IPS e.max® CAD

Technical Guide, May 2022


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IPS e.max CAD
THE ORIGINAL

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IPS e.max CAD

IPS e.max CAD is a tried-and-tested lithium disilicate glass-ceramic block (LS_2) for the fabrication of fixed anterior and posterior restorations.

IPS e.max CAD can be processed in an authorized CAD/CAM machine[1] in the intermediate crystalline state (≥ 130 MPa). After wet-processing of the block, the restoration is crystallized in a ceramic furnace.[2]

Proven & reliable

- Since 2005 on your side
- The world's best-selling glass ceramic[3]
- 97.2% survival rate[4]

High strength, esthetic &

530 MPa[7]

Maximum flexibility

- Comprehensive range of restoration types
- Adhesive, self-adhesive or conventional cementation[8-10]

Trust builds confidence

10 years guarantee

[1] e.g. PrograMill, CEREC/inLab, PlanMill. The complete list is available at www.ivoclar.com.
[2] e.g. Programat CS6, CS4, CS3, CS2, CS, CEREC SpeedFire.
[3] Based on international sales figures.
[4] The survival rate of monolithic IPS e.max CAD posterior crowns over a period of 10 years was evaluated using the Kaplan-Meier method. The failure rate refers to technical failures such as fractures and chipping, R&D Ivoclar, Schaan.
[5] Reich S. et al., Clin Oral Invest, 2014, p. 2171-2178.
[6] Ojeda G et al., Case Reports in Dentistry, 2017, p. 1-6.
[7] Mean biaxial flexural strength, result following more than 10 years of continuous quality testing, R&D Ivoclar, Schaan.
[8] Aslan Y. U et al., Eur. J. Prosthodont. Restor. Dent. 2019 (27), p. 131-140.
[9] Lyann S. K et al., J. Adhes. Dent. 2018 (20), p. 261-268.
[10] Schmitz JH, Beani M, J. Adv. Prosthodont. 2016 (115), p. 678-683.

Solutions

IPS e.max CAD

IPS e.max CAD
Monolithic Solutions

IPS e.max CAD
Abutment Solutions

Types of restoration

Monolithic Solutions

- Veneers
- Inlays
- Onlays (e.g. occlusal veneers, partial crowns)
- Minimally invasive crowns in the anterior and posterior region
- Crowns in the anterior and posterior region
- 3-unit bridges in the anterior and posterior region
  (up to the second premolar as the terminal abutment)

Abutment Solutions

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

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Authorized Chairside[1]

Manufacturer of CAD-CAM units	System		IPS e.max® CAD				IPS e.max® ZirCAD		IPS Empress® CAD	Tetric® CAD	Telio® CAD	
			Inlays, onlays, veneers and crowns	Three-unit bridges[2]	Implant-supported hybrid abutments	Implant- supported hybrid abutment crowns	Crowns	Three-unit bridges	Inlays, onlays, veneers and crowns	Inlays, onlays, veneers and crowns	Temporary crowns and bridges[3]	Implant-supported hybrid abutment crowns
Dentsply Sirona	CEREC® MC[4]	1 block up to 20 mm	■				■		■	■		
	CEREC® MC X[4][5]	1 block up to 55 mm	■	■	■	■	■	■	■	■	■	■
	CEREC® MC XL[4]	1 block up to 85 mm	■	■	■	■	■	■	■	■	■	■
	CEREC® Primemill	1 block up to 70 mm	■	■	■	■	■	■	■	■	■	■
PLANMECA	PlanMill® 30 S	1 block up to 85 mm	■	■			■	■	■	■	■	
	PlanMill® 40	1 block up to 55 mm	■	■			■	■	■	■	■	
	PlanMill® 40 S	1 block up to 85 mm	■	■		■	■	■	■	■	■	■
ivoclar	PrograMill® One	Material changer for up to 5 blocks and 45 mm	■						■	■		
AMANNGIRRBACH	ceramill® motion drs	1 block up to 55 mm	■	■					■	■		

[1] The range of products may vary from country to country.
[2] Up to the second premolar as the terminal abutment
[3] With up to two connected pontics
[4] Wet Milling is possible with new machines since 2013, or with older machines after retrofitting. Dry Milling is possible with construction years 2016 and higher. No retrofitting of older machines.
[5] B45 (IPS e.max ZirCAD) and B55 (Telio CAD) blocks are possible as of CEREC SW 5.1.3 (Jan. 2021)

Date information prepared: 2022-03-31/Rev. 3

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Authorized Labside[1]

Authorized for IPS e.max® ivoclar

Manufacturer of CAD-CAM units	System	IPS e.max® CAD: Inlays, onlays, veneers and crowns	IPS e.max® CAD: Three-unit bridges[2]	IPS e.max® CAD: Implant-supported hybrid abutments	IPS e.max® CAD: Implant-supported hybrid abutment crowns	IPS e.max® ZirCAD: Crowns	IPS e.max® ZirCAD: Bridges	IPS Empress® CAD: Inlays, onlays, veneers and crowns	Tetric® CAD: Inlays, onlays, veneers and crowns	Telio® CAD: Temporary crowns and bridges[3]	Telio® CAD: Implant-supported hybrid abutment crowns
ivoclar	PrograMill® One	■						■	■		
	PrograMill® Dry					●	●			●	
	PrograMill® PM3 / PM5	■	■			●	●	■	■	●	
	PrograMill® PM7	■	■			●	●	■	■	●	
	Zenotec® mini					●	●			●	
	Zenotec® select					●	●			●	
	Zenotec® select hybrid	■	■			●	●	■	■	●	
AMANNGIRRBACH	ceramill® mikro ic	■	■								
	ceramill® motion 2 / motion 3	■	■					■	■		
	ceramill® matik	■	■					■	■		
Dentsply Sirona	inLab® MC XL	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
	inLab® MC X5	▬	▬	▬	▬	●	●	▬	▬	●	

[1] The range of products may vary from country to country
[2] Up to the second premolar as the terminal abutment
[3] With up to two connected pontics

▬ ■ blocks ● 98,5 mm discs

Date information prepared: 2022-04-14/Rev. 3

IPS e.max CAD
Monolithic Solutions

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The translucency concept

Degree of translucency	Block sizes/ shades	Processing technique				Types of restorations						
		Polishing technique	Staining technique 	Cut-back technique 	Layering technique 	Occlusal veneer [a]	Thin veneer[a]	Veneer	Inlay, onlay	Partial crown	Crown	3-unit bridge
HT High Translucency	I12, C14, B40, B40 L available in 20 shades[f]	✓	✓	✓		✓	✓[d]	✓[d]	✓[d]	✓[d]	✓[d]	
MT Medium Translucency	C14, available in 7 shades	✓	✓	✓		✓	✓[d]	✓[d]	✓[d]	✓[d]	✓[d]	
LT Low Translucency	I12, C14, C16, B32 in 20 shades[f]	✓	✓	✓				✓[d]		✓[d]	✓[d]	✓[b]
MO Medium Opacity	C14, in MO 0 – 4[f]				✓						✓[c]	
I Impulse	C14 in O1 and O2	✓	✓	✓		✓	✓	✓				

[a] The cut-back technique must not be used when fabricating thin anterior veneers and occlusal veneers.
[b] Only up to the second premolar as the terminal abutment
[c] Up to the second premolar
[d] Max. 2 units if the IPS Speed Tray is used
[f] The shade range may vary depending on the translucency level/block size or the CAD/CAM machine.

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Block concept

	Translucency levels	Shades
HT The minimally invasive	**High translucency** Thin veneers , occlusal veneers, veneers, inlays, onlays, partial crowns I12, C14	**20** (16 A–D, 4 Bleach)
MT The bright	**Medium translucency** Thin veneers , occlusal veneers, veneers, partial crowns, crowns C14	**7** (BL2, BL3, BL4, A1, A2, A3, B1)
LT The versatile	**Low translucency** Veneers, partial crowns, crowns, bridges, hybrid abutment crowns I12, C14, C16*, A14 & A16 (S&L)*. B32	**20** (16 A–D, 4 Bleach)
MO The classical	**Average opacity** frameworks on slightly discoloured preparations C14, A14 (S&L)	**5** (MO 0, MO 1, MO 2, MO 3, MO 4)
I The opalescent	**Impulse** Thin veneers, occlusal veneers, veneers C14	**2** (Opal 1, Opal 2)

*10 shades: BL2, A1, A2, A3, A3,5, B1, B2, C1, C2, D2

Block selection

IPS e.max® **S**hade **N**avigation **A**pp

Only 5 steps to find the right shade and translucency level

recommendation

Block selection

The IPS e.max Shade Navigation App provides the correct shade and level of translucency for your IPS e.max restoration. All important factors that influence the overall shade design are taken into account.

5 steps to find the correct shade and translucency level

1. Tooth Shade

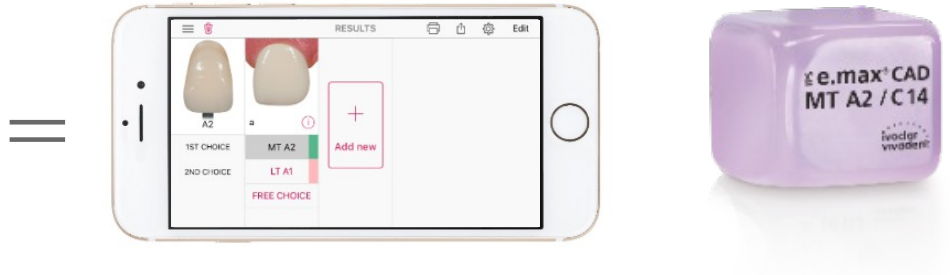
2. Types of restoration

3. Die shade

4. Layer thickness

5. Material

Result for the suitable block



Download on the App Store

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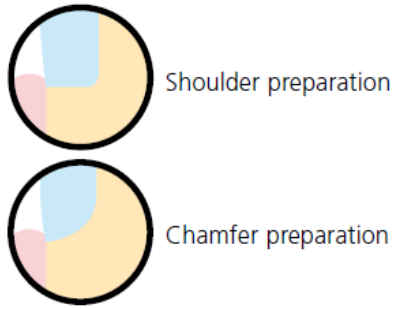
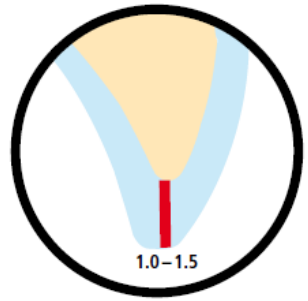
Preparatiton guidelines

Basic preparation guidelines for all-ceramic restorations

- No angles or edges
- Shoulder preparation with rounded inner edges and/or pronounced chamfer preparation
- The indicated dimensions reflect the minimum layer thickness for IPS e.max CAD restorations.
- The thickness of the preparation edge, particularly for anterior teeth, should be at least 1.0 mm in order to permit optimum milling during CAD/CAM processing.





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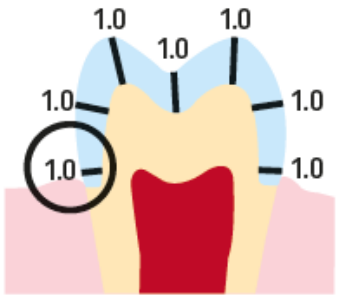
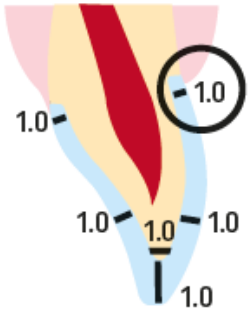
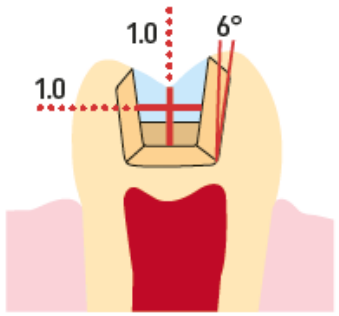
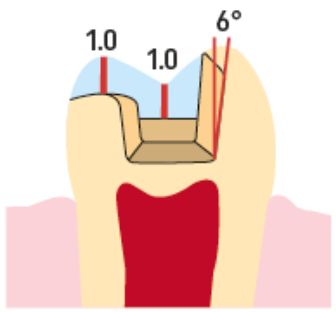
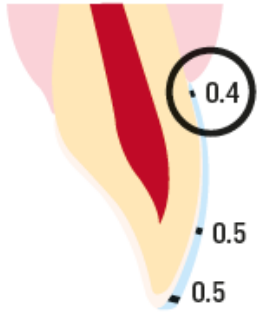
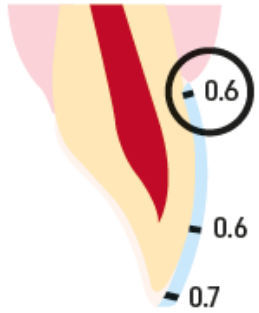
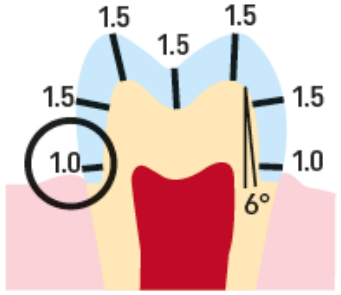
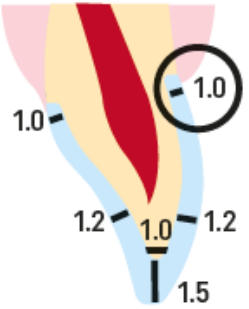
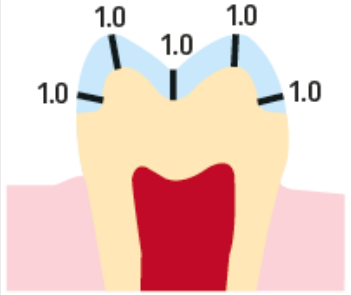
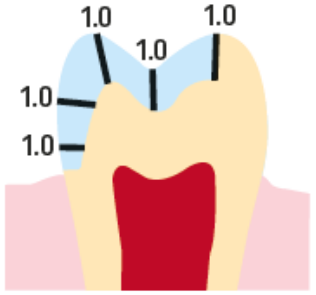
Preparation guidelines

Minimally invasive posterior crown (adhesive cementation mandatory)	Minimally invasive anterior crown (adhesive cementation mandatory)	Inlay	Onlay	Thin veneer
				

Veneer	Posterior crown/bridge abutment in the premolar region	Anterior crown/bridge abutment in the anterior region	Occlusal veneer (table top)	Partial crown
				

Dimensions in mm

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Minimum layer thicknesses

Cementation	**Mandatory** adhesive cementation				**Optional** adhesive, self-adhesive or conventional cementation			
					Crown		Bridge	
Types of restorations	Thin veneer	Inlay	Onlay (e.g. occlusal veneer, partial crown)	Minimally invasive crown in the anterior and posterior region	Anterior region	Posterior region	Anterior region	Posterior region
Minimum layer thickness IPS e.max CAD – **Polishing technique**								
Minimum layer thickness IPS e.max CAD – **Staining technique**								
Incisal/occlusal	0.5	1.0 Depth of the fissures	1.0	1.0	1.5	1.5	1.5	1.5
Circular	0.4	1.0 Isthmus width	1.0	1.0	1.2	1.5	1.2	1.5
Connector dimension	–	–	–	–	–	–	16 mm² In general: height ≥ width	

The design of bridge connectors should be extended in a vertical direction rather than in a horizontal direction.

Dimensions in mm

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Minimum layer thicknesses

Cementation	Mandatory adhesive cementation				Optional adhesive, self-adhesive or conventional cementation				
Types of restorations	Veneer	Inlay	Onlay	Partial crown	Crown			Bridge	
					Anterior region	Premolar region	Molar region	Anterior region	Premolar region
Minimum layer thickness IPS e.max CAD – **Cut-back technique**									
Incisal/occlusal	0.4	–	–	1.3	0.8	1.0	1.3	0.8	1.0
Circular	0.6	–	–	1.5	1.2	1.5	1.5	1.2	1.5
Connector dimension	–	–	–	–	–	–	–	16 mm² In general: height ≥ width	
Minimum layer thickness IPS e.max CAD – **Layering technique**									
Incisal/occlusal	–	–	–	–	0.8	1.0	–	–	–
Circular	–	–	–	–	0.8	0.8	–	–	–
Design type	–	–	–	–	Supporting the tooth shape		–	–	–

Dimensions in mm

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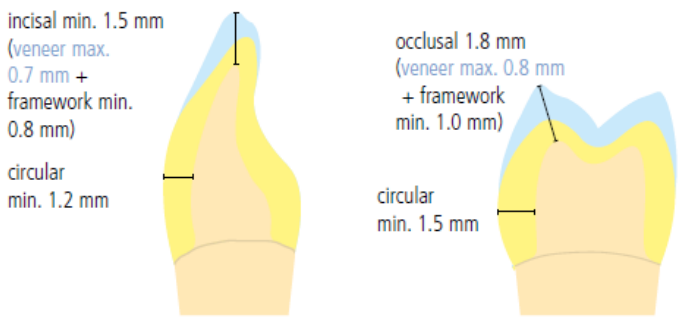
Minimum layer thicknesses

IPS e.max CAD is the high-strength component of the restoration and must, therefore, always make up at least 50% of the total layer thickness of the restoration. The total layer thickness of the restoration (depending on the type of restoration) consists of:

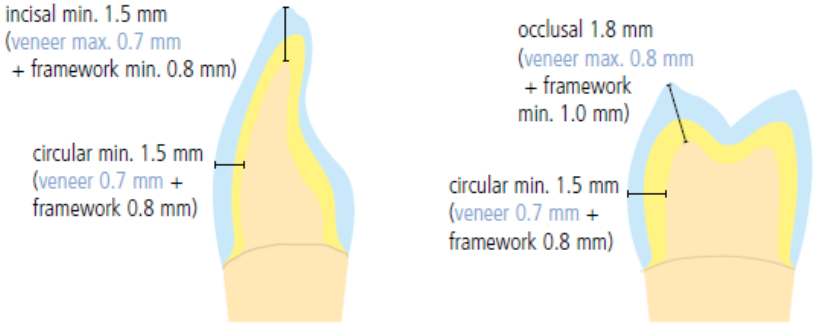
Total layer thickness of the restoration	0.8	1.0	1.2	1.5	1.8	2.0	2.5	3.0
Minimum thickness of the IPS e.max CAD framework	0.4	0.5	0.6	0.8	1.0	1.1	1.3	1.6
Maximum layer thickness of the IPS e.max Ceram veneer	0.4	0.5	0.6	0.7	0.8	0.9	1.2	1.4

Dimensions in mm

Example 1:
Minimum layer thicknesses for anterior and posterior crowns in the cut-back technique



Example 2:
Minimum layer thicknesses for anterior and posterior crowns in the layering technique



Model and tooth preparation

Fabricate a working model with removable segments as usual. The manufacturer's instructions of the different CAD/CAM systems must be observed regarding the type of plaster to be used.

