straumann

BASIC INFORMATION ON
STRAUMANN® CARES® TOOTH-BORNE PROSTHETIC PROCEDURES

Straumann® CARES® Tooth-borne prosthetic

COMMITTED TO
SIMPLY DOING MORE
FOR DENTAL PROFESSIONALS

CONTENTS

1. Introduction **2**

2. General information **2**
2.1 Product description 2
2.2 Intended use 2
2.3 Material features and benefits 3
2.4 Indications 6
2.5 Material selection 7
2.5.1 Restoration shade/color 7
2.5.2 Processing technique 8
2.5.3 Processing step 9
2.6 Warning 10
2.7 Caution 10
2.8 Use and handling 10

3. Tooth preparation **10**

4. Scanning, restoration design and finishing **11**
4.1 Data digitization 11
4.2 Restoration design 11
4.3 Finishing and processing 11
4.3.1 Finishing 11
4.3.2 Processing 12
4.3.3 Seating 13
4.3.4 Removal of a seated restoration 13

Further information

Appendix A Restoration thickness guidelines 14
A1 Full-contour 15
A2 Cut-back 16
A3 Veneerable frameworks 17

Appendix B Instructions for setting the die parameters 18
B1 Straumann® CARES® Visual up to version 6.2 18
B2 Straumann® CARES® Visual version 7.0 and higher 19

Appendix C Chemical composition and physical properties 20

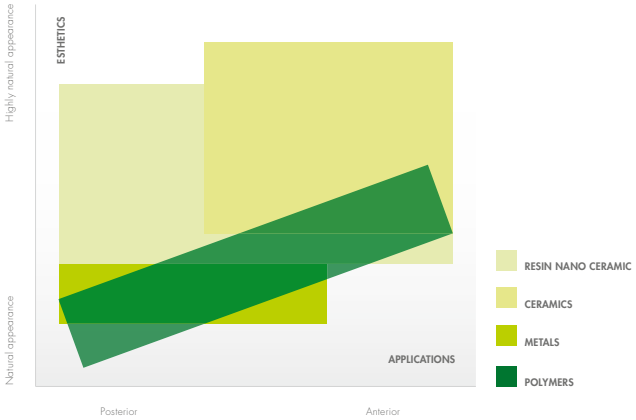
Appendix D Additional material-specific guidelines 24
D1 3M™ ESPE™ Lava™ Ultimate Restorative 24
D2 zerion® 24
D3 IPS e.max® CAD 25
D4 IPS Empress® CAD 26
D5 VITA® Mark II and TriLuxe 28
D6 ticon® 29
D7 coron® 30
D8 polyamide 30
D9 polycon® ae 30

1. INTRODUCTION

Straumann® CARES® CADCAM offers you a unique portfolio of materials designed to provide patients and the restorative team with a broad range of treatment options.

Straumann® CARES® CADCAM continuously invests in state-of-the-art production centers and in the development of innovative new technologies. Our CADCAM solution maintains high-quality standards due to its rigorous and certified quality management system. The excellent properties of all our CADCAM element offerings are designed for high reliability and predictability.

With our innovative and constantly evolving solution combined with our extensive service and support program, you have an excellent foundation for successful prosthetic restorations.



2. GENERAL INFORMATION

2.1 Product Description

Straumann® CARES® Tooth-borne prosthetic restorations are used on natural teeth or for the restoration of Straumann® Implants and prosthetic solutions. Straumann® CARES® Tooth-borne prosthetic restorations allow individual customization regarding function and esthetics for various applications.

Straumann® CARES® Tooth-borne prosthetic restorations are designed by the customer using a Straumann approved software (such as Straumann® CARES® Visual). The design data is then transferred to Straumann where the individualized restorations are fabricated.

2.2 Intended use

Straumann® CARES® Tooth-borne prosthetic restorations are intended to restore natural teeth or to be placed on top of abutments.

2.3 Material features and benefits

Resin Nano Ceramic

3M™ ESPE™ Lava™ Ultimate Restorative

(RNC manufactured by 3M)

- Designed to be durable and reliable
- Brilliant esthetics with long-lasting polish
- High efficiency thanks to easy adjustment and polish
- Tooth-preserving wear and shock-absorbent maintaining functional balance

Ceramics

zerion®

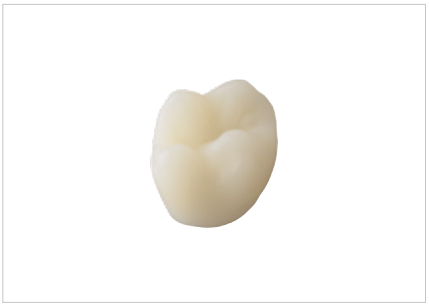
(zirconium-dioxide ceramic)

- Broad range of applications from frameworks to full-contour restorations for high flexibility
- High-stability frameworks designed for a predictable prosthetic outcome

IPS e.max® CAD

(lithium-disilicate glass-ceramic manufactured by Ivoclar Vivadent AG)

- All-ceramic restorations for efficient esthetics
- Versatility for easy handling
- High-strength product designed for reliable restorations



IPS Empress® CAD

(leucite glass-ceramic manufactured by Ivoclar Vivadent AG)

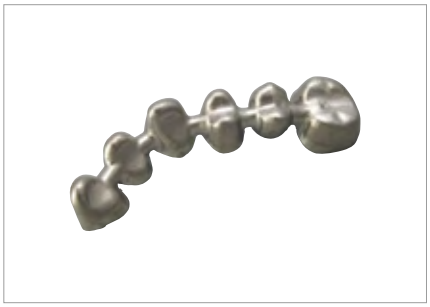
- All-ceramic restorations for natural looking esthetics
- Simplicity for easy handling
- Well-established product designed for predictable restorations

VITA® Mark II and TriLuxe

(feldspar ceramic manufactured by VITA Zahnfabrik H. Rauter GmbH & Co. KG)

- Wide range of shades for natural looking esthetics
- Versatility for easy handling
- High-quality material designed for predictable results

Metals



ticon®

(titanium)

- Milled frameworks designed for high reliability and precision
- Veneering processing comparable to noble casting alloys for easy processing
- Ideal alternative to noble casting alloys

coron®

(cobalt-chromium alloy)

- Milled frameworks for consistent and high quality
- Broad range of applications for high flexibility
- Veneering processing comparable to noble casting alloys for easy processing

Polymers

Polyamide

(Polyamide reinforced with glass-fibre)

- Strong crown and bridge frameworks for temporary restorations
- Stable compound designed for high reliability

polycon® ae

(PMMA-based acrylate resin)

- Specially suited for full-contoured temporary restorations for high efficiency
- Excellent compound stability for easy handling

polycon® cast

(filler-free acrylate burn-out resin)*

- Specifically for conventional crown and bridge wax-up (can be burned out without residue)

*polycon® cast is not to be inserted into the patient's mouth to check the fit. polycon® cast is not a medical device!

2.4 Indications

Straumann® CARES® CADCAM offers you a broad array of materials with an extensive range of applications.

MATERIALS[1]	APPLICATIONS[1]	Single-tooth restorations					Bridges			Specials		
		Coping	Partial crown	Crown	Veneer	Inlay/Onlay[3]	Inlay/Maryland bridge	Bridge maximum unit[2]	Maximum pontics in the anterior/posterior region	Telescopic crown	Bar	Retaining attachment
	RESIN NANO CERAMIC											
	3M™ ESPE™ Lava™ Ultimate Restorative – LT & HT		●	●	●	●						
	CERAMICS											
	zerion® LT	●				○	●	16	4/2	●	○	○
	zerion® HT	○		●				3	1/1			
	IPS e.max® CAD – MO	●										
	IPS e.max® CAD – LT		●	●	●							
	IPS e.max® CAD – HT		●	●	●	●						
	IPS Empress® CAD – Multi & LT		●	●	●							
	IPS Empress® CAD – HT				●	●						
	VITA® Mark II		●	●	●	●						
	VITA® TriLuxe		●	●	●							
	METALS											
	ticon®	●		○		○	○	16	4/3	●	○	●
	coron®	●		○		○	○	16	4/3	●	○	●
	POLYMERS											
	Polyamide	●				○		16	2/2			
	polycon® ae	○		●		○	●	16	1/1			
	polycon® cast	◆		◆		◆	◆	16	4/4	◆	◆	◆

● strongly recommended application ○ possible application ◆ acrylic burn-out

[1] Application and material availability might differ from country to country
[2] Veneerable inlay for zerion®, ticon®, coron® and polycon® ae materials
[3] Availability of maximum bridge unit might differ from country to country

2.5 Material selection

2.5.1 Restoration shade/color

The selected Straumann® CARES® Tooth-borne prosthetic materials are available in various shades for maximum flexibility and application variety to meet individual patient needs.

2.5.1.1 Resin Nano Ceramic – 3M™ ESPE™ Lava™ Ultimate Restorative

The 3M™ ESPE™ Lava™ Ultimate Restorative material is available in two levels of translucency:

- **High Translucency (HT)** available in the following shades: A1, A2, A3, B1
- **Low Translucency (LT)** available in the following shades: A1, A2, A3, A3.5, B1, C2, D2, Bleach

2.5.1.2 Ceramics

zerion®

The Straumann® CARES® zerion® material is available in two levels of translucency:

- **High Translucency (HT)** specially suited for full-contour restorations in the following shades: pure, light, medium, intense.
- **Low Translucency (LT)** available for frameworks in the following shades: Bleach, Light 1, Light 2, Light 3, Light 4, Medium 1, Medium 2, Medium 3, Dark

IPS e.max® CAD

The IPS e.max® CAD material is available in three levels of translucency:

- **High Translucency (HT)** available in the following shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4, BL1, BL2, BL3, BL4
- **Low Translucency (LT)** available in the following shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4, BL1, BL2, BL3, BL4
- **Medium Opacity (MO)** available in the following shades: MO 0, MO 1, MO 2, MO 3, MO 4

IPS Empress® CAD

The IPS Empress® CAD material is available in three levels of translucency:

- **High Translucency (HT)** available in the following shades: A1, A2, A3, A3.5, B1, B2, B3, C2, D3
- **Low translucency (LT)** available in the following shades: A1, A2, A3, A3.5, B1, B2, B3, C2, D3, BL1, BL2, BL3, BL4
- **Multi** available in the following A-D and Bleach (BL) shades: A1, A2, A3, A3.5, B1, BL1, BL3

VITA® Mark II

The VITA® Mark II material is available in the following monochromatic shades: 0M1C, 1M1C, 1M2C, 2M1C, 2M2C, 2M3C, 3M1C, 3M2C, 3M3C, 4M2C, A1C, A2C, A3C according to the VITA color system.

