

e.max[®] CAD

Abutment Solutions

IPS



Instructions for Use
(for USA only)

CE 0123

Table of Contents

3	IPS e.max System
4	IPS e.max CAD
5	Product Information Description of IPS e.max CAD Abutment Solutions Material Scientific data CAD/CAM partners
9	Fabrication of Hybrid Abutments and Hybrid Abutment Crowns Treatment/Fabrication process Shade – tooth shade and abutment shade Preparation for the CAD/CAM process Layer thicknesses of the ceramic components Block selection CAD/CAM processing Finishing
17	Optional: Clinical Try-In Temporarily securing the ceramic structure on the Ti base Clinical try-in
22	Completing the IPS e.max CAD Ceramic Structure Polishing technique Staining technique on the "blue restoration" Staining technique on the "tooth-coloured restoration"
44	Crowns on IPS e.max CAD Hybrid Abutments
46	Permanent Cementation Ti Base / Ceramic Structure
52	Seating and Aftercare Sterilization Intraoral preparation Seating the hybrid abutment and separate crown Seating the hybrid abutment crown Care notes – Implant care
60	General Information Frequently asked questions Material selection table Crystallization and firing parameters Clinical cases

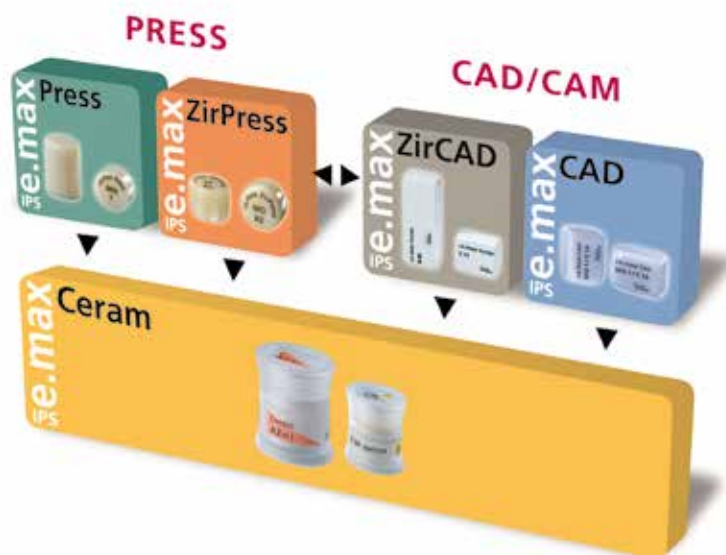
IPS e.max® System

IPS e.max is an innovative all-ceramic system which covers the entire all-ceramic indication range – from thin veneers to multiple-unit bridges.

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

The requirements and aims of every case differ. IPS e.max meets these requirements, because due to the system components, you obtain exactly what you need.

- In the field of the **Press technology**, the highly esthetic **IPS e.max Press lithium disilicate glass-ceramic is available** and with **IPS e.max ZirPress a fluor apatite glass-ceramic ingot** for the quick and efficient press-on technique on zirconium oxide.
- For the **CAD/CAM technology**, depending on the case requirements, the innovative **lithium disilicate block IPS e.max CAD** is used or the high-strength **zirconium oxide IPS e.max ZirCAD**.
- The **nano-fluorapatite layering ceramic IPS e.max Ceram**, which is used to characterize and/or veneer all IPS e.max components – glass or oxide ceramics –, completes the IPS e.max System.





IPS e.max CAD Solutions

IPS e.max CAD stands for individuality. Depending on the indication, users may select from three approaches: This ensures maximum flexibility in the digital work process.

IPS e.max CAD Monolithic Solutions

Efficient fabrication of full-contour restorations with high strength (≥ 360 MPa) ranging from thin veneers to three-unit bridges.



IPS e.max CAD Veneering Solutions

Digitally fabricated high-strength veneering structures for zirconium oxide frameworks (ZrO_2) – for tooth- and implant-retained crowns and long-span bridges (CAD-on).



NEW

IPS e.max CAD Abutment Solutions

Individual CAD/CAM-fabricated hybrid restorations for implants – for single-tooth restorations in the anterior and posterior region.



IPS e.max[®] CAD Abutment Solutions

Product Information

Description

IPS e.max[®] CAD Abutment Solutions is a system comprising IPS e.max CAD ceramic structure, Sirona TiBase and Sirona CAD/CAM to design and fabricate the ceramic structure. The IPS e.max CAD ceramic structure is cemented to the Ti base and these implant-supported hybrid restorations are for the restoration of single teeth.

Two different approaches are available:

- IPS e.max CAD hybrid abutment and separate IPS e.max CAD crown
- IPS e.max CAD hybrid abutment crown

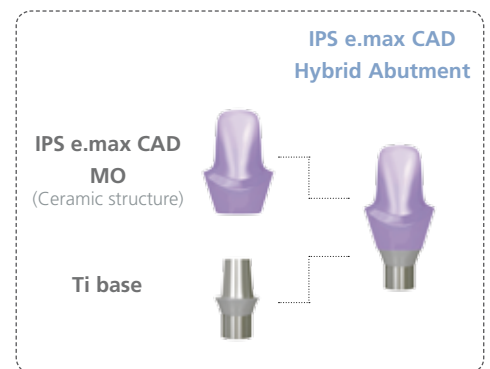
Both solutions show outstanding function, efficiency and esthetics. The durable bond to the Ti base is achieved by means of the self-curing Multilink[®] Hybrid Abutment luting composite.

Hybrid abutment

The hybrid abutment is an individually milled LS₂ abutment which is luted to the Ti base. The shape, emergence profile and esthetic properties of this abutment can be ideally adjusted to the clinical situation.

Given the lifelike appearance of LS₂ glass-ceramics, the esthetic possibilities are virtually limitless, particularly in the anterior region. Due to the individual characterization, a lifelike appearance is achieved near the root and the transition area to the crown. With the preparation margin of the crown located on the gingival level, the geometry of the hybrid abutments allows for an easy integration of the restoration. Excess cementation material is therefore easily removed.

The milled and crystallized LS₂ ceramic structure is extraorally luted to a Ti base with Multilink Hybrid Abutment, then screwed into place in the oral cavity and finally provided with a permanent IPS e.max CAD crown. Given the convenient fabrication of the hybrid abutment, the process is time-saving and flexible.

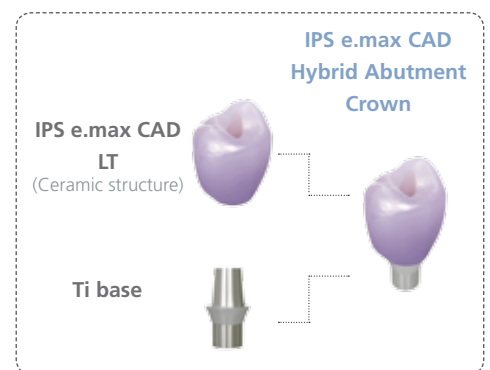


Hybrid abutment crown

Hybrid abutment crowns are characterized by combining abutment and monolithic crown in one piece. This is an efficient two-in-one solution made of lithium disilicate (LS₂), which is directly luted to a Ti base.

LS₂ glass-ceramics provide for strength, durability and efficiency, particularly in the posterior region. Moreover, the material offers well-known esthetic properties, allowing restorations to be simply characterized with IPS e.max Ceram stains.

The monolithically milled hybrid abutment crown is reliably and extraorally luted to the Ti base by means of Multilink Hybrid Abutment. Then, the restoration is screwed onto the implant – in one piece. Subsequently, the screw access channel is sealed with a composite material (e.g. Tetric EvoCeram[®]). If required, the screw can be accessed at any time, which affords the dental team clinical flexibility.



IPS e.max CAD hybrid abutment crowns are a new, economically attractive alternative to conventional implant-supported restorations, particularly for the posterior region, where strength, durability and convenient clinical handling matter.

Ideally coordinated – Multilink[®] Hybrid Abutment

The self-curing luting composite Multilink Hybrid Abutment in conjunction with Monobond[®] Plus is used for the permanent cementation of ceramic structures made of lithium disilicate glass-ceramic (LS₂) or zirconium oxide (ZrO₂) onto bases (e.g. abutment or adhesive base) of titanium/titanium alloy.

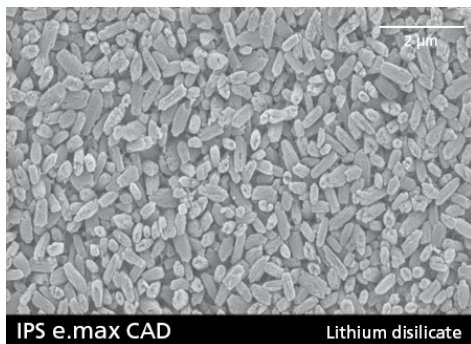
This allows

- reliable adhesion due to high bonding values
- optimum esthetics due to two available degrees of opacity
- easy handling due to the convenient Automix syringe

Material

IPS e.max CAD

IPS e.max CAD is a lithium disilicate glass-ceramic block for the CAD/CAM technology. It is fabricated using an innovative process which provides an impressive homogeneity of the material. The block can be processed very easily in a CAD/CAM unit in this crystalline intermediate stage. The typical and striking colour of IPS e.max CAD ranges from whitish to blue and bluish-grey. This shade is a result of the composition and the microstructure of the glass-ceramic. The strength of the material in this processable intermediate phase is ≥ 130 MPa. After the IPS e.max CAD blocks are milled, the restoration is crystallized in an Ivoclar Vivadent ceramic furnace (e.g. Programat® P500). Unlike with some other CAD/CAM ceramics, the easy-to-conduct crystallization process neither causes any major shrinkage, nor are any complicated infiltration processes required. The crystallization process leads to a change in the microstructure in the IPS e.max CAD material, during which lithium disilicate crystals grow. The densification of 0.2% is accounted for in the CAD software and taken into account upon milling. The final physical properties, such as the strength of ≥ 360 MPa and the corresponding optical properties, are achieved through the transformation of the microstructure.



CTE (100–500°C) [$10^{-6}/K$]	10.5 ± 0.5
Flexural strength (biaxial) [MPa]	≥ 360 according to ISO 6872
Fracture toughness [$MPa \cdot m^{0.5}$]	≥ 2.0 according to ISO 6872
Chem. solubility [$\mu g/cm^2$]	≤ 50 according to ISO 6872

Classification: ceramic materials Type 2, Class 3

Ti base

Ti bases are used for the fabrication of IPS e.max CAD Abutment Solutions. The Ti bases are made of titanium alloy. The compatible Ti bases are listed on Page 11. Please observe the instructions for use and processing of the manufacturer of the Ti bases used.

More information about the authorized CAD/CAM systems is available on the Internet from www.ivoclarvivadent.com.



Uses

Indications

IPS e.max CAD Abutment Solutions is intended for use in partially or fully edentulous mandibles and maxillae in support of single cement-retained restorations. The system comprises three parts: IPS e.max CAD ceramic structure, Ti base and CAD/CAM software. The IPS e.max CAD ceramic structure cemented to the Ti base is recommended for two-piece hybrid abutments for single tooth restorations and hybrid abutment crowns, used in conjunction with endosseous dental implants. The compatible Implant systems, Ti bases and CAD/CAM systems are listed on Page 11.

Contraindications

- Caution: Small diameter implants and large angled abutments in the anterior region of the mouth due to possible failure of the implant system.
- Failure to observe the requirements stipulated by the implant manufacturer for using the selected implant type (diameter and length of the implant must be approved for the respective position in the jaw by the implant manufacturer)
- Failure to observe the permissible maximum and minimum ceramic wall thicknesses
- Parafunctions (e.g. bruxism)
- Use of a luting composite other than Multilink® Hybrid Abutment to lute IPS e.max CAD to the Ti base
- Intraoral adhesion of the ceramic structures to the Ti base
- Temporary cementation of the crown on the hybrid abutment
- All uses not stated as indications are contraindicated.

Important processing restrictions

- The hybrid abutments and hybrid abutment crowns are for single use only.
- Do not mill the blocks with non-compatible CAD/CAM systems.
- If hybrid abutment crowns are fabricated, the opening of the screw channel must not be located in the area of contact points. If this is not possible, a hybrid abutment with a separate crown should be preferred.
- Combination with materials other than IPS e.max Ceram or IPS e.max CAD Crystall./ materials
- Crystallization in a non-recommended ceramic furnace
- Crystallization in a non-calibrated ceramic furnace
- Crystallization in a high-temperature furnace (e.g. Programat® S1)
- Crystallization with deviating firing parameters
- Failure to observe the manufacturer's instructions regarding the processing of the Ti base.

Side effects

If the patient is known to be allergic to any of the components, IPS e.max CAD and the other materials necessary for the fabrication should not be used.

Composition

- **IPS e.max CAD blocks**
Components: SiO₂, Li₂O, K₂O, MgO, Al₂O₃, P₂O₅ and other oxides
- **IPS e.max CAD Crystall./Glaze, Shades and Stains**
Components: Oxide, glycols
- **IPS e.max CAD Crystall./Glaze Liquid**
Components: Butandiol
- **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 Natural Die Material**
Components: Polymethacrylate, paraffin oil, SiO₂ and copolymer
- **IPS Natural Die Material Separator**
Components: Wax dissolved in hexane
- **Virtual Extra Light Body Fast Set**
Components: Vinyl polysiloxane, methyl hydrogen polysiloxane, organic platinum complex, silicate and food colouring
- **Multilink Hybrid Abutment**
Components: Dimethacrylate, HEMA, as well as fillers (barium glass, ytterbium trifluoride, spheroid mixed oxide and titanium dioxide).
- **Monobond Plus**
Components: Alcohol solution of silane methacrylate, phosphoric acid methacrylate and sulphide methacrylate
- **IPS Ceramic Etching Gel**
Components: Hydrofluoric acid (approx. 5%)

Warning

- Do not inhale ceramic dust during finishing. Use exhaust air discharge and mouth protection.
- IPS Ceramic Etching Gel contains hydrofluoric acid. Contact with skin, eyes and clothing must be prevented at all costs, since the material is extremely toxic and corrosive. The etching gel is intended for extraoral use only and must not be applied intraorally (inside the mouth).
- Rx Only – Caution: US Federal Law restricts sale of this device to or on the order of a licensed physician, dentist or practitioner.

Scientific data

Further scientific data (i.e. strength, wear, biocompatibility) are contained in the **Scientific Documentation IPS e.max CAD**.

The **IPS e.max Scientific Report** contains all studies (in vitro, in vivo) on IPS e.max CAD and the IPS e.max system.

For further information about all-ceramics in general, please refer to the **Ivoclar Vivadent Report No. 16**.