Inlay and Onlay

Veneer and
anterior crown

Posterior crown

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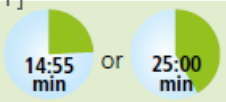
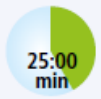
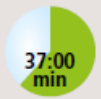
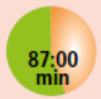
Processing techniques

Efficiency → Esthetics

Technique	Polishing technique (self-glaze)	Staining technique / Staining technique on the "blue" restoration			Staining technique on the "tooth-coloured" restoration	Cut-back technique	Layering technique
		Variant A	Variant B	Variant C			
Description	 Polishing of the "blue" restoration, followed by crystallization without individual characterization and glaze.	 Glazing with IPS e.max CAD Crystall./Glaze Spray on the blue restoration followed by Speed Crystallization (Speed Crystallization and Glaze firing in one step).	 Staining and glazing with IPS e.max CAD Crystall./ Glaze Paste/FLUO on the blue restoration followed by Crystallization and the Stain/Glaze firing in one step.	 Staining and glazing with IPS e.max CAD Crystall./ Glaze Spray on the blue restoration followed by Crystallization and the Stain/Glaze firing in one step.	 Crystallization without the application of materials. Stain/Glaze firing on the tooth-coloured restoration either with IPS e.max CAD Crystall./ or IPS Ivocolor materials	 Crystallization without the application of materials. Incisal firing with IPS e.max Ceram materials. Stain/Glaze firing with IPS Ivocolor materials.	 Crystallization without the application of materials. Dentin/Incisal firing with IPS e.max Ceram materials. Stain/Glaze firing with IPS Ivocolor materials.
Total firing time	[1]  14:55 min or 25:00 min	 14:55 min	 25:00 min	 25:00 min	 37:00 min	 63:00 min	 87:00 min
	11:10 min[2]	11:10 min[2]	16:50 min[3]	16:50 min[3]			

[1] The respective crystallization and firing parameters are included in the Ivoclar furnaces. Firing times, R&D Ivoclar, Schaan.
[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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Processing techniques

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[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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Polishing technique – Finishing and polishing

Smooth out the attachment point of the holder and finish the restoration using suitable grinding instruments.

Pre-polishing with e.g. OptraGloss PP.
Prevent the glass-ceramic from overheating.

High-gloss polishing with e.g. OptraGloss HP. Overheating of the glass-ceramic must be prevented.

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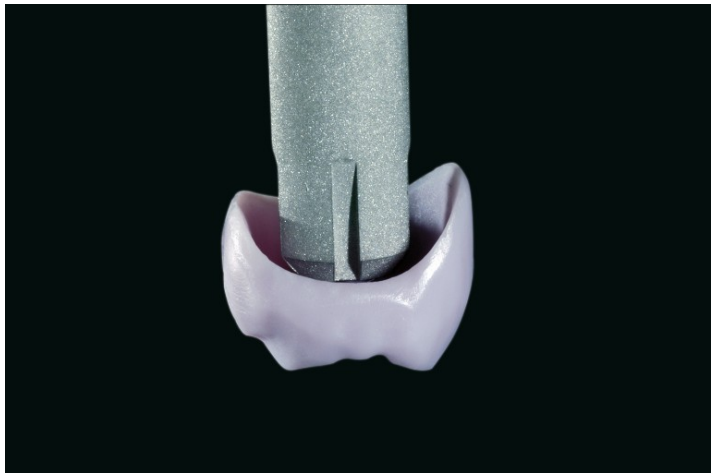
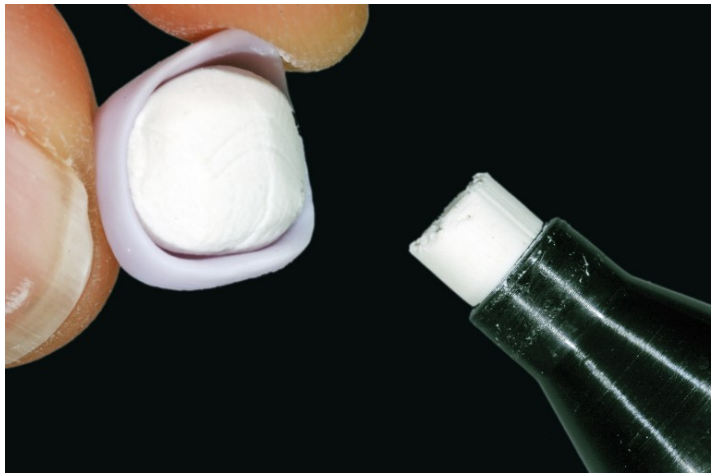
Polishing technique –
Speed crystallization or crystallization



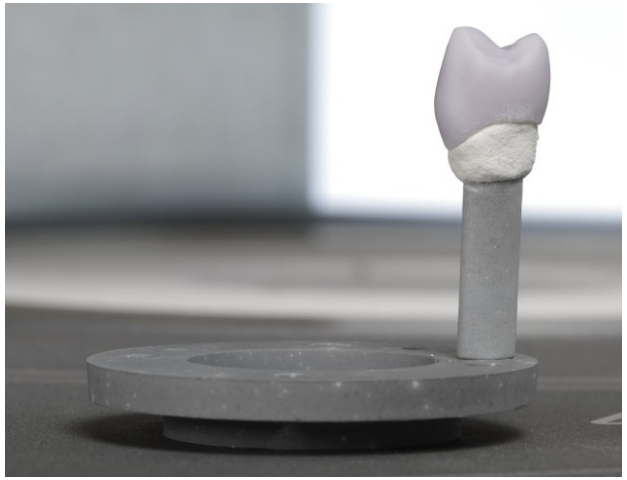
Select the largest possible
IPS e.max CAD Crystallization Pin.



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

Polishing technique –
Speed crystallization or crystallization

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



Place the restoration in the centre of the IPS e.max CAD Speed Crystallization Tray or IPS Speed Tray and crystallize using the stipulated firing parameters.

Polishing technique –
Speed crystallization or crystallization

Completed, polished and crystallized IPS e.max CAD restoration.

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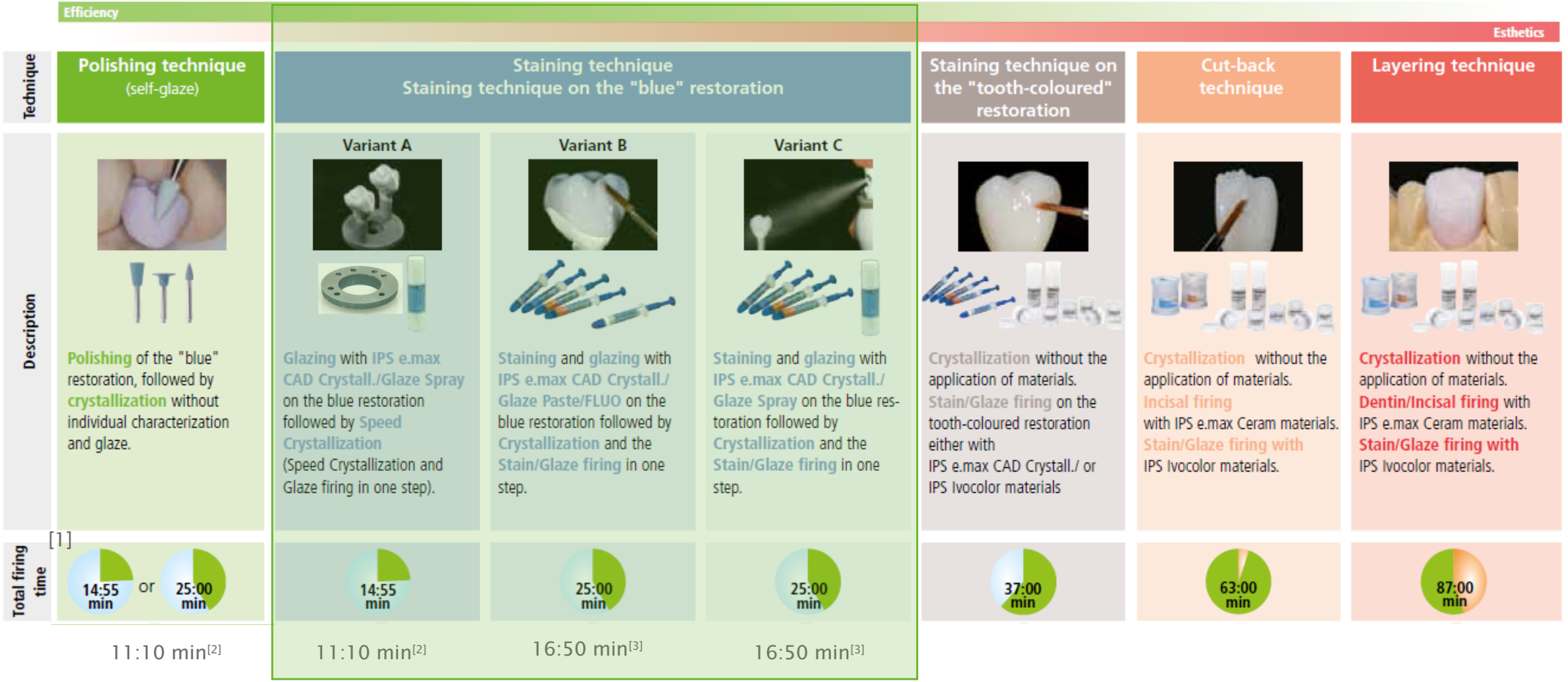
Processing techniques

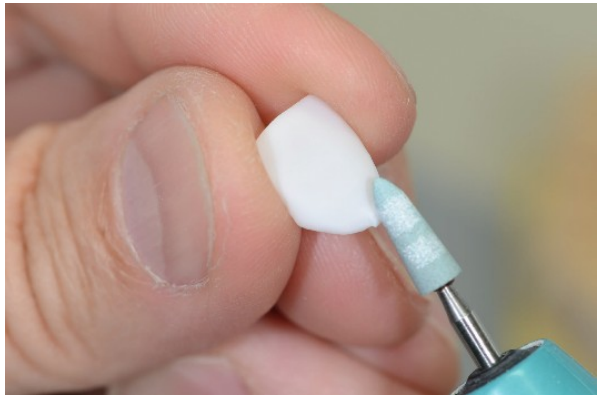


[1] The respective crystallization and firing parameters are included in the Ivoclar furnaces. Firing times, R&D Ivoclar, Schaan.
[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

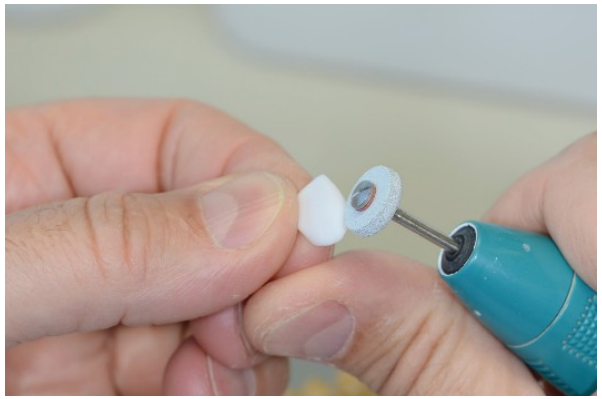
Staining technique on the "blue" restoration – Finishing

Thin veneers

Carefully separate the thin veneer from the block using a diamond-coated separating disk.



Smooth out attachment point and finish the restoration.

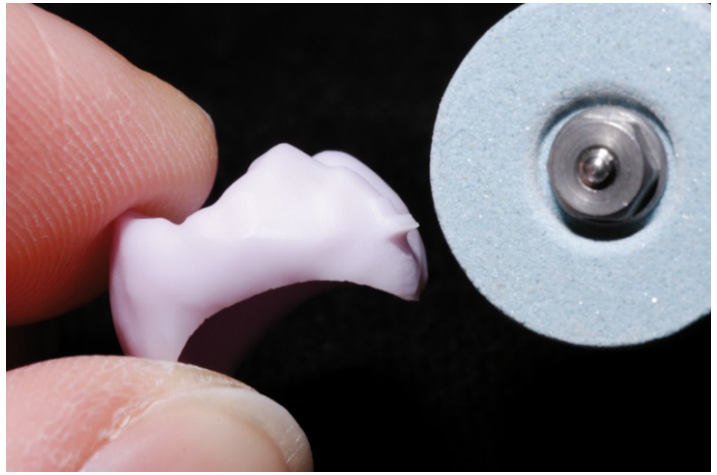


Finish margins with suitable instruments.

ivoclar

Staining technique – Finishing

Inlays, onlays, crowns



Smooth out attachment point.

Finish the outer surfaces ...

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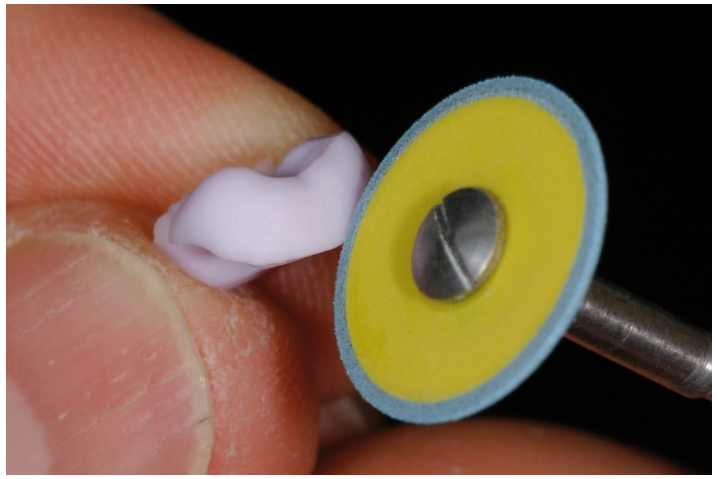
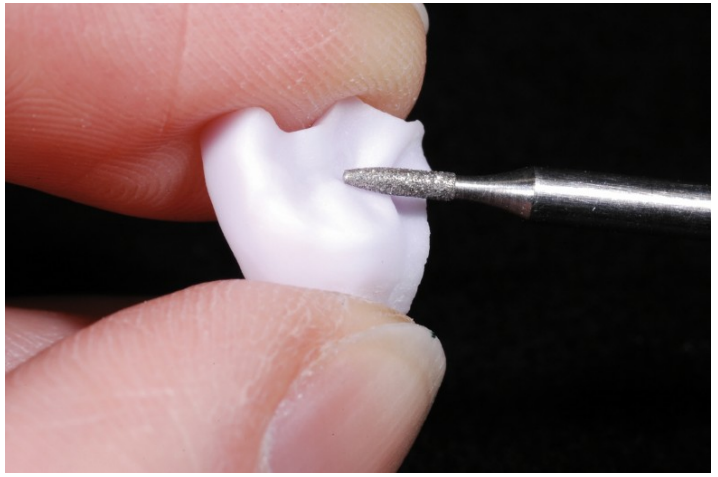
Staining technique – Finishing



... and margins using suitable grinding instruments.



Surface-grind the functional areas in particular with a fine diamond instrument to smooth out the surface structure created by the CAD/CAM procedure.

Staining technique – Finishing

Fitted IPS e.max CAD LT crown ...

... and IPS e.max CAD HT inlay and onlay on the model.

Staining technique – Finishing

Bridges

Bridge after the CAD/CAM process.

Smooth out the attachment point and take proximal contacts into account.

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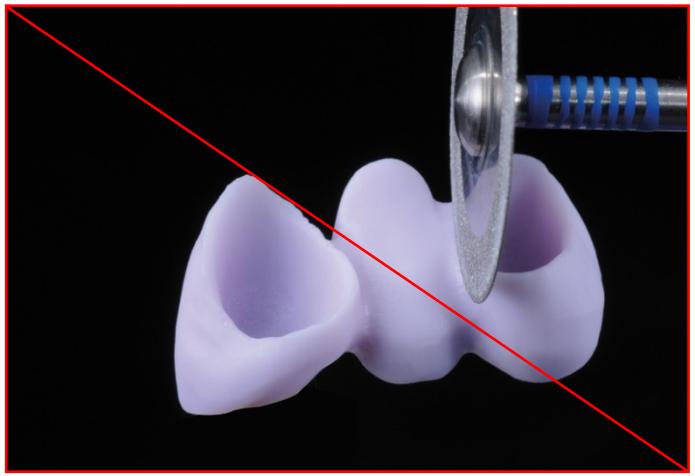
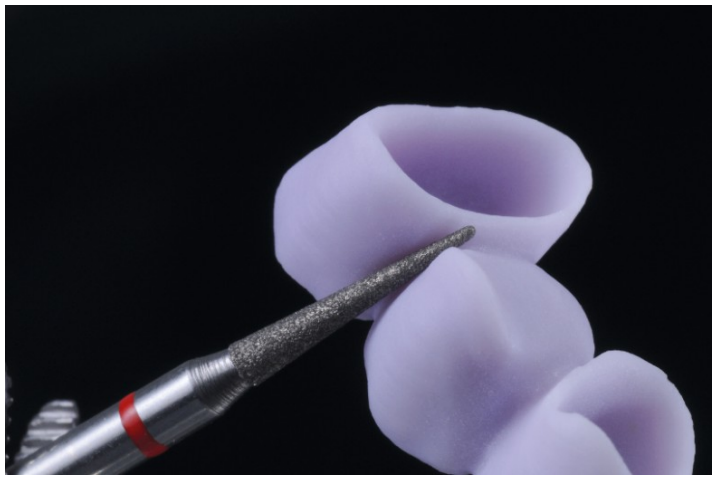
Staining technique – Finishing



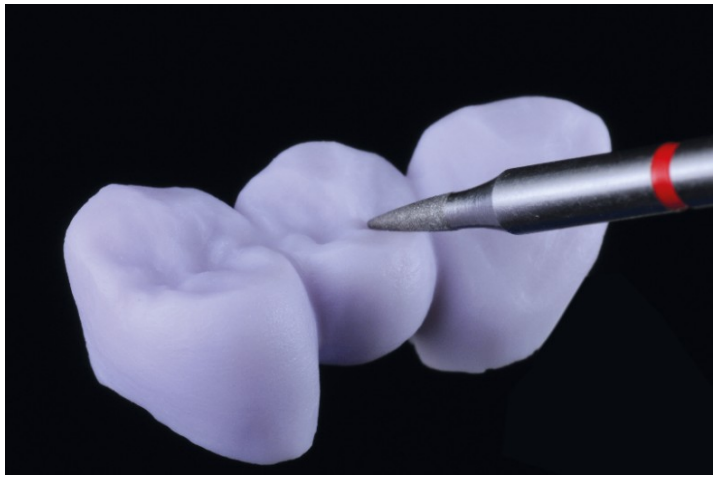
Do not use a diamond disc to finish the interdental areas, as this will initiate predetermined breaking points.