VITA® TriLuxe

The VITA® TriLuxe material is available in the following three multilayer shades: 1M2C, 2M2C, 3M2C according to the VITA color system.

2.5.1.3 Polymer – polycon® ae

The Straumann® CARES® polycon® ae material is available in five shades: A1, A2, A3, B1, B2

2.5.2 Processing techniques

Depending on the processing technique and indication, the following recommendation can be made regarding the choice of material:

	PROCESSING TECHNIQUE											
	Full-contour					Cut-back				Layering		
	Inlay/Onlay	Veneer	Partial crown	Crown	Bridge	Veneer	Partial crown	Crown	Bridge	Veneerable inlay	Coping	Bridge
RESIN NANO CERAMIC												
3M™ ESPE™ Lava™ Ultimate Restorative – HT/LT	●	●	●	●								
CERAMICS												
zerion® LT										○	●	●
zerion® HT				●	●						○	○
IPS e.max® CAD – HT	●	●	●	●		●	●	●				
IPS e.max® CAD – LT		●	●	●		●	●	●				
IPS e.max® CAD – MO											●**	
IPS Empress® CAD – HT	●	●				●						
IPS Empress® CAD – LT		●	●	●		●		●*				
IPS Empress® CAD – Multi		●	●	●		●						
VITA® Mark II	●	●	●	●		●		●*				
VITA® TriLuxe		●	●	●		●		●*				
METALS												
ticon®				○	○			○	○	○	●	●
coron®				○	○			○	○	○	●	●
POLYMERS												
Polyamide										○	●	●
polycon® ae				●	●			●	●	○	○	○
polycon® cast				●	●			●	●	○	●	●

● recommended ○ possible

* only for anterior crowns

** only for anterior crowns and premolars

2.5.3 Processing steps

Depending on the indication, material and chosen technique, different processing steps can be followed to achieve the final restoration.

	PROCESSING STEPS						
	None	Crystallization	Polishing	Glazing	Staining/Charaterization	Layering	Build-up/Adding-on
RESIN NANO CERAMIC							
3M™ ESPE™ Lava™ Ultimate Restorative – LT & HT	○		○		○		○
CERAMICS							
zerion® LT						●	
zerion® HT			●	○	○	○	
IPS e.max® CAD – MO		●				●	
IPS e.max® CAD – LT & HT		●		○	○	○	
IPS Empress® CAD – Multi, LT & HT	○		○	○	○	○	
VITA® Mark II & TriLuxe	○		○	○	○	○	
METALS							
ticon®			○			○	
coron®			○			○	
POLYMERS							
Polyamide						●	
polycon® ae	○		○			○	
polycon® cast	n.a.						

● mandatory processing step and/or technique
○ possible processing step and/or technique
(note: some can be combined depending on the material selected)

2.6 Warning

The instructions provided are insufficient to serve as the only means for processing and placing Straumann® CARES® Tooth-borne prosthetic restorations and related components. Only those dental professionals thoroughly trained in dental restorations should be processing and placing these restorations. Processing and placing Straumann® CARES® Tooth-borne prosthetic restorations and related components without proper training may lead to failure of the restoration and other complications. Restoration failure may lead to restoration removal or other complications.

Failure to follow the procedures outlined in these instructions may harm the patient and/or lead to any or all of the following complications:

- Aspiration or ingestion of components
- Damage to the components or teeth
- Loosening of the restoration or other components
- Improper final restoration or malfunction of the restoration application
- Impairment of the patient's chewing function

2.7 Caution

Apply appropriate precautions in order to prevent aspiration and/or ingestion when placing Straumann® CARES® Tooth-borne prosthetic restorations and related components.

2.8 Use and handling

If the Straumann® CARES® Tooth-borne prosthetic restorations are not processed and placed by the same dental professional, these instructions for use shall be transmitted to the person placing the restoration.

Straumann® CARES® Tooth-borne prosthetic restorations are not sterile when delivered. The restoration needs to go through a standard disinfection or comparable cleaning process before being placed.

3. TOOTH PREPARATION

For successful results with Straumann® CARES® Tooth-borne prosthetic restorations, the following tooth preparation guidelines shall be observed:

- The preparation shall not have angles or sharp edges.
- The shoulder preparation shall be with rounded inner edges and/or chamfer.
- The preparation shall have retentive surfaces for conventional cementation and/or self-adhesive cementation.

Additional preparation guidelines specific to 3M™ ESPE™ Lava™ Ultimate Restorative, IPS e.max® CAD, IPS Empress® CAD, VITA® Mark II and TriLuxe shall also be observed – see Appendix D.

4. SCANNING, RESTORATION DESIGN AND FINISHING

4.1 Data digitization

The patient situation can be scanned with a Straumann approved intra-oral scanner. The data can be imported in the Straumann approved software (e.g. Straumann® CARES® Visual version 5.IO or higher).

The patient situation can be taken with a conventional impression tray. The dental laboratory will scan the fabricated master model (preferably with removable segments) with a Straumann approved desktop scanner (e.g. Straumann® CARES® CS2 Scan).

For further information, please refer to the instructions for use of the respective scanner.

4.2 Restoration design

The restoration is designed with a Straumann approved software (such as Straumann® CARES® Visual), which is engineered to ensure the following:

- The design of the Straumann® CARES® Tooth-borne prosthetic restorations ordered from Straumann meets the restoration thickness guidelines (see Appendix A).
- The restoration dimension complies with the Straumann manufacturing capabilities.

For bridge constructions, the cross-sections shall be adjusted in relation to the total size of the bridge work and the transition from a connector to a crown or coping shall be rounded.
For specific preparations (e.g. sharp incisal edge, flat preparation), the software die parameters can be adapted (see Appendix B).

For further information please refer to Instructions For Use or Quick Reference Guide of the respective software.

4.3 Restoration finishing and processing

4.3.1 Finishing

Straumann® CARES® Tooth-borne prosthetic restorations may need to be ground for finishing and adjusting. For successful results the following rules shall be observed:

- The restoration thickness guidelines shall be followed (see Appendix A).
- Only suitable grinding instruments (see Appendix D) for the selected material shall be used for finishing and adjusting the Straumann® CARES® Tooth-borne prosthetic restorations.

Caution: Take appropriate precautions in order to prevent inhalation of grinding/polishing dust.

Additional finishing guidelines specific to each of our Straumann® CARES® Tooth-borne prosthetic material shall also be observed – see Appendix D.

4.3.2 Processing

Depending on the material, processing technique and indication selected, the Straumann® CARES® Tooth-borne prosthetic restorations can be directly seated or finalized through different processing steps (see chapter 2.5.3 Processing steps).

The processing steps can be overall described as follows:

a) Crystallization

This processing step is exclusive and mandatory for IPS e.max® CAD restorations by Straumann® CARES®. The flexural strength of the delivered IPS e.max® CAD restoration by Straumann® CARES® is 130 ± 30 MPa. To reach its final flexural strength of 360 ± 60 MPa and its final optical characteristics (shade, translucency and brightness), the IPS e.max® CAD restorations by Straumann® CARES® need to go through a crystallization firing in a furnace at 840 °C – 850 °C (1544 °F – 1562 °F) for approximately 21 to 30 minutes. Further information on the crystallization, compatible furnaces, firing programs, etc. is available in the instructions for use.

b) Polishing

In this processing technique, the delivered full-contour restoration is only polished.

c) Glazing

In this processing technique, glazing is applied on the delivered full-contour restoration followed by a glaze firing.

For IPS e.max® CAD restorations by Straumann® CARES®, the crystallization and glaze firing can be performed in one step.

d) Staining

In this processing technique, staining is applied on the delivered full-contour restoration. Depending on the material, the restoration is then either polished or glazed and followed by a stain and glaze firing.

For IPS e.max® CAD restorations by Straumann® CARES®, the crystallization, stain and glaze firing can be performed in one step.

e) Layering

In this processing technique, various layering materials are fired on the delivered framework.

All commercially available veneering materials intended for layering the selected material and suitable for the CTE value of the selected material (see Appendix C) can be used. The processing instructions of the veneering material manufacturers shall be followed.

Before layering, the restoration shall be cleaned with a steam jet.

f) Build-up or adding-on

This processing step is exclusive for Straumann® CARES® Restorations made of 3M™ ESPE™ Lava™ Ultimate Restorative. It allows to adjust the restoration with additive technique. In this processing technique, methacrylate based lightcured restorative is applied on the delivered full-contour restoration, followed by light curing and polishing.

Additional processing guidelines specific to each of our Straumann® CARES® Tooth-borne prosthetic material shall also be observed – see Appendix D.

4.3.3 Seating

Depending on the indication and material selected, the Straumann® CARES® Tooth-borne prosthetic restorations can be seated using adhesive, self-adhesive or conventional cementation (see table below).

	CEMENTATION			
	Adhesive	Self-adhesive	Conventional	Temporary
RESIN NANO CERAMIC				
3M™ ESPE™ Lava™ Ultimate Restorative – LT & HT	●			
CERAMICS				
zerion®	●		●	
IPS e.max® CAD	●	●*	●*	
IPS Empress® CAD	●			
VITA® Mark II & TriLuxe	●	●*		
VITA® TriLuxe	●	●*		
METALS				
ticon®			●	
coron®			●	
POLYMERS				
Polyamide				●
polycon® ae				●
polycon® cast	n.a.			

* for crowns only

Only suitable cementation systems for the selected material shall be used. The instructions for use of the cement manufacturer shall be followed.

Straumann® CARES® Tooth-borne prosthetic restorations need to go through a standard cleaning process before being seated.

Before being seated, the restoration shall be prepared (the conditioning of the ceramic or metal surface is decisive for generating a sound bond between the cementation material and the restoration) and the preparation shall be conditioned.

- Thoroughly clean the restoration.
- Remove the temporary restoration (when relevant) and clean the preparation thoroughly.
- Conduct the clinical try-in and check the occlusion and articulation before conditioning.
- If adjustments are required, polish the restoration extraorally.
- Condition the restoration and preparation in accordance with the processing instructions of the selected cementation material before cementation.

Additional seating guidelines for 3M™ ESPE™ Lava™ Ultimate Restorative, zerion® HT, IPS e.max® CAD, IPS Empress® CAD, VITA® Mark II and TriLuxe shall also be observed – see Appendix D.