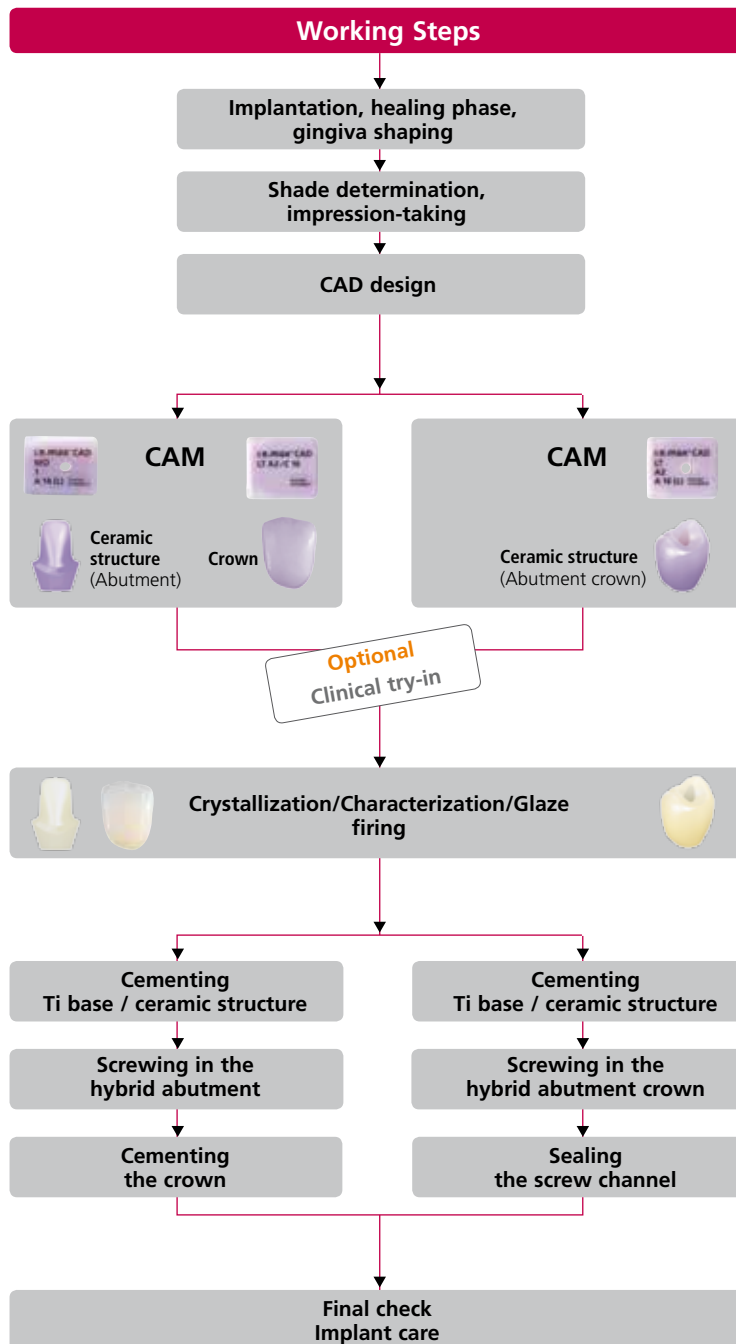
CAD/CAM partners

IPS e.max CAD has to be processed with an authorized CAD/CAM system. For questions regarding the different systems, please contact the respective cooperation partners.

More information is available on the Internet from **www.ivoclarvivadent.com**.

IPS e.max CAD Abutment Solutions

Fabrication of IPS e.max CAD hybrid abutment and hybrid abutment crown



Ivoclar Vivadent Products

Cervitec® Plus, Cervitec® Liquid, Telio® System

OptraGate®, Virtual®

IPS e.max® CAD

Virtual® Extra Light Body Fast Set

IPS e.max® CAD Crystall./ ...
IPS e.max® Ceram
Programat® furnaces

IPS Ceramic Etching Gel, Monobond® Plus,
Multilink® Hybrid Abutment, Liquid Strip

SpeedCEM®, Bluephase®, Tetric EvoCeram®

OptraFine,
Implant Care

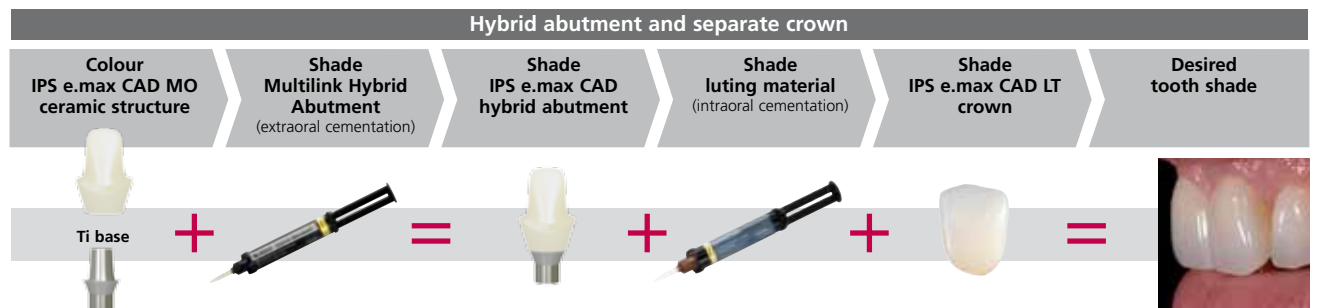
Shade – tooth shade and abutment shade

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

With IPS e.max CAD Abutment Solutions, you can imitate not only the clinical crown of a natural tooth, but also a part of the root. This allows you to achieve highly esthetic implant-supported restorations which retain their lifelike appearance also in the case of gingiva recession.

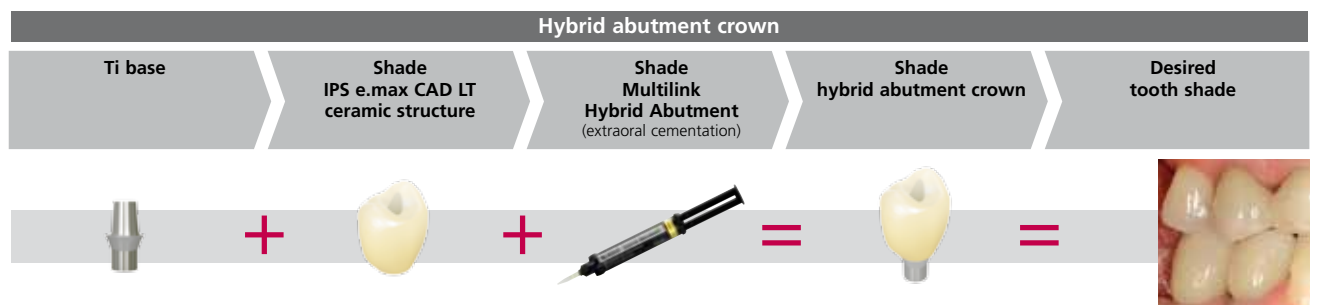
For IPS e.max CAD **hybrid abutment and the separate crown**, the desired tooth shade results from

- the shade of the IPS e.max CAD hybrid abutment (IPS e.max CAD MO ceramic structure, Multilink Hybrid Abutment)
- the shade of the luting material for intraoral cementation of the crown on the IPS e.max CAD hybrid abutment (e.g. SpeedCEM)
- the shade of the IPS e.max CAD LT crown.



For the IPS e.max CAD **hybrid abutment crown**, the desired tooth shade results from

- the shade of the IPS e.max CAD LT ceramic structure
- the shade of Multilink Hybrid Abutment.



Preparation for the CAD/CAM process

Implant system

The IPS e.max CAD ceramic structure and TiBase hybrid abutment is compatible with the following implant systems:

- Nobel Biocare Replace
- Nobel Biocare Active
- Straumann Bone Level
- Biomet 3i Certain

Scanning

For the fabrication of IPS e.max CAD Abutment Solutions and depending on the CAD/CAM system used, the clinical situation is digitalized either by a direct intraoral scan or an indirect model scan. For notes regarding the scan, please observe the manufacturer's instructions for use of the CAD/CAM system.

Compatible Systems:

Sirona inLab and CEREC SW 4.2 (or higher) software

Selecting a Ti base

Compatible Ti base:

Please note the Ti bases are offered in various versions, each of which is compatible with a specific diameter of a specific implant system (see below). For the titanium base SBL 3.3 L the indication is restricted for replacement of single lateral incisors in the maxilla and lateral and central incisors in the mandible.

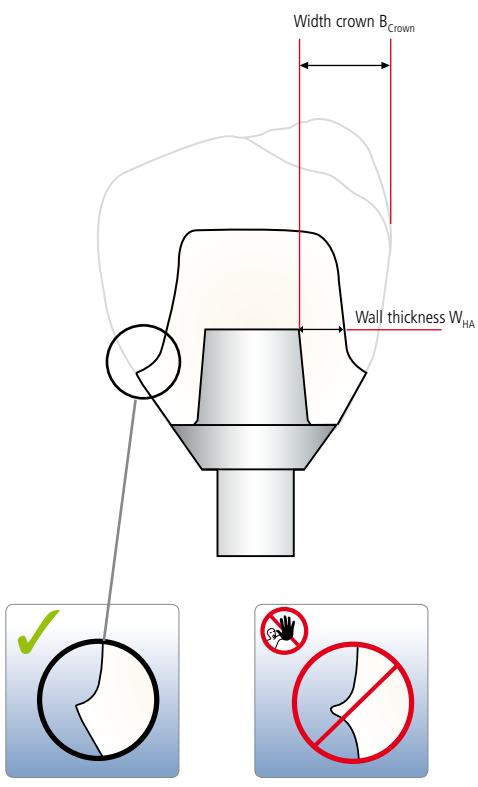
Implant manufacturer	Implant System	Implant Diameter (mm)	TiBase	Sirona Ref.	Interface size	Ceramic structure
Nobel Biocare	Replace NP	3.5	NBRS 3.5	6282474	L	IPS e.max CAD A14 (L), A16 (L)
	Replace RP	4.3	NBRS 4.3	6282482	L	IPS e.max CAD A14 (L), A16 (L)
	Replace WP	5.0	NBRS 5.0	6282490	L	IPS e.max CAD A14 (L), A16 (L)
	Replace 6.0	6.0	NBRS 6.0	6282508	L	IPS e.max CAD A14 (L), A16 (L)
	Nobel Active NP	3.5	NB A 4.5	6208188	L	IPS e.max CAD A14 (L), A16 (L)
	Nobel Active RP	4.3 / 5.0	NB A 5.0	6208253	L	IPS e.max CAD A14 (L), A16 (L)
Straumann	Bone Level NC	3.3	S BL 3.3	6308154	L	IPS e.max CAD A14 (L), A16 (L)
	Bone Level RC	4.1 / 4.8	S BL 4.1	6308337	L	IPS e.max CAD A14 (L), A16 (L)
Biomet 3i	Certain	3.4	B C 3.4	6308048	S	IPS e.max CAD A14 (S), A16 (S)
		4.1	B C 4.1	6308097	L	IPS e.max CAD A14 (L), A16 (L)
		5.0	B C 5.0	6308121	L	IPS e.max CAD A14 (L), A16 (L)

Layer thicknesses of the ceramic components

Observing the geometry requirements of the IPS e.max CAD ceramic structures is the key to success for a durable restoration. The more attention is given to the design, the better the final results and the clinical success will turn out to be.

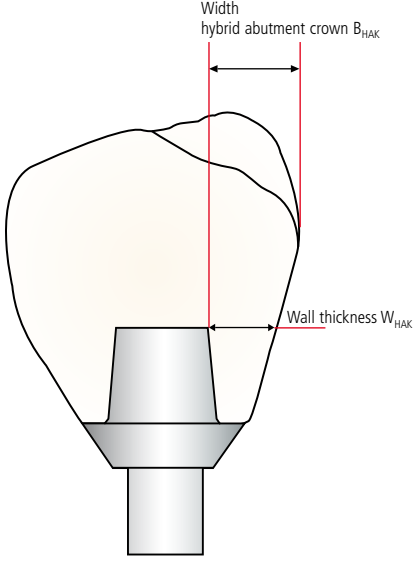
The following basic guidelines have to be observed:

Hybrid abutment



- The **wall thickness W_{HA}** must be at least 0.5 mm.
- The hybrid abutment should be designed in a similar way as a prepared natural tooth:
 - Circular epi-/supragingival shoulder with rounded inner edges or a chamfer.
 - In order for the crown to be cemented to the hybrid abutment using a conventional/self-adhesive cementation protocol, retentive surfaces and a sufficient "preparation height" must be observed.
 - Maximum angle: 20°
 - Create an emergence profile with a right angle at the transition to the crown (see picture).
- The **crown width B_{Crown}** is limited to 6.0 mm from the axial height of contour to the screw channel of the hybrid abutment.
- The notes of the implant manufacturer must be observed regarding the maximum height of the hybrid abutment and separate crown.

Hybrid abutment crown



- The wall thickness of **hybrid abutment crown W_{HAK}** must be larger than 1.5 mm for the entire circumference.
- The opening of the screw channel must not be located in the area of contact points. If this is not possible, a hybrid abutment with a separate crown would be preferred.
- The width of the **hybrid abutment crown B_{HAK}** is limited to 6.0 mm from the axial height of contour to the screw channel.
- Maximum angle: 20°
- The notes of the implant manufacturer must be observed regarding the maximum height of the hybrid abutment crown.

Block selection

An IPS e.max CAD MO or LT block is selected depending on the indication.

When using a Ti base from Sirona, the dimensions of the interface to the Ti Base (S or L) have to be observed.

<p>IPS e.max CAD hybrid abutment</p>	 <p>IPS e.max CAD MO (Medium Opacity)</p>	<p>Please refer to the table on page 62 for the selection of the block shade for the desired tooth shade.</p>
<p>IPS e.max CAD crown (on IPS e.max CAD hybrid abutment)</p>	 <p>IPS e.max CAD LT (Low Translucency)</p>	
<p>IPS e.max CAD hybrid abutment crown</p>	 <p>IPS e.max CAD LT (Low Translucency)</p>	

CAD/CAM processing

As densification of about 0.2% occurs in IPS e.max CAD during crystallization, this factor has been taken into account in the respective software of the tested CAD/CAM system. Consequently, the milled IPS e.max CAD restorations demonstrate a high accuracy of 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.

Finishing

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

Basic notes regarding the finishing of IPS e.max CAD

- Carry out adjustments by grinding of IPS e.max CAD restorations while they are still in their pre-crystallized (blue) state, if possible.
- Only use suitable grinding instruments, low speed and light pressure to prevent delamination and chipping at the margins in particular. **Overheating of the glass-ceramic must be avoided.**
- During finishing, make sure that the minimum layer thicknesses are observed.
- Cut the ceramic structure from the block using a diamond separating disc. Slightly scratch the attachment area at the incisal side of the abutment and separate the attachment point from the basal.

Checking the fit of the ceramic structure on the Ti base

- Carefully place the ceramic structure on the Ti base and check the fit. Observe the position of the rotation lock.



The incisal side of the attachment point is scratched with a diamond separating disc.



The attachment is cut from the basal using a diamond separating disc.



The ceramic structure is carefully placed on the Ti base to check the fit.



Optimum fit of the ceramic structure on the Ti base

Finishing

Important!

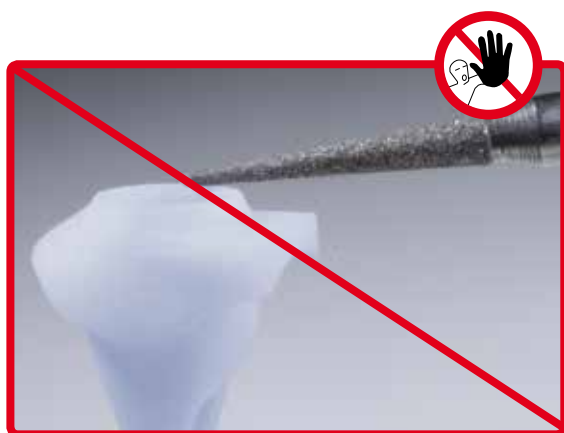
- Do not finish the shoulder of the ceramic structure to prevent negatively affecting the Ti base.
- Finish the emergence profile if required taking the fit to the gingiva and the minimum thickness (0.5mm) into account.