Finish interdental areas with fine diamond instruments (grain size 40 – 50 µm), pay attention to the connector dimensions.

Staining technique – Finishing

Check the occlusion, articulation and proximal contact points.



Finish the outer surface, particularly the functional areas of the restoration with a fine diamond instrument to smooth out the surface structure created by the CAD/CAM process.

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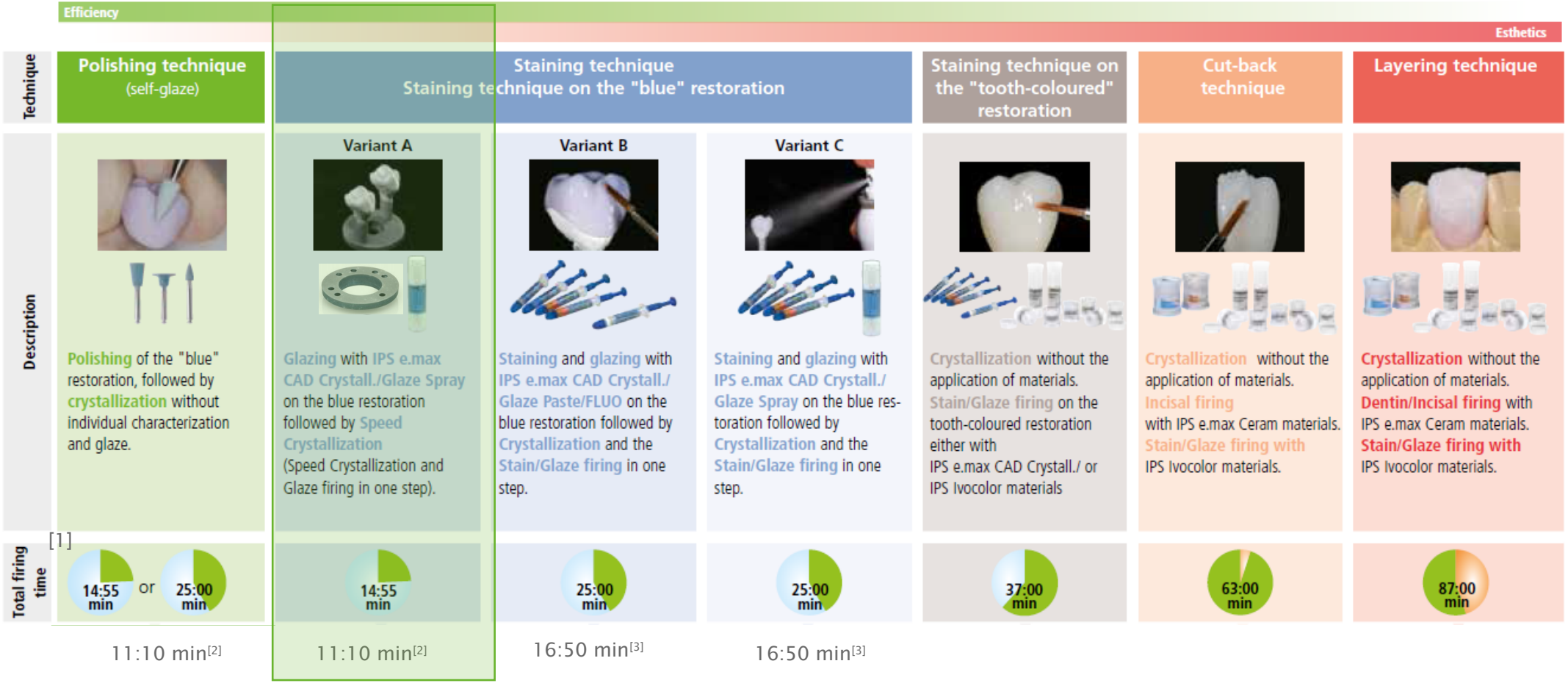
Processing techniques



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[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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Staining technique (Variant A) – Speed Crystalllization and Glaze firing in one step with glazing spray

Glazing with IPS e.max CAD Crystall./ Glaze spray on the "blue" restoration followed by Crystallization.

Only IPS e.max CAD Crystall./Glaze Spray must be used for this processing technique. Crystallization and Glaze firing are performed in one step. The requirements for Speed Crystallization must be observed.

Required materials

- **IPS e.max CAD Crystall./Glaze Spray** is a ready-to-use glazing spray.
- **IPS e.max CAD Speed Crystallization Tray** is a special firing tray for the Speed Crystallization of IPS e.max CAD.

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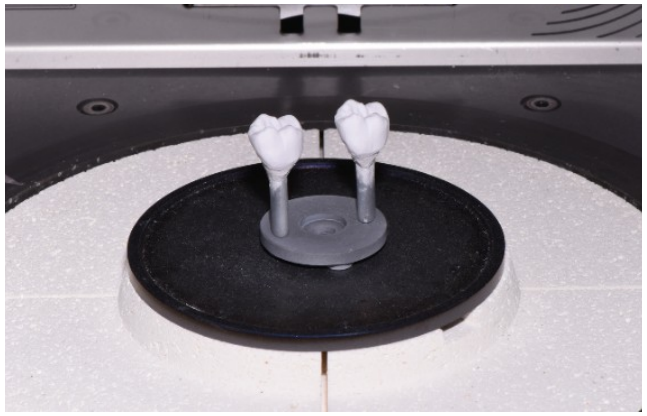
Staining technique (Variant A) – Requirements for Speed Crystallization

IPS e.max CAD	Indication	**max. 2 units** with IPS e.max CAD Crystall./Glaze Spray
HT High Translucency	Thin veneers, veneers, inlays, onlays, partial crowns, crowns	✓
MT Medium Translucency	Thin veneers, veneers, inlays, onlays, partial crowns, crowns	✓
LT Low Translucency	Veneers, inlays, onlays, crowns	✓
	Hybrid abutment crowns, 3-unit bridges	–
MO Medium Opacity	Hybrid abutments, crowns (framework)	–
I Impulse	Thin veneers, veneers	–

Staining technique (Variant A) – Speed Crystallization (Speed Crystallization and Glaze firing in one step)

Secure the restoration on a suitable IPS e.max CAD Crystallization Pin as described in Variant B and C and apply IPS e.max CAD Crystall./Glaze Spray.



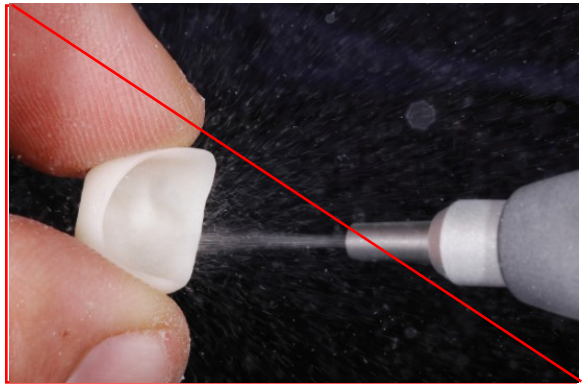
Position the IPS Speed Tray with max. two IPS e.max CAD HT/MT/LT in the furnace and fire using the parameters for the Speed Crystallization firing.

Remove the cool restoration from the set IPS Object Fix Putty or Flow.

Staining technique (Variant A) – Speed Crystallization (Speed Crystallization and Glaze firing in one step)

Remove residue with ultrasound in a water bath ...

... or with the steam jet.

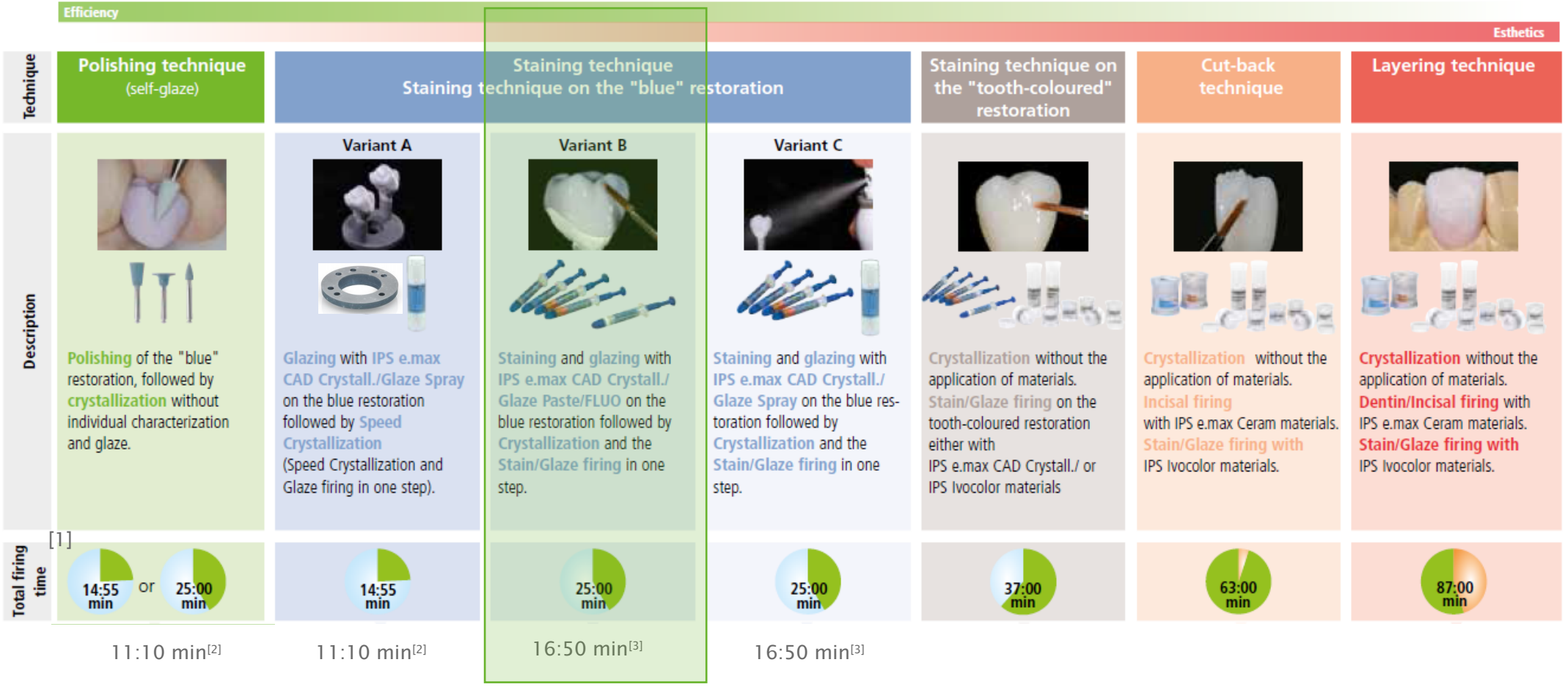


Do **not** remove residue with Al_2O_3 or glass polishing beads.

Staining technique (Variant A) – Speed Crystallization (Speed Crystallization and Glaze firing in one step)

Completed IPS e.max CAD LT crown after Speed Crystallization.

Processing techniques



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[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

Staining technique (Variant B) – Crystallization and Stain/Glaze Firing in one step with glazing paste

Staining and glazing with IPS e.max CAD Crystall./ Shades, Stain and Glaze Paste/FLUO on the "blue" restoration followed by Crystallization.

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

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/FLUO** 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.

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Staining technique (Variant B) - Preparation

with
IPS e.max CAD Crystallization Pin

Partial crowns, anterior crowns, posterior crowns, bridges

Use either IPS Object Fix Putty or Flow to secure the restoration on the pin.

without (optional)
IPS e.max CAD Crystallization Pin

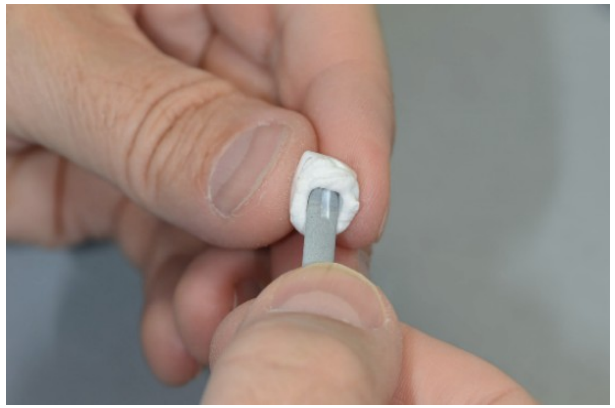
Thin veneers, veneers, inlays, onlays

To apply Glaze, Shades, and Stains, secure the restoration
– with an OptraStick,
– with diamond tweezers, or
– directly on the die.

Staining technique (Variant B) - Preparation

Thin veneers – veneers (optional)

Fill the inside of the veneer with IPS Object Fix Flow.



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

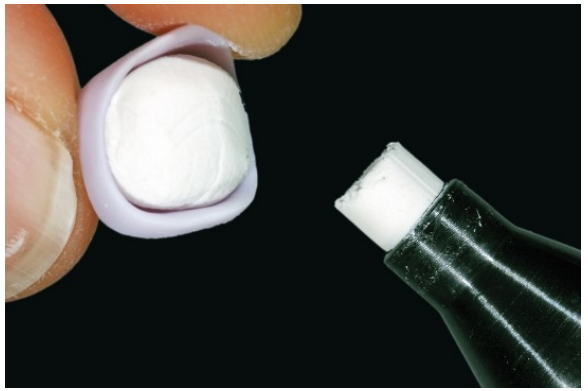
Adapt IPS Object Fix Putty to the pin and restoration margin. Remove any contamination from the outer surface.

Staining technique (Variant B) - Preparation

Crowns – inlays, onlays (optional)

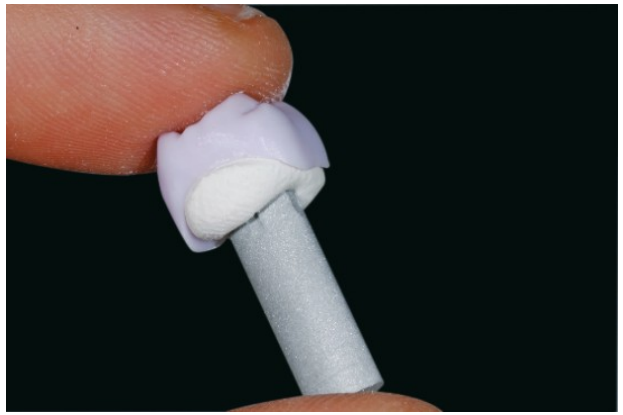
IPS Object Fix Flow and IPS Object Fix Putty.

Select the largest possible IPS e.max CAD Crystallization Pin.

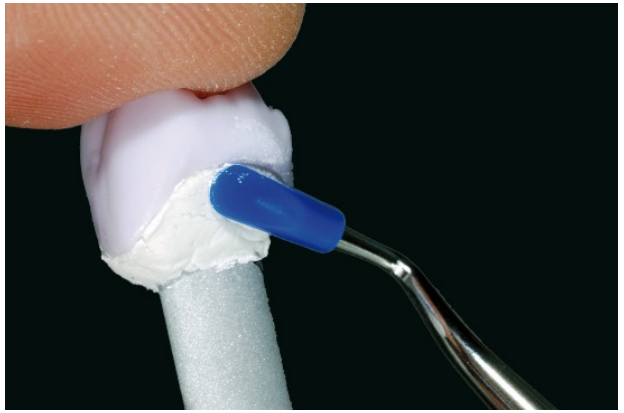


Fill the inside of the restoration with IPS Object Fix Putty or Flow.

Staining technique (Variant B) - Preparation



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

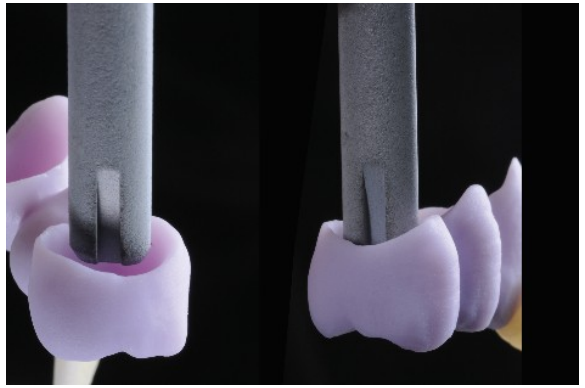


Smooth out displaced IPS Object Fix Putty or Flow with a plastic spatula from the margin towards the support pin so that the pin is secured in the paste and the restoration wall is exactly supported.

Clean off any possible residue adhering to the outer surface of the crown with a brush dampened with water and then dry.

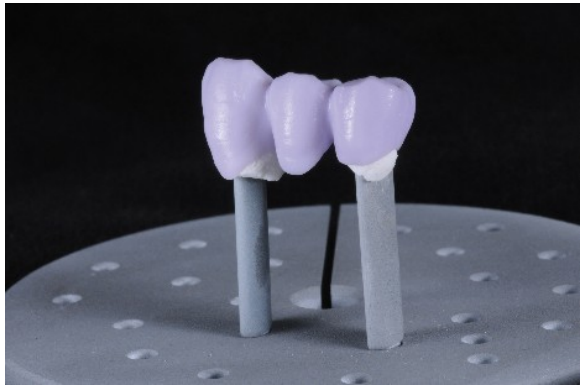
Staining technique (Variant B) - Preparation

Bridge



Select the largest possible IPS e.max CAD Crystallization Pin.