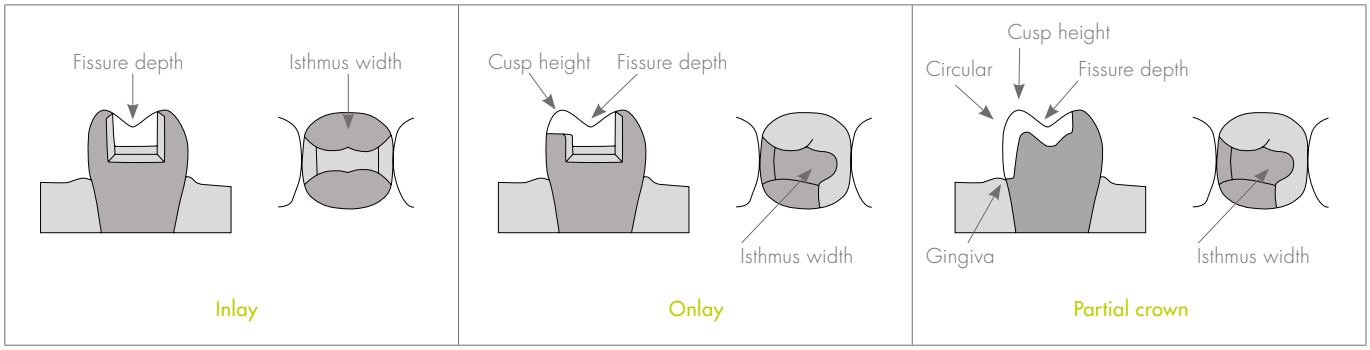
4.3.4 Removal of a seated restoration

To remove a seated restoration, the following steps shall be observed:

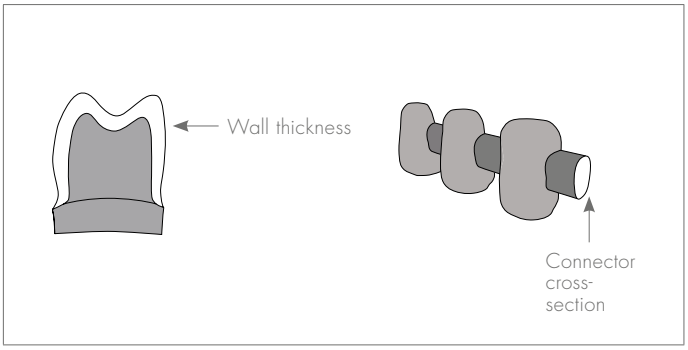
- Grind down the approximal contact at the restoration in order to release and protect the adjacent teeth.
- Use conventional dental tools and adequate water cooling to slit the restoration.
- Lift and pull off the restoration with common dental tools.

Appendix A – Restoration thickness guidelines

Single-unit restoration



Bridge construction



Appendix A1 – Full-contour

	FULL-CONTOUR MINIMUM THICKNESS GUIDELINES																								
	Inlay/Onlay			Veneer			Incisal overlapped veneer			Partial crown					Anterior crown			Posterior crown			Bridge				
	Cusp height (mm)	Fissure depth (mm)	Isthmus width (mm)	Gingiva (mm)	Circular (mm)	Incisal (mm)	Gingiva (mm)	Circular (mm)	Incisal (mm)	Gingiva (mm)	Circular (mm)	Cusp height (mm)	Fissure depth (mm)	Isthmus width (mm)	Incisal (mm)	Circular (mm)	Gingiva (mm)	Occlusal (mm)	Circular (mm)	Gingiva (mm)	Wall thickness (mm)	Connector cross-section (mm^2)	Maximum pontics in the anterior/posterior region
RESIN NANO CERAMIC																									
3M™ ESPE™ Lava™ Ultimate – HT & LT	1.5			0.4	0.6	0.5	0.4	0.6	1.5	1.0	1.5				1.5		1.0	1.5		1.0					
CERAMICS																									
zerion® HT															0.6			0.6			0.6	12	1/1		
IPS e.max® CAD – HT	1.0			0.6		0.7	0.6		0.7	1.0	1.5				1.5	1.2	1.0	1.5		1.0					
IPS e.max® CAD – LT																									
IPS Empress® CAD – HT	2.0	1.5		0.6	0.7		0.6	1.0																	
IPS Empress® CAD – LT & Multi										1.0	1.5	2.0	1.5		2.0	1.5	1.0	2.0	1.5	1.0					
VITA® Mark II	2.0	1.5	1.5	0.5			0.5			1.0		2.0	1.5		1.5	1.0		2.0	1.0						
VITA® TriLuxe																									
METALS																									
ticon®															0.4			0.4			0.4	5	4/3		
coron®															0.3			0.3			0.3	5	4/3		
POLYMERS																									
polycon® ae															0.6			0.6			0.6	9	1/1		
polycon® cast															0.25			0.25			0.25	5	4/4		

Appendix A2 – Cut-back

	CUT-BACK MINIMUM THICKNESS GUIDELINES													
	Veneer*			Partial crown			Anterior crown			Posterior crown			Bridge		
	Gingiva (mm)	Circular (mm)	Incisal (mm)	Gingiva (mm)	Circular (mm)	Cusp height (mm)	Gingiva (mm)	Circular (mm)	Incisal (mm)	Gingiva (mm)	Circular (mm)	Occlusal (mm)	Wall thickness (mm)	Connector cross-section (mm^2)	Maximum pontics in the anterior/posterior region
CERAMICS															
IPS e.max® CAD – HT & LT	0.6		0.4	1.0	1.5	1.3	1.0	1.2	0.4	1.5		1.0**			
IPS e.max® CAD – Multi & HT	0.6		0.5												
IPS Empress® CAD – LT							0.5	1.5	1.0						
VITA® Mark II & TriLuxe	0.3						1.0								
METALS															
ticon®							0.4			0.4			0.4	5	4/3
coron®							0.3			0.3			0.3	5	4/3
POLYMERS															
polycon® ae							0.6			0.6			0.6	9	1/1
polycon® cast							0.25			0.25			0.25	5	4/4

* includes incisal overlapped veneer
** 1.3 for molars

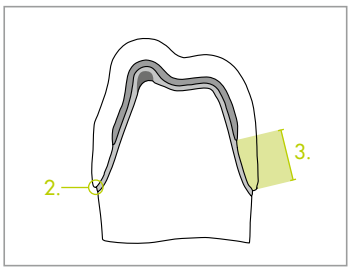
Appendix A3 – Veneerable frameworks

	FRAMEWORK MINIMUM THICKNESS GUIDELINES		
	Anterior bridge		
	Wall thickness (mm)	Connector cross-section (mm^2)	Maximum pontics in the anterior/posterior region
CERAMICS			
zerion® LT	0.5	9	4/2
zerion® HT	0.6	9	1/1
IPS e.max® CAD – MO (up to premolar)	0.8*	n.a.	n.a.
METALS			
ticon®	0.4	5	4/3
coron®	0.3	5	4/3
POLYMERS			
Polyamide	0.6	9	2/2
polycon® ae	0.6	9	1/1
polycon® cast	0.25	5	4/4

* 1.0 mm occlusal for premolars

Appendix B – Instructions for setting the die parameters

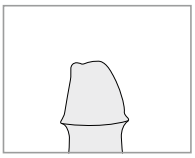
Appendix B1 – Straumann® CARES® Visual – up to version 6.2



PARAMETERS

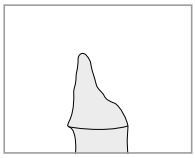
- Settable parameters

1. Correction of milling radius
2. Cement gap
3. Beginning of spacer above PL



NORMAL PREPARATION

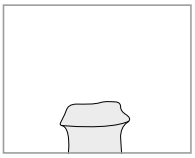
- No parameter adjustments necessary



by approx.
10–20%

SHARP INCISAL EDGE

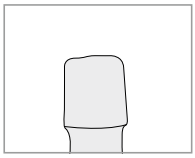
- Increase *Correction of milling radius*



by approx.
0.01 mm

FLAT PREPARATION, VERY CONICAL PREPARATION

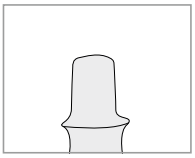
- Increase *Beginning of spacer above PL* (up to max. 2/3 of die height) to achieve more friction
- Reduce *Cement gap* for a tighter fit



by approx.
0.01–0.02 mm

PREPARATION WITH PARALLEL WALLS WITHOUT SHOULDER

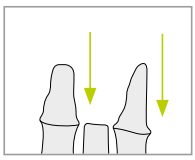
- Increase *Cement gap* to achieve a looser fit



by approx.
0.01 mm

PREPARATION WITH PARALLEL WALLS AND SHOULDER

- Reduce *Beginning of spacer above PL* until the colored zones inside the copings decrease
- Increase *Cement gap* to achieve a looser fit



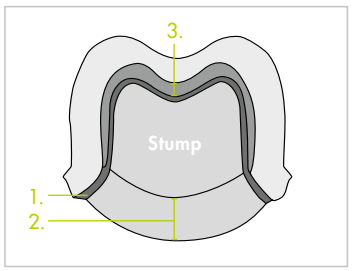
by approx.
0.01 mm

PARALLEL WALLS ON BRIDGES

- In bridge situations there may be opposing parallel walls with colored areas inside the copings
- Reduce *Beginning of spacer above PL* until the colored zones inside the copings decrease
- Increase *Cement gap* to achieve a looser fit

The information above applies to all materials and is provided to optimize the individual fit. We generally advise you to use default settings or to make only minor adjustments.

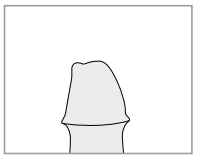
Appendix B2 – Straumann® CARES® Visual – Version 7.0 and higher



PARAMETERS

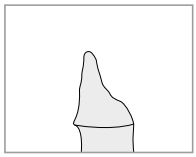
- Settable parameters

1. Cement gap
2. Collar position
3. Extra vertical gap



NORMAL PREPARATION

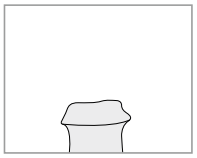
- No parameter adjustments necessary



by approx.
0.01 – 0.02 mm

SHARP INCISAL EDGE

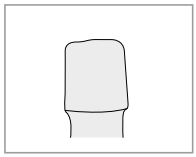
- Increase *Extra vertical gap*
  Note: increase *Collar position* additionally by extreme shoulder



by approx.
0.01 – 0.02 mm

FLAT PREPARATION, VERY CONICAL PREPARATION

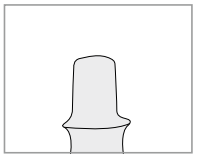
- Increase *Collar position* (up to max. 2/3 of die height) to achieve friction
- Reduce *Cement gap* for a tighter fit



by approx.
0.01 – 0.02 mm

PREPARATION WITH PARALLEL WALLS WITHOUT SHOULDER

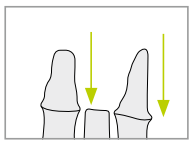
- Increase *Cement gap* to achieve a looser fit
- Reduce *Cement gap* if a tighter fit should be achieved



by approx.
0.01 – 0.02 mm

PREPARATION WITH PARALLEL WALLS AND SHOULDER

- Reduce *Extra vertical gap*
- Increase *Cement gap* to achieve a looser fit
- Reduce *Cement gap* if a tighter fit should be achieved



by approx.
0.01 – 0.02 mm

PARALLEL WALLS ON BRIDGES

- Reduce *Collar position*
- Increase *Cement gap* to achieve a looser fit

The information above applies to all materials and is provided to optimize the individual fit. We generally advise you to use default settings or to make only minor adjustments.