Finishing the outer surface of the ceramic structure (hybrid abutment)

- Smooth out the attachment point to the block with fine diamond grinding instruments taking the shape of the emergence profile and the crown margin into account.
- Do not perform any individual shape adjustments, as this will negatively affect the fit of the crown on the hybrid abutment. **Note regarding the crown:** If there are any inaccuracies of fit to the hybrid abutment, adjust the crown by grinding.

Finishing the outer surface of the ceramic structure (hybrid abutment crown)

- Smooth out the attachment point to the block with fine diamond grinding instruments taking the shape of the emergence profile and the proximal contacts into account.
 - Surface-grind the entire occlusal surface with a fine diamond to smooth out the surface structure created by the CAD/CAM procedure.
 - Check the proximal and occlusal contacts.
 - Design surface textures.
- Clean the ceramic structures with ultrasound in a water bath or blast with the steam jet before further processing.
 - Make sure to thoroughly remove any residue of the milling additive of the CAD/CAM milling unit. Residue of the milling additive remaining on the surface may result in bonding problems and discolouration.
 - Do **not** blast ceramic structures with Al_2O_3 or glass polishing beads!



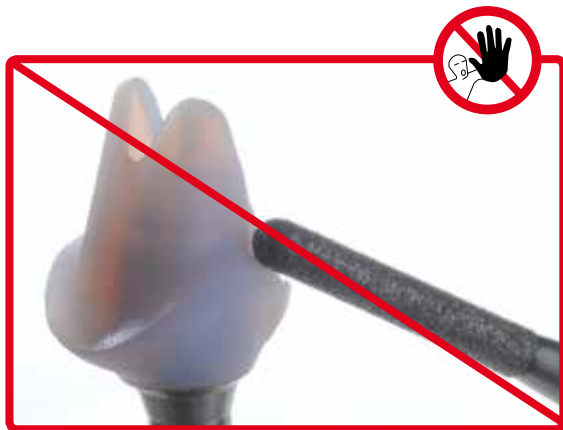
The shoulder of the ceramic structure must not be finished to prevent negatively affecting the Ti base.



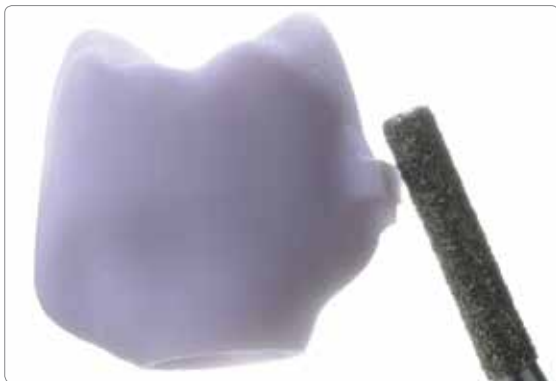
Care should be taken when finishing the emergence profile to prevent affecting the fit to the gingiva.



The attachment point to the block is smoothed out taking the shape of the emergence profile and the crown margin into account.



Individual shape adjustments must not be performed, as this negatively affects the fit of the crown on the hybrid abutment.



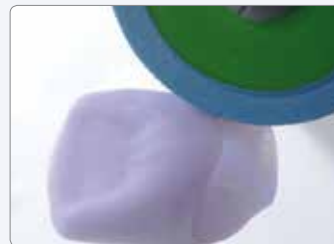
The attachment point to the block is smoothed out taking the shape of the emergence profile and the crown margin into account.



The surface of the ceramic structure is ground with a fine diamond to smooth out the surface structure created by the CAD/CAM procedure.

Tip

Place the crown on the ceramic structure to finish the crown margins. In this way, a smooth transition between the crown and hybrid abutment can be achieved.



next working step ...



Optional: Clinical try-in page 17



Completing the IPS e.max CAD ceramic structure page 22

A clinical try-in to check the accuracy of fit can be conducted prior to further processing. Clinical try-in may also take place at a later stage, i.e. with the crystallized, tooth-coloured IPS e.max CAD ceramic structure.

Provisional securing of the ceramic structure on the Ti base

To facilitate the intraoral handling, the components are temporarily attached to one another with silicone material, e.g. Virtual Extra Light Body Fast Set.

The following procedure should be observed in the temporary attachment of the components:

- Clean the untreated Ti base and the ceramic structure with steam and subsequently dry with blown air.
- Place the ceramic structure on the Ti base (which is screwed on the model analog) and mark the relative position of the components with a waterproof pen. This step makes it easier to attain the correct position when the parts are temporarily assembled.
- Seal the screw channel with a foam pellet.
- Insert the Virtual cartridge in the dispenser and remove the protective cap.
- Screw on the mixing tip and attach the Oral Tip to the mixing tip.
- Apply Virtual Extra Light Body Fast Set to the Ti base and directly into the ceramic structure.
- Introduce the Ti base into the ceramic structure. The alignment of the two component must be checked (rotation lock/markings).
- Hold the components firmly in the correct position for 2:30 minutes until Virtual Extra Light Body Fast Set has set.
- Carefully remove any excess that has been displaced with a suitable instrument, e.g. a scalpel.



Cleaned, untreated ceramic structures



The ceramic structure is placed on the Ti base and the relative position is marked.



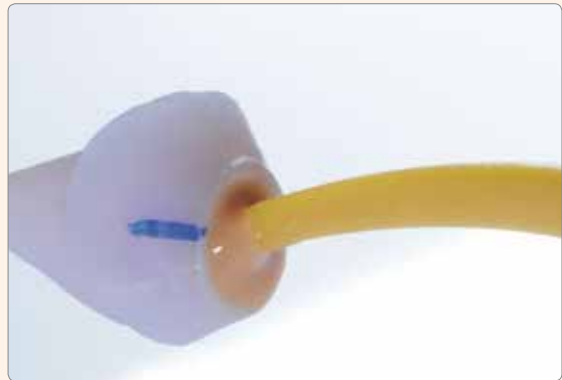
The screw channel is sealed with a foam pellet.



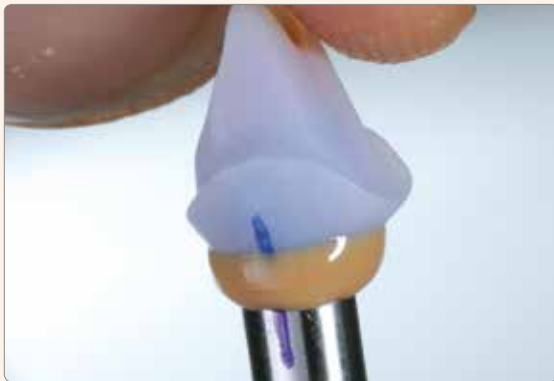
The Virtual cartridge is inserted in the dispenser. The mixing tip is screwed on and the Oral Tip is attached.



Virtual Extra Light Body Fast Set is applied to the Ti base ...



... and directly on the ceramic structure.



The Ti base is introduced into the ceramic structure. In doing so, the alignment of the two components is checked (rotation lock/marking). The components are firmly held in place for approx. 2:30 minutes until the Virtual Extra Light Body Fast Set has set.



Excess Virtual Extra Light Body Fast Set is removed from the screw channel with an instrument, e.g. a scalpel.



Excess Virtual Extra Light Body Fast Set material is removed from the screw channel with an instrument.



Prepared hybrid abutment or hybrid abutment crown

Clinical try-in

Hybrid abutment and dedicated crown

Important note: Any intraoral inspection of the occlusion/articulation and necessary grinding adjustments may only be carried out if the components have been attached to one another with Virtual Extra Light Body Fast Set. Virtual has a cushioning effect during the try-in procedure, in particular, if any grinding adjustments have to be made. Therefore, it prevents chipping in the transition area between the hybrid abutment and the crown.

The following procedure should be observed during the clinical try-in:

- The prepared hybrid abutment (provisionally secured in place) and the clean corresponding crown are laid out.
- Remove the provisional restoration.
- Screw the hybrid abutment in manually with the dedicated screw.
- Check the geometry of the hybrid abutment (e.g. fit gingival anaemia) in relation to the gingival margin.
- If desired, the screw channel on the hybrid abutment can be sealed with a foam pellet.
- **Tip:** Isolate the inner aspect of the crown with glycerine gel, e.g. Try-in paste, Liquid Strip
- Place the crown on the hybrid abutment intraorally to check and adjust the proximal contacts, if necessary.
- **Note: No occlusal functional inspection must be performed at this stage.**
- For the functional inspection, the crown has to be secured on the hybrid abutment with Virtual Extra Light Body Fast Set. Try-in paste must not be used for this purpose, as this material is not sufficiently resistant to compressive force.
- Insert the Virtual cartridge in the dispenser and remove the protective cap.
- Screw on the mixing tip and attach the Oral Tip to the mixing tip.
- Apply Virtual Extra Light Body Fast Set to the inner aspect of the crown.
- Press the crown onto the hybrid abutment using the fingers until it has reached the final position. Hold the crown in the final position until the Virtual material has set.
- Remove excess Virtual material.
- Check the occlusion/articulation and make adjustments with suitable grinding instruments, if necessary (see separate IPS e.max recommended grinding instruments for ceramics – use in the dental practice).
- Carefully remove the crown from the hybrid abutment and the hybrid abutment from the implant (including the Ti base).
- Rinse the implant site e.g. with Cervitec Liquid (antibacterial mouth wash with chlorhexidine) to clean and disinfect it.
- Place the temporary restoration.



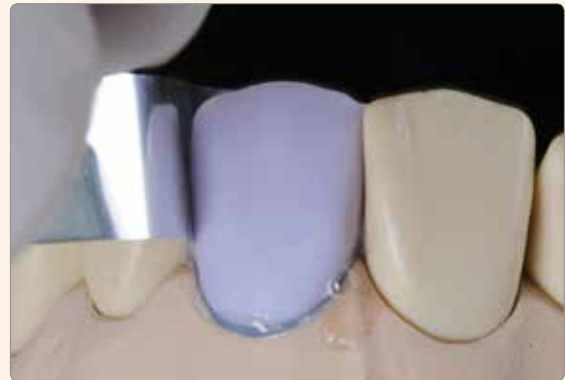
The hybrid abutment is manually screwed in place with the dedicated screw. The geometry of the hybrid abutment (e.g. fit, gingival anaemia) is checked in relation to the gingival margin.



If desired, the screw channel of the hybrid abutment can be sealed with a foam pellet.



Tip: The inner aspect of the crown can be isolated with glycerine gel.



The crown is placed on the hybrid abutment intraorally to check and if necessary adjust the proximal contacts. **Note: No occlusal functional inspection must be performed at this stage.**



Virtual Extra Light Body Fast Set is applied to the inner aspect of the crown.



The crown is pressed onto the hybrid abutment using the fingers until the final position is reached. The crown is held in the final position until the Virtual material has set.



Excess Virtual material is removed.



The occlusion/articulation is checked and adjustments are made with suitable grinding instruments, if necessary.



The crown is carefully lifted from the hybrid abutment and the Virtual Extra Light Body Fast Set material is removed.



The hybrid abutment is unscrewed.

Hybrid abutment crown

The following procedure should be observed during the clinical try-in:

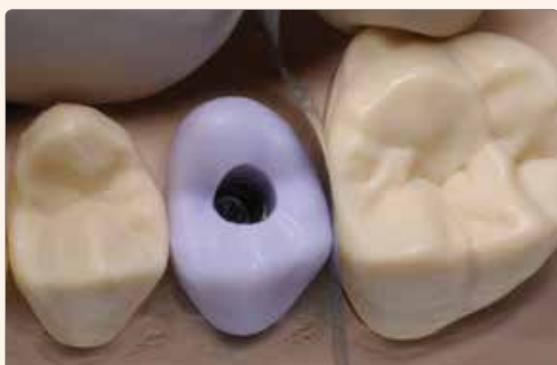
- The prepared and cleaned hybrid abutment crown (provisionally secured with in place with Virtual Extra Light Body Fast Set) is laid out.
 - Remove the provisional restoration.
 - Place the hybrid abutment crown on the implant intraorally in order to check and adjust the proximal contacts, if necessary.
- Note: No occlusal functional inspection must be performed at this stage.**
- Screw the hybrid abutment crown in manually with the dedicated screw.
 - Check the geometry of the hybrid abutment crown (e.g. fit, gingival anaemia) in relation to the gingiva.
 - Check the occlusion/articulation and make adjustments with suitable grinding instruments, if necessary (see separate IPS e.max recommended grinding instruments for ceramics – use in the dental practice).
 - Carefully remove the hybrid abutment crown.
 - Rinse the implant site, e.g. with Cervitec Liquid (antibacterial mouth rinse containing chlorhexidine), to clean and disinfect it.
 - Place the temporary restoration.



The hybrid abutment crown is placed on the implant intraorally in order to check and if necessary adjust the proximal contacts. **Note: No occlusal functional inspection must be performed at this stage.**



The hybrid abutment crown is screwed in with the dedicated screw.



The geometry of the hybrid abutment crown is checked (e.g. fit, gingival anaemia) in relation to the gingiva.



The occlusion/articulation is checked and if necessary adjustments are made with suitable grinding instruments.



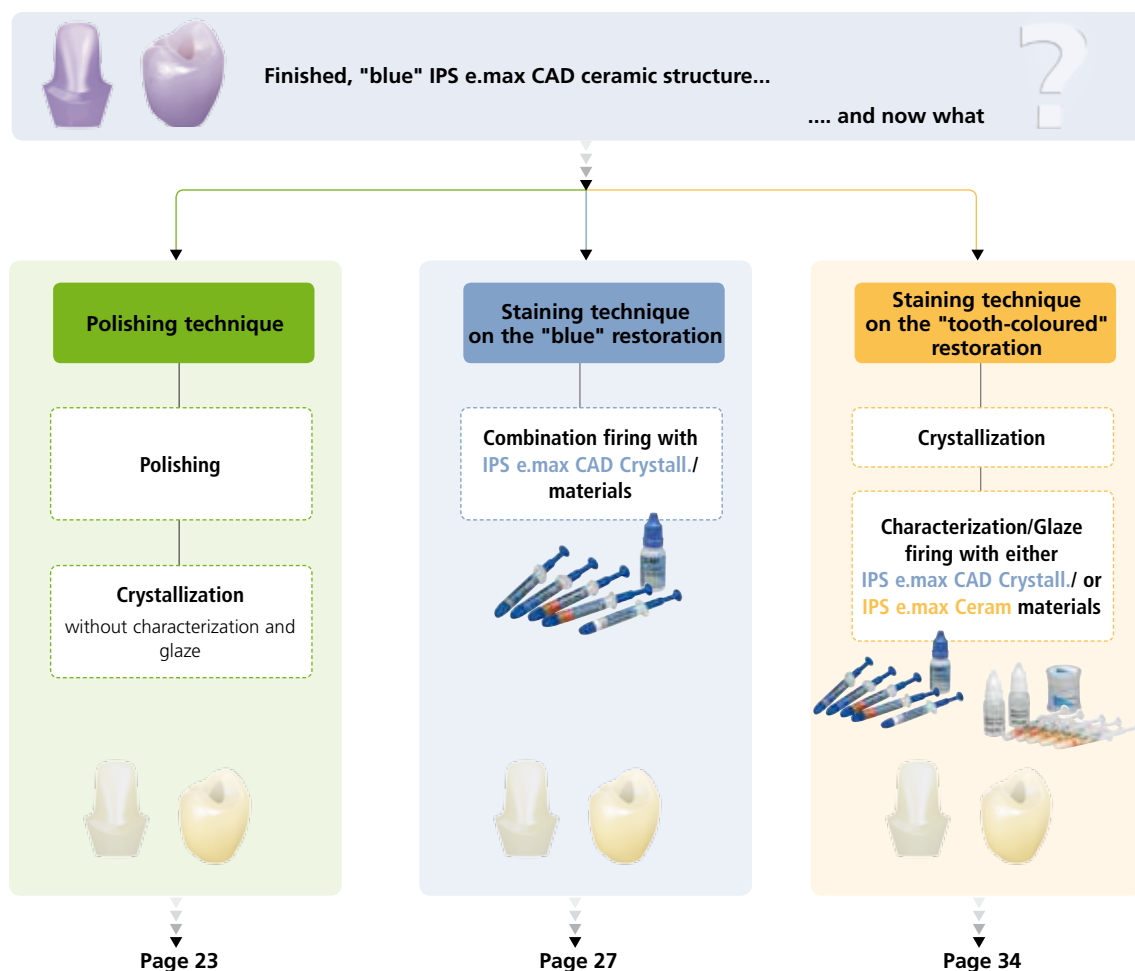
The hybrid abutment crown (including base) is carefully removed.