Fill the inner aspects of the crowns of the cleaned bridge with IPS Object Fix Putty or Glow and press the suitable IPS e.max CAD Crystallization Pin into it.



Immediately place the bridge on the IPS e.max CAD Crystallization Tray.

Staining technique (Variant B) - Preparation

Smooth out displaced IPS Object Fix Putty or Flow with a plastic spatula from the margin towards the support pin so that the pin is secured in the paste and the crown margins are exactly supported.

Clean off any possible residue adhering to the outer surface with a brush dampened with water and then dry.

Staining technique (Variant B) – Crystallisation and Stain/Glaze firing in one step

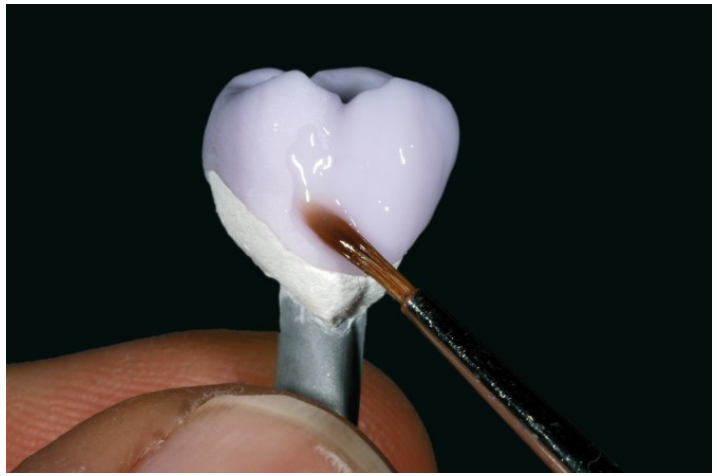
Thin veneers, veneers, inlays, onlays

Individualized characterization with IPS e.max CAD Crystall./Shades, Stains and Glaze Paste/FLUO.

Secure inlays, onlays on an OptraStick for the application of IPS e.max CAD Crystall./ Glaze Paste/FLUO, Shades and Stains.

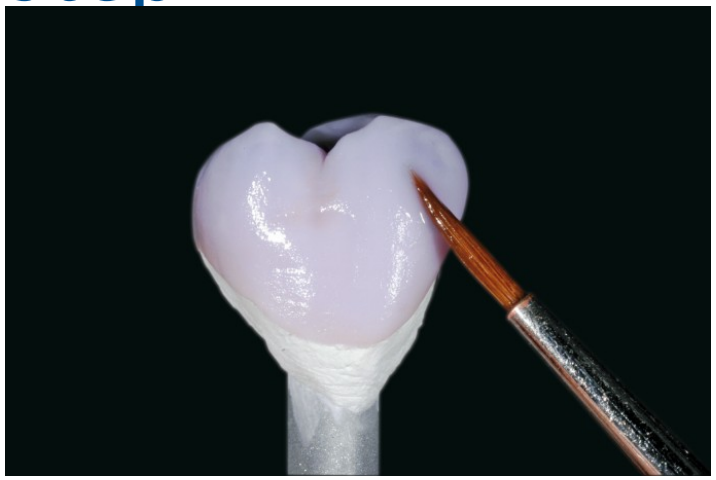
Staining technique (Variant B) – Crystallisation and Stain/Glaze firing in one step

Crowns, bridges



Apply IPS e.max CAD Crystall./Glaze Paste/FLUO evenly on the blue restoration.

Staining technique (Variant B) – Crystallisation and Stain/Glaze firing in one step



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

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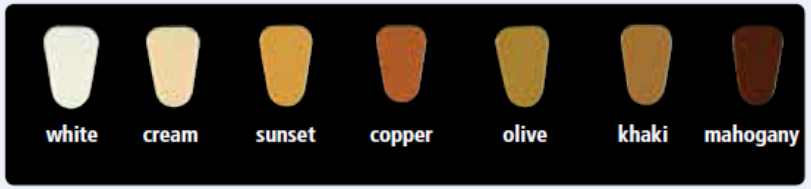
Staining technique (Variant B) – Characterization Guide

Characterization Guide

With the IPS e.max CAD Crystall./Shades and IPS e.max CAD Crystall./Stains, it is possible to characterize the restoration whilst it is in the "blue" state prior to Crystallization. The following Shades and Stains are available for characterization:

IPS e.max CAD Crystall./Shades

IPS e.max CAD Crystall./Stains



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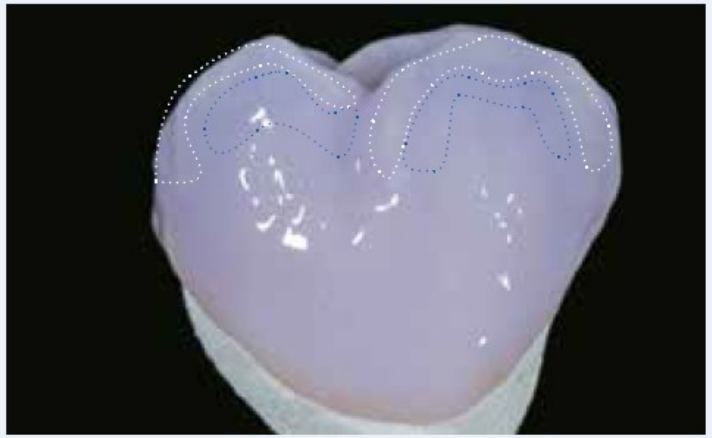
Staining technique (Variant B) – Characterization Guide

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



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

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

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

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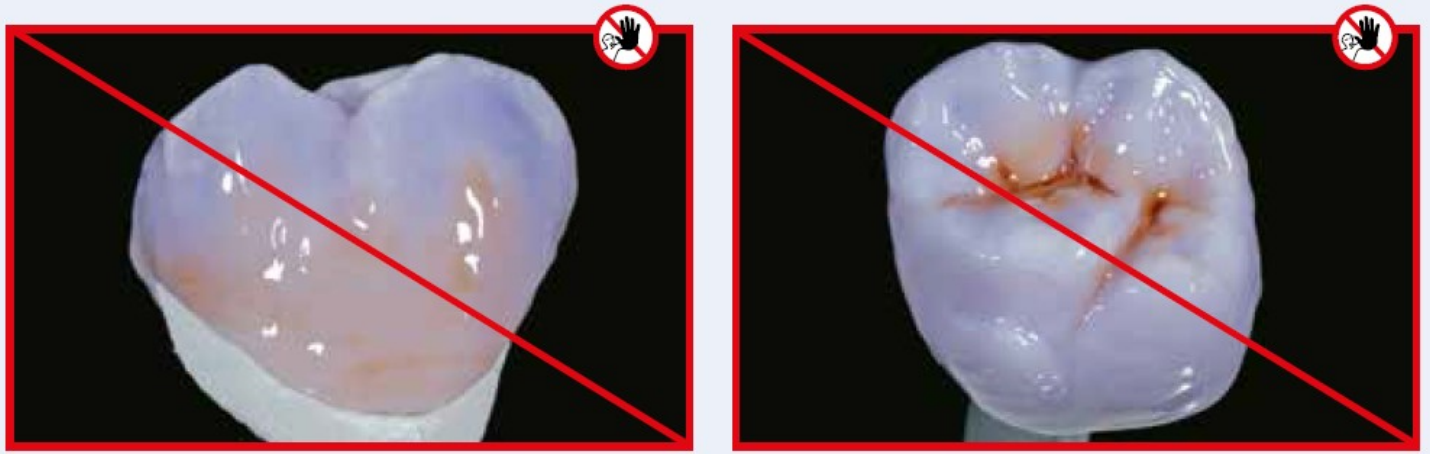
Staining technique (Variant B) – Wrong application

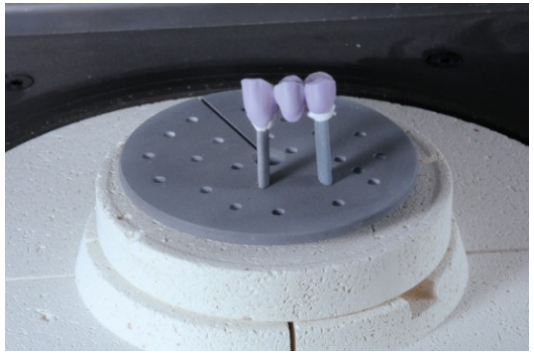
Example of IPS e.max CAD Crystall./Shades and Stains applied too thickly

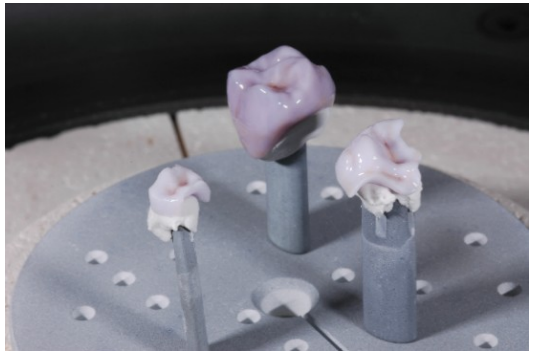


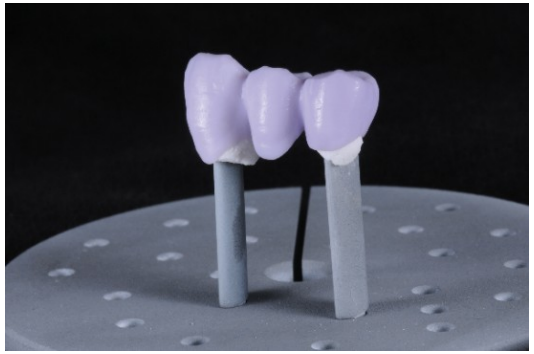
Too thick a layer of IPS e.max CAD Crystall./Shades and Stains

Staining technique (Variant B) – Positioning

- Place the restoration in the centre of the IPS e.max CAD Crystallization Tray.
- Place veneers, inlays and onlays directly on the IPS e.max CAD Crystallization Pin with a small amount of IPS Object Fix Flow.
- A maximum of 6 units can be positioned on the firing tray and crystallized with IPS e.max CAD Crystall./Glaze Paste/FLUO.

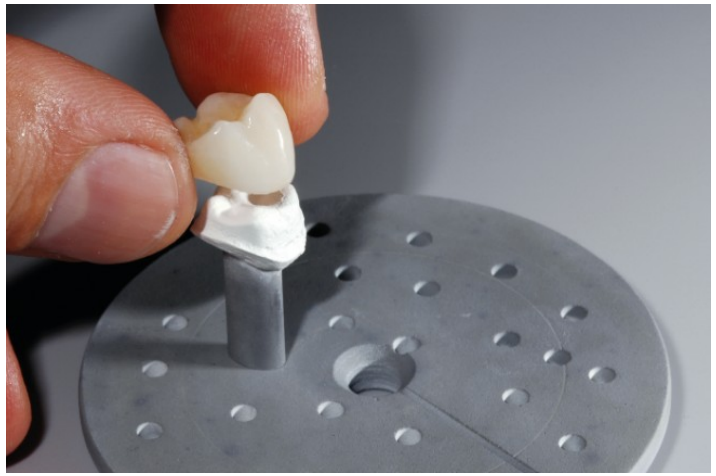






Place the restoration in the centre of the IPS e.max CAD Crystallization Tray and fire using the stipulated firing parameters.

Staining technique (Variant B) – Cleaning



Remove the cool restoration from the set IPS Object Fix Putty or Flow.

Remove residue with ultrasound in a water bath ...

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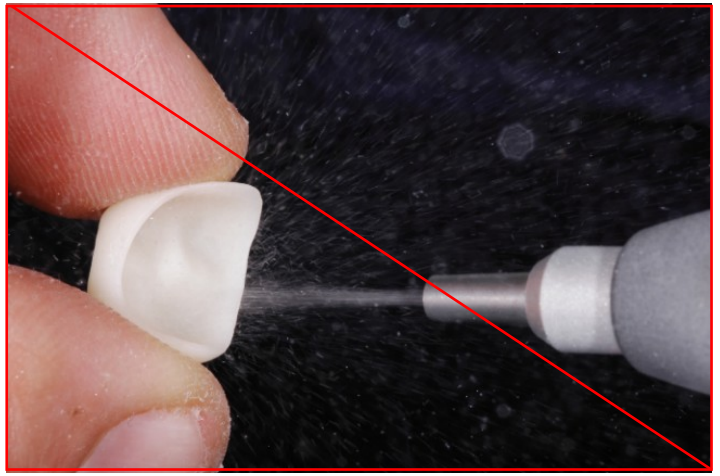
Staining technique (Variant B) – Cleaning

... or with the steam jet.



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

Staining technique (Variant B) – Finished restoration

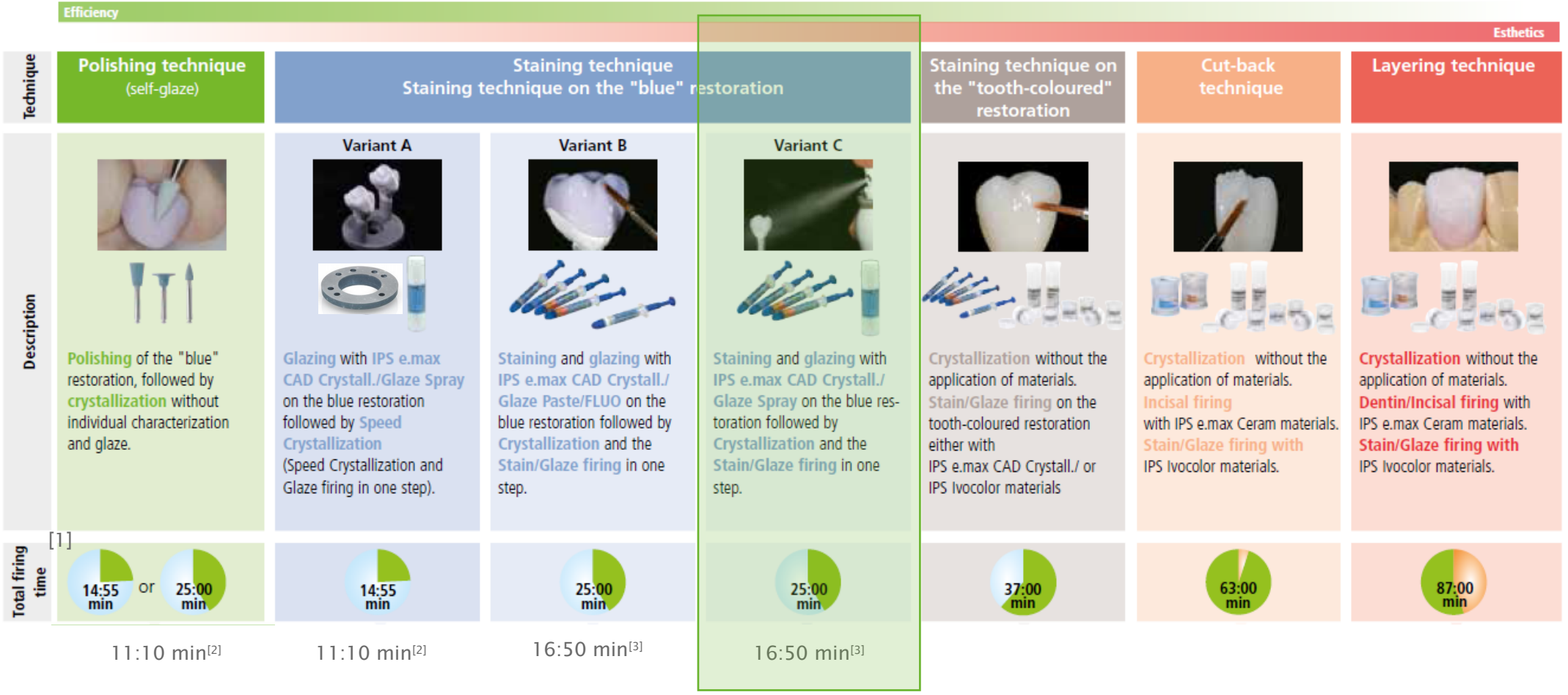
IPS e.max CAD LT crown after crystallization.

Onlay and inlay made of aus IPS e.max CAD HT after Crystallization.

Staining technique (Variant B) – Finished restoration

IPS e.max CAD LT bridge after Crystallization.

Processing techniques



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[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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Staining technique (Variant C) – Crystallization and Stain/Glaze Firing in one step with glazing spray

Staining and glazing with IPS e.max CAD Crystall./ Shades, Stains and Glaze Spray on the "blue" restoration followed by Crystallization.

In this processing technique, IPS e.max CAD Crystall./Glaze Spray is used instead of IPS e.max CAD Crystall./Glaze Paste/FLUO. Crystallization and the Stain/Glaze firing are performed in one step. Characterizations are applied using IPS e.max CAD Crystall./Shades and Stains.
The spray should only be used if IPS Object Fix auxiliary firing paste is adapted up to the margins.

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 Spray** is a ready-to-use glazing spray.