Appendix C – Chemical composition and physical properties

Appendix C1 – 3M™ ESPE™ Lava™ Ultimate Restorative

Chemical composition

3M™ ESPE™ Lava™ Ultimate Restorative is a Resin Nano Ceramic containing approximately 80 % (by weight) nanoceramic particles bound in the resin matrix. The ceramic particles are made up of three different ceramic fillers that reinforce a highly cross-linked polymeric matrix. The fillers are a combination of non-agglomerated/non-aggregated 20 nm (nanometer) silica filler, non-agglomerated/non-aggregated 4 to 11 nm zirconia filler, and aggregated zirconia/silica cluster filler (comprised of 20 nm silica and 4 to 11 nm zirconia particles).

Physical properties

Material	Resin Nano Ceramic
Density [g/cm^3]	2.1
Flexural strength [MPa]	204 ± 19

Appendix C2 – zerion®

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
$ZrO_2 + HfO_2 + Y_2O_3$	≥ 99.0 %
Y_2O_3	> 4.5 to ≤ 6.0 %
HfO_2	≤ 5 %
Al_2O_3	≥ 0.05 to ≤ 0.5 %
Other oxides	≤ 0.5 %

Physical properties

Material	Y-TZP-A
Density [g/cm^3]	≥ 6.05
Flexural strength [MPa]	≥ 800
CTE (20 – 500 °C) [K^{-1}]	10.5 × 10^{-6}

Appendix C3 – IPS e.max® CAD

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
SiO_2	57 – 80 %
Li_2O	11 – 19 %
K_2O	0 – 13 %
P_2O_5	0 – 11 %
ZrO_2	0 – 8 %
ZnO	0 – 8 %
Others + coloring oxides	0 – 12 %

	BEFORE CRYSTALLIZATION	AFTER CRYSTALLIZATION
Material	Lithium-disilicate glass-ceramic	
Density [g/cm³]		2.5 ± 0.1
Vickers hardness HV	5400 ± 100	5800 ± 100
Flexural strength [MPa]	130 ± 30	360 ± 60
Fracture toughness [MPa $m^{0.5}$]	0.9 – 1.25	2.25 ± 0.25
Chemical solubility [µg/cm²]	130 ± 30	40 ± 10
Modulus of elasticity [GPa]		95 ± 5
CTE (100 – 500 °C) [K^{-1}]		10.45 ± 0.25 10^{-6}
Crystallization temperature	840 – 850 °C (1544 – 1562 °F)	

Appendix C4- IPS Empress® CAD

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
SiO_2	60 – 65 %
Al_2O_3	16 – 20 %
K_2O	10 – 14 %
Na_2O	3.5 – 6.5 %
Other oxides	0.5 – 7 %
Pigments	0.2 – 1 %

Physical properties

Material	Leucite glass-ceramic
Density [g/cm³]	2.5 ± 0.1
Vickers hardness HV	6200 ± 250
Flexural strength [MPa]	160 ± 20
Fracture toughness [MPa $m^{0.5}$]	1.3 ± 0.1
Chemical solubility [µg/cm²]	25
Modulus of elasticity [GPa]	62 ± 8
CTE (100 – 500 °C) [10^{-6} K^{-1}]	17.5 ± 0.25

Appendix C5 – VITA® Mark II and TriLuxe

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
SiO_2	56 – 64 %
Al_2O_3	20 – 23 %
K_2O	6 – 8 %
Na_2O	6 – 9 %
CaO	0.3 – 0.6 %
TiO_2	0.0 – 0.1 %

Coloring oxides in very small concentrations are not listed.

Specifications

Material	fine-structure feldspar ceramic
Density [g/cm3]	2.44 ± 0.01
Flexural strength [MPa]	154 ± 15
CTE (25 – 500 °C) [10^{-6} K^{-1}]	9.4 ± 0.1
Transformation range [°C]	780 – 790
Chemical solubility (ISO 6872) with Akzent finishing [µg/cm²]	≈ 30

Appendix C6 – ticon®

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
Ti	Balance
O	≤ 0.25 %
Fe	≤ 0.30 %
N	≤ 0.03 %
C	≤ 0.08 %
H	≤ 0.015 %

Physical properties

Color	Silver
Material	Titanium Grade 2
Yield strength $R_{p0.2}$ [MPa]	≥ 275
Tensile strength R_m [MPa]	≥ 345
Elongation, A [%]	≥ 20
CTE (25 – 500 °C) [K^{-1}]	9.6×10^{-6}

Appendix C7 – coron®

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
Co	Balance
Cr	28.0 %
W	8.50 %
Si	1.65 %
Additional elements below 1 %	Mn, N, Nb, Fe

Physical properties

	WITH THERMAL TREATMENT
Color	Silver grey
Material	NPM alloy
Yield strength $R_{p0.2}$ [MPa]	≥ 360
Elongation at break A_5 [%]	≥ 2
CTE (25 – 500 °C) [K^{-1}]	14.3×10^{-6}

Appendix C8 – Polyamide

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
Polyamide reinforced with glass fibre	> 98 %
Residual monomer	< 1 %
Initiator	< 1 %
Pigments	< 0.5 %

Physical properties

Color	Light-green – gray
Material	Polyamide
Biaxial flexural strength [MPa]	≥ 50
Water absorption [µg/mm³]	≤ 40
Water solubility [µg/mm³]	≤ 7.5

Appendix C9 – polycon® ae

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
Polymethyl methacrylate (PMMA)	> 98 %
Methylmethacrylate	< 1 %
Dibenzoylperoxide	< 1 %
Pigments	< 0.5 %

Physical properties

Material	PMMA
Biaxial flexural strength [MPa]	≥ 50
Water absorption [µg/mm³]	≤ 40
Water solubility [µg/mm³]	≤ 7.5

Appendix C10 – polycon® cast

Chemical composition

ELEMENTS	WEIGHT (PERCENTAGE)
Polymethyl methacrylate (PMMA)	> 98 %
Methylmethacrylate	< 1 %
Dibenzoylperoxide	< 1 %
Pigments	< 0.5 %

Physical properties

Color	colorless
Material	PMMA

Appendix D – Additional guidelines which are material specific

Appendix D1 – Additional guidelines specific to 3M™ ESPE™ Lava™ Ultimate Restorative

Contraindications and side effects
Allergies or hypersensitivity to chemical ingredients of 3M™ ESPE™ Lava™ Ultimate Restorative – see "Chemical composition".

Tooth preparation guideline
- For inlays and onlays, traditional design is recommended. Do not undercut. Taper the cavity walls 5–6 degrees to the long axis of the preparation. All internal edges and angles should be rounded. Incisal/occlusal reduction is 1.5 to 2 mm clearance in centric occlusion and all excursions.
- For veneers, standard reduction of the labial surface is 0.6 mm and 0.4 mm at the gingival portion because the enamel is thinner in this area. The reduction of the incisal, labial-lingual angle is 0.5 to 1.5 mm. Keep preparation margins in the enamel. Margins for the veneers should be above the gingival tissues. Proximal extensions should be far enough into the proximal region so margins do not show and have no proximal-gingival undercuts.
- For crowns and partial crowns, axial reduction is 1.2 to 1.5 mm with a 5–6 degree taper. Incisal/occlusal reduction is 1.5 to 2 mm clearance in centric occlusion and all excursions. Shoulders must extend at least 1.0 mm lingual to proximal contact area. Non-beveled shoulder finish lines are recommended.

Finishing and polishing
The Straumann® CARES® Restorations made of 3M™ ESPE™ Lava™ Ultimate Restorative is supplied in a highly cured state. This material **must not be fired** under any circumstances during finishing.

- Clean the restoration in an ultrasonic cleaner or steam cleaner; gently blow dry with an air syringe.
- Check the fit of the final restoration to the preparation. If necessary, gently ad just contacts, occlusion and accentuate grooves using a fine needle diamond.
- To remove the bulk of the sprue, use either a sanding wheel or a course rubber wheel.
- For final finishing, use a diamond impregnated rubber wheel or a medium wheel to smooth.
- When polishing extraorally: use a bristle brush, spin brush in polishing agent to incorporate paste into brush. Apply to the surface of the restoration with low speed hand piece working slowly into surface.
- Buff with muslin rag wheel.
- When polishing intraorally, apply intraoral paste directly to unpolished restoration using a soft black, latch angle, intraoral prophy brush. Paste must be worked slowly into surface. This will take about 1 minute. Use water or isopro-pyl alcohol while brush is rotating to disperse paste.
- Buff with diamond impregnated points/cups.

Processing
Before being processed, the restoration shall always be cleaned in an ultrasonic cleaner or steam cleaner, gently blow dry with an air syringe.

Recommended material for the characterization
3M™ Filtek™ Supreme Ultra/XTE/Z350 Universal Restorative.
Please refer to the material availability and instructions for use of 3M™ ESPE™.

Seating
For successful results with Straumann® CARES® Restorations made of 3M™ ESPE™ Lava™ Ultimate Restorative, do not use hydrofluoric acid etching and do not use phosphoric acid to clean the restoration.

- Ensure a tight fit with minimal cement gap.
- Clean the restoration in an ultrasonic cleaner or steam cleaner, gently blow dry with an air syringe.
- Check the fit of the final restoration. Adjust, finish and polish if necessary.
- Sandblast (air abrade) the bonding surface with aluminium oxide (Al_2O_3) with a grain size < 50 µm at a pressure of 2 bars (30 psi).
- Clean the restoration with alcohol and dry the restoration. Ensure that the surface is free of contamination (e.g. saliva, acetone).
- Depending on the cement, apply appropriate primer/bonding agents. If no primer is recommended, apply silane to the bonding surface of the restoration. The instructions for use of the cement, primer/bonding manufacturer shall be followed.
- Follow the instructions for resin based materials provided with the cement selected.

Recommended cement
3M™ ESPE™ RelyX™ Ultimate Adhesive Resin Cement with 3M™ ESPE™ Scotchbond™ Universal Adhesive (Primer and Adhesive in one bottle).
Please refer to the material availability and instructions for use of 3M™ ESPE™.

Build-up or adding-on to the restorations
The Straumann® CARES® Restorations made of 3M™ ESPE™ Lava™ Ultimate Restorative is supplied in a highly cured state. This material **must not be fired** under any circumstances during build-up or adding-on.