IPS e.max CAD Abutment Solutions

Completing the IPS e.max CAD ceramic structure

Depending on the desired processing technique and materials, the way to complete the ceramic structure is selected. Basically, two ways to complete the ceramic structure can be distinguished.

- **Polishing technique**
Polishing of the "blue" restoration, followed by **crystallization** without individual characterization and glaze.
- **Staining technique on the "blue" restoration**
Characterization and glaze with **IPS e.max CAD Crystall./ materials** on the blue restoration, followed by **Combination firing** (Crystallization and Characterization/Glaze firing in one step).
- **Staining technique on the tooth-coloured restoration**
Crystallization without the application of materials. **Characterization/Glaze firing** of the tooth-coloured restorations with either IPS e.max CAD Crystall./ or IPS e.max Ceram materials.



Polishing technique



Polishing of the "blue" restoration, followed by crystallization without individual characterization and glaze

If **no characterizations** and **no Glaze firing** are desired, it is possible to polish the ceramic structure manually, followed by crystallization. Please note that polishing causes slight abrasion.

The polishing technique is preferably used for the emergence profile of the hybrid abutment. For the hybrid abutment crown, the application of glaze is recommended.



On hybrid abutments, only the emergence profile is polished.



On hybrid abutment crowns, the entire outer aspect is polished.

Polishing

Please observe the following procedure for polishing the pre-crystallized (blue) ceramic structure:

- Clean the ceramic structure with ultrasound in a water bath or a steam cleaner to remove any contaminations and grease residue.
- Screw Ti base onto a model analog for easier handling.
- Secure the ceramic structure on the Ti base. **Note:** Do **not** finish the Ti base.
- **Overheating of the glass-ceramic must be avoided during polishing.** Observe the recommendations of the manufacturer of the grinding tools.
- Pre-polishing with a diamond rubber polisher (e.g. OptraFine F).
- Fine polishing with a high-gloss rubber polisher (e.g. OptraFine P)
- High-gloss polishing with brushes and polishing paste (e.g. OptaFine HP)
- Clean the ceramic structure with ultrasound in a water bath or the steam jet.



Pre-polishing by means of diamond rubber polishers



Fine polishing by means of high-gloss rubber polishers



High-gloss polishing with brushes and polishing paste



Residue is removed with ultrasound in a water bath...



...or with the steam jet.

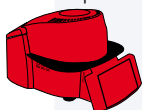
Crystallization

The following steps must be observed:

- Clean the ceramic structure to remove any contaminations and grease residue. Any contamination after cleaning must be prevented.
- Slightly overfill the interface of the ceramic structure with IPS Object Fix Putty or Flow.
- **Immediately reseal the IPS Object Fix Putty/Flow syringe after extruding the material.**
- Place the ceramic structure in the centre of the IPS e.max CAD Crystallization Tray.

Important

- Conduct the **crystallization** on the IPS e.max CAD Crystallization Tray using the stipulated firing parameters.



Observe the firing parameters for IPS e.max CAD MO and IPS e.max CAD LT. Firing parameters see page 64

Note:

If a restoration made of IPS e.max CAD MO and one made of IPS e.max CAD LT are to be crystallized in the same firing, the firing parameters for IPS e.max CAD MO must be used.

- Remove ceramic structure 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.
- Remove the ceramic structure from the IPS e.max CAD Crystallization Tray.
- 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 ceramic structure on the Ti base and check the fit.
- **If adjustments by grinding of the restoration are required, make sure that no overheating of the ceramic occurs.**



The interface of the ceramic structure is slightly overfilled with IPS Object Fix Putty or Flow. Then the ceramic structure is placed in the centre on the IPS e.max CAD Crystallization Tray.



The crystallization tray is removed from the furnace once the crystallization program has been completed and the object is allowed to cool



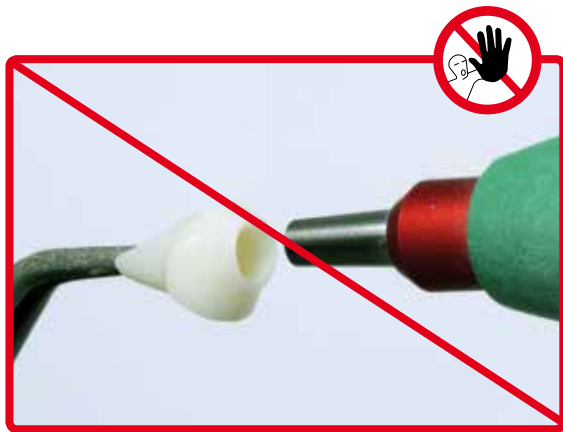
The ceramic structure is removed from the IPS e.max CAD Crystallization Tray.



Residue is removed with ultrasound in a water bath....



... or with the steam jet.



Residue **must not** be removed with Al_2O_3 or glass polishing beads.



Polished, crystallized ceramic structure

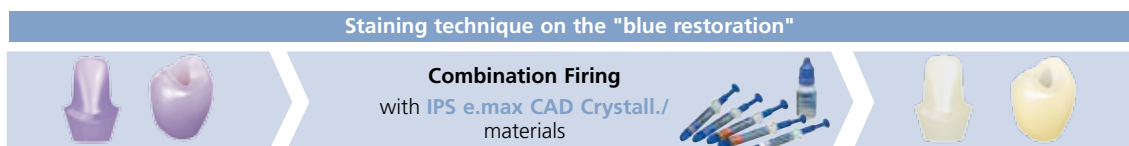


next working step ...



Permanent cementation Ti base / ceramic structure page 46

Staining technique on the "blue restoration"



Characterization and glaze with IPS e.max CAD Crystall./ materials on the "blue" restoration, followed by Combination firing

The following paragraphs will explain the steps of glazing and characterizing with IPS e.max CAD Crystall./Shades, Stains and Glaze. In this processing technique, Crystallization and Glaze firing are performed in one step. Characterizations are applied using IPS e.max CAD Crystall./Shades and Stains.



If hybrid abutments are fabricated, only the area of the emergence profile is characterized with IPS e.max CAD Crystall./Shades, Stains and Glaze.



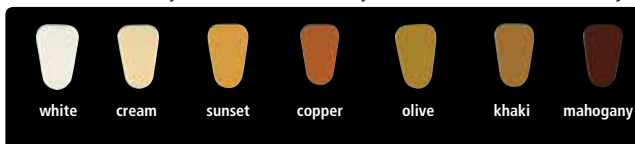
If hybrid abutment crowns are fabricated, the entire outer surface may be individually characterized.

Required materials

- IPS e.max CAD Crystall./Shades are ready-to-use "Dentin" stains in syringes.



- IPS e.max CAD Crystall./Stains are ready-to-use intensive stains in syringes.



- IPS e.max CAD Crystall./Glaze Paste is a ready-to-use glazing paste.
- IPS e.max CAD Crystall./Glaze Liquid is a special liquid for mixing with Shades, Stains and Glaze.



Note:

The IPS e.max CAD Crystall./Glaze Spray is **not** recommended for glazing IPS e.max CAD Abutment Solutions, as it requires very targeted application. The glazing material must neither reach the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit.

Preparing for Combination firing (Crystallization and Stain/Glaze firing in one step)

- Clean the ceramic structure with the steam jet to remove any contaminations and grease residue. Any contamination after cleaning must be prevented.
- Use the **IPS e.max CAD Crystallization Pin XS** for the crystallization of the ceramic structure.
- Fill the interface of the ceramic structure with either IPS Object Fix Putty or Flow auxiliary firing paste. **Immediately reseal the IPS Object Fix Putty/Flow syringe after extruding the material.**
- Press the **IPS e.max CAD Crystallization Pin XS only slightly** into the IPS Object Fix Putty/Flow. **Important: Do not press the pin in too deep to make sure that it does not touch the walls. This may lead to cracks in the ceramic structure.**
- Smooth out displaced auxiliary firing paste using a plastic spatula so that the pin is securely in place.
- Prevent contamination of the outer surface / occlusal surface of the ceramic structure.
- Clean off any possible contamination with a brush dampened with water and dry.



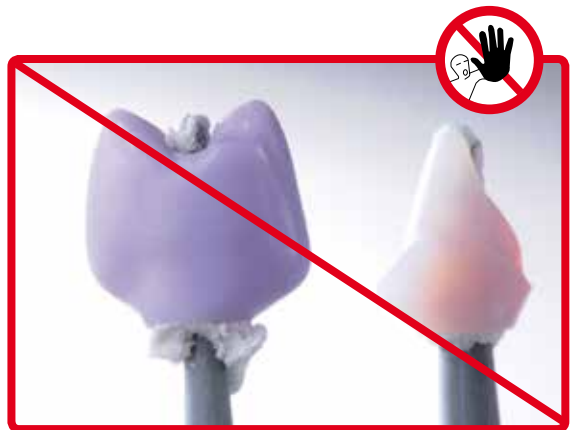
The IPS e.max CAD Crystallization Pin XS is used for the crystallization of the ceramic structure.



The interface of the ceramic structure is filled with either IPS Object Fix Putty or Flow auxiliary firing paste.



Important – The **IPS e.max CAD Crystallization Pin XS** should be pressed **only slightly** into the IPS Object Fix Putty/Flow so that it does not touch the walls of the ceramic structure.



Incorrect: Pin pressed in too deep. Pin touches the ceramic structure, which may lead to cracks.



Displaced auxiliary firing paste is smoothed out with a plastic spatula from the margin towards the support pin so that the pin is secured in the paste.



Any possible residue adhering to the outer surface/occlusal surface is cleaned off with a brush dampened with water and dried.

Combination firing (Crystallization and Stain/Glaze firing in one step)

Please observe the following procedure for the combination firing:

- Extrude the ready-to-use IPS e.max CAD Crystall./Glaze Paste from the syringe and mix.
- If a slight thinning is desired, the ready-to-use glaze may be mixed with a small amount of IPS e.max CAD Crystall./Glaze Liquid.

Important:

- The glazing material must neither reach the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit. Check the interface before firing and carefully remove any contamination.
- On the abutment, do not apply any materials to the bonding surface to the crown, as this might compromise the fit of the crown.
- Apply IPS e.max CAD Crystall./Glaze Paste evenly on the areas to be glazed using a small brush. Avoid to apply too thick a glaze layer. Avoid "pooling", especially on the occlusal surface of the abutment crown.
- Too thin a glaze layer may lead to an unsatisfactory gloss.
- Apply characterizations with IPS e.max CAD Crystall./Shades and/or IPS e.max CAD Crystall./Stains. For that purpose, extrude the Shades and Stains from the syringe and mix. If necessary, slightly thin them 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. More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
- To imitate the incisal area and translucency of the hybrid abutment crown in the incisal and occlusal third, IPS e.max CAD Crystall./Shades Incisal may be used. The cusps and fissures can be individualized using Stains.

Optional:

For minor shape adjustments (e.g. proximal or occlusal contact points), IPS e.max CAD Crystall./Add-On is available. The detailed procedure is described on page 33.

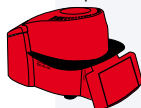


After glazing and staining, the Combination firing is conducted in a compatible ceramic furnace (e.g. Programat® CS or Programat P500). When placing the objects into the furnace and setting the firing parameters, observe the following points:

- Place the restoration in the centre of the IPS e.max CAD Crystallization Tray.
- A maximum of 6 units can be positioned on the firing tray and crystallized in the Combination firing with IPS e.max CAD Crystall./Glaze Paste.

Important

- Conduct the **Combination firing** on the IPS e.max CAD Crystallization Tray using the stipulated firing parameters.



Observe the firing parameters for IPS e.max CAD MO and IPS e.max CAD LT. Firing parameters see page 64

Note:

If a restoration made of IPS e.max CAD MO and one made of IPS e.max CAD LT are to be crystallized in the same firing, the firing parameters for IPS e.max CAD MO must be used!

- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.



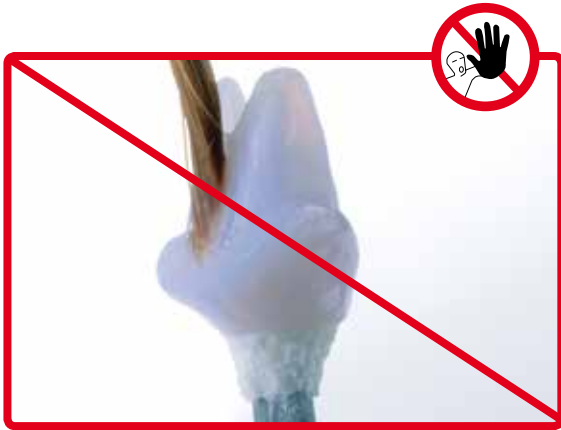
IPS e.max CAD Crystall./Glaze Paste is extruded from the syringe and mixed. If required, the paste can be thinned with IPS e.max CAD Crystall./Glaze Liquid.



IPS e.max CAD Crystall./Glaze Paste is applied evenly on the emergence profile of the hybrid abutment or the outer surface of the hybrid abutment crown.



Important: The glazing material must reach neither the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit.



Important: The materials must not be applied to the bonding surface to the crown, as this might compromise the fit of the crown.



Individual characterizations of the emergence profile are applied using IPS e.max CAD Crystall./Shades.



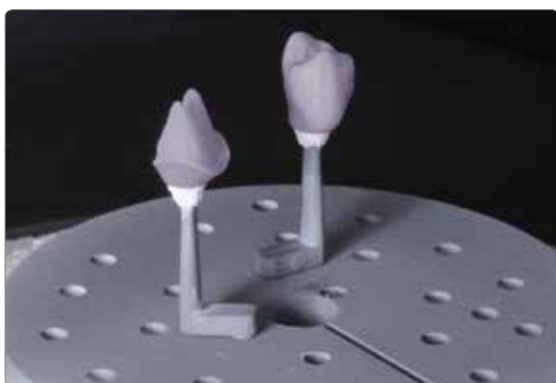
Enhancing the chroma on the buccal surface with IPS e.max CAD Crystall./Shades



IPS e.max CAD Crystall./Shade Incisal is applied to imitate the incisal area.