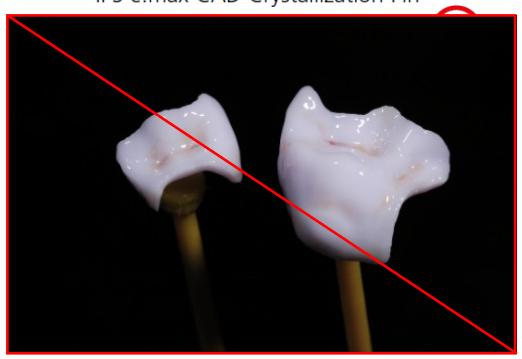
Staining technique (Variant C) – Preparation

with
IPS e.max CAD Crystallization Pin

Thin veneers, veneers, inlays, onlays, partial crowns, anterior crowns, posterior crowns

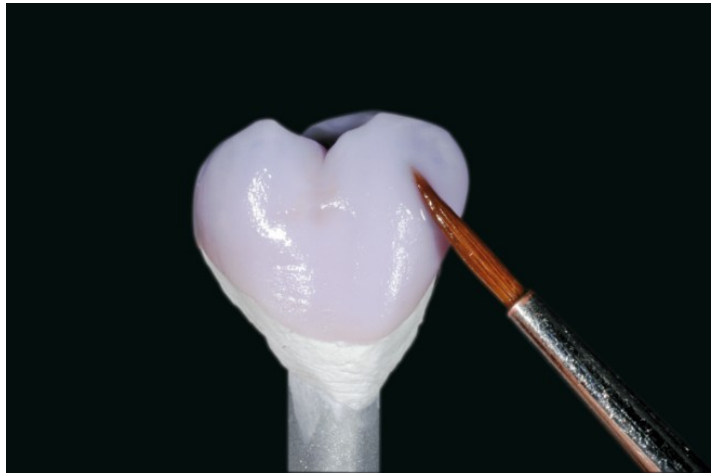
Adapt IPS Object Fix Putty or Flow exactly up to the restoration margin so that the glazing spray does not touch the inner areas.

without
IPS e.max CAD Crystallization Pin



Staining technique (Variant C) – Crystallization and Stain/Glaze firing in one step

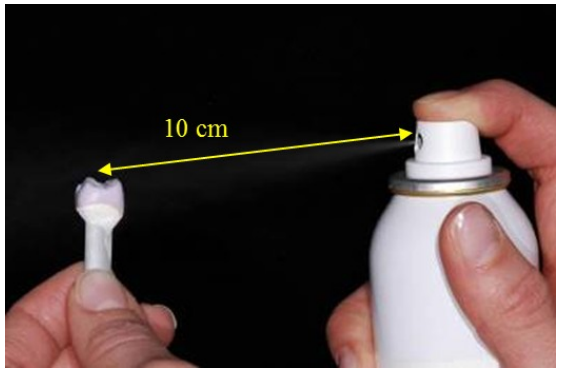
Extrude IPS e.max CAD Crystall./Shades and Stains from the syringe and mix thoroughly. If required, thin with IPS e.max CAD Crystall./Glaze Liquid.



Apply mixed Shades and Stains directly on the blue restoration.

Staining technique (Variant C) – Crystallization and Stain/Glaze firing in one step

Scuturati bine flaconul de CAD Crystall Glaze Spray



Tineti lucrarea folosind IPS e.max CAD Crystallization Pin.

Spreiati IPS e.max CAD Crystall./ Glaze Spray direct pe IPS e.max CAD Crystall nearsa./Shades and Stains. Spretiati din toate partile, rotind simultan.

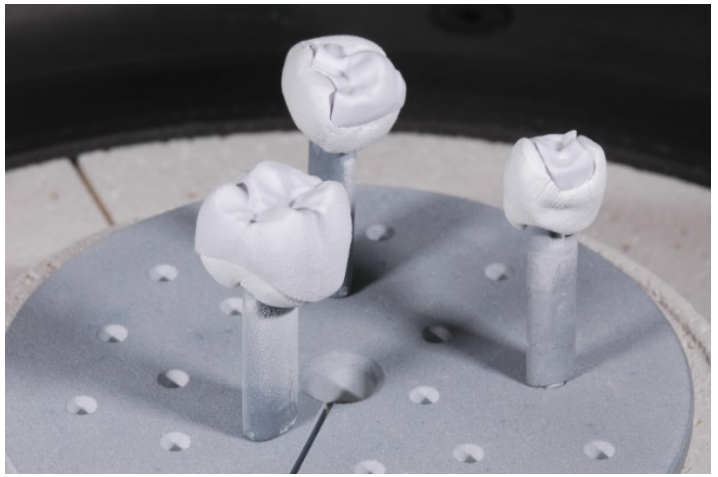
Staining technique (Variant C) – Crystallization and Stain/Glaze firing in one step

Shake the spray can again between individual bursts.

Spray an even layer onto the restoration.

Staining technique (Variant C) – Crystallization and Stain/Glaze firing in one step

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



Place the restoration in the centre of the IPS e.max CAD Crystallization Tray and fire using the stipulated firing parameters.

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Staining technique (Variant C) – Example of incorrect Glaze Spray application

Example of incorrect Glaze Spray application

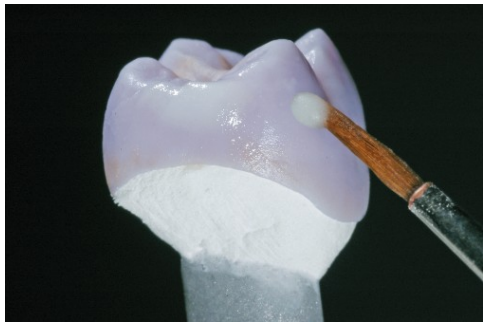
Problem/Cause	Before Firing Application of the Glaze Spray	After Firing Detailed view of the surface
Problem: **Not enough Glaze Spray** on the restoration Possible cause: – Distance between the spray can and the restoration too far – Spraying too short – Spray is not shaken sufficiently – Spray can held not upright during spraying	 Insufficient application of IPS e.max CAD Crystall./ Glaze Spray	 Insufficient gloss or incomplete glaze layer
Problem: **Too much Glaze Spray** on the restoration Possible cause: – Distance between the spray can and the restoration too small – Too much Glaze Spray applied	 Too much IPS e.max CAD Crystall./Glaze Spray was applied.	 Loss of texture and too glossy surface

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

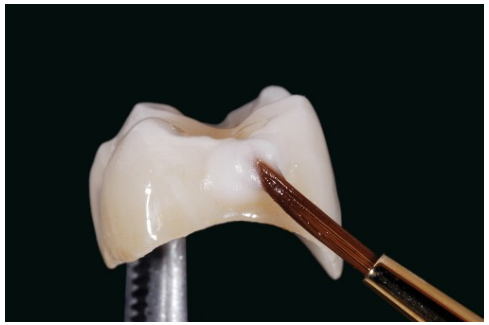
Optional:

- 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 Crystallization firing or a separate Corrective firing.

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



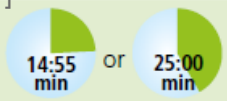
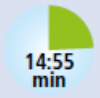
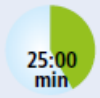
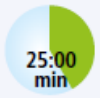
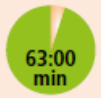
Application of the mixed Add-On on the blue restoration before crystallization.



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

Processing techniques

Efficiency — Esthetics

Technique	Polishing technique (self-glaze)	Staining technique / Staining technique on the "blue" restoration			Staining technique on the "tooth-coloured" restoration	Cut-back technique	Layering technique
Description	 Polishing of the "blue" restoration, followed by crystallization without individual characterization and glaze.	Variant A  Glazing with IPS e.max CAD Crystall./Glaze Spray on the blue restoration followed by Speed Crystallization (Speed Crystallization and Glaze firing in one step).	Variant B  Staining and glazing with IPS e.max CAD Crystall./ Glaze Paste/FLUO on the blue restoration followed by Crystallization and the Stain/Glaze firing in one step.	Variant C  Staining and glazing with IPS e.max CAD Crystall./ Glaze Spray on the blue restoration followed by Crystallization and the Stain/Glaze firing in one step.	 Crystallization without the application of materials. Stain/Glaze firing on the tooth-coloured restoration either with IPS e.max CAD Crystall./ or IPS Ivocolor materials	 Crystallization without the application of materials. Incisal firing with IPS e.max Ceram materials. Stain/Glaze firing with IPS Ivocolor materials.	 Crystallization without the application of materials. Dentin/Incisal firing with IPS e.max Ceram materials. Stain/Glaze firing with IPS Ivocolor materials.
Total firing time [1]	 14:55 min or 25:00 min	 14:55 min	 25:00 min	 25:00 min	 37:00 min	 63:00 min	 87:00 min
	11:10 min[2]	11:10 min[2]	16:50 min[3]	16:50 min[3]			

[1] The respective crystallization and firing parameters are included in the Ivoclar furnaces. Firing times, R&D Ivoclar, Schaan.
[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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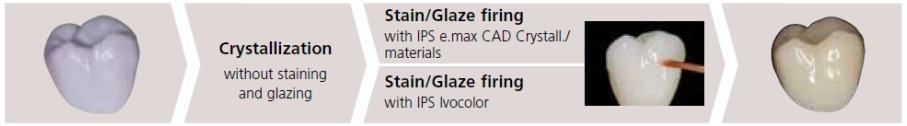
Staining technique on the "tooth-coloured" restoration – Crystallization and Separate Stain/Glaze fi...



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

In this processing technique, the IPS e.max CAD restorations are crystallized in a first step without applying any Stains and Glaze materials. Subsequently, the Stain and Glaze firing of the tooth-coloured restoration is conducted.

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/FLUO** 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.

or

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

Staining technique – Crystallization

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

Remove the crystallization tray from the furnace once the Crystallization program has been completed and allow it to cool.

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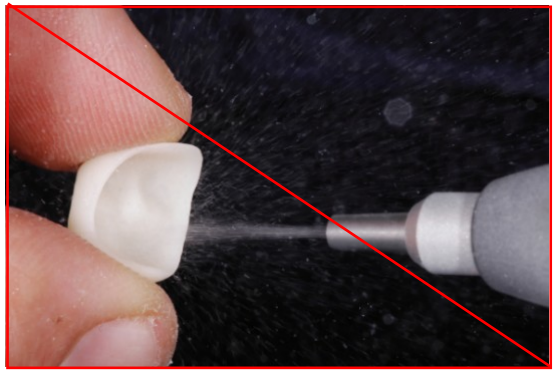
Staining technique – Cleaning

Remove residue with ultrasound in a water bath ...

... or with the steam jet.



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

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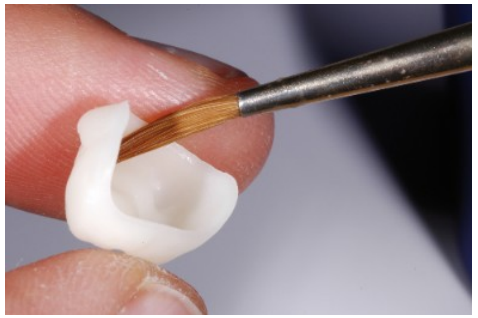
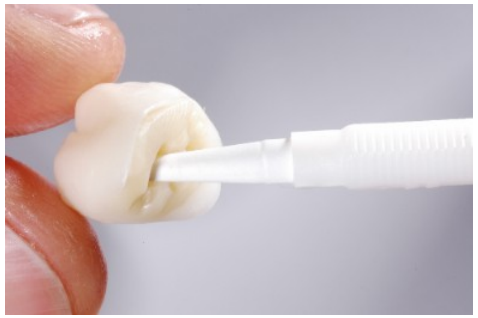
Staining technique –
Die fabrication with IPS Natural Die Material



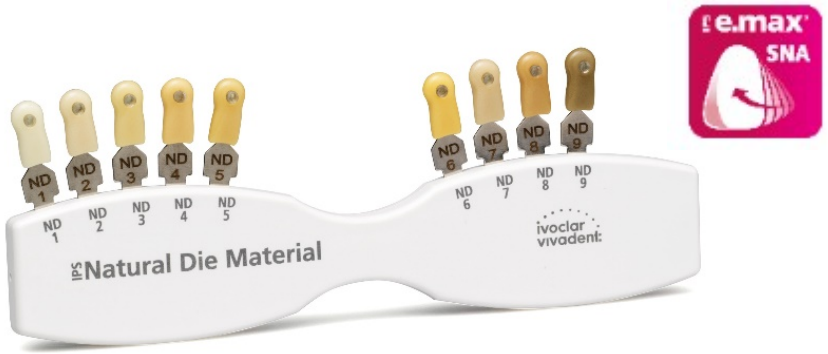
Coat the inner surfaces of the ceramic restoration with IPS Natural Die Material Separator and allow it to react for a short time.



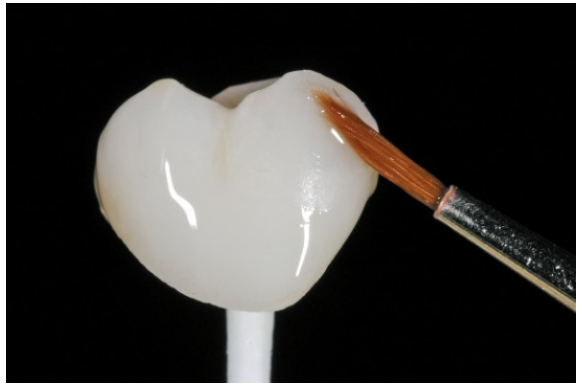
Apply IPS Natural Die Material in the restoration and
insert the die holder.

Cure in a customary light curing device.

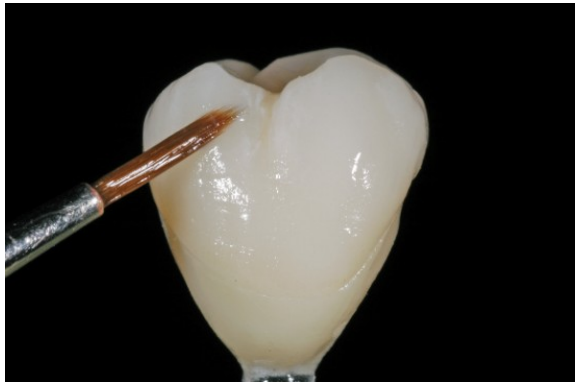
A die made of IPS Natural Die Material provides the optimum basis for true-to-nature all-ceramic restorations.



Staining technique – Stain and Glaze firing with IPS Ivocolor or IPS e.max CAD Crystall./ materials



Application of IPS Ivocolor Glaze/FLUO before Glaze firing.



Application of IPS Ivocolor Essences and Shades before the Stain and Characterization firing.

Completed IPS e.max CAD LT crown after Glaze firing.

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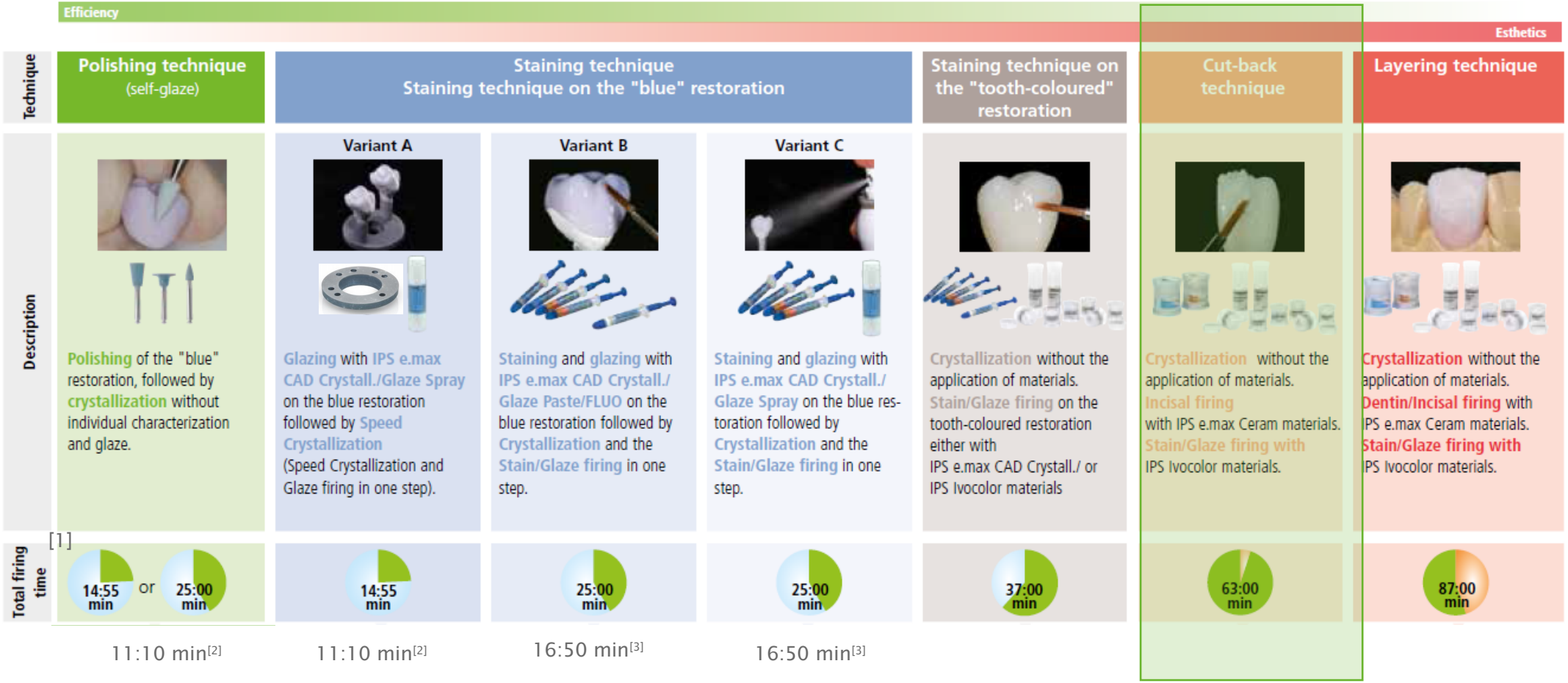
Processing techniques



[1] The respective crystallization and firing parameters are included in the Ivoclar furnaces. Firing times, R&D Ivoclar, Schaan.
[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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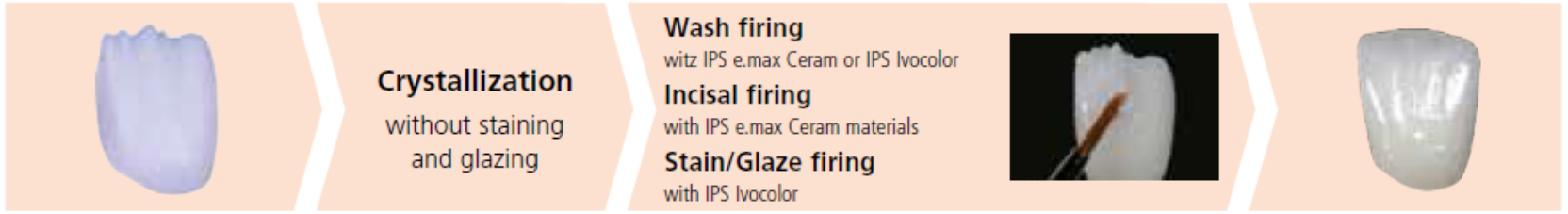
Cut-back technique –
Crystallization – Incisal firing – Stain/Glaze

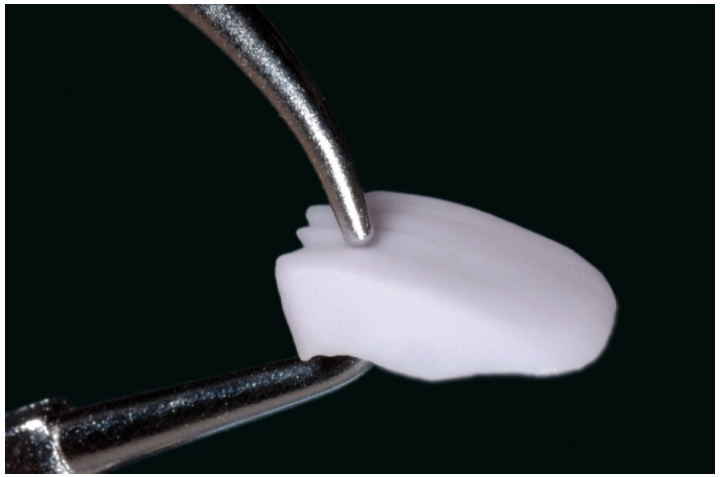


Crystallization without the application of materials. Incisal firing with IPS e.max Ceram materials. Stain/Glaze firing with IPS Ivocolor materials.