- Extraorally roughen the site to be added to with a coarse diamond or stone, or air abrade (sandblast with 50 µm aluminum oxide). Clean the restoration in an ultrasonic cleaner with normal detergent.
- Intraorally roughen the site to be added to with a coarse diamond, stone or intraoral air abrasion unit. Rinse and clean the prepped site, then dry.
- Brush on 3M™ ESPE™ Scotchbond™ Universal Adhesive to the roughened area for 20 seconds and gently blow dry for 5 seconds.
- Light-cure adhesive for 10 seconds.
- Apply 3M™ Filtek™ Supreme Ultra/XTE/Z350 Universal Restorative (or other methacrylate based light-cured restorative) and light cure according to the in-structions for use of the methacrylate based light-cured restorative manufacturer.
- Shape and smooth the addition using a medium wheel or diamond impregnat-ed rubber wheel.
- Polish using the appropriate steps – see "Finishing and polishing".

Recommended Build-up or Adding-on material
3M™ Filtek™ Supreme Ultra/XTE/Z350 Universal Restorative.
Please refer to the material availability and instructions for use of 3M™ ESPE™.

Appendix D2 – Additional guidelines specific to zerion®

Contraindications and side effects
- Allergies or hypersensitivity to chemical ingredients of the zirconium dioxide material (ZrO_2, Y_2O_3, HfO_2, Al_2O_3).
- In common with all full-ceramic restorations, zirconium oxide frameworks are not suitable for patients suffering from bruxism.
- In cases where space is restricted or the preparation is unsuitable, an alternative form of restoration should be chosen.

Use and handling specific to zerion® HT
zerion® HT full-contour restorations shall be checked at least twice a year to ensure that the dynamic occlusion of the tooth structure of the opposing and surrounding natural teeth is in order, and any necessary adjustments should be made accordingly. In doing so, any areas of the occlusal surfaces that have been subjected to adjustments must be conditioned with appropriate polishing tools in order to restore them to maximum surface smoothness.

Finishing
zerion® Frameworks delivered by Straumann should only be processed mechanically if absolutely necessary.

- Only suitable grinding instruments (see below) shall be used:
  - Use only water-cooled, fine diamond tools, preferably ≤ 100 µm for zerion® LT and preferably ≤ 30 µm for zerion® HT.
  - Localized overheating may occur during grinding, which will result in fissures in the material.
  - Use modern fine-grain diamonds for the careful reduction of edges and fine processing of surfaces.
  - Use only diamond tools in excellent condition. A reduced cutting performance of the tool generates heat.
  - Do not use dry polishing tools.
  - The removal can be done with high rotational speed but with a low grinding pressure.
- Grinding of the interdental connections shall be avoided.
- The subsequent separation with cutting discs shall not be performed, as this would initiate breaking points.
- Grinding indents into the framework or sharp edges shall be avoided.
- Sandblasting of the veneering surfaces shall be avoided.

Note
Through the mechanical surface processing such as polishing and sandblasting (with Al_2O_3 or high luster sandblasting beads), critical amounts of energy may be added to the framework, which will damage the surface structure. The deformation of the crystal lattice structure might cause a phase change of the zirconium dioxide ceramic (from tetragonal to monoclinic). A monoclinic structure has a lower CTE (app. 7 x 10^{-6}/K) than a tetragonal one.

If mechanical processing of the framework is required, a final thermal treatment is recommended for the regeneration of the structure (see table below).

Note: slow cooling recommended

Start temperature °C	→ min.	↗ min.	↗ (°C/min)	Temp. app. °C	→ min.	Vac
500	–	5.00	100	1000	15.0	–

Clean the zerion® Framework in an ultrasonic cleaner or with short steaming after processing.

Processing specific to zerion® HT
zerion® HT restorations shall be evenly polished, and the occlusal surface shall be polished to a high shine, which is important for antagonist-friendly abrasion characteristics. Before polishing, the restoration shall be cleaned with a steam jet.
Recommended tools: Zenostar Polishing Sets.

Different procedures can also be followed to achieve the final restoration result.
- Glazing: the delivered full-contour restoration is completed by applying glaze materials (e.g. Magic Glaze spray)
- Staining and glazing: the delivered full-contour restoration is completed by applying stain (e.g. ZENOSTAR body stains, ZENOSTAR Stains) and glaze materials.

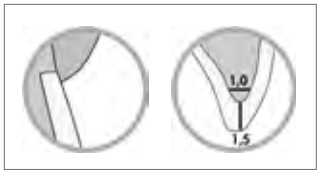
Seating specific to zerion® HT
The inner surface of the zerion® HT Restoration should be sandblasted with a maximum 50 µm abrasive at a pressure not exceeding 2 bars.

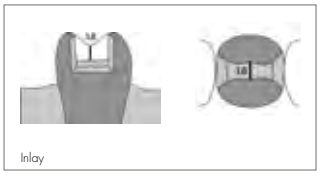
Appendix D3 – Additional guidelines specific to IPS e.max® CAD

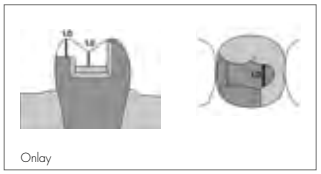
Information sessions on IPS e.max® CAD restorations by Straumann® CARES®
Before you start processing IPS e.max® CAD restorations by Straumann® CARES®, please ensure your participation in a Straumann® CADCAM information session including the presentation of the IPS e.max® system.

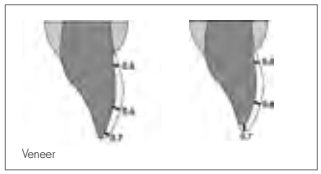
Contraindications and side effects
- Allergies or hypersensitivity to chemical ingredients of the lithium-disilicate glass-ceramic material (SiO_2, Li_2O, K_2O, P_2O_5, ZrO_2, ZnO, coloring oxides)
- Layering technique for molar crowns
- Very deep subgingival preparations
- Patients with severely reduced residual dentitions
- Bruxism

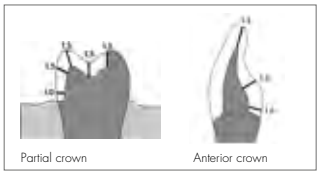
Tooth preparation guideline
- The tooth preparation guidelines (see figure below) shall be followed.
- The preparation must demonstrate retentive surfaces for conventional and/or self-adhesive cementation.
- For inlays, onlays and partial crowns, the static and dynamic antagonist contacts must be taken into consideration and the preparation margin must not be located on the centric antagonist contacts.
- For veneers, if possible, the preparation should be located in the enamel and the incisal preparation margins should not be located in the area of static or dynamic enamel contact.











Restoration design
For the cut-back and layering techniques, the following relationship of the layer thickness between IPS e.max® CAD (restoration) and IPS e.max® Ceram (veneer) must be observed:

For a total layer thickness of the restoration of respectively 0.8 mm, 1.0 mm, 1.2 mm, 1.5 mm, 1.8 mm, 2.0 mm, 2.5 mm and 3.0 mm, the minimum layer thickness of the delivered restorations (IPS e.max® CAD) must respectively be 0.4 mm, 0.5 mm, 0.6 mm, 0.8 mm, 1.0 mm, 1.1 mm, 1.3 mm, 1.6 mm and the maximum layer thickness of the veneer (IPS e.max® Ceram) must respectively be 0.4 mm, 0.5 mm, 0.6 mm, 0.7 mm, 0.8 mm, 0.9 mm, 1.2 mm, 1.4 mm.

Finishing
- The IPS e.max® CAD restorations by Straumann® CARES® must have enough support from the tooth shape.
- The IPS e.max® CAD restorations by Straumann® CARES® must always make up at least 50 % of the total layer thickness of the restoration.
- To prevent delamination and, in particular, chipping at the edges, the resto-rations must be ground only with low rpms and light pressure.
- Overheating of the ceramic must be avoided.
- Always clean the restoration with ultrasound in a water bath or blast with a steam jet before crystallization.
- Recommended grinding instruments
  - For smoothing out of attachment points: DCB Grinder Disk (1), Diadur DD-8 Disk (2), Super Max (3), Diamond Stone Disk (4), Diagen Turbo Grinder Disk (5)
  - For finishing of surface: DCB Grinder Cone (1), Diadur DD-13 Cone (2), CeraPro (3), Diamond Stone Cone(4), Diagen Turbo Grinder Cone (5)
  - For finishing of margins: Ceramic Polisher 9690/9691 (1), Diapol L26DG/L26 Dmf (2), CeraGloss blue/yellow (3) Diamond Polisher (4), High End Power Disk 626-C/626.M (5)

Manufacturers: *Komet Brasseler (1), EVE (2), edenta (3), Jota (4), Bredent (5)*

Processing
The flexural strength of the IPS e.max® CAD restorations by Straumann® CARES® is 130 ± 30 MPa. To reach its final flexural strength of 360 ± 60 MPa and its final optical characteristics (shade, translucency and brightness), the IPS e.max® CAD restorations by Straumann® CARES® need to go through a crystallization firing in a furnace at 840 °C – 850 °C (1544 °F – 1562 °F) for approximately 21 to 30 minutes.

Important processing restrictions for the crystallization procedure
Failure to observe the following restrictions may compromise the results achieved with IPS e.max® CAD restorations by Straumann® CARES®:
- Crystallization must be conducted in a ceramic furnace that has been calibrated and approved or recommended by Ivoclar Vivadent AG.
- Crystallization parameters defined by Ivoclar Vivadent AG must be followed.
- Use a firing paste for the crystallization. After the crystallization, do not remove firing paste residue with Al_2O_3 or polishing beads (use steam blaster and ultra sonic water quench).

The following processing techniques are possible to characterize the final restoration:
- Staining technique: the delivered full-contour restoration is completed by applying stain and glaze materials.
- Layering technique: various IPS e.max® Ceram layering materials are fired onto the delivered coping.
- Cut-Back technique: various IPS e.max® Ceram layering materials are applied

in the incisal and/or occlusal area of the delivered restorations, followed by the application of stain and glaze materials.

Depending on the restoration and the chosen technique, different procedures can be followed to achieve the final restoration result.

a) Crystallization and glazing (in one step) – Staining technique
In this processing technique, staining and glazing are applied on the delivered restoration. The crystallization and glaze firing is performed in one step.

The delivered IPS e.max® CAD restorations by Straumann® CARES® have to be placed on a Crystallization Pin (smaller restorations as inlays, onlays and veneers do not need to be entirely supported if Glaze Paste is applied). Characterizations are applied using IPS e.max® CAD Crystall./Shades and Stains with the Glaze Paste or Glaze Spray by Ivoclar Vivadent AG.