Optional: For minor shape adjustments (e.g. proximal contact points), IPS e.max CAD Crystall./Add-On is available.



The ceramic structure is placed in the centre of the IPS e.max CAD Crystallization Tray. The **Combination firing** is conducted using the stipulated **firing parameters**. The firing parameters for **IPS e.max CAD MO** and **IPS e.max CAD LT** must be observed.



The ceramic structure is removed from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).

Optional

Corrective firing

If characterizations or adjustments are required after crystallization, a corrective firing using IPS e.max CAD Crystall./Shades and Stains and Glaze can be conducted. Conduct the corrective firing also on the IPS e.max CAD Crystallization Tray.

For minor shape adjustments (e.g. proximal or occlusal contact points), IPS e.max CAD Crystall./Add-On is available. The detailed procedure is described on page 33.



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

- Remove the ceramic structure from the IPS e.max CAD Crystallization Pin XS.
- Remove any residue with ultrasound in a water bath and/or with the steam jet.
- Do **not** remove residue with Al₂O₃ or glass polishing beads.
- Place the ceramic structure on the Ti base and check the fit.
- **If adjustments by grinding are required, make sure that no overheating of the ceramic occurs.**



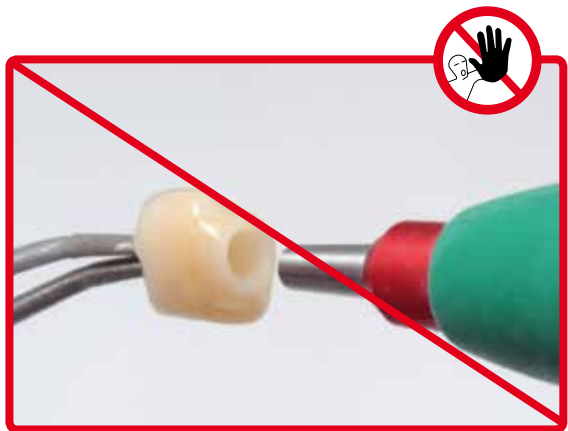
The ceramic structure is removed from the IPS e.max CAD Crystallization Pin XS.



Residue is removed with ultrasound in a water bath....



... or with the steam jet.



Residue **must not** be removed with Al_2O_3 or glass polishing beads.



Glazed and characterized ceramic structures (hybrid abutment crown and hybrid abutment)

Optional

Shape adjustments with IPS e.max CAD Crystall./Add-On

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

Processing

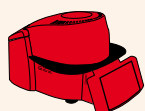
- Mix IPS e.max CAD Crystall./Add-On with IPS e.max CAD Crystall./Add-On Liquid to an easy-to-contour consistency.
- Ensure even mixing of the add-on material and the liquid in order to achieve an optimum firing result.
- Apply the mixed add-on material directly on the unfired Glaze Paste and/or Shades and Stains in the areas to be adjusted and fire.
- Conduct the Combination firing if Add-On is applied on the "blue" partially crystallized restoration.
- Conduct the Corrective firing if Add-On is applied on an already crystallized restoration.



Mixing IPS e.max CAD Crystall./Add-On with IPS e.max CAD Crystall./Add-On Liquid to an easy-to-contour consistency



Application of the mixed Add-On on the blue restoration before crystallization or on the crystallized restoration



Firing parameters see page 64

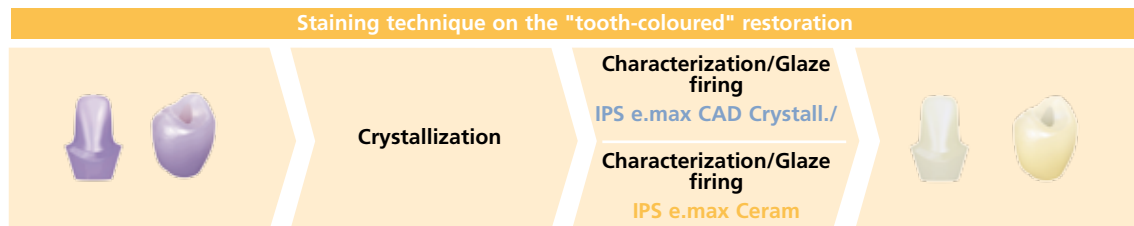


next working step ...



Permanent cementation Ti base / ceramic structure page 46

Staining technique on the "tooth-coloured" restoration



Crystallization without application of any materials; separate Characterization/Glaze firing with either IPS e.max CAD Crystall./ or IPS e.max Ceram materials.

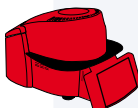
Crystallization

The following steps must be observed:

- Use the **IPS e.max CAD Crystallization Pin XS** for the crystallization of the ceramic structure.
- Fill the interface of the ceramic structure with either IPS Object Fix Putty or Flow auxiliary firing paste. **Immediately reseal the IPS Object Fix Putty/Flow syringe after extruding the material.**
- Slightly press the **IPS e.max CAD Crystallization Pin XS** into the IPS Object Fix Putty/Flow. **Important: Do not press the pin in too deep to make sure that it does not touch the walls. This may lead to cracks in the ceramic structure.**
- Smooth out displaced auxiliary firing paste using a plastic spatula so that the pin is securely in place.
- Prevent contamination of the outer restoration surface. Clean off contamination with a brush dampened with water and dry.
- Place the ceramic structure in the centre of the IPS e.max CAD Crystallization Tray.

Important

- Conduct the **crystallization** on the IPS e.max CAD Crystallization Tray using the stipulated firing parameters.



Observe the firing parameters for IPS e.max CAD MO and IPS e.max CAD LT. Firing parameters see page 64

– Note:

If a restoration made of IPS e.max CAD MO and one made of IPS e.max CAD LT are to be crystallized in the same firing, the firing parameters for IPS e.max CAD MO must be used!



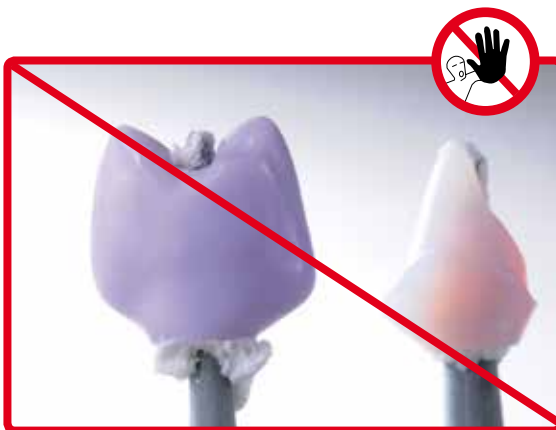
The IPS e.max CAD Crystallization Pin XS should be used for the crystallization of the ceramic structure.



The interface of the ceramic structure is filled with either IPS Object Fix Putty or Flow auxiliary firing paste.



Important: – The IPS e.max CAD Crystallization Pin XS is only slightly pressed into the IPS Object Fix Putty/Flow so that it **does not touch the walls** of the ceramic structure.



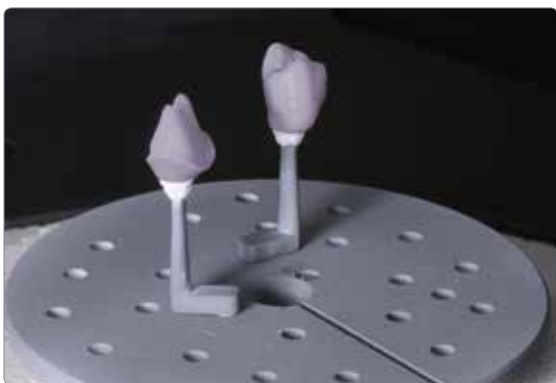
Incorrect: Pin pressed in too deep. Pin touches the ceramic structure. This may lead to cracks in the ceramic structure.



Displaced auxiliary firing paste is smoothed out with a plastic spatula from the margin towards the support pin so that the pin is secured in the paste.



Any possible residue adhering to the outer surface is cleaned off with a brush dampened with water and dried.





Conduct the crystallization using the stipulated firing parameters. The **firing parameters** for IPS e.max CAD MO and IPS e.max CAD LT must be observed.




Crystallized ceramic structures

- Remove ceramic structures 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.
- Remove the ceramic structure from the IPS e.max CAD Crystallization Pin.
- Remove any residue with ultrasound in a water bath and/or with the steam jet.
- Do **not** remove residue with Al₂O₃ or glass polishing beads.
- Place the ceramic structure on the Ti base and check the fit.
- **If adjustments by grinding of the restoration are required, make sure that no overheating of the ceramic occurs.**

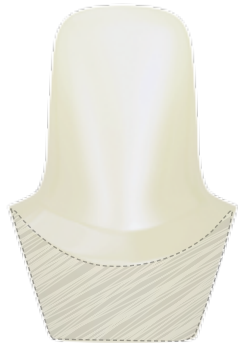
next working step, either...

  **Stain / Glaze firing with IPS e.max CAD Crystall.;** page 36

 **Stain / Glaze firing with IPS e.max CAD Ceram;** page 40

Characterization/Glaze firing with IPS e.max CAD Crystall./...

The following paragraphs will explain the steps of characterizing and glazing with IPS e.max CAD Crystall./Shades, Stains and Glaze.



If hybrid abutments are fabricated, only the area of the emergence profile is characterized with IPS e.max CAD Crystall./Shades, Stains and Glaze.



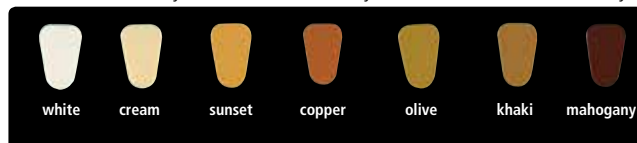
If hybrid abutment crowns are fabricated, the entire outer surface may be individually characterized.

Required materials

- IPS e.max CAD Crystall./Shades are ready-to-use "Dentin" stains in syringes.



- IPS e.max CAD Crystall./Stains are ready-to-use intensive stains in syringes.



- IPS e.max CAD Crystall./Glaze Paste is a ready-to-use glazing paste.
- IPS e.max CAD Crystall./Glaze Liquid is a special liquid for mixing with Shades, Stains and Glaze.



Note:

The IPS e.max CAD Crystall./Glaze Spray is **not** recommended for glazing IPS e.max CAD Abutment Solutions, as it requires very targeted application. The glazing material must neither reach the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit.

Please observe the following procedure for the Characterization/Glaze firing:

- Extrude the ready-to-use IPS e.max CAD Crystall./Glaze Paste from the syringe and mix.
- If a slight thinning is desired, the ready-to-use glaze may be mixed with a small amount of IPS e.max CAD Crystall./Glaze Liquid.

Important:

- The glazing material must neither reach the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit. Check the interface before firing and carefully remove any contamination.
- On the hybrid abutment, do not apply any materials to the bonding surface to the crown, as this might compromise the fit of the crown.

- Apply IPS e.max CAD Crystall./Glaze Paste evenly on the areas to be glazed using a small brush. Avoid to apply too thick a glaze layer. Avoid "pooling", especially on the occlusal surface of the hybrid abutment crown.
- Too thin a glaze layer may lead to an unsatisfactory gloss.
- Apply characterizations with IPS e.max CAD Crystall./Shades and/or IPS e.max CAD Crystall./Stains. For that purpose, extrude the Shades and Stains from the syringe and mix. If necessary, slightly thin them 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. More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
- To imitate the incisal area and translucency of the abutment crown in the incisal and occlusal third, IPS e.max CAD Crystall./Shades Incisal may be used. The cusps and fissures can be individualized using Stains.

After glazing and staining, the Characterization/Glaze firing (Corrective firing) is conducted in a compatible ceramic furnace (e.g. Programat® CS or Programat P500). When placing the objects into the furnace and setting the firing parameters, observe the following points:

- Place the restoration in the centre of the IPS e.max CAD Crystallization Tray.
- A maximum of 6 units can be positioned on the firing tray for the firing with IPS e.max CAD Crystall./Glaze Paste.

Important

- Conduct the **Corrective firing** on the IPS e.max CAD Crystallization Tray using the stipulated firing parameters.



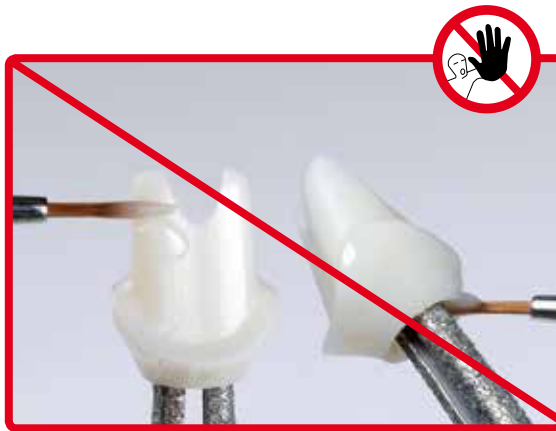
Firing parameters see page 64



IPS e.max CAD Crystall./Glaze Paste is extruded from the syringe and mixed. If required, the paste is thinned with IPS e.max CAD Crystall./Glaze Liquid.



IPS e.max CAD Crystall./Glaze Paste is applied evenly on the emergence profile of the hybrid abutment or the outer surface of the hybrid abutment crown.



Important: The glazing material must reach neither the bonding surface to the Ti base nor the screw channel or the bonding surface to the crown, as this may compromise the accuracy of fit.



Characterizing the emergence profile with Shades



Enhancing the chroma of the buccal surface



IPS e.max CAD Crystall./Shade Incisal is applied to imitate the incisal area.



The Corrective firing is conducted on the IPS e.max CAD Crystallization Tray using the stipulated firing parameters.

Optional

Corrective firing

- If adjustments are required, another Corrective firing using IPS e.max CAD Crystall./Shades and Stains and Glaze can be conducted. Conduct the Corrective firing also on the IPS e.max CAD Crystallization Tray.
- For minor shape adjustments (e.g. proximal contact points), IPS e.max CAD Crystall./Add-On is available. The adjustments may be made with both Crystallization/Glaze and Corrective firing.
- The detailed procedure is described on page 33.



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

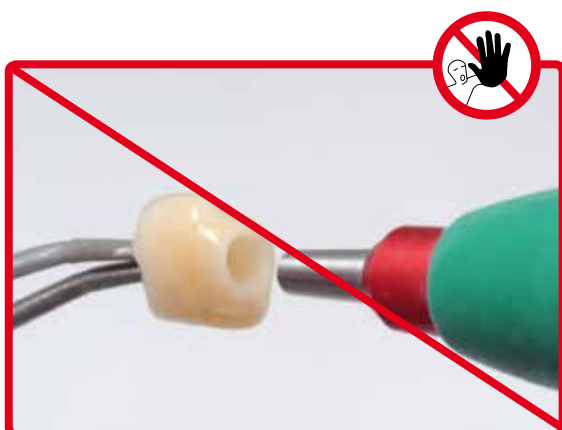
- Remove the ceramic structure from the IPS e.max CAD Crystallization Pin XS.
- Remove any residue with ultrasound in a water bath and/or with the steam jet.
- Do **not** remove residue with Al_2O_3 or glass polishing beads.
- Place the ceramic structure on the Ti base and check the fit.
- If adjustments by grinding 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.