In the cut-back technique, IPS e.max Ceram Impulse and Incisal materials are layered in the incisal and/or occlusal area of the crystallized, reduced IPS e.max CAD restoration. Subsequently, the Stain and Glaze firing is conducted. The minimal amount of build-up material required means that highly esthetic restorations can be fabricated within only a few working steps.

Cut-back technique –
Finishing and Preparation for Crystallization

Fit the milled restoration on the model.
Tooth 11: Anterior crown with cut-back
Tooth 21: Full-contour veneer



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

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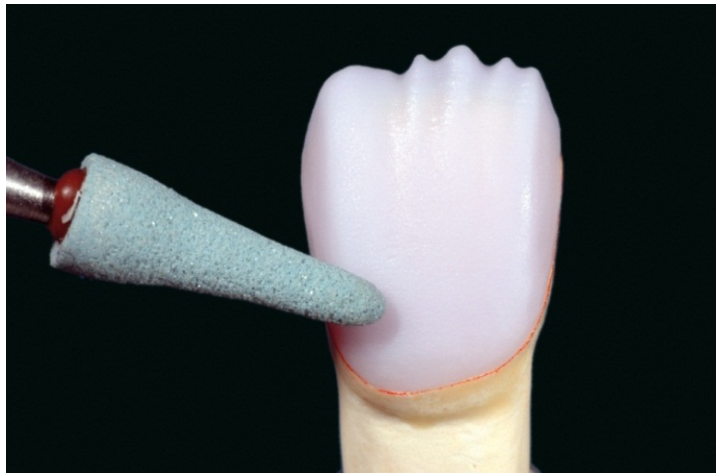
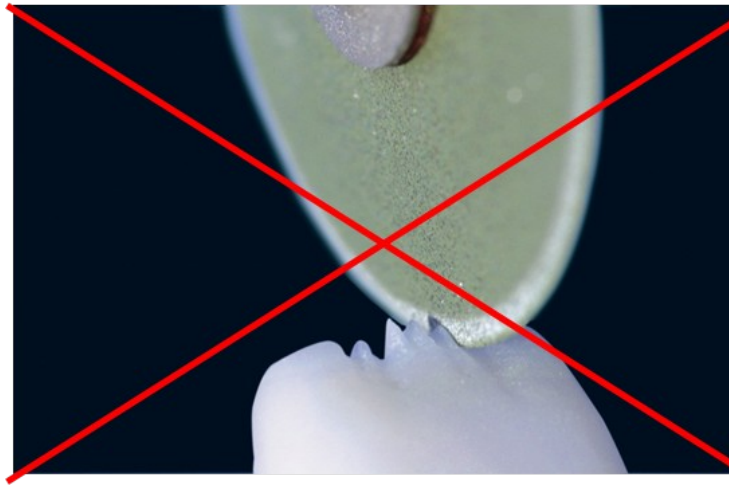
Cut-back technique –
Finishing and Preparation for Crystallization



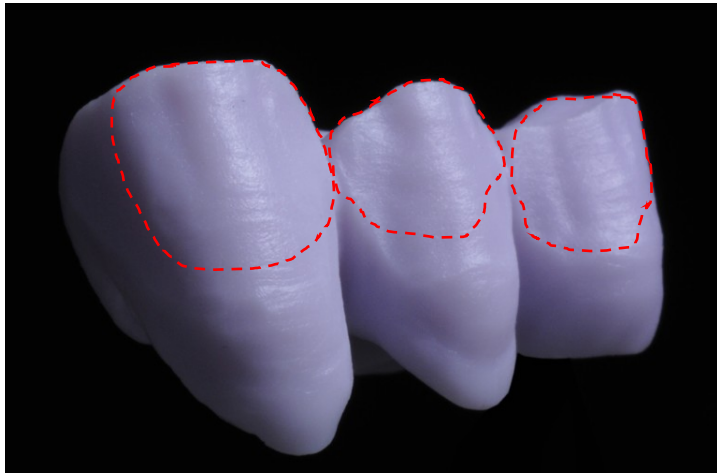
Finish the restoration surface with suitable grinding instruments.



Refrain from designing extreme morphologies with undercuts for mamelons.

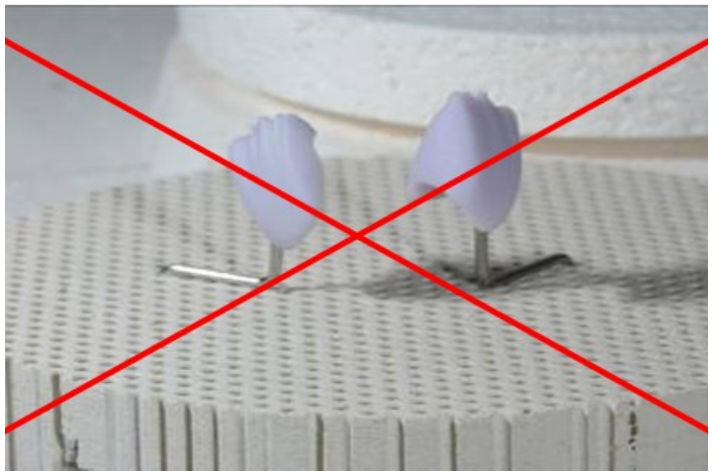
Cut-back technique –
Finishing and Preparation for Crystallization

Veneer and anterior crown with cut-back on dies.



Bridge with cut-back.

Cut-back technique – Crystallization



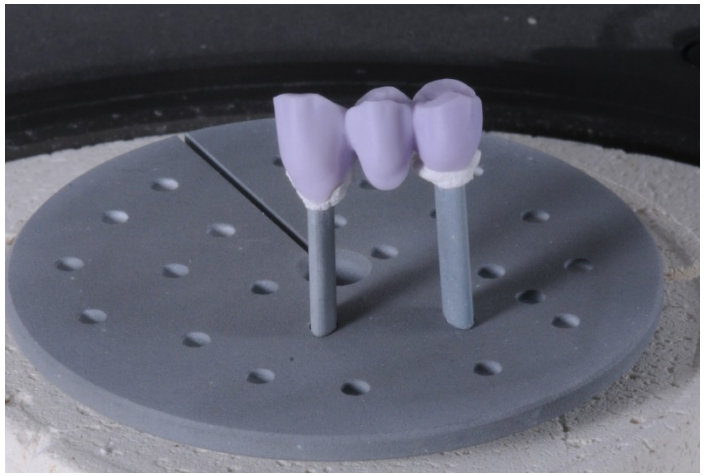
Do not place the IPS e.max CAD restoration on metal pins and do not use a honey-combed firing tray.

Slightly overfill the restoration cavity with IPS Object Fix Putty or Flow.

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

Cut-back technique – Crystallization

Fill the inner aspects of the crowns of the cleaned bridge with IPS Object Fix Putty or Glow and press the suitable IPS e.max CAD Crystallization Pin into it.



Immediately place the bridge on the IPS e.max CAD Crystallization Tray.

Remove the crystallization tray from the furnace once the Crystallization program has been completed and allow the IPS e.max CAD restoration to cool to room temperature.

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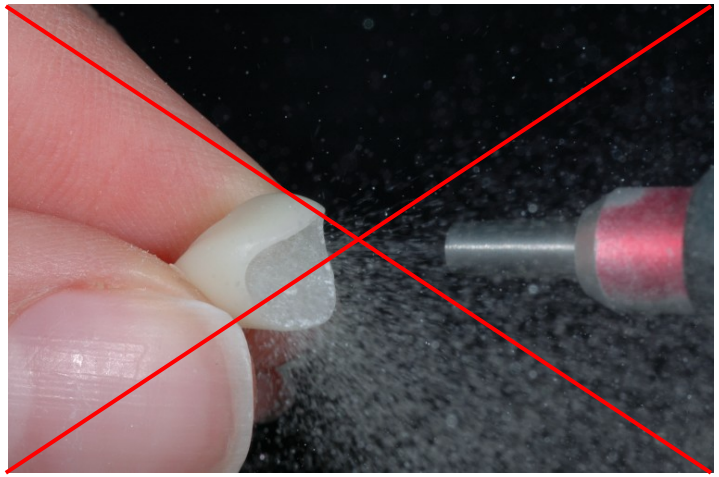
Cut-back technique – Preparing for veneering



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

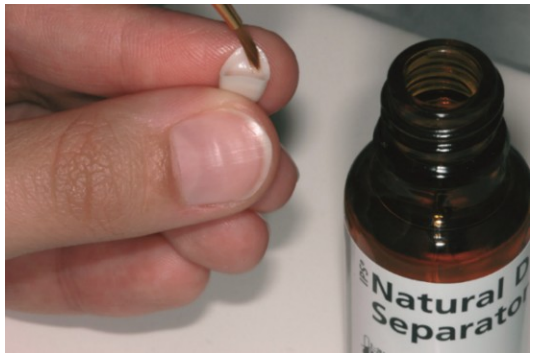
Remove residue with ultrasound in a water bath ...

Cut-back technique – Preparing for veneering

... or with the steam jet.

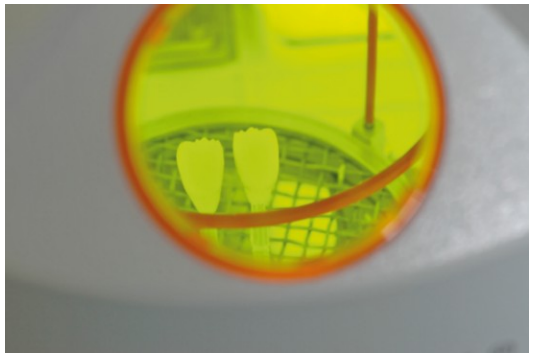
Reduced IPS e.max CAD frameworks prepared for veneering.

Cut-back technique –
Die fabrication with IPS Natural Die Material

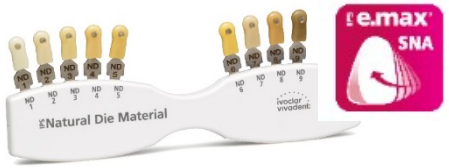


Coat the inner surfaces of the ceramic restoration with IPS Natural Die Material Separator and allow it to react for a short time.

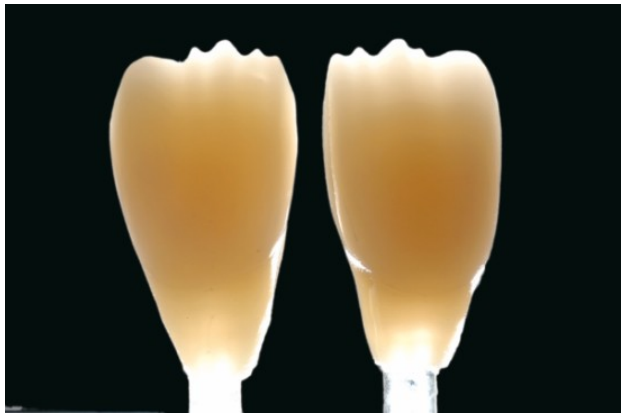
Apply IPS Natural Die Material in the restoration and insert the die holder.



Cure in a customary light curing device.



Cut-back technique –
Die fabrication with IPS Natural Die Material



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

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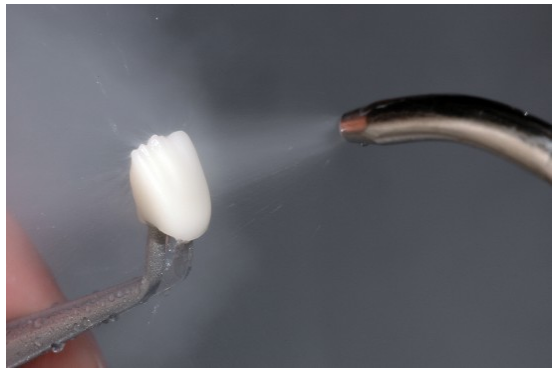
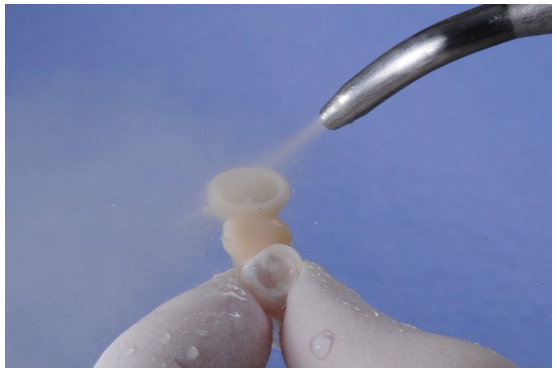
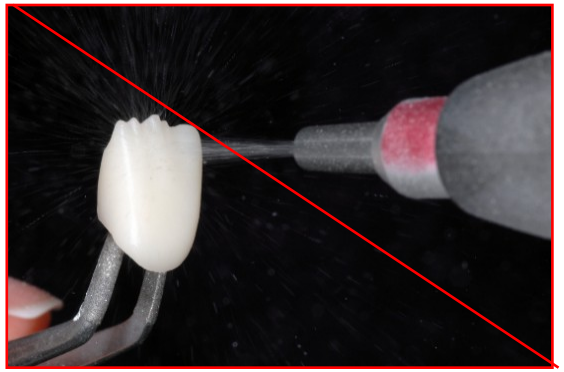
Cut-back technique – Preparation for veneering







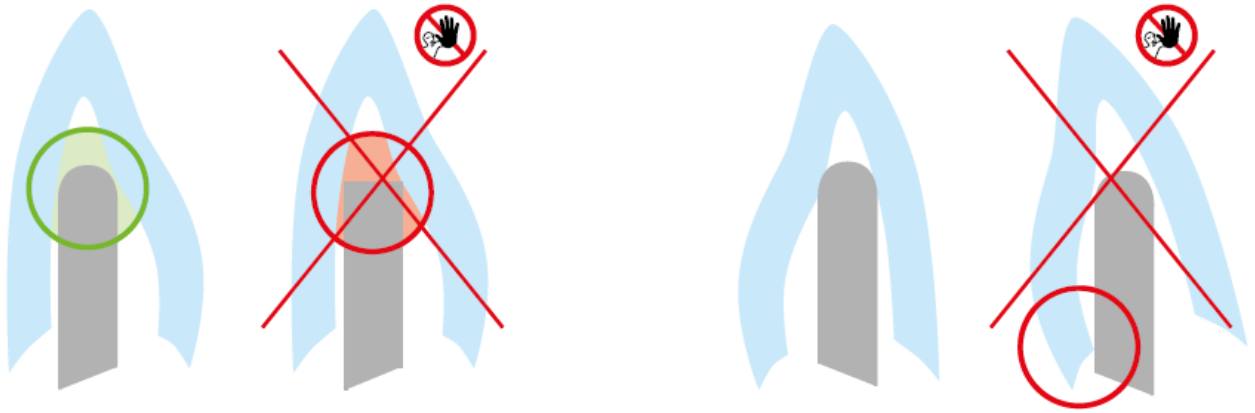
Before veneering, clean the framework under running water or with the steam jet.

Do **not** blast the framework with Al_2O_3 or glass polishing beads.

Cut-back technique –
Veneering with IPS e.max Ceram

Firing tray and pins

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



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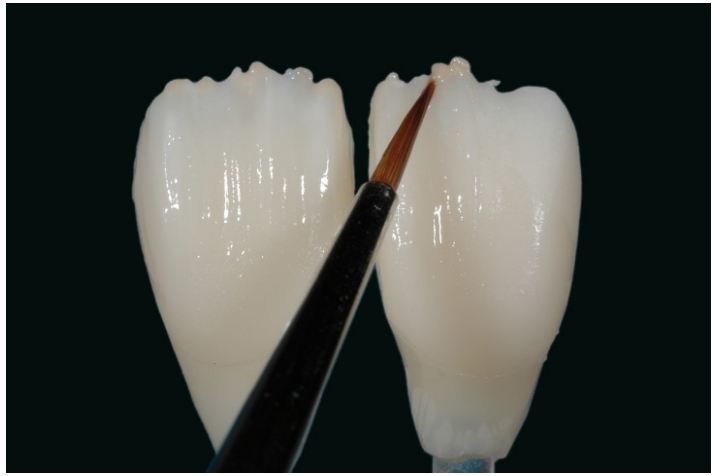
Cut-back technique – Wash firing – **Variant A with IPS e.max Ceram**

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

... and fire using the stipulated firing parameters.

Cut-back technique –
Wash firing – **Variant B with IPS Ivocolor**



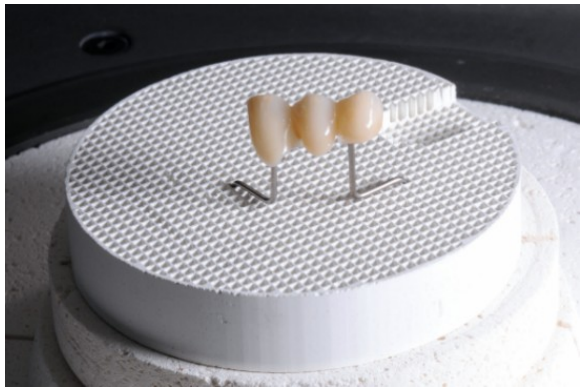
Apply the wash using Glaze, Shades, and Essence ...

... and fire using the stipulated firing parameters.

