered with IPS e.max Ceram. Also, they are to be used for full-contour and partially reduced frameworks with low to no fluorescence.

#### IPS e.max Ceram Glaze Spray

IPS e.max Ceram Glaze Spray is intended for quick and easy glazing of full-contour pressed, milled or layered IPS e.max restorations. Shake the IPS e.max CAD Crystall./Glaze Spray well immediately before use until the mixing ball in the container is moving freely (approximately 20 seconds). If the can is not shaken sufficiently, the spray will contain mainly propellant. This means there will be an insufficient coverage of glazing powder. Observe a distance of 10 cm between the nozzle and the surface to be sprayed and keep the can as vertical as possible during spraying. Spray the restoration from all sides with short bursts while simultaneously rotating the restoration so that an even layer is created. Shake the spray can again between individual bursts. Wait briefly 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. If the glaze spray accidentally reached the inner aspects of the restoration, remove it with a dry short-hair brush.

#### IPS e.max Ceram Glaze and Stain Liquid allround

Liquid for mixing all IPS Ceram Shade, Essence and Glaze powders and pastes. The Liquid allround enables consistency adjustment for conventional processing. Powders mixed with the Liquid allround are workable for a shorter period of time (approximately 1/2 day).

#### IPS e.max Ceram Glaze and Stain Liquid longlife

Liquid for mixing all IPS Ceram Shade, Essence and Glaze powders and pastes. The Liquid longlife enables a rather pasty consistency of the materials. The mixed powders remain workable for a longer period of time (approximately 1 week).

- The set consistencies affect the application behaviour and the firing result. If the glazing material is applied correctly, the restoration demonstrates an even gloss after firing and obtains the surface texture.
- More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
- The restoration must be free of contaminations and grease residue before staining and glazing.
- A steam jet or ultrasonic bath is suitable for cleaning the restoration.
- Pooling should be avoided and the material must not be applied in too thick layers.

### Shade combinations

The listed combinations are reference values:


IPS e.max Ceram Shade	A-D	Bleach BL
Shade Incisal 1	A1, A2, A3, B1, B2, B3, B4	BL1, BL2, BL3, BL4
Shade Incisal 2	A3.5, A4, C1, C2, C3, C4, D2, D3, D4	
Shade 0		BL1, BL2, BL3, BL4
Shade 1	A1, A2, A3, A3.5	
Shade 2	B1, B2, B3, B4, D4	
Shade 3	C1, C2, C3, C4	
Shade 4	A2, D2, D3	

### Firing parameters – IPS e.max Ceram Stains and Glazes

Stain and Glaze firing in the staining technique (monolithic)

	IPS e.max Press	IPS e.max CAD	IPS e.max ZirPress	IPS e.max ZirCAD
Stand-by temperature B [ $^{\circ}\text{C}/^{\circ}\text{F}$ ]	403 / 757	403 / 757	403 / 757	403 / 757
Closing time * S [min]	IRT / 06:00	IRT / 06:00	IRT / 06:00	IRT / 06:00
Heating rate $t_{\uparrow}$ [ $^{\circ}\text{C}/^{\circ}\text{F}/\text{min}$ ]	60 / 108	60 / 108	60 / 108	60 / 108
Firing temperature T [ $^{\circ}\text{C}/^{\circ}\text{F}$ ]	770 / 1418	770 / 1418	770 / 1418	770 / 1418
Holding time H [min]	01:30	01:30	01:30	01:30
Vacuum 1 1 [ $^{\circ}\text{C}/^{\circ}\text{F}$ ]	450 / 842	450 / 842	450 / 842	450 / 842
Vacuum 2 2 [ $^{\circ}\text{C}/^{\circ}\text{F}$ ]	769 / 1416	769 / 1416	769 / 1416	769 / 1416
Long-term cooling ** L [ $^{\circ}\text{C}/^{\circ}\text{F}$ ]	0	0	450 / 842	0
Cooling rate $t_{\downarrow}$ [ $^{\circ}\text{C}/^{\circ}\text{F}/\text{min}$ ]	0	0	0	0


\* IRT standard mode \*\* Long-term cooling for the last firing

 If IPS e.max ZirCAD restorations are veneered with IPS e.max Ceram or pressed over with IPS e.max ZirPress, long-term cooling to  $450^{\circ}\text{C}$  ( $842^{\circ}\text{F}$ ) is required for the final Stain and/or Glaze firing cycle. If several IPS e.max ZirCAD restoration units (multi-unit bridges with massive pontics or several full-contour restorations) are fired in the same firing cycle, thorough heating of the objects to be fired may be delayed. This can be counteracted by reducing the heating rate or prolonging the holding time at the final temperature.