The ceramic structure is removed from the IPS e.max CAD Crystallization Pin XS.



Any residue is removed with ultrasound in a water bath or with the steam jet.



Residue **must not** be removed with Al_2O_3 or glass polishing beads.



Glazed and characterized ceramic structures (hybrid abutment and/or hybrid abutment crown)



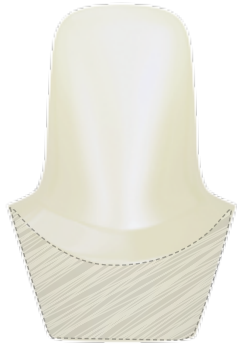
next working step ...



Permanent cementation Ti base / ceramic structure page 46

Characterization/Glaze firing with IPS e.max Ceram

The following paragraphs will explain the steps of characterizing and glazing with **IPS e.max Ceram**.



If hybrid abutments are fabricated, only the area of the emergence profile is characterized with IPS e.max Ceram Shades, Essences and Glaze.



If hybrid abutment crowns are fabricated, the entire outer surface may be individually characterized with IPS e.max Ceram Shades, Essences, and Glaze.

Required materials

- **IPS e.max Ceram Essences** are intensively shaded stains in powder form.
- **IPS e.max Ceram Shades** are ready-to-use stains in syringes.
- **IPS e.max Ceram Glaze and Stain Liquid (allround, longlife)** to mix the materials in powder form (Essences, Glaze), as well as to thin paste materials (Shades, Glaze).



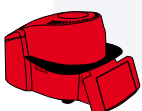
IPS e.max CAD Crystall./Shades, Stains, Glaze and IPS e.max Ceram Shades, Essence, Glaze must not be mixed with each other!

The following steps must be observed:

- Clean the finished ceramic structure with the steam jet to remove any contaminations and grease residue. Any contamination after cleaning must be prevented.
- For better wetting of the stains, a small quantity of IPS e.max Ceram Glaze and Stain Liquid may be slightly rubbed into the area that needs to be characterized.
- Mix the pastes or powders with the IPS e.max Ceram Glaze and Stain Liquid allround or longlife to the desired consistency.
- More intensive shades are achieved by several staining procedures and repeated firing, not by applying thicker layers.
- To imitate the incisal area and translucency of the hybrid abutment crown in the incisal and occlusal third, IPS e.max Ceram Shade Incisal may be used. The cusps and fissures can be individualized using Essences.
- If hybrid abutments are fabricated, only the area of the emergence profile is characterized with IPS e.max Ceram Shades and Essences.
- Secure the ceramic structure on the firing pin of the honey-comb tray with a little IPS Object Fix Putty or Flow for firing.

Important:

The characterization must neither reach the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit. Check the interface before firing and carefully remove any contamination. On the hybrid abutment, do not apply any materials to the bonding surface to the crown, as this may compromise the fit of the crown.



Conduct the Characterization/Glaze firing for IPS e.max Ceram on a honey-comb firing tray using the stipulated firing parameters. Firing parameters see page 64





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



Enhancing the chroma of the buccal surface



Individual characterization of the emergence profile with IPS e.max Ceram Essences



The Stain and Characterization firing is conducted on a honey-comb firing tray.

- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.

Additional Characterization firings can be conducted with the same firing parameters.

Glaze firing

Glaze firing is conducted with powder or paste glaze. On abutments, only the emergence profile is glazed. On hybrid abutment crowns, glaze is applied to the entire outer surface.

Required materials

- **IPS e.max Ceram Glaze Paste, Glaze Powder** are glazing materials in paste and powder forms.
- **IPS e.max Ceram Glaze and Stain Liquid (allround, longlife) to mix** the materials in powder form (Essences, Glaze), as well as to thin paste materials (Shades, Glaze)



IPS e.max CAD Crystall./Shades, Stains, Glaze and IPS e.max Ceram Shades, Essence, Glaze must not be mixed with each other!

The following procedure is recommended:

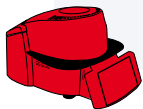
- For easier handling, the ceramic structure can be positioned on the Ti base for glazing. For that purpose, secure Ti base on a model analog.
- Mix the glazing material (IPS e.max Ceram Glaze Paste or Powder) with the IPS e.max Ceram Glaze and Stain Liquid allround or longlife to the desired consistency.
- Apply an even layer of glazing material covering all areas that are to be glazed.
- If required, the fluorescence may be increased by applying a fluorescing glazing material (paste or powder).

Important:

The glazing material **must neither reach the bonding surface** to the Ti base nor the screw channel, as this may compromise the accuracy of fit. Check the interface before firing and carefully remove any contamination. On the abutment, do not apply any glaze to the bonding surface to the crown, as this might compromise the fit of the crown.



The **IPS e.max CAD Crystall./Glaze Spray** is not recommended for glazing IPS e.max CAD Abutment Solutions, as it requires very targeted application. The glazing material must neither reach the bonding surface to the Ti base nor the screw channel, as this may compromise the accuracy of fit.



Conduct the Characterization/Glaze firing for IPS e.max Ceram on a honey-comb firing tray using the stipulated firing parameters. Firing parameters see page 64



An even layer of glaze material is applied to the emergence profile of the hybrid abutment. Care has to be taken that no glaze material enters the screw channel.



The glazing material is applied evenly on the outer surface of the hybrid abutment crown. Care has to be taken that no glaze material enters the screw channel.



Care has to be taken that no glaze material is present on the interface of the hybrid abutment and hybrid abutment crown prior to the firing cycle. The glaze material is carefully removed, if necessary.



The Characterization/Glaze firing is conducted on a honey-comb firing tray with the corresponding parameters.

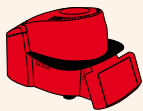
- Remove restoration from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.

Optional

Shape adjustments of IPS e.max Ceram Add-On

Use IPS e.max Ceram Add-On Dentin and/or Incisal for shape adjustments after Glaze firing. Please observe the following procedure for processing:

- Mix IPS e.max Ceram Add-On Dentin or Incisal with IPS e.max Ceram Build-Up Liquid soft or allround and apply on the corresponding areas.
- Fire with the stipulated parameters for the "Add-On after Glaze firing". Observe long-term cooling!
- If necessary, polish the adjusted areas to a high gloss after firing.



Firing parameters see page 64



next working step ...



Permanent cementation Ti base / ceramic structure page 46

IPS e.max CAD Abutment Solutions

Crown on IPS e.max CAD hybrid abutment

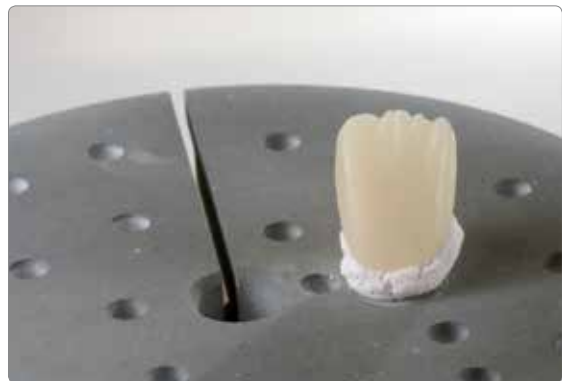
The crown on the IPS e.max Hybrid Abutment can be completed using either the staining technique or the cut-back technique. To characterize and glaze, either the PS e.max CAD Crystall./ materials or the IPS e.max Ceram materials are used.

Basically, the procedure for completing a crown is the same as that for a crown on a prepared tooth. For detailed information about the procedure, please refer to the IPS e.max CAD Instructions for Use.

Example: IPS e.max CAD crown – Cut-back technique – IPS e.max Ceram



Partially reduced IPS e.max CAD restorations fitted on the model. Always observe minimum thicknesses!



For crystallization, the partially reduced IPS e.max CAD restorations are placed directly on the IPS e.max CAD Crystallization Tray using IPS Object Fix Putty or Flow.



The wash firing is conducted using e.g. IPS e.max Ceram Glaze, Shades and Essences.



Completion of the anatomical shape of the reduced areas using IPS e.max Ceram Incisal and Opal materials



Finishing with diamond burs and design of a true-to-nature shape and surface structure Finally, glaze firing is conducted using IPS e.max Ceram Glaze.



IPS e.max CAD crown after glaze firing (partially reduced and veneered with IPS e.max Ceram) on a IPS e.max CAD hybrid abutment

IPS e.max CAD Abutment Solutions

Permanent cementation of base / ceramic structure

Careful preparation of the bonding surface is a prerequisite for the successful adhesive cementation of the base and the ceramic structure. The following paragraphs outline the required procedure. The procedure is the same for hybrid abutments and hybrid abutment crowns.

Required materials

- IPS Ceramic Etching Gel
- Monobond® Plus
- Multilink® Hybrid Abutment
- Glyceringel (z.B. Liquid Strip)



	IPS e.max CAD ceramic structure (LS ₂)	Base
Blasting	–	According to the instructions of the manufacturer
Etching	Bonding area to the base with IPS® Ceramic Etching Gel for 20 s	–
Conditioning	The bonding area with Monobond® Plus for 60 s	
Adhesive cementation	Multilink® Hybrid Abutment	
Covering the cementation joint	Glycerine gel, e.g. Liquid Strip	
Curing	7 minutes auto-polymerization	
Polishing the cementation joint	Conventional polishers for ceramic/composite resin	

Preparation of the Ti base

The following procedure should be observed in the preparation of the Ti base for the cementation with the ceramic structure:

- The Ti base should be prepared according to the instructions of the manufacturer.
- Clean the Ti base with an ultrasonic bath or with a steam cleaner and then dry it with blown air.
- Screw the Ti base on the model analog.
- Place the ceramic structure on the Ti base and mark the relative position of the components with a waterproof pen. This facilitates locating the correct position when the parts are assembled at a later stage.
- The emergence profile of the base must not be blasted or modified in any way.
- **If the manufacturer recommends that the bonding surface of the Ti base be blasted, the following procedure should be observed:**
 - Apply silicone (Virtual Extra Light Body Fast Set) to protect the emergence profile and the screw channel .
 - Carefully blast the bonding area according to the instructions of the manufacturer.
 - Remove silicone.
 - Clean the Ti base with ultrasound in a water bath or with the steam jet.
 - After cleaning, the bonding surface must not be contaminated under any circumstances, as this would impair the bond.
- Apply Monobond Plus on the clean bonding surface and allow it to react for 60 s. After the reaction time, disperse any residue with air that is free of water and oil.
- Seal the screw channel with a foam pellet or wax. The bonding surface must not be contaminated in the process.



The Ti base is screwed on the model analog. The relative position to the ceramic structure is marked with a waterproof pen.



E.g. silicone (Virtual Extra Light Body Fast Set) is applied in order to protect the emergence profile and the screw channel.



The bonding surface can be carefully blasted **according to the instructions of the manufacturer.**



Removal of the silicone and subsequently cleaning with ultrasound in a water bath or with the steam jet.



Monobond Plus is applied to the clean bonding surface and allowed to react for 60 s. After the reaction time, any remaining residue is dried with blown air that is free of water and oil.



The screw channel is sealed with a foam pellet or wax. The bonding surface must not be contaminated in the process.

Preparing the ceramic structure

The following procedure must be observed in the preparation of the ceramic structure for cementation on the Ti base:

- Do **not** blast the ceramic structure in preparation for the cementation.
- Clean the ceramic structure in an ultrasonic bath or with a steam cleaner and subsequently blow dry.
- After cleaning, the bonding surface must not be contaminated under any circumstances, as this would impair the bond.
- Wax can be applied to protect the outer surfaces or the glazed areas.
- Etch the bonding surface with 5% hydrofluoric acid gel (IPS Ceramic Etching Gel) for 20 s.
- Subsequently, thoroughly rinse the bonding surface under running water and dry with air that is free of water and oil.
- Apply Monobond Plus on the clean bonding surface and allow it to react for 60 s. After the reaction time, dry any remaining residue with blown air that is free of water and oil.



The ceramic structure **must not** be blasted.



Etching with IPS Ceramic Etching Gel for 20 seconds. Subsequently, the restoration is rinsed with water and blown dry.



Monobond Plus is allowed to react for 60 s, and excess is blown dry.

Cementation with Multilink® Hybrid Abutment

The following instructions must be observed in the cementation procedure:

- The cleaned and conditioned components (ceramic structure, Ti base) are laid out ready for cementation.
- **The subsequent cementation procedure must be carried out quickly and without interruption. The working time of Multilink Hybrid Abutment is approximately 2 min at 23 °C (± 1 °C) or 73 °F (± 1.8 °F).**
- As a general rule, a new mixing tip is attached to the Multilink Hybrid Abutment syringe prior to each use.
- Apply a thin layer of Multilink Hybrid Abutment directly from the mixing syringe to the bonding surface of the Ti base and **the bonding surface of the ceramic structure.**
- The mixing tip is left on the Multilink Hybrid Abutment syringe until the next use. The remaining cement polymerizes in the tip and functions as a seal.
- Place the ceramic structure on the Ti base in such a way that the position markings are aligned.
- Press the parts lightly and evenly together and check the correct relative position of the components (transition Ti base/ceramic structure).
- Subsequently, press the parts tightly together for 5 s.
- Carefully remove excess in the screw channel, e.g. with a Microbrush or brush, using rotary movements.

Important:

- **Important: Excess must not be removed before curing has started, i.e. 2-3 minutes after mixing. For the purpose, a suitable dental lab instrument (e.g. Le Cron) is used. The components are held in place with light pressure in the process.**
- Glycerine gel is applied (e.g. Liquid Strip) on the cementation joint to prevent the formation of an inhibition layer. The glycerine gel must be applied cautiously to avoid blending it with or displacing the composite. Make sure to leave the gel on the cementation joint until polymerization is complete.
- Next, the luting composite is completely auto-polymerized within 7 min.
- **Important: Do not move the components until Multilink Hybrid Abutment has completely cured. They can be held immobile with e.g. diamond-coated tweezers.**
- After the completion of auto-polymerization, rinse off the glycerine gel with water.
- **Make sure to cautiously polish the cementation joint with rubber polishers at a low speed (< 5,000 rpm) to avoid overheating.**
- Remove any cement residue left in the screw channel with suitable rotating instruments.
- Clean the restoration with ultrasound in a water bath or with the steam jet.



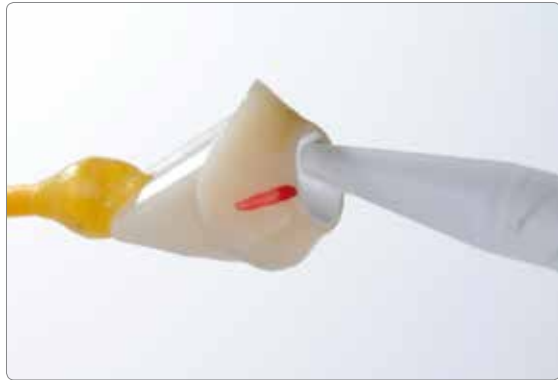
The cleaned and conditioned components are laid out ready for cementation.



A new mixing tips is attached to the Multilink Hybrid Abutment prior to each use.
The Multilink Hybrid Abutment mixing syringe is attached.