Cut-back technique –
Wash firing – **Variant B with IPS Ivocolor**

Finish the full-contour areas of the IPS e.max CAD bridge with diamond grinding instruments and create a true-tonature shape and surface texture.

Apply IPS Ivocolor Glaze on the entire bridge and individually characterize the bridge using IPS Ivocolor Shades and Essences.



The wash must be fired before the actual layering procedure is started. Place the honey-comb firing tray in the furnace and conduct the Wash firing (foundation)
using the stipulated firing parameters.

Cut-back technique - Incisal firing

Design the incisal edge using Impulse and Transpa materials.

Complete the layering procedure with Incisal and Transpa materials.

Fire with the firing parameters for the Incisal firing.

Cut-back technique - Incisal firing

Complete the anatomical shape using IPS e.max Ceram Incisal and Transpa materials. Do not veneer the connectors or separate the interdental space.

Place the honey-comb firing tray in the furnace and conduct the Incisal firing using the stipulated firing parameters.

Restoration after the Incisal firing.

Cut-back technique –
Finishing and preparing for the Stain and Glaze

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

Cut-back technique – Stain and Glaze firing

IPS e.max CAD LT veneer and anterior crown after Glaze firing.

Completed IPS e.max CAD LT bridge after Glaze firing.

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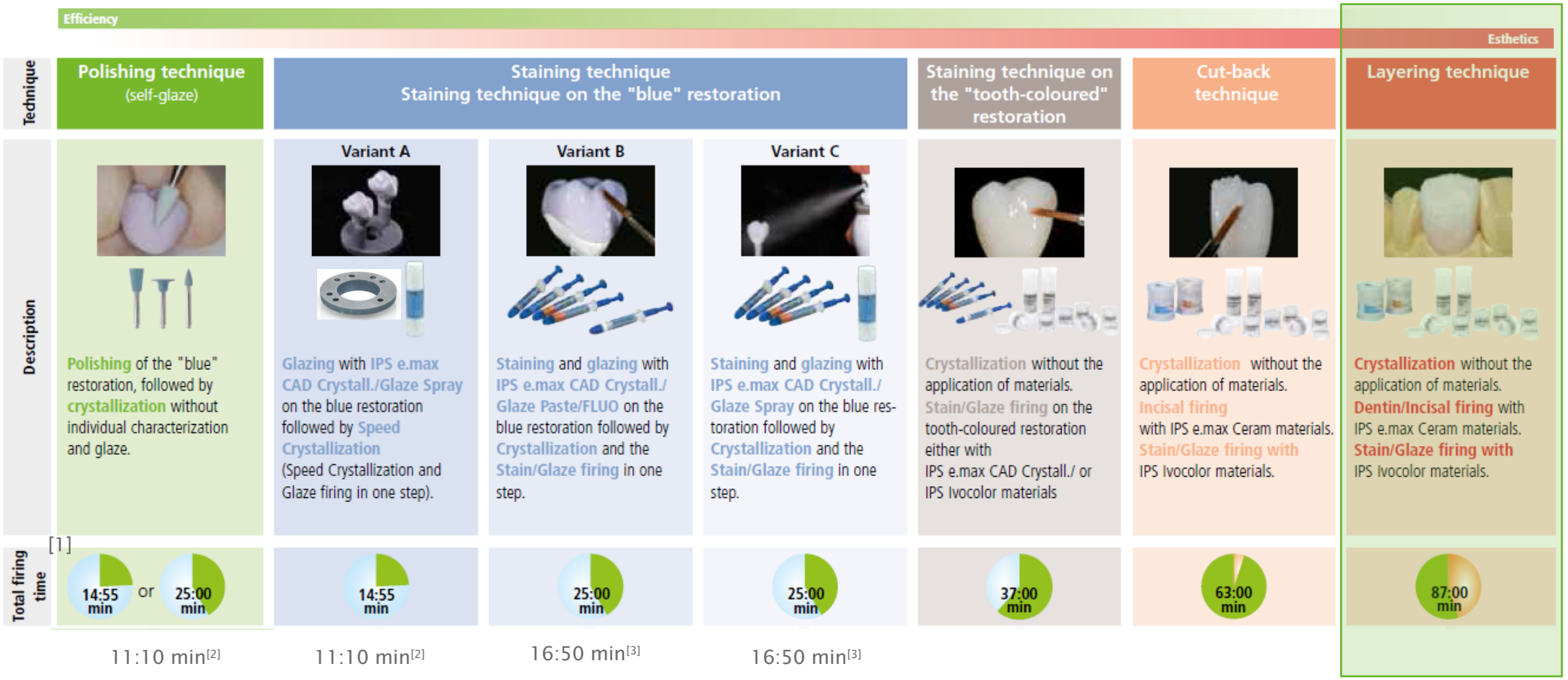
Processing techniques



[1] The respective crystallization and firing parameters are included in the Ivoclar furnaces. Firing times, R&D Ivoclar, Schaan.
[2] Programat CS6, Superspeed crystallization, 11:10 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Self Glaze technique, max. two restorations, R&D Ivoclar, Schaan.
[3] Programat CS6, Speed crystallization, 16:50 minutes, IPS e.max CAD HT, MT, LT, IPS e.max CAD Crystall./ Glaze Spray or Paste and Shades/Stains, max. three restorations, R&D Ivoclar, Schaan.

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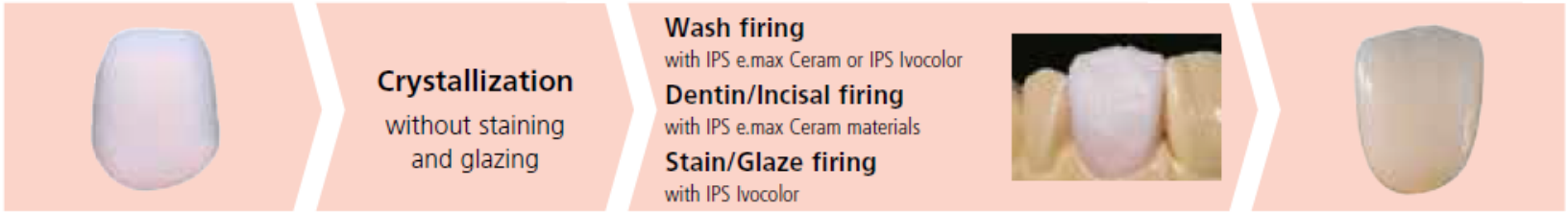
Layering technique –
Crystallization – Dentin–/Incisal firing – Stain/Glaze firing



Crystallization without the application of materials. Dentin/Incisal firing with IPS e.max Ceram materials. Stain/Glaze firing with IPS Ivocolor materials.

In the layering technique, the IPS e.max Ceram layering materials are fired onto the framework made from IPS e.max CAD MO. This enables very individualized design possibilities. The opacity of the IPS e.max CAD MO framework permits the fabrication of highly esthetic restorations on discoloured dies as well as metal core build-ups and Ti abutments.

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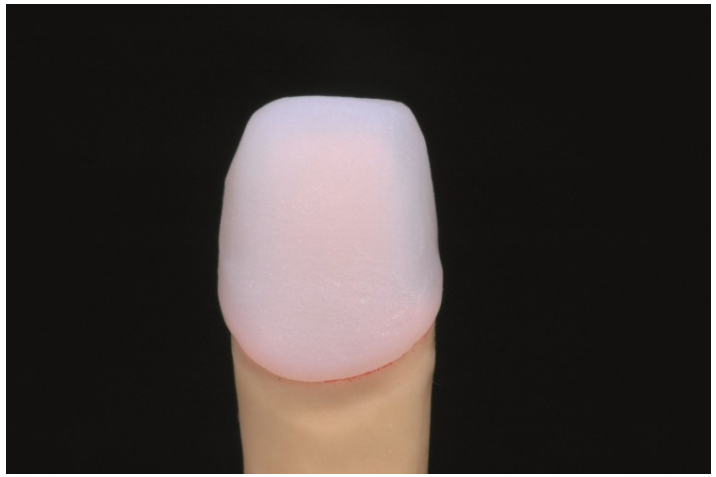
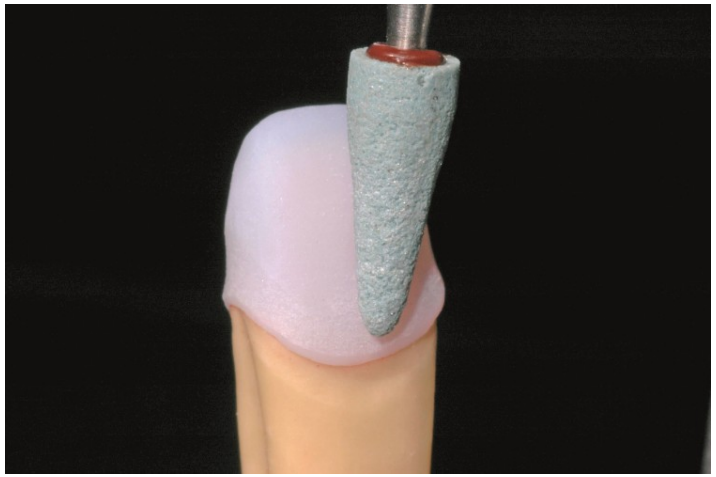
Layering technique – Finishing and preparation for Crystallization



Place the milled framework on the model and check fit.



Finish the framework with suitable grinding instruments.

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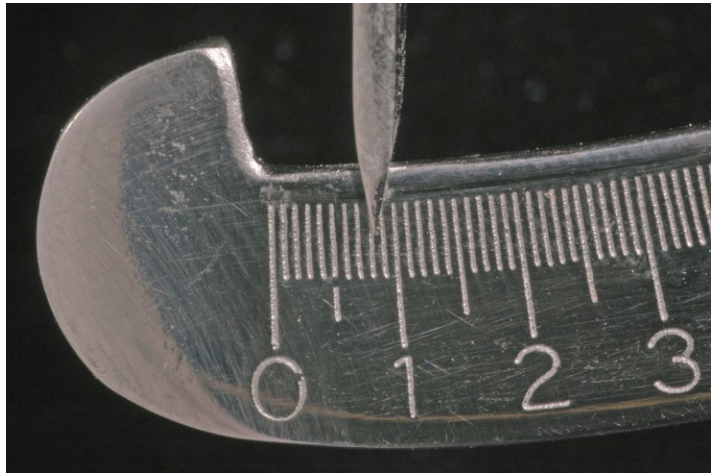
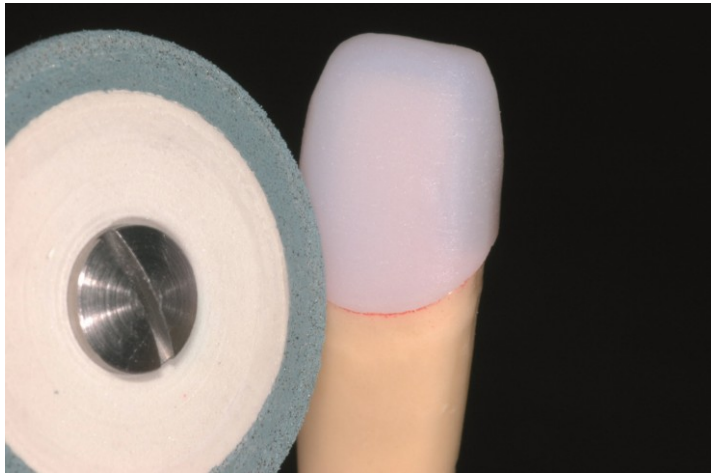
Layering technique –
Finishing and preparation for Crystallization



Make sure that the minimum layer thicknesses are maintained even after the minor adjustments.



Finish the margins with suitable grinding instruments.

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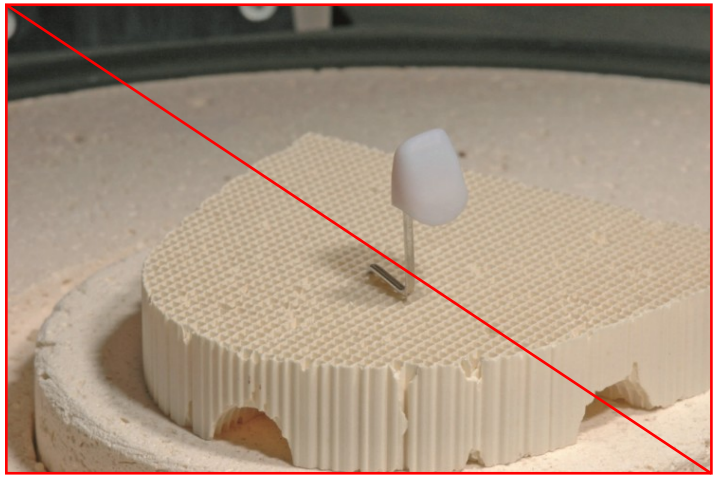
Layering technique – Crystallization



Do **not** place the IPS e.max CAD restoration on metal firing pins and do not use a honey-comb firing tray for crystallization.

Fill the entire cavity with IPS Object Fix Putty or Flow and extend.

Place the firing tray in the furnace and start Crystallization

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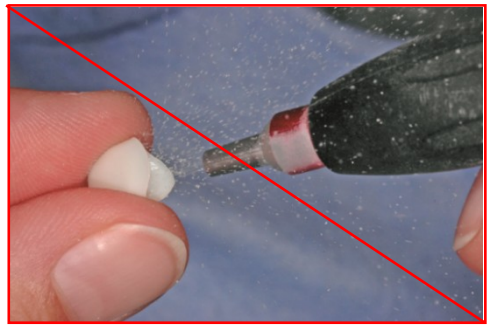
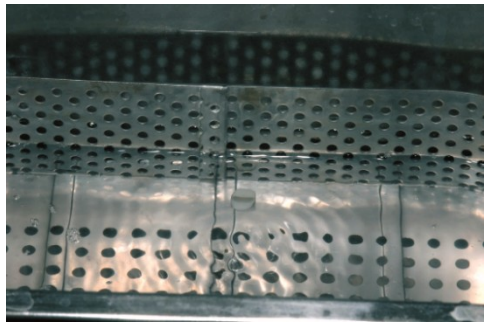
Layering technique – Preparation for veneering

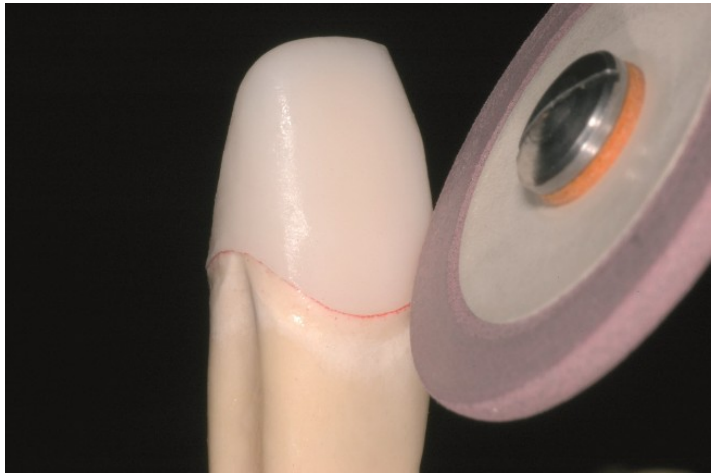


Do **not** remove residue with Al_2O_3 or glass polishing beads.

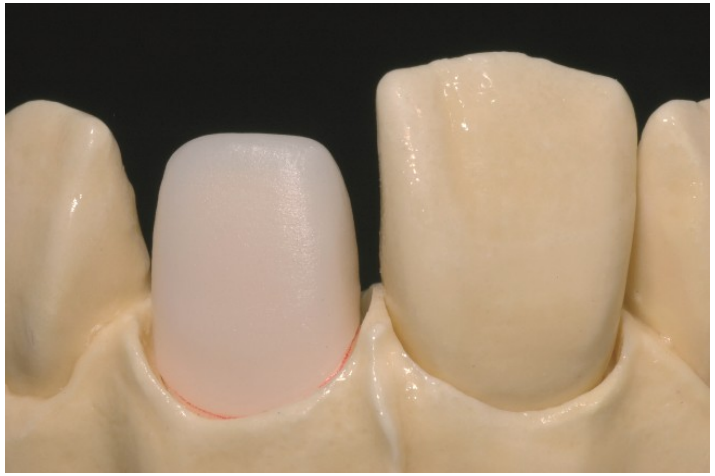


Remove any residue with ultrasound in a water bath and/or with steam.

Layering technique – Preparation for veneering



Check marginal areas and slightly finish, if necessary.

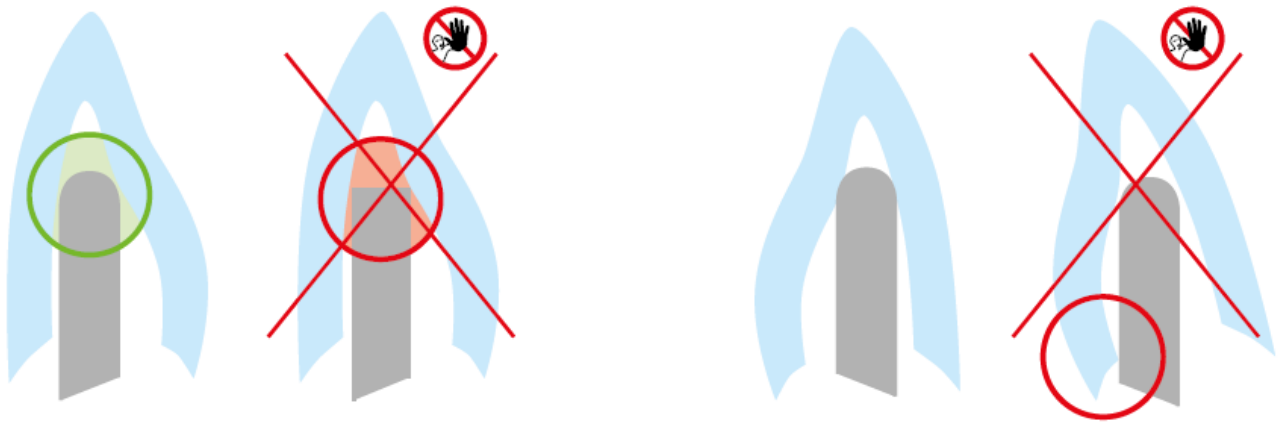


Finished IPS e.max CAD MO framework.