The following procedure must be observed for partial crowns and crowns:
- Select the largest possible Crystallization Pin, which does not come into contact with the circular crown.
- Fill the inside of the restoration with auxiliary firing paste up to the margin.
- Press the selected Crystallization Pin deeply into the restoration margin so that it is adequately fixed.
- Avoid contamination of the outer restoration surface.

Then apply Crystall./Glaze Paste by holding the restoration by the firing pin and glazing evenly the entire restoration. Apply mixed Shades and Stains directly into the unfired glaze layer using a fine brush.

After glazing and staining, the crystallization and stain/glaze firing (combination firing) is conducted in a compatible ceramic furnace. When placing the objects and setting the firing parameters, observe the following procedure:
- Place the restoration with the Crystallization Pin into the center of the Crystallization Tray.
- If the Glaze Paste was selected, place inlays, onlays, veneers directly on a Crystallization Pin, using a small amount of fix flow if applied.
- Do not place more than six restorations at once on the firing tray for the combination firing.
- Conduct the combination firing using the parameters specified by Ivoclar Vivadent AG.

When the combination firing is completed, the restorations have to cool down to room temperature in a place protected from draft. Then, the restorations can be removed from the hardened firing paste and the residue must be removed with ultrasound in a water bath or with steam.

Caution: Do not blast or quench objects.

b) Crystallization followed by staining & glazing – Staining technique
In this processing technique the restoration is crystallized in a first step. Staining and glazing are applied in a second step, followed by the stain and glaze firing of the tooth-colored restoration.

The IPS e.max® CAD restorations by Straumann® CARES® must be placed on the firing tray by using only IPS Object Fix Putty or Flow as an auxiliary firing paste. Slightly overfill the restoration with the auxiliary firing paste. The restoration must be placed in the centre of the IPS e.max® CAD Crystallization Tray. The crystallization firing must follow the parameters specified by Ivoclar Vivadent AG.

When the crystallization is completed, the restorations have to cool down to room temperature. Then, the restorations can be removed from the hardened firing paste, and the residue must be removed with ultrasound in a water bath or with steam.

The stain and glaze firing is only conducted once the IPS e.max® CAD restorations by Straumann® CARES® were cleaned. Depending on the situation, the stain and glaze firing may be conducted together or separately. If more pronounced characterizations are required, a separate stain and characterization firing is recommended.

c) Crystallization followed by layering & glazing – Layering and cut-back techniques
In this processing technique the restoration is crystallized in a first step. Various layering materials are then fired on the delivered restorations followed by a final glazing firing.

The IPS e.max® CAD restorations by Straumann® CARES® must be placed on the firing tray by using only IPS Object Fix Putty or Flow as an auxiliary firing paste. Slightly overfill the restoration with the auxiliary firing paste. The restoration must be placed in the centre of the IPS e.max® CAD Crystallization Tray. The crystallization firing must follow the parameters specified by Ivoclar Vivadent AG.

When the crystallization is completed, the restorations have to cool down to room temperature. After, the restorations can be removed from the hardened firing paste, and the residue must be removed with ultrasound in a water bath or with steam.

The restoration can be placed on the model to check the fit, and slight adjustments can be done if necessary, observing the minimum thicknesses guidelines (see Appendix A). Before layering, the restoration must be cleaned with a steam jet. Place the restorations on a honey-combed firing tray and the corresponding support pins (do not use the IPS e.max® CAD Crystallization Tray or Pin) and prevent the restoration from sticking to the pin by rounding the top edges of the support pin, covering the pin with platinum foil or covering the pin with small amount of Fix Putty or Flow. Do not use contaminated pins.

Conduct the wash firing with Deep Dentin or Dentin materials on clean restorations (free of dirt and grease). Apply the wash in a thin coat on the entire restoration.

Note
The wash firing must be conducted with the parameters specified by Ivoclar Vivadent AG.

The IPS e.max® Ceram layering material can be applied on the restoration. Perform the layering in accordance with the layering diagram. Conduct the 1st dentin and incisal firing with the corresponding parameters specified by Ivoclar Vivadent AG (for the cut-back technique only one incisal firing is requested).

Compensate for the shrinkage and complete the missing areas in the next layering process. Then conduct the 2nd dentin and incisal firing with the corresponding parameters specified by Ivoclar Vivadent AG.

Note
For the cut-back technique finish the restoration using diamonds and give it a true-to-nature shape and surface structure such as growth lines and convex/concave areas. If gold or silver dust was used to visualize the surface texture, the restoration has to be thoroughly cleaned with steam.

Important processing restrictions for the layering procedure
Strictly follow the guidelines and framework thicknesses (see Appendix A) to achieve successful results with IPS e.max® CAD restorations by Straumann® CARES®. For layering the IPS e.max® CAD restorations by Straumann® CARES® use the Ivoclar Vivadent IPS e.max® Ceram veneering material. The instruction for use by Ivoclar Vivadent AG must be followed.

Depending on the situation, the stain and glaze firings may be conducted together or separately one after the other. Conduct the stain and glaze firings with the corresponding parameters specified by Ivoclar Vivadent AG.

Seating
Before being seated, the restoration must be prepared. The conditioning of the ceramic surface is decisive for generating a sound bond between the cementation material and the restoration. The following steps must be observed:
- Conduct the clinical try-in before etching in order not to contaminate the etched surface.
- Thoroughly clean the restoration with water and blow dry.
- Condition the restoration (generally etch bond the bonding surface with 5% hydrofluoric acid gel for 20 seconds; for adhesive or self-adhesive cementation, silanize the bonding surface of the restoration).

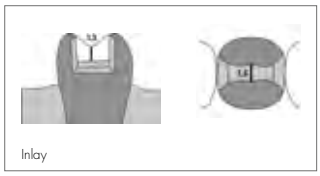
Before seating the restoration, the preparation must be conditioned. The following steps must be observed:
- Remove the temporary and thoroughly clean the preparation.
- Try in and check the occlusion and articulation before conditioning.
- Polish the restoration extraorally if adjustments are required.
- Condition the preparation in accordance with the selected cementation material.

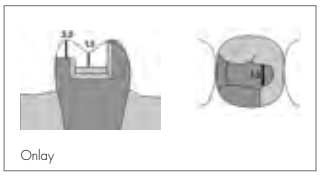
Appendix D4 – Additional guidelines which are specific to IPS Empress® CAD

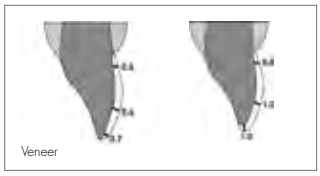
Information sessions on the IPS Empress® CAD restorations by Straumann® CARES®
Before you start processing IPS Empress® CAD restorations by Straumann® CARES®, please ensure your participation in a Straumann® CADCAM information session including the presentation of the IPS Empress® System.

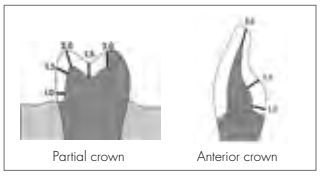
Contraindications and side effects
- Allergies or hypersensitivity to chemical ingredients of the leucite glass-ceramic material (SiO_2, Al_2O_3, K_2O, Na_2O, other oxides, pigments)
- Very deep subgingival preparations
- Patients with severely reduced residual dentition
- Bruxism

Tooth preparation guideline
- The tooth preparation guidelines (see figure below) shall be followed.
- The preparation must not have angles or sharp edges and the shoulder preparation must be with rounded inner edges and/or chamfer.
- For inlays, onlays and partial crowns, the static and dynamic antagonist contacts must be taken into consideration and the preparation margin must not be located on the centric antagonist contacts.
- For veneers, if possible, the preparation should be located in the enamel and the incisal preparation margins should not be located in the area of static or dynamic enamel contact.


Inlay


Onlay


Veneer


Partial crown Anterior crown

Posterior crown

Finishing
- Only suitable grinding instruments must be used for finishing and adjusting the IPS Empress® CAD restorations by Straumann® CARES®:
  - Use only fine-grained (grain size < 60 µm), ceramic-bonded grinding instruments or diamonds at a speed of up to 20,000 rpm and little pressure.
  - If necessary, finish carefully the restoration margins using rubber and silicone polishers (speed: < 10000 rpm).
- Overheating of the ceramic must be avoided.
- Extraoral polishing of proximal areas and large surfaces is required prior to cementation.
- Always clean the restoration with ultrasound in a water bath or blast with Al_2O_3 at 0.5 bar pressure and clean under running water or using the steam jet before further processing.

Recommended grinding instruments:
- For smoothing out of attachment points: DCB Grinder Disk (1), Diadur DD-8 Disk (2), Super Max (3), Diamond Stone Disk (4), Diagen Turbo Grinder Disk (5)
- For finishing of surface: DCB Grinder Cone (1), Diadur DD-13 Cone (2), CeraPro (3), Diamond Stone Cone(4), Diagen Turbo Grinder Cone (5)
- For finishing of margins: Ceramic Polisher 9690/9691 (1), Diapol L26DG/L26 Dmf (2), CeraGloss blue/yellow (3) Diamond Polisher (4), High End Power Disk 626-C/626.M (5)

Manufacturers: Komet Brasseler (1), EVE (2), edenta (3), Jota (4), Bredent (5)

Processing
Important processing restrictions:
Failure to observe the following restrictions may compromise the results achieved with IPS Empress® CAD restorations by Straumann® CARES®:
- The various required firings (staining, glazing, layering) must be conducted in a ceramic furnace that has been calibrated and approved or recommended by Ivoclar Vivadent AG.
- Firing parameters defined by Ivoclar Vivadent AG must be followed.
- Before being processed, the restoration must always be cleaned with ultrasound in a water bath or blast with Al_2O_3 at 0.5 bar pressure and clean under running water or using the steam jet before further processing.

The following processing techniques are possible to characterize the final restoration:
- Polishing of the delivered full-contour restoration without staining and glazing.
- Staining technique: the delivered full-contour restoration is completed by applying stain and glaze materials.
- Cut-back technique: various layering materials are applied in the incisal area of the delivered restorations, followed by the application of stain and glaze materials.

Depending on the restoration and the chosen technique, different procedures can be followed to achieve the final restoration result.

a) Polishing
In this processing technique, the delivered full-contour restoration is only polished.

The occlusion/articulation of the restoration can be adjusted using diamonds, before polishing the restoration manually. The following procedure must be observed:
- Observe contact points and margins during the entire polishing procedure.
- Use the corresponding speed and little pressure to avoid heat development.
- Polish proximal areas and large surfaces extraorally prior to cementation.
- Finish/smooth out the surfaces (speed: max. 15000 rpm, water cooling).
- Polish the restoration (speed: max 15000 rpm, water cooling) to a high gloss using the high-gloss brush and diamond polishing paste (speed: max. 15'000 rpm).

b) Staining & glazing (in one step) – Staining technique
In this processing technique, staining and glazing are applied on the delivered restoration. The stain & glaze firing is performed in one step.