A thin layer of Multilink Hybrid Abutment is directly applied from the mixing tip to the bonding surface of the Ti base.



A thin layer of Multilink Hybrid Abutment is directly applied from the mixing tip on the bonding surface of the ceramic structure.



The ceramic structure is placed on the Ti base in such a way that the position markings are aligned. The components are joined using even and light pressure and the relative position of the components is checked (transition base/ceramic structure).



Subsequently, the components are tightly pressed together for 5 s.



Excess in the screw channel is carefully removed, e.g. with a Microbrush or brush, using rotary movements.



Important: Excess must not be removed before **curing has started**, i.e. **2-3 minutes after mixing**. The components are held in place with light pressure in the process.



Glycerine gel (e.g. Liquid Strip) is applied on the cementation joint to prevent the formation of an inhibition layer.



The luting composite auto-polymerizes within 7 min. **Important:** The components must not be moved until auto-polymerization is completed. The components must be immobilized during this time.



After the completion of auto-polymerization, the glycerine gel is rinsed off with water.



The cementation joint is cautiously polished with rubber polishers at low speed (< 5,000 rpm), to avoid overheating.



Any remaining cement residue in the screw channel is removed with suitable rotating instruments. The Ti base must not be damaged.



Completed hybrid abutment and hybrid abutment crown after cementation

IPS e.max[®] CAD Abutment Solutions

Seating and Aftercare

Sterilization

The hybrid abutments or hybrid abutment crowns must be sterilized prior to insertion. Furthermore, the locally applicable legal regulations and the hygiene standards applicable for a dental practice must be observed.

Steam sterilization can be performed with the 3 x fractionated pre-vacuum with the following parameters: Sterilization time 3 min; steam temperature 132 °C/270 °F; resulting in a half-cycle exposure time of 1.5 min. The abutment is for immediate use. No storage after sterilization!



The responsibility for the sterility of the hybrid abutment or hybrid abutment crown lies with the user. It must be ensured that only suitable devices, materials and product-specifically validated methods are used to perform sterilization. It must be ensured that the methods used have been validated. The equipment and devices must be properly maintained and serviced at regular intervals. The fabricator (dental technician) of the IPS e.max CAD Abutment Solution must inform the dentist of the need to sterilize the abutment before inserting it in the patient's mouth!

Intraoral preparation

Please observe the following procedure to prepare for the permanent cementation of the implant-supported restoration:

- Remove the temporary restoration.
- Clean the implant site.
- Check the periimplant tissue (emergence profile).

Seating the hybrid abutment and crown

Preparing/conditioning the hybrid abutment with dedicated crown

Conditioning of the ceramic surface, i.e. the bonding surface, in preparation for cementation is critical for generating a sound bond between the cementation material and the all-ceramic material.

The following procedure must be observed in the preparation of the ceramic structure for cementation on the Ti base:

- Do **not** blast IPS e.max CAD hybrid abutment or IPS e.max CAD crown with Al_2O_3 or glass polishing beads.
- Ideally, the clinical try-in is conducted before etching to prevent contamination of the bonding surface.
- Thoroughly clean the hybrid abutment and crown with water and subsequently blow dry.
- Etch the bonding surface with 5% hydrofluoric acid gel (IPS Ceramic Etching Gel) for 20 s. The etching gel must not come into contact with the emergence profile or the outer side of the crown. **Important: No intraoral application of the IPS Ceramic Etching Gel.**
- Subsequently, thoroughly rinse the bonding surface under running water and dry it with air that is free of water and oil.
- If an adhesive or self-adhesive cementation protocol is used, apply Monobond Plus to the clean bonding surface and allow it to react for 60 s. After this reaction time, disperse any residue with air that is free of water and oil.



The IPS e.max CAD ceramic structures **must not** be blasted in preparation for cementation.



The bonding surfaces are etched with IPS Ceramic Etching Gel and subsequently cleaned.



Monobond Plus is applied to the bonding surfaces, and allowed to react for 60 s. Excess is dispersed with air.



Seating the hybrid abutment and dedicated crown

Note:

Temporary insertion of the IPS e.max CAD crown on the IPS e.max CAD hybrid abutment is contraindicated!

For the permanent seating of the hybrid abutment and the crown, please observe the following working steps. Please also observe the Instructions for Use of the selected luting material.

SpeedCEM® is recommended for the seating of IPS e.max CAD crowns on IPS e.max hybrid abutments.



- Do not use phenolic mouth washes, as such products negatively influence the bond between the ceramic and the composite.
- Insert the hybrid abutment intraorally into the implant.
- Manually screw in the matching implant screw.
- Tighten the implant screw with a torque wrench (observe the instructions of the manufacturer).
- Insert a cotton or foam pellet into the screw channel.
- Seal the screw channel with a temporary composite (e.g. Telio® CS Inlay). This serves to ensure access to the screw at a later stage.
- Check the bonding area for contamination/moisture and clean or dry with an air syringe, if necessary.
- Apply the luting material, **e.g. SpeedCEM**, into the conditioned crown.
- Place the crown onto the hybrid abutment and secure in place in the final position.
- Conduct the pre-polymerization using the four-quarter technique.
- Remove excess luting material.
- Cover the cementation joint with glycerine gel (e.g. Liquid Strip).
- Polymerize with an LED curing light (e.g. Bluephase®).
- Rinse off the glycerine gel with water.
- Check the occlusion and articulation and make adjustments, if necessary. If adjustments are made to the restoration by grinding, these areas must subsequently be polished to a high gloss, e.g. using OptraFine.
- Polish restoration margins and the cementation joint with silicone polishers (e.g. Astropol®, OptraFine).
- Apply Cervitec Plus in the area of the gingival margin.



The hybrid abutment is inserted into the implant intraorally.



The matching implant screw is screwed in manually.



The implant screw is tightened with a torque wrench (the instructions of the manufacturer must be observed).



The screw channel is sealed, for instance with a cotton or foam pellet and a temporary composite material.



The luting material, e.g. SpeedCEM, is applied into the conditioned crown.



The crown is placed on the hybrid abutment and secured in place.



Pre-polymerization using the four-quarter technique



Excess luting material is removed.



The restoration margin is covered with glycerine gel (e.g. Liquid Strip).



The luting material is cured with an LED curing light (e.g. Bluephase).



The glycerine gel is rinsed off with water.



The occlusion and articulation is checked and adjustments are made, if necessary.



The restoration margins and the cementation joint are polished (e.g. OptraPol, OptraFine).



Completed IPS e.max CAD hybrid abutment and crown

Seating the hybrid abutment crown

Preparing/Conditioning the Hybrid Abutment Crown

Please observe the following notes to prepare for the intraoral sealing of the screw channel:

- As a general rule, do **not** blast IPS e.max CAD hybrid abutment crowns with Al_2O_3 or glass polishing beads.
- Thoroughly clean the the hybrid abutment crown with water and blow dry.
- Etch the screw channel from the occlusal side with 5% hydrofluoric acid gel (IPS Ceramic Etching Gel) for 20 seconds. Make sure that no etching gel comes into contact with the occlusal surface. **Important: Do not use the IPS Ceramic Etching Gel intraorally.**
- Thoroughly rinse off the etching gel with water and dry with oil- and water-free air.
- Apply Monobond Plus to the etched and cleaned surface in the screw channel, allow to react for 60 seconds and then disperse excess with oil- and water-free air.



IPS e.max CAD ceramic structures **must not** be blasted.



The screw channel is etched with IPS Ceramic Etching Gel for 20 s and subsequently cleaned.



Monobond Plus is applied, allowed to react for 60 s and excess is dispersed.

Seating the hybrid abutment crown

For the permanent seating of the hybrid abutment crown, please observe the following working steps:

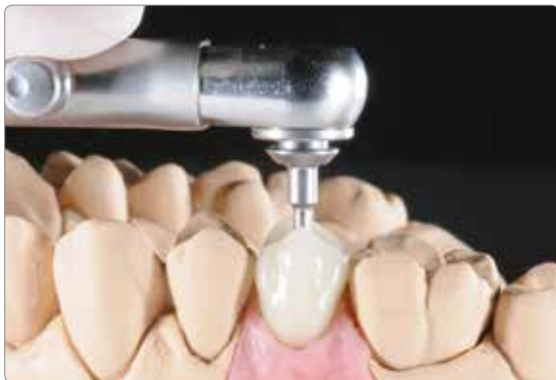
- Do not use phenolic mouth washes, as such products negatively influence the bond between the ceramic and the composite.
- Insert the hybrid abutment crown intraorally into the implant.
- Manually screw in the matching implant screw.
- Tighten the implant screw with a torque wrench (observe the instructions of the manufacturer).
- Check the screw channel for contamination/moisture and clean with Total Etch (phosphoric acid gel), if necessary.
- Insert a cotton or foam pellet into the screw channel.
- Apply the bonding agent, followed by polymerization.
- Seal the screw channel with a composite material (e.g. Tetric EvoCeram) in the appropriate shade.
- Polymerize with an LED curing light (e.g. Bluephase).
- Check the occlusion/articulation after polymerization and correct possible rough spots with suitable fine-grit diamonds.
- Polish to a high gloss with silicone polishers (e.g. OptraPol/OptraFine).



The hybrid abutment crown is inserted into the implant intraorally.



The matching implant screw is screwed in manually.



The implant screw is tightened with a torque wrench (the instructions of the manufacturer must be observed).



The screw channel is sealed with a composite material (e.g. Tetric EvoCeram) in the appropriate shade.



Polymerization with an LED curing light (e.g. Bluephase)



After polymerization, the occlusion/articulation is checked and possible rough spots are adjusted with suitable finishers or fine diamonds.



High-gloss polishing is performed using silicone polishers (e.g. Astropol P, Astropol HP or Astrobrush).



Completed IPS e.max CAD hybrid abutment crown

Care notes – Implant Care

Implant Care comprises a range of coordinated products for the professional care of patients during the various phases of implant treatment and lifelong aftercare. Products for professional tooth cleaning and bacterial control contribute to the long-term quality assurance of implant-supported restorations. Structural elements peri-implant tissue, natural teeth, dental restorations, gingiva and the mucosa are treated in an optimum way with regard to function and esthetics.



IPS e.max[®] CAD Abutment Solutions

General Information

Frequently Asked Questions

In addition to the desired tooth shade, why should the root shade also be defined/determined upon shade determination?

IPS e.max CAD Abutment Solutions allow you to fabricate restorations with a lifelike appearance both in the visible area and the area below the gingiva (root). By defining the root shade, a highly esthetic outcome can be achieved especially in the case of receding gingiva.

Is it possible to fabricate an abutment or an abutment crown with IPS e.max CAD (LS₂) without using a Ti base?

No! For this indication, IPS e.max CAD needs the support provided by the Ti base. In addition, the Ti base allows an optimum (industrially fabricated) fit to the implant to be achieved.

Which Ti bases can be used for the fabrication of IPS e.max CAD Abutment Solutions?

Only Ti bases of authorized CAD/CAM systems may be used. More information about the CAD/CAM cooperation systems is available on the Internet from www.ivoclarvivadent.com.

Is it permissible to modify the selected Ti base?

The Ti base must not be adjusted by grinding, as this would compromise the fit of the IPS e.max CAD ceramic structure.

The instructions of the manufacturer regarding the preparation for permanent cementation must be observed.

Is a hybrid abutment crown indicated in the anterior region?

This indication depends on the position and inclination of the implant. If the opening of the screw channel is located on the oral surface, a hybrid abutment crown may be fabricated in the anterior region.

May a hybrid abutment crown be cut-back and subsequently supplemented with IPS e.max Ceram layering materials?

No. For implant-supported restorations, it is recommended to fabricate monolithic restorations (without veneer). In this way, chipping of the layering ceramic is prevented.

Do IPS e.max CAD ceramic structures have to be glazed in all cases?

No. High gloss can also be achieved by a corresponding polishing procedure. The polishing technique (before crystallization) is preferably used for the emergence profile of the hybrid abutment. For the hybrid abutment crown, the application of glaze is recommended.

Is it possible to use an IPS e.max CAD hybrid abutment as an abutment for a bridge restoration?

No. Only single-tooth restorations may be fabricated.

Can different CAM units be used for milling the IPS e.max CAD ceramic structure (abutment) and the dedicated IPS e.max CAD crown?

If different CAM units are used, inaccuracies of fit may occur in unfavourable cases. Therefore, both IPS e.max CAD objects (abutment, crown) should be ideally milled in the same CAM unit.

Can a clinical try-in be conducted with the IPS e.max CAD Abutment Solutions? How are the ceramic structures prepared for this?

Yes. Clinical try-in may be performed either before or after crystallization of the IPS e.max CAD ceramic structures. The Ti base and IPS e.max CAD ceramic structure are temporarily joined in the laboratory by means of a silicone material, e.g. Virtual Extra Light Body Fast Set. This facilitates the intraoral handling during clinical try-in with the patient.

What must be observed for the clinical try-in of a crown on a hybrid abutment?

To check the occlusion/articulation and to make possible adjustments, the crown must be temporarily secured on the hybrid abutment with a silicone material, e.g. Virtual Extra Light Body Fast Set. The silicone material acts as a buffer and prevents chipping in the marginal area of the crown. Try-in pastes or Vaseline must not be used for functional checks.

Can a glaze spray be used for glazing IPS e.max CAD ceramic structures (e.g. IPS e.max CAD Crystall./Glaze Spray)?

We do not recommend using the Glaze Spray for the indications hybrid abutment or hybrid abutment crown, as there is a risk that the bonding surface to the Ti base or the screw channel are contamination with glaze.

What material is used to permanently cement the IPS e.max CAD ceramic structures to the Ti base?

Only Multilink Hybrid Abutment is to be used for permanent cementation. This ensures a high-quality bond. Given the high opacity of the luting composite, complete optical masking of the Ti base is achieved and thus an excellent esthetic appearance ensured.

How is the Ti base prepared for the permanent cementation with Multilink Hybrid Abutment?

Provided it has been approved by the manufacturer, carefully blast the bonding area with Al_2O_3 at low pressure until an even mat surface has been achieved. After cleaning, the area is conditioned with Monobond Plus.

How is the screw channel of a hybrid abutment crown sealed after seating?

The screw channel is extraorally conditioned (etching, silanating). After the restoration has been intraorally screwed down on the implant, the screw channel is sealed with a restorative composite.

Material Selection Table

IPS e.max CAD hybrid abutment and IPS e.max CAD dedicated crown

The material is selected on the basis of the desired tooth shade (Bleach BL or A-D). Depending on the geometry of the hybrid abutment and the crown, shade adjustment by means of characterization with IPS e.max CAD Crystall./Shades, Stains, or IPS e.mx Ceram Shades and Essences may be necessary to achieve the desired shade.

The block recommendations for the hybrid abutment have been selected in such a way that the desired tooth shade is achieved in combination with the crown. In the "cervical area", it may be necessary to characterize the hybrid abutment according to the clinical situation.

Desired tooth shade	Bleach BL and A-D Shade Guide																				
	BL1	BL2	BL3	BL4	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4	
Material combination to achieve the tooth shade	Ti base																				
	Multilink Hybrid Abutment HO 0*																				
Extraoral cementation IPS e.max CAD abutment / Ti base	MO 0																				
	MO 1 MO 2 MO 3 MO 1 MO 3 MO 4 MO 3																				
Intraoral cementation Crown on hybrid abutment	Adhesive, self-adhesive or conventional cementation, e.g. SpeedCEM																				
	LT BL1	LT BL2	LT BL3	LT BL4	LT A1	LT A2	LT A3	LT A3.5	LT A4	LT B1	LT B2	LT B3	LT B4	LT C1	LT C2	LT C3	LT C4	LT D2	LT D3	LT D4	

* The range of products may vary from country to country.