Layering technique – Veneering with IPS e.max Ceram

Firing tray and pins

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



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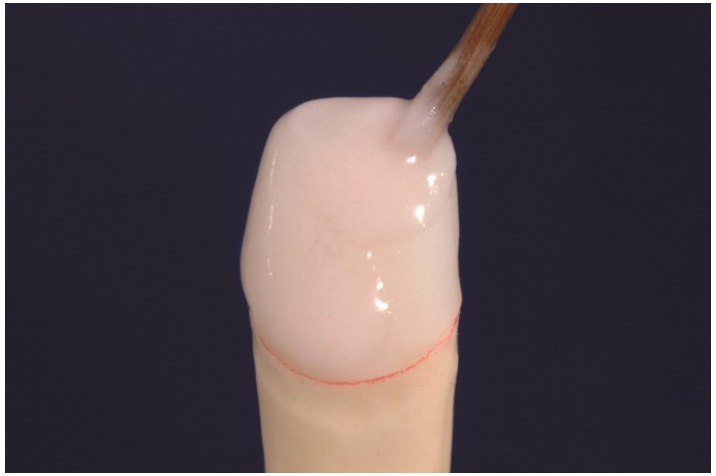
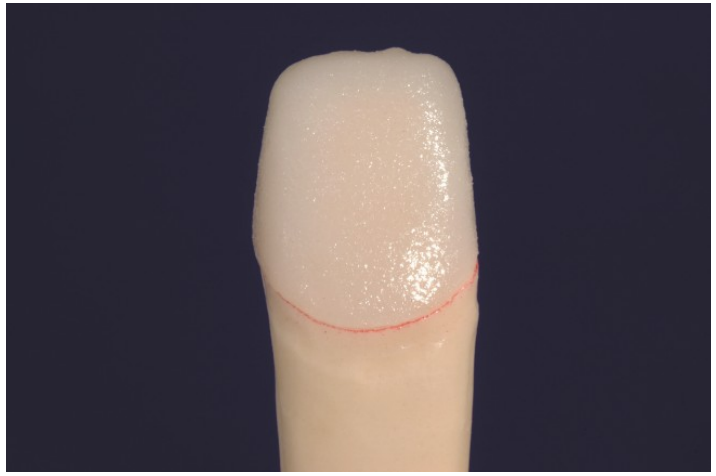
Layering technique – Wash firing – **Variant A with IPS e.max Ceram**

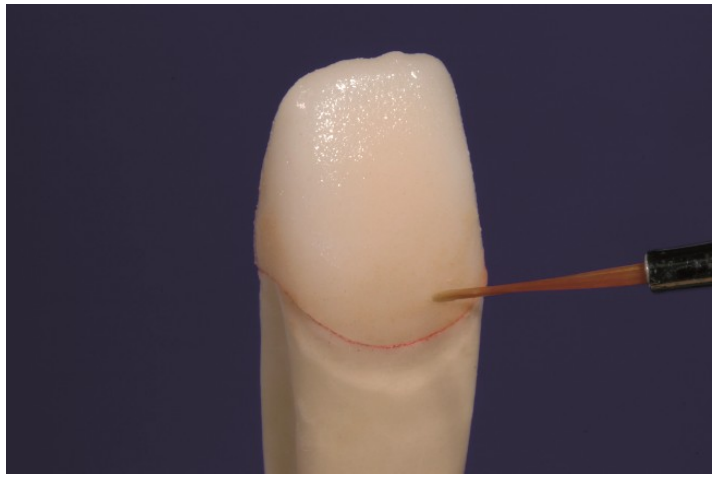


With ideal space, apply the wash layer with the required IPS e.max Ceram Deep Dentin, Dentin, Transpa Incisal and/or Impulse materials ...

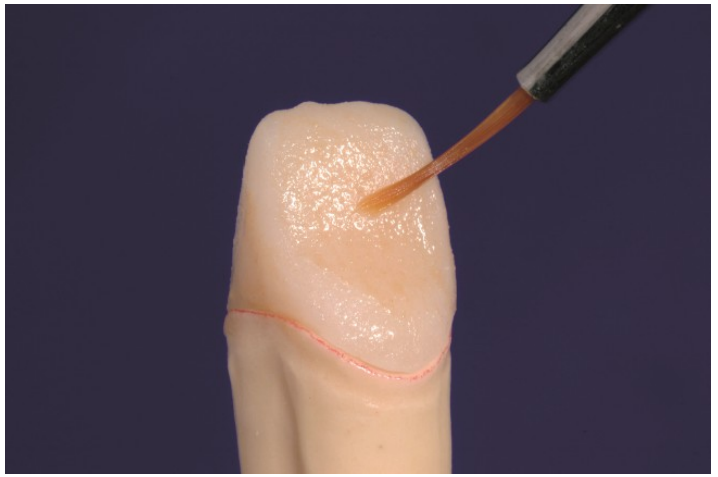


... and fire using the stipulated firing parameters.

Layering technique – Wash firing – Variant B with IPS Ivocolor

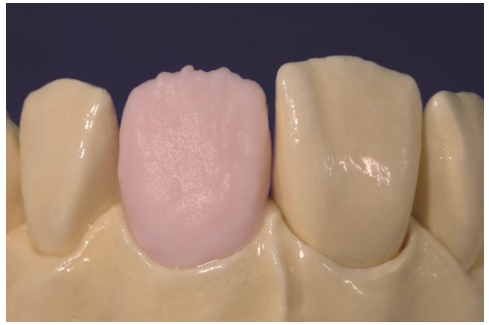


Apply the wash using Glaze, Shades, and Essence ...

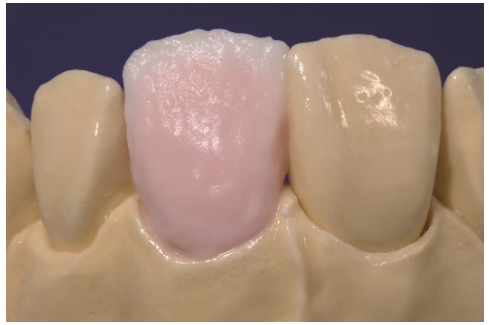


... and fire using the stipulated firing parameters.

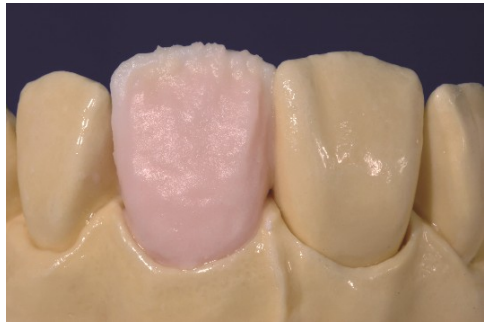
Layering technique – 1st Dentin/Incisal firing



Contour the tooth shape with Dentin material.

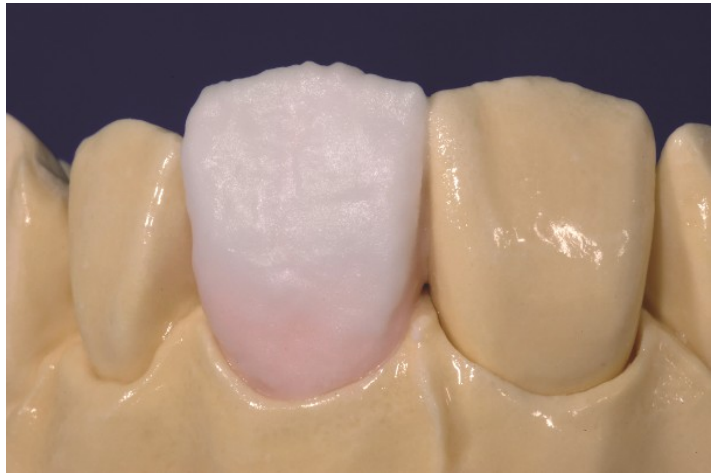


Cut-back and build-up of the incisal area with incisal extension.



Design the incisal third using Impulse materials.

Layering technique – 1st Dentin/Incisal firing



Complete the layering procedure with Incisal and Transpa materials.

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

Layering technique –
2nd Dentin/Incisal firing (Corrective firing)

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

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

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Layering technique – Stain and Glaze firing

Completed, stained and glazed IPS e.max CAD MO restoration.

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Cementation possibilities

	Adhesive cementation e.g. Variolink® Esthetic, Multilink® Automix	**Self-adhesive cementation** e.g. SpeedCEM® Plus	**Conventional cementation** e.g. Vivaglass® CEM, ZirCAD® Cement
Preparation requirements	Non-retentive preparation	Retentive preparation	Retentive preparation
Veneers	✓	–	–
Inlays, onlays (e.g. occlusal veneers, partial crowns)	✓	–	–
Minimally invasive crowns	✓	–	–
Crowns	✓	✓	✓
Three-unit bridges up to the second premolar as the terminal abutment	✓	✓	✓

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Cementation possibilities

	Firing						Polishing					
	IPS e.max® CAD				IPS e.max® ZirCAD		IPS Empress® CAD		Tetric® CAD		Telio® CAD	
												
	Lithium disilicate glass-ceramics (LS_2)				Zirconium oxide ceramics (ZrO_2)		Leucite glass-ceramics		Composite		PMMA	
Flexural strength	530 MPa[1]				MT Multi: 850 MPa[2] LT: 1200 MPa[2]		185 MPa[1]		272 MPa[2]		135 MPa[2]	
Types of restorations	Veneers, inlays, onlays, minimally invasive crowns (min. 1.0 mm)		Crowns (min. 1.5 mm), 3-unit bridges up to the 2nd premolar		Crowns, 3-unit bridges		Veneers, inlays, onlays, crowns		Occlusal veneers, veneers, inlays, onlays, crowns		Temporary crowns and bridges	Long-term crowns and bridges
Cementation method	adhesive		self-adhesive	conventional	adhesive	self-adhesive/ conventional	adhesive		adhesive		temporary	adhesive
Blasting	–				Al_2O_3, 25–70 µm, 1 bar or Al_2O_3, 70–110 µm, 1.5 bar		–		Al_2O_3, 25–70 µm, 1 bar or Al_2O_3, 70–110 µm, 1.5 bar		Al_2O_3, 25–70 µm, 1 bar or Al_2O_3, 70–110 µm, 1.5 bar	
Etching	**Option 1:** Agitate Monobond Etch&Prime® for 20 s and allow it to react for another 40 s	**Option 2:** 20 s with IPS® Ceramic Etching Gel	**Option 1:** Agitate Monobond Etch&Prime® for 20 s and allow it to react for another 40 s	**Option 2:** 20 s with IPS® Ceramic Etching Gel	20 s with IPS® Ceramic Etching Gel	–	**Option 1:** Agitate Monobond Etch&Prime® for 20 s and allow it to react for another 40 s	**Option 2:** 60 s with IPS® Ceramic Etching Gel	–		–	
Conditioning		60 s with Monobond® Plus		60 s with Monobond® Plus	–	60 s with Monobond® Plus		60 s with Monobond® Plus	20 s with Adhese® Universal	30 s with Multilink® Primer A+B	–	2–3 min with SR® Connect
Cementation system	Variolink® Esthetic, Multilink® Automix[3]		SpeedCEM® Plus	Vivaglass® CEM	Multilink® Automix	SpeedCEM® Plus, Vivaglass® CEM	Variolink® Esthetic, Multilink® Automix[3]		Variolink® Esthetic	Multilink® Automix[3]	Telio® Link	Variolink® Esthetic, Multilink® Automix

[1] Average biaxial flexural strength, Outcome after more than 10 years of ongoing quality testing, R&D Ivoclar, Schaan.
[2] Typical mean value of biaxial flexural strength, R&D Ivoclar, Schaan.
[3] Not recommended for veneers.

more Informationen
www.cementation-navigation.com

Manufacturer
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Date information prepared: 2022-04-08, Rev. 2
702850/DE/EN

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Shade Combination Tables

IPS e.max Crystall./Shades, Stains
To be used on "blue" and "tooth-coloured" IPS e.max CAD restorations

A–D tooth shade	BL1	BL2	BL3	BL4	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
IPS e.max CAD Crystall./ Shade		0					1				2				3				4	
IPS e.max CAD Crystall./ Shade Incisal				I1				I2			I1						I2			
IPS e.max CAD Crystall./ Stains				white			cream		sunset		copper		olive			khaki			mahogany	

IPS Ivocoloar Shades, Essences
To be used on "tooth-coloured" IPS e.max CAD restorations

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

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Crystallization and Firing Parameters

Crystallization MO, Impulse, LT, MT, HT
with or *without* the application of **IPS e.max CAD Crystall./ materials**

Furnaces Programat	Stand-by temperature B [°C]	Closing time * S [min]	Heating rate t ↗ [°C/min]	Firing temperature T1 [°C]	Holding time H1 [min]	Heating rate t ↗ [°C/min]	Firing temperature T2 [°C]	Holding time H2 [min]	Vacuum 1 11 12 [°C]	Vacuum 2 21 22 [°C]	Long-term cooling L [°C]	Cooling rate tl [°C/min]
P300 P500 P700	403	6:00	60	770	0:10	30	850	10:00	550/770	770/850	700	0
P310 P510 P710	403	6:00	60	780	0:10	30	860	10:00	550/780	780/860	710	0
CS/CS2/ CS3/CS4/ CS6	Select the corresponding program											

Crystallization LT, MT, HT
with or *without* the application of **IPS e.max CAD Crystall./ materials**

Furnaces Programat	Stand-by temperature B [°C]	Closing time * S [min]	Heating rate t ↗ [°C/min]	Firing temperature T1 [°C]	Holding time H1 [min]	Heating rate t ↗ [°C/min]	Firing temperature T2 [°C]	Holding time H2 [min]	Vacuum 1 11 12 [°C]	Vacuum 2 21 22 [°C]	Long-term cooling L [°C]	Cooling rate tl [°C/min]
P300 P500 P700	403	6:00	90	820	0:10	30	840	7:00	550/820	820/840	700	0
P310 P510 P710	403	6:00	90	830	0:10	30	850	7:00	550/830	830/850	710	0
CS/CS2/ CS3/CS4/ CS6	Select the corresponding program											

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Crystallization and Firing Parameters

Speed crystallization (observe the block concept)
Max. 2 units *with* or *without* the application of **IPS e.max CAD Crystall./Glaze Spray** on an IPS Speed Tray

Furnaces Programat	Stand-by temperature B [°C]	Closing time * S [min]	Heating rate t ↗ [°C/min]	Firing temperature T1 [°C]	Holding time H1 [min]	Heating rate t ↗ [°C/min]	Firing temperature T2 [°C]	Holding time H2 [min]	Vacuum 1 11 12 [°C]	Vacuum 2 21 22 [°C]	Long-term cooling L [°C]	Cooling rate tl [°C/min]
P300 P500 P700	403	1:00	110	800	0:00	50	850	3:00	690/800	800/850	700	40
P310 P510 P710	403	0:30	120	850	0:00	70	870	3:30	690/850	850/870	705	0
CS/CS2/ CS3/CS4/ CS6	Select the corresponding program											

Corrective firing/stain firing/glaze firing
with **IPS e.max CAD Crystall./ materials**

Furnaces Programat	Stand-by temperature B [°C]	Closing time * S [min]	Heating rate t ↗ [°C/min]	Firing temperature T1 [°C]	Holding time H1 [min]	Heating rate t ↗ [°C/min]	Firing temperature T2 [°C]	Holding time H2 [min]	Vacuum 1 11 12 [°C]	Vacuum 2 21 22 [°C]	Long-term cooling L [°C]	Cooling rate tl [°C/min]
P300 P500 P700	403	6:00	90	820	0:10	30	840	3:00	550/820	820/840	700	0
P310 P510 P710	403	6:00	90	830	0:10	30	850	3:00	550/830	830/850	710	0
CS/CS2/ CS3/CS4/ CS6	Select the corresponding program											

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Firing Parameters

Firing parameters for the staining technique
with **IPS Ivocolor Shade, Essence, Glaze**

	Stand-by temperature B [°C]	Closing time * S [min]	Heating rate t↗ [°C/min]	Firing temperature T [°C]	Holding time H [min]	Vacuum 1 V1 [°C]	Vacuum 2 V2 [°C]	Long-term cooling ** L [°C]	Cooling rate tl [°C/min]
Stain and Glaze firing	403	IRT/ 6:00	60	710	1:00	450	709	0	0

* IRT normal mode
** Note: If the layer thicknesses exceed 2 mm, long-term cooling to 500 °C is required.

Note: Due to their geometry, the restorations may feature varying layer thicknesses. When the objects cool after the firing cycle, the different cooling speeds in the areas with different thicknesses may result in a build-up of internal tension. In the worst case, these internal tensions may result in fracture of the restoration. By using slow cooling (long-term cooling L), these tensions can be minimized. For monolithic restorations (staining technique) featuring layer thicknesses of more than 2 mm, long-term cooling L must be used.

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Firing Parameters

Firing parameters for the cut-back and layering technique
with **IPS e.max Ceram/IPS Ivocolor Shade, Essence, Glaze**

	Stand-by temperature B [°C]	Closing time * S [min]	Heating rate t ↗ [°C/min]	Firing temperature T1 [°C]	Holding time H1 [min]	Heating rate t ↗ [°C/min]	Firing temperature T2 [°C]	Holding time H2 [min]	Vacuum 1 11 12 [°C]	Vacuum 2 21 22 [°C]	Long-term cooling L [°C]	Cooling rate tl [°C/min]
Wash firing (foundation)	403	IRT/ 04:00	90	650	00:00	20	730	02:00	400/650	650/729	0	0
1st Dentin and Incisal firing	403	IRT/ 04:00	90	650	00:00	20	730	02:00	400/650	650/729	0	0
2nd Dentin and Incisal firing	403	IRT/ 04:00	90	650	00:00	20	730	02:00	400/650	650/729	0	0
Stain firing using IPS Ivocolor	403	IRT/ 06:00	60	710	01:00	–	–	–	450	709	0	0
Glaze firing using IPS Ivocolor	403	IRT/ 06:00	60	710	01:00	–	–	–	450	709	0	0
Add-On with Glaze firing	403	IRT/ 06:00	60	710	01:00	–	–	–	450	709	0	0
Add-On after Glaze firing	403	IRT/ 06:00	50	700	01:00	–	–	–	450	699	0	0

* IRT normal mode

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