## Stain and Glaze firing in the cut-back and layering technique (full veneer)

	IPS e.max Press	IPS e.max CAD	IPS e.max ZirPress	IPS e.max ZirCAD
Stand-by temperature B [°C/°F]	403 / 757	403 / 757	403 / 757	403 / 757
Closing time * S [min]	IRT / 06:00	IRT / 06:00	IRT / 06:00	IRT / 06:00
Heating rate t <sub>r</sub> [°C/°F/min]	60 / 108	60 / 108	60 / 108	60 / 108
Firing temperature T [°C/°F]	725 / 1337	725 / 1337	725 / 1337	725 / 1337
Holding time H [min]	01:00	01:00	01:00	01:00
Vacuum 1 1 [°C/°F]	450 / 842	450 / 842	450 / 842	450 / 842
Vacuum 2 2 [°C/°F]	724 / 1335	724 / 1335	724 / 1335	724 / 1335
Long-term cooling ** L [°C/°F]	0	0	450 / 842	450 / 842
Cooling rate t <sub>c</sub> [°C/min]	0	0	0	0

\* IRT standard mode \*\* Long-term cooling for the last firing

 If IPS e.max ZirCAD restorations are veneered with IPS e.max Ceram, long-term cooling to 450 °C (842 °F) is required for the final Stain and/or Glaze firing cycle.

- The indicated firing parameters are guidance values. They are valid for the Ivoclar furnaces Programat® P310, P510, P710, P300, EP3010 and EP5010. For furnaces of an older generation (e.g. P80, P90, P95, P100, X1) these temperatures are also guidance values. However, depending on the age of the firing chamber, the values may deviate by ± 10 °C / 18 °F.
- If a non-Ivoclar furnace is used, temperature corrections may be necessary.
- Regional differences in the power supply or the operation of several electronic devices by means of the same circuit may render adjustments of the temperatures necessary.
- To maintain the material properties, open product containers must be resealed immediately after use.

### 3 Safety information

- In the case of serious incidents related to the product, please contact Ivoclar Vivadent AG, Bendererstrasse 2, 9494 Schaan / Liechtenstein, Website: [www.ivoclar.com](http://www.ivoclar.com) or your responsible competent authority.
- The current version of the Instruction for Use is available on our Website: [www.ivoclar.com](http://www.ivoclar.com)
- Explanations of the symbols: [www.ivoclar.com/eIFU](http://www.ivoclar.com/eIFU)
- The Summary of Safety and Clinical Performance - SSCP can be retrieved from the European Database on Medical Devices (EUDAMED) on <https://ec.europa.eu/tools/eudamed>.
- Basic UDI-DI: 76152082ACERA008F6

### Warnings

- Observe the Safety Data Sheets (SDS) (available from [www.ivoclar.com](http://www.ivoclar.com)).
- Do not inhale ceramic dust during finishing. Use suction equipment, face mask and protective goggles.
- The frequent and long-term use of professional peroxide-based bleaching agents (carbamide peroxide, hydrogen peroxide) and acidic phosphate fluorides used for caries prevention may turn the surface of existing restorations rough and dull.
- IPS Margin Sealer contains hexane. Hexane is highly flammable and detrimental to health. Avoid contact of the material with skin and eyes. Do not inhale vapours and keep away from sources of ignition.
- IPS e.max Ceram Glaze Spray: Do not inhale the spray mist. Container is pressurized. Protect from direct sunlight and temperatures over 50 °C / 122 °F. Do not forcibly open or burn the can, even after it has been completely emptied.

### Disposal information

Remaining stocks must be disposed of according to the corresponding national legal requirements.

### Residual risks

Users should be aware that any dental intervention in the oral cavity involves certain risks.

The following known residual clinical risks exist:

- Delamination / fracture / decementation of the restorative material may lead to swallowing or inhalation of material and to repeated dental treatment.

### 4 Storage and shelf life

- Storage temperature Liquids / Sealer / Shade / Pastes: 2–28 °C (36–82 °F)
- Layering materials: No special storage conditions
- Do not use the product after the indicated date of expiration.
- Date of expiration: See note on packaging
- Before use, make sure that the packaging and product are undamaged. If in doubt, contact Ivoclar Vivadent AG or your local distribution partner.

### Additional information

Keep material out of the reach of children!  
Not all products are available in all countries!

The material has been developed solely for use in dentistry. Processing should be carried out strictly according to the Instructions for Use. Liability cannot be accepted for damages resulting from misuse or failure to observe the Instructions. The user is responsible for testing the product for its suitability and use for any purpose not explicitly stated in the Instructions. Descriptions and data constitute no warranty of attributes and are not binding.