IPS e.max CAD hybrid abutment crown

The material is selected on the basis of the desired tooth shade (Bleach BL or A-D). Depending on the geometry of the hybrid abutment crown, shade adjustment by means of characterization with IPS e.max CAD Crystall./Shades, Stains, or IPS e.mx Ceram Shades and Essences may be necessary to achieve the desired shade. In the "cervical area", it may be necessary to characterize the hybrid abutment crown according to the clinical situation.

Desired tooth shade	Bleach BL and A-D Shade Guide																				
	BL1	BL2	BL3	BL4	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4	
Material combination to achieve the tooth shade	Ti base																				
	Multilink Hybrid Abutment HO 0*																				
Extraoral cementation IPS e.max CAD abutment crown / Ti base	MO 0																				
	MO 1 MO 2 MO 3 MO 1 MO 3 MO 4 MO 3																				
Intraoral cementation Crown on hybrid abutment	Adhesive, self-adhesive or conventional cementation, e.g. SpeedCEM																				
	LT BL1 ¹	LT BL2	LT BL3	LT BL4 ¹	LT A1	LT A2	LT A3	LT A3.5	LT A4 ¹	LT B1	LT B2	LT B3 ¹	LT B4 ¹	LT C1	LT C2	LT C3 ¹	LT C4 ¹	LT D2	LT D3 ¹	LT D4 ¹	

* The range of products may vary from country to country.

¹ IPS e.max CAD LT Blocks are available in 10 shades. To create the desired tooth shade, select the closest block shade in the respective shade group and determine the restoration shade by means of Stains.

Clinical Cases

IPS e.max CAD hybrid abutment / IPS e.max CAD-crown

Dr. R. Watzke / F. Perkon, Ivoclar Vivadent, Liechtenstein



Starting situation with shaped emergence profile



IPS e.max CAD ceramic structure (abutment) / IPS e.max CAD crown, milled



IPS e.max CAD hybrid abutment / IPS e.max CAD crown, completed



Screwed in IPS e.max CAD hybrid abutment



IPS e.max CAD crown on IPS e.max CAD hybrid abutment, cemented

IPS e.max CAD hybrid abutment crown

Dr. L. Enggist / P. Scherrer, Ivoclar Vivadent, Liechtenstein



Starting situation



IPS e.max CAD hybrid abutment crowns (prepared for clinical try-in)



Try-in of the IPS e.max CAD hybrid abutment crowns



Completed IPS e.max CAD hybrid abutment crowns



Seated IPS e.max CAD hybrid abutment crowns



Crystallization and Firing Parameters

Crystallization/Combination firing: IPS e.max CAD MO – optional for LT

with or without application of IPS e.max CAD Crystall./ materials



Furnaces	Stand-by temperature B [°C/°F]	Closing time S [min]	Heating rate t ₁ [°C/°F/min]	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]	Vacuum 1 1 ₁ [°C/°F] 1 ₂ [°C/°F]	Vacuum 2 2 ₁ [°C/°F] 2 ₂ [°C/°F]	Long-term cooling L [°C/°F]	Cooling rate t ₁ [°C/°F/min]
Programat P300 P500 P700	403/757	06:00	60/108	770/1418	00:10	30/54	850/1562	10:00	550/770 1022/1418	770/850 1418/1562	700/1292	0
Programat CS Program 7	403/757	06:00	60/108	770/1418	00:10	30/54	850/1562	10:00	550/770 1022/1418	770/850 1418/1562	700/1292	0

Crystallization/Combination firing: IPS e.max CAD LT – not suitable for MO

with or without application of IPS e.max CAD Crystall./ materials



Furnaces	Stand-by temperature B [°C/°F]	Closing time S [min]	Heating rate t ₁ [°C/°F/min]	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]	Vacuum 1 1 ₁ [°C/°F] 1 ₂ [°C/°F]	Vacuum 2 2 ₁ [°C/°F] 2 ₂ [°C/°F]	Long-term cooling L [°C/°F]	Cooling rate t ₁ [°C/°F/min]
Programat P300 P500 P700	403/757	06:00	90/162	820/1508	00:10	30/54	840/1544	07:00	550/820 1022/1508	820/840 1508/1544	700/1292	0
Programat CS Program 1	403/757	06:00	90/162	820/1508	00:10	30/54	840/1544	07:00	550/820 1022/1508	820/840 1508/1544	700/1292	0

Corrective firing – Characterization/Glaze firing IPS e.max CAD MO, LT

with IPS e.max CAD Crystall./ materials



Furnaces	Stand-by temperature B [°C/°F]	Closing time S [min]	Heating rate t ₁ [°C/°F/min]	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]	Vacuum 1 1 ₁ [°C/°F] 1 ₂ [°C/°F]	Vacuum 2 2 ₁ [°C/°F] 2 ₂ [°C/°F]	Long-term cooling L [°C/°F]	Cooling rate t ₁ [°C/°F/min]
Programat P300 P500 P700	403/757	06:00	90/162	820/1508	00:10	30/54	840/1544	03:00	550/820 1022/1508	820/840 1508/1544	700/1292	0
Programat CS Program 3	403/757	06:00	90/162	820/1508	00:10	30/54	840/1544	03:00	550/820 1022/1508	820/840 1508/1544	700/1292	0

Characterization/Glaze firing

with IPS e.max Ceram Shades, Essences, Glaze



Furnaces	Stand-by temperature B [°C/°F]	Closing time S [min]	Heating rate t ₁ [°C/°F/min]	Firing temperature T ₁ [°C/°F]	Holding time H [min]	Vacuum 1 V ₁ [°C/°F]	Vacuum 2 V ₂ [°C/°F]	Long-term cooling L [°C/°F]
Programat P300 P500 P700	403/757	06:00	60/108	770/1418	1:00 – 2:00	450/842	769/1416	500/932

Note:

If the layer thickness is less than 2 mm on the IPS e.max CAD object, long-term cooling (L) is not required.

Corrective firing

with IPS e.max Ceram Add-On



Furnaces	Stand-by temperature B [°C/°F]	Closing time S [min]	Heating rate t ₁ [°C/°F/min]	Firing temperature T ₁ [°C/°F]	Holding time H [min]	Vacuum 1 V ₁ [°C/°F]	Vacuum 2 V ₂ [°C/°F]	Long-term cooling L [°C/°F]
Programat P300 P500 P700	403/757	06:00	50/90	700/1292	01:00	450/842	699/1290	500/932

Crystallization and Firing Parameters

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

- Crystallization should be carried out in an Ivoclar Vivadent ceramic furnace (e.g. Programat CS, Programat P300, P500, or P700).
- If you use other, untested ceramic furnaces, please consult Ivoclar Vivadent about their compatibility with IPS e.max CAD.

Basically, the following applies:

- Ceramic furnaces without
 - function for controlled (long-term) cooling
 - vacuum functioncannot be used.
- Before the first crystallization and every six months after that, the ceramic furnace must be calibrated.
- Depending on the mode of operation, more frequent calibrations may be required. Observe the instructions of the manufacturer.

The following aspects should be observed for conducting the **crystallization**:

- Use only IPS Object Fix Putty or Flow as an auxiliary firing paste to place the restoration directly on the IPS e.max CAD Crystallization Tray.
- IPS e.max CAD restorations must not be directly placed on the IPS e.max CAD Crystallization Tray and the Pins, i.e. without auxiliary firing paste, for crystallization.
- Use only the IPS e.max CAD Crystallization Tray and the corresponding Pins, since they store the heat necessary for slow and above all tension-free cooling of the glass-ceramic.
- Always conduct the crystallization under vacuum.
- Remove IPS e.max CAD objects from the furnace after completion of the firing cycle (wait for the acoustic signal of the furnace).
- Allow the objects to cool to room temperature in a place protected from draft.
- Do not touch the hot objects with metal tongs.
- Do not blast or quench the objects.



crystallization and firing parameters



please fold out the page



Ivoclar Vivadent – worldwide

Ivoclar Vivadent AG

Bendererstrasse 2
9494 Schaan
Liechtenstein
Tel. +423 235 35 35
Fax +423 235 33 60
www.ivoclarvivadent.com

Ivoclar Vivadent Pty. Ltd.

1 – 5 Overseas Drive
P.O. Box 367
Noble Park, Vic. 3174
Australia
Tel. +61 3 979 595 99
Fax +61 3 979 596 45
www.ivoclarvivadent.com.au

Ivoclar Vivadent Ltda.

Alameda Caiapós, 723
Centro Empresarial Tamboaré
CEP 06460-110 Barueri – SP
Brazil
Tel. +55 11 2424 7400
Fax +55 11 3466 0840
www.ivoclarvivadent.com.br

Ivoclar Vivadent Inc.

1-6600 Dixie Road
Mississauga, Ontario
L5T 2Y2
Canada
Tel. +1 905 670 8499
Fax +1 905 670 3102
www.ivoclarvivadent.us

Ivoclar Vivadent Shanghai Trading Co., Ltd.

2/F Building 1, 881 Wuding Road,
Jing An District
200040 Shanghai
China
Tel. +86 21 6032 1657
Fax +86 21 6176 0968
www.ivoclarvivadent.com

Ivoclar Vivadent Marketing Ltd.

Calle 134 No. 7-B-83, Of. 520
Bogotá
Colombia
Tel. +57 1 627 33 99
Fax +57 1 633 16 63
www.ivoclarvivadent.co

Ivoclar Vivadent SAS

B.P. 118
F-74410 Saint-Jorioz
France
Tel. +33 450 88 64 00
Fax +33 450 68 91 52
www.ivoclarvivadent.fr

Ivoclar Vivadent GmbH

Dr. Adolf-Schneider-Str. 2
D-73479 Ellwangen, Jagst
Germany
Tel. +49 (0) 79 61 / 8 89-0
Fax +49 (0) 79 61 / 63 26
www.ivoclarvivadent.de

Wieland Dental + Technik GmbH & Co. KG

Schwenninger Strasse 13
D-75179 Pforzheim
Germany
Tel. +49 (0) 72 31 / 37 05-0
Fax +49 (0) 72 31 / 35 79 59
www.wieland-dental.com

Ivoclar Vivadent Marketing (India) Pvt. Ltd.

503/504 Raheja Plaza
15 B Shah Industrial Estate
Veera Desai Road, Andheri (West)
Mumbai, 400 053
India
Tel. +91 (22) 2673 0302
Fax +91 (22) 2673 0301
www.ivoclarvivadent.in

Ivoclar Vivadent s.r.l.

Via Isonzo 67/69
40033 Casalecchio di Reno (BO)
Italy
Tel. +39 051 611 35 55
Fax +39 051 611 35 65
www.ivoclarvivadent.it

Ivoclar Vivadent K.K.

1-28-24-4F Hongo
Bunkyo-ku
Tokyo 113-0033
Japan
Tel. +81 3 6903 3535
Fax +81 3 5844 3657
www.ivoclarvivadent.jp

Ivoclar Vivadent Ltd.

12F W-Tower, 1303-37
Seocho-dong, Seocho-gu,
Seoul 137-855
Republic of Korea
Tel. +82 (2) 536 0714
Fax +82 (2) 596 0155
www.ivoclarvivadent.co.kr

Ivoclar Vivadent S.A. de C.V.

Av. Insurgentes Sur No. 863.
Piso 14, Col. Napoles
03810 México, D.F.
México
Tel. +52 (55) 50 62 10 00
Fax +52 (55) 50 62 10 29
www.ivoclarvivadent.com.mx
Ivoclar Vivadent BV
De Fruittuinen 32
2132 NZ Hoofddorp
Netherlands
Tel. +31 23 529 37 91
Fax +31 23 555 45 04
www.ivoclarvivadent.com

Ivoclar Vivadent Ltd.

12 Omega St, Rosedale
PO Box 303011 North Harbour
Auckland 0751
New Zealand
Tel. +64 9 914 99 99
Fax +64 9 914 99 90
www.ivoclarvivadent.co.nz

Ivoclar Vivadent Polska Sp. z o.o.

Al. Jana Pawla II 78
00-175 Warszawa
Poland
Tel. +48 22 635 54 96
Fax +48 22 635 54 69
www.ivoclarvivadent.pl

Ivoclar Vivadent Marketing Ltd.

Prospekt Andropova 18 korp. 6/
office 10-06
115432 Moscow
Russia
Tel. +7 499 418-03-00
Fax +7 499 418-03-10
www.ivoclarvivadent.ru

Ivoclar Vivadent Marketing Ltd.

Qlaya Main St.
Siricon Building No.14, 2nd Floor
Office No. 204
P.O. Box 300146
Riyadh 11372
Saudi Arabia
Tel. +966 1 293 83 45
Fax +966 1 293 83 44
www.ivoclarvivadent.com

Ivoclar Vivadent Pte. Ltd.

171 Chin Swee Road
#02-01 San Centre
Singapore 169877
Tel. +65 6535 6775
Fax +65 6535 4991
www.ivoclarvivadent.com

Ivoclar Vivadent S.L.U.

c/ Emilio Muñoz N° 15
Entrada c/ Albarracin
E-28037 Madrid
Spain
Tel. +34 91 375 78 20
Fax +34 91 375 78 38
www.ivoclarvivadent.es
Ivoclar Vivadent AB
Dalvägen 14
S-169 56 Solna
Sweden
Tel. +46 (0) 8 514 93 930
Fax +46 (0) 8 514 93 940
www.ivoclarvivadent.se

Ivoclar Vivadent Liaison Office

: Tesvikiye Mahallesi
Sakayik Sokak
Nisantas' Plaza No:38/2
Kat:5 Daire:24
34021 Sisli – Istanbul
Turkey
Tel. +90 212 343 08 02
Fax +90 212 343 08 42
www.ivoclarvivadent.com

Ivoclar Vivadent Limited

Ground Floor Compass Building
Feldspar Close
Warrens Business Park
Enderby
Leicester LE19 4SE
United Kingdom
Tel. +44 116 284 78 80
Fax +44 116 284 78 81
www.ivoclarvivadent.co.uk

Ivoclar Vivadent, Inc.

175 Pineview Drive
Amherst, N.Y. 14228
USA
Tel. +1 800 533 6825
Fax +1 716 691 2285
www.ivoclarvivadent.us



Manufacturer:
Ivoclar Vivadent AG, 9494 Schaan, Liechtenstein
www.ivoclarvivadent.com

Date information prepared: 2013-06/Rev. 0

Some products and/or indications may not be regulatory cleared/released in all markets. Please contact the local Ivoclar Vivadent sales office for the current national status.

These materials have 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 failure to observe the Instructions or the stipulated area of application. The user is responsible for testing the products for their suitability and use for any purpose not explicitly stated in the Instructions. Descriptions and data constitute no warranty of attributes and are not binding. These regulations also apply if the materials are used in conjunction with products of other manufacturers.

Printed in Liechtenstein
© Ivoclar Vivadent AG, Schaan / Liechtenstein
666447/en/USA/2013-06-12


ivoclar
vivadent
technical