First, the glazing material is applied, followed by the Stains material, which is applied on the unfired glaze layer. The following procedure must be observed:
- Apply the glazing material on the entire outer surfaces of the restoration (the glazing material must not come into contact with the inner aspects of the restoration).
- Then, apply the mixed Shades material directly into the unfired glazing material layer.
- When completed, apply individualized effects and characterizations on cusps and in fissures with the Stains materials using a brush.
- Conduct the glaze and stain firing in a compatible ceramic furnace.

When placing the objects and setting the firing parameters, observe the following procedure:
- Support inlays, onlays, and partial crowns with a firing pillow and place them on a honey-comb firing tray.
- Place veneers as well as crowns on metal pins and position them on the honey-comb firing tray.
- As an alternative to the firing pillow and to better secure the restoration on the metal pins (particularly with veneers), a small amount of IPS Object Fix may also be used.
- Make sure that the firing pillow is regularly replaced in order to prevent contamination. Keep firing pillows used for all-ceramic materials separated from those for metal-ceramics to avoid cross-contamination.

c) Staining followed by glazing – Staining technique
In this processing technique, first staining is applied on the delivered restoration and the staining firing is conducted. Glazing is applied in a second step and the glazing firing can be conducted.

First, the staining material is applied. The following procedure must be observed:
- Apply the mixed Shades material directly onto the surface.
- Apply individualized effects and characterizations with the Stains materials using a brush.
- Conduct the stain firing in a compatible ceramic furnace.

When placing the objects and setting the firing parameters, observe the following procedure:
- Support inlays, onlays, and partial crowns with a firing pillow and place them on a honey-comb firing tray.
- Place veneers as well as crowns on metal pins and position them on the honey-comb firing tray.
- As an alternative to the firing pillow and to better secure the restoration on the metal pins (particularly with veneers), a small amount of IPS Object Fix may also be used.
- Make sure that the firing pillow is regularly replaced in order to prevent contamination. Keep firing pillows used for all-ceramic materials separated from those for metal-ceramics to avoid cross-contamination.

Then, the glazing material is applied. The following procedure must be observed:
- Apply the glazing material on the entire outer surfaces of the restoration (the glazing material must not come into contact with the inner aspects of the restoration).
- Once the glaze application is completed, conduct the glaze firing in a compatible ceramic furnace. (If the gloss is unsatisfactory after the first glaze firing, further glaze firing procedures may be conducted using the same firing parameters.)

d) Layering followed by glazing – Cut-back technique
In this processing technique, various layering materials are fired on the delivered restoration followed by a glazing firing.

IPS Empress® Esthetic Veneer Wash Paste must be applied neutrally and thinly on the entire restoration surface to be layered, in order to enable an optimum bond. If required, mamelons should be designed and internal effects applied on the unfired Wash Paste neutral layer. Then the restorations must be placed on the honey-comb firing tray with the help of metal pins (the veneers can be additionally supported with a small amount IPS Object Fix). Conduct the wash firing with the parameters specified by Ivoclar Vivadent AG.

The IPS Empress® Esthetic Veneer layering material can be applied on the restoration using a ceramic brush. Once the tooth shape has been completed, the layering material must dry for a short period of time. Then the restorations can be placed on the honey-comb firing tray with the help of metal pins (the veneers can be additionally supported with a small amount of IPS Object Fix). Conduct the first Incisal/Transpa firing with the parameters specified by Ivoclar Vivadent AG.

Once the first Incisal/Transpa firing is completed, clean the restoration with ultrasound in a water bath or with the steam jet and completely dry it. Carefully place the restoration on the model and complete the missing areas of the final tooth shape. Once the tooth shape has been completed, the layering material must dry for a short period of time. Then the restorations can be placed on the honey-comb firing tray with the help of metal pins (the veneers can be additionally supported with a small amount of IPS Object Fix). Conduct the second Incisal/Transpa firing with the parameters specified by Ivoclar Vivadent AG.

If necessary, finish the restorations using diamonds. The areas that are not covered with layering ceramic must be smoothed out and pre-polished using silicone disks in order to obtain an even gloss on the surface after glaze firing. The restoration must be cleaned with ultrasound in a water bath or using the steam jet. Then the glazing material can be applied, even a little thicker on areas that are not covered with layering ceramic to achieve an even gloss. The glazing material must not come into contact with the inner aspects of the restoration. The restorations can be placed on the honey-comb firing tray with the help of metal pins (the veneers can be additionally supported with a small amount of IPS Object Fix). Conduct the stain & glaze firing with the parameters specified by Ivoclar Vivadent AG.

Important processing restrictions for the layering procedure
Strictly follow the guidelines and framework thicknesses (see Appendix A) to achieve successful results with IPS Empress® CAD restorations by Straumann® CARES®. For layering the IPS Empress® CAD restorations by Straumann® CARES® use the Ivoclar Vivadent IPS Empress® Esthetic Veneer ceramic materials. The instructions for use by Ivoclar Vivadent AG must be followed.

Seating
The conditioning of the ceramic surface in preparation for cementation is decisive for generating a sound bond between the luting material and the restoration. The following steps must be observed:
- Conduct the clinical try-in before etching in order not to contaminate the etched surface.
- Thoroughly clean the restoration with water and blow dry.
- Etch the inner surface for 60 seconds using 5 % hydrofluoric acid gel and then condition/silanate the restoration in accordance with the selected cementation material.

After the seating, adjust the occlusion/articulation of the restoration using diamonds if required. Polish the restoration manually. Procedure as described in section "a) Polishing" in "Processing" must be observed.

Appendix D5 – Additional guidelines specific to VITA® Mark II and TriLuxe

Contraindications and side effects
- Insufficient oral hygiene
- Insufficient preparation results
- Insufficient tooth structure substance
- Insufficient space
- Significant tetracycline discoloration
- Highly interlaced teeth
- Extreme dystopias of the teeth
- Bruxism
- Allergies or hypersensivity to chemical ingredients of the fine-structure feldspar ceramic material (SiO_2, Al_2O_3, Na_2O, CaO, K_2O, TiO_2)
- Very deep subgingival preparations

Tooth preparation guideline
- The tooth shall be sufficiently cooled during the preparation and shall no be exposed to heat caused by high pressure.
- Instruments with good cutting performance shall be used.
- The coarse preparation shall be carried out before the fine preparation.
- The pulp shall be protected against damage caused by milling/grinding.
- Subgingival preparation margins shall be avoided.

The preparation shall comply with the following requirements:
- Tooth-specific preparation
- The upper and lower tooth axes shall be aligned.
- The required residual dentine thickness of 0.7 – 1.0 mm shall be ensured in all areas.

Preparation information for posterior crown and anterior crown:
- A chamfer or shoulder with rounded inner angle shall be prepared. The aim shall be a circumferential cutting depth of 1 mm.
- The vertical preparation angle shall be at least 3°.
- All transitions from the axial to the occlusal or incisal surfaces shall be rounded.
- A subgingival preparation border shall generally be avoided.

Preparation information for veneers:
- Avoid proximal "gutter-shaped" preparation.

Finishing and polishing
A careful polishing is crucial for esthetics and the functionality of the restorations
- The occlusion shall be designed in order to avoid interferences (no early contact in static and dynamic occlusion).
- For very thin restorations, the fine correction of the occlusion shall be carried out after seating in order to avoid fractures of the ceramic.
- Interference contact points can be revealed by means of Shimstock film.

Caution
The following guidelines shall also be observed:

- The removal of occlusal contact points shall be carried out by spindle-shape diamond abrasive instruments with ample water cooling. Too sharp diamond instruments shall not be used.
- Pre-polishing of the fissures with fine-grained diamond abrasives (8 µm) and ample water cooling is recommended.
- The correction of the ceramic restorations shall be carried out by means of rounded fine-grained diamond instruments.
- Extraoral polishing of proximal areas and large surfaces is required prior to cementation.

Caution
The following guidelines shall also be observed:
- Do not use hard metal instruments.
- Use only fine-grained diamond abrasives (grain size 40 µm) for contouring and finish diamonds (grain size 8 µm) for pre-polishing.
- The margins and contact points shall be carefully polished.
- Recommended speed shall be used and heat development shall be avoided.
- The restoration shall be finished/smoothed out with Al_2O_3 coated flexible discs and diamond polishing pastes with decreasing particle sizes and fine-grained finishing diamond paste with low rotation speed and ample water cooling.
- Adequate brushes and diamond polish pastes shall be used for mirror finishing of the ceramic surface. Low rotation speed and low pressure (< 15'000 rpm) shall be applied without water cooling.
- The polishing paste shall be removed with a water spray.
- The restoration shall be fluoridated.
- The restoration shall be always cleaned with water in an ultrasound bath, under running water or using the steam jet before further processing.

Processing
- For optimal results, recommendations of the manufacturers of staining, glazing and layering materials shall be followed.
- In the case of restorations with large surfaces and for surface individualization, staining or glazing materials shall be applied.
- The various firing required (staining, glazing, layering) shall be conducted in an adequate furnace recommended by the manufacturer of the materials.
- Firing parameters defined by the manufacturer of the materials shall be followed.
- Before being processed, the restoration shall always be cleaned with ultrasound in a water bath and clean under running water or using the steam jet.

Recommended material:
VITA® Mark II and VITA® TriLuxe restorations by Straumann can be characterized or individualized, respectively, by means of the following:
- Shading pastes such as VITA Shading Paste or staining such as VITA Akzent
- Layering materials such as VITA VM 9, or
- Glazing materials such as VITA Akzent glaze

Depending on the restoration and the chosen technique, different procedures can be followed to achieve the final restoration result.

Seating
For the adhesive cementation of VITA® Mark II and VITA® TriLuxe restorations by Straumann, light or dual hardening composites shall be used according to a correct and established functional enamel-dentin-adhesive system (total bonding) procedure. Conditioning of the ceramic internal surfaces in preparation for cementation is decisive for generating a sound bond between the adhesive materials and the restoration. Adhesive seating protocols for inlays, onlays, crowns, partial crowns and veneers are similar. However, a few specific recommendations for veneers and crowns shall be observed:
- For thin veneers, the use of dual-curing composites shall be avoided for esthetical reasons. Instead, light curing composites shall be used.
- The fixation of the veneers with a finger allows for a homogeneous pressure distribution during placement.
- The adhesive seating of crowns are with free-flowing dualcuring composites is advantageous.

To condition the tooth structure, the following steps shall be observed:
- The clinical try-in shall be conducted before etching in order to not contami-nate the etched surface.
- Any contamination of the surfaces shall be avoided. For this, a rubber dam might be placed.
- The enamel, if available, shall be etched with a phosphoric acid gel, 35% (e.g. VITA ETCHANT GEL) during 30 s. rinsing 30 s, drying 20 s.
- The dentin primer (e.g. VITA A.R.T. Bond Primer A+B) shall be rubbed in with a single-use micro brush for 30 s and dried by blowing out for 15 s.
- The dentin adhesive (e.g. Syntac Adhesive) shall be rubbed in for 30 s and dried by blowing out for 15 s.
- The adhesive layer (e.g. VITA A.R.T. Bond) shall be rubbed in for 20 s and dried by carefully blowing out for 5 s.
- Curing with light shall be carried out for 60 s.

To condition the restoration, the following steps shall be observed:
- The restoration shall be thoroughly cleaned with alcohol.
- The internal surfaces of the restoration shall be etched with hydrofluoric acid gel, 5% (e.g. VITA CERAMICS ETCH) during 60 s.
- The acidic residues shall be completely removed with a steam jet during 60 s. Alternatively, clean the restoration with water in an ultrasonic bath. Dry the restoration for 20 s. Do not brush the restoration in order to avoid any contamination.
- Coat the etched surfaces with a silan layer (e.g. VITASIL) and let evaporate completely.
- A layer of bonder (e.g. VITA A.R.T. Bond) shall be applied and blown out. Do not light cure. Do not expose the restoration to light.

To place the restoration, the following steps shall be observed:
- A thin layer of composite shall be applied in the cavity and carefully place the restoration in situ.
- The exceeding materials shall be removed with a probe.
- A_3O_2-protective gel (e.g. VITA OXY-PREVENT) shall be applied on the cervical margins.
- Curing with light shall be carried as follows. 40 s. buccal, 40 s. oral, 40 s. oc-clusal per proximal cavity with a LEDpolymerization lamp of the 2nd generation with 5W LED chips and a light power higher than 1000 mW/cm².
- The material excess shall be removed using a scaler, respectively with fine-grained diamond abrasives (grain size < 40 µm).
- The proximal part of the restoration shall be polished with flexible abrasive discs. See procedures described in in section "Finishing and polishing".
- The restoration shall not be cleaned before being placed.

Appendix D6 – Additional guidelines specific to ticon®

Contraindications and side effects
Allergies or hypersensitivity to titanium (Ti).

Finishing
- Special titanium carbide cutters shall be used.
- The surface should always be processed in the same direction to avoid overlaps of the material.
- Moderate rotational speed (max. 15000 rpm), as well as low grinding pressure are required. If necessary, reduce the grinding pressure and/or rotational speed.
- The finished framework surface shall be sandblasted with pure Al_2O_3 with a medium grain size of 110 to 150 µm at a maximum pressure of 2 bar.
- Subsequently allow the framework to rest for 5 minutes (for passivation of the surface) and then the framework shall be cleaned with a hot steam. Do not perform any ultrasound or acid bath treatment.
- After this final step, the ticon® Framework should no longer be touched with fingers.

Note
Titanium dust and particles are highly flammable. Sufficient safety measures must therefore be taken (e.g. no smoking during grinding, no open flames, etc.). If titanium dust or vapors are generated, safety panes, goggles, respirator and exhaust must be used.

Caution: Apply appropriate precautions in order to prevent inhalation of grinding/polishing dust.

ticon® Frameworks delivered by Straumann® may be welded.
For successful results, it is important to observe the geometry, surface structures, welding sequence, and welding parameters recommended for each individual device during laser welding. Suitable additional material may be required. The processing instructions of the welding device manufacturers shall be followed.

Note
We do not recommend titanium/precious metal or titanium/non precious metal combination weld seams.

Processing – Polishing
The finished ticon® Framework surfaces can be brightly polished with commercially available polishing compounds or with diamond polishing paste. The polish improves the condition of the finished surface. To prevent smudging, use a moderate rotational speed and low pressure during polishing. Polishing residue shall be removed with an ultrasound cleaner or steam jet.

Appendix D7 – Additional guidelines specific to coron®

Contraindications and side effects
Allergies or hypersensitivity to chemical ingredients of the cobalt-chromium material (Co, Cr, W, Si, Mn, N, Nb, Fe).

Note
- Isolated patient cases have shown local irritation caused by electrochemical reactions.
- Galvanic effects may occur if different alloy groups are used.

Finishing
coron® Frameworks delivered by Straumann may need to be ground for finishing and adjusting. For successful results the following rules shall be observed:
- Coarse and fine, sharp, tungsten carbide cutters shall be used for surfaces to be layered.
- The surface should always be processed in the same direction to avoid overlaps of the material. The finished framework surface shall be sandblasted with a one-way sandblast abrasive Al_2O_3 with a medium grain size of 125 µm at a maximum pressure of 2 to 3 bar.
- The framework shall be cleaned with a hot steam or with distilled water in an ultrasound bath. Do not immerse coron® Frameworks into a pickling bath.

Note
Material overlaps as well as the use of silicon carbide abrasive tools may lead to the formation of blowholes during the ceramic firing.

Caution: Apply appropriate precautions in order to prevent inhalation of grinding/polishing dust.

coron® Frameworks delivered by Straumann may be soldered and welded. For successful results use solders and welding flux with suitable composition and melting temperature for the alloy to be soldered.

Note
Soldering after the ceramic firing is not recommended due to the reduced corrosion resistance and lower diffusion of the precious metal solder with the NPM (Non-Precious Metals) alloys. Other joining techniques such as laser or TIG welding are advisable. Laser welding will be done with the according grade of laser welding wire. Soldered frameworks shall be cooled slowly after the ceramic has been fired.

Processing

a) Polishing
The coron® Frameworks and occlusal surfaces may be covered with fine aluminium abrasive bodies prior to buffing and high gloss polishing to attain smooth and even transitions.

b) Layering
An oxide firing or control firing is not required for veneering ceramic due to the exclusion of casting faults, inclusions and blowholes. If an oxide firing is carried out however, then select 10 minutes at 980 °C in air (no vacuum).

For successful results with coron® Frameworks, the following guidelines shall be observed:
- The thickness of the veneering ceramic shall be even and not exceed 2 mm.
- The surface shall be cleaned thoroughly by brushing it with distilled water after each ceramic firing to remove soluble oxides.
- When using opaquer containing titanium dioxide, it should be noted that the titanium dioxide and chromium from the alloy may form a yellowish green pigment and thus result in discolorations at the margin.
- The higher modulus of elasticity of the coron® Frameworks, in comparison to NPM alloys results in greater tensions in the NPM alloy-ceramic compound. This special circumstance shall be taken into account for large-span units, with delayed cooling off in the sense of slow cooling, or rather expansion cooling, after the firing according to the instructions of the veneering ceramics manufacturer.

Note
Repeated firings and longer resting time in ceramics ovens may possibly increase the CTE value of the ceramic. The result is tensile stresses in the ceramic, which can lead to fissures. All firings – except opaquer firings – should be exposed to slow cooling.

Appendix D8 – Additional guidelines which are specific to polyamide

Contraindications and side effects
Allergies or hypersensitivity to chemical ingredients of polyamide (polyamide reinforced with glass fibres, residual monomer, initiator, pigments).

Finishing
- Carbide tools with a maximum rotational speed of 20000 rpm shall be used in order to prevent smearing.
- The finished framework surface shall be sandblasted with pure Al_2O_3 with a medium grain size of 110 to 150 µm at a maximum pressure of 2 bar.
- The framework can be cleaned with a hot steam, however it is not necessary.
- After this final step, the polyamide framework should no longer be touched with fingers.

Caution: Apply appropriate precautions in order to prevent inhalation of grinding/polishing dust.

Processing
Note: Silane conditioning is required to ensure a sound bond between the polyamide framework and the veneering material.

Appendix D9 – Additional guidelines specific to polycon® ae

Contraindications and side effects
Allergies or hypersensitivity to chemical ingredients of polycon® ae (polymethyl methacrylate, methylmethacrylate, dibenzoylperoxide, pigments)

Finishing
- Tungsten carbide cutters for plastics with a maximum rotational speed of 20'000 rpm shall be used in order to prevent smearing.
- Overheating of the framework shall be avoided in order no to affect the fit of the framework.

Caution: Apply appropriate precautions in order to prevent inhalation of grinding/polishing dust.

Note
If polymer dust develops, ensure not to exceed the general dust limit and wear a fine particle mask with a particle filter FFP.

Processing
Before layering, roughen the surface to be layered with small coarse grinding stones or diamonds.

Further information

- For additional information about the use of Straumann® Products, call Straumann's customer service department.
- Additional information on Straumann® Products and Straumann® CARES® Digital Solutions are available on the Straumann website (www.straumann.com).
- Additional information on the different Straumann® CARES® Tooth-borne prosthetic restorations are available in the instructions for use (IFU) listed below:

IFU REFERENCE	IFU DESCRIPTION
701225	Straumann® CARES® Restorations made of 3M™ ESPE™ Lava™ Ultimate Restorative
701049	zerion® LT
701403	zerion® HT
150.772	IPS e.max® CAD Restorations by Straumann® CARES®
701045	IPS Empress® CAD Restorations by Straumann® CARES®
701043	VITA® Mark II and TriLuxe Restorations by Straumann®
701051	ticon®
701050	coron®
701052	polyamide
701053	polycon® ae

All IFUs are available on the Straumann® CARES® Visual Dental Desktop (version 7.0 or higher) and on the Straumann® CARES® website (www.ifu.straumann.com).

Please note
Practitioners must have appropriate knowledge and instruction in the handling of the Straumann product described herein ("Straumann Product") for using the Straumann Product safely and properly in accordance with these instructions for use.

The Straumann Product must be used in accordance with the instructions for use provided by the manufacturer. It is the practitioner's responsibility to use the device in accordance with these instructions for use and to determine if the device fits to the individual patient situation.

The Straumann Product is part of an overall concept and must be used only in conjunction with the corresponding original components and instruments distributed by Institut Straumann AG, its ultimate parent company and all affiliates or subsidiaries of such parent company ("Straumann"), except if stated otherwise in the instructions for use. If use of products made by third parties is not recommended by Straumann in the instructions for use, any such use will void any warranty or other obligation, express or implied, of Straumann.

Validity
Upon publication of these instructions for use, all previous versions are superseded.

Caution, consult accompanying documents

Consult instructions for use

Manufacturer

Do not re-use

Catalogue number

Non-sterile

Rx only

Caution: U.S. Federal law restricts this device to sale by or on the order of a dental professional.

NOTES

www.straumann.com

International Headquarters
Institut Straumann AG
Peter Merian-Weg 12
CH-4002 Basel, Switzerland
Phone +41 (0)61 965 11 11
Fax +41 (0)61 965 11 01

3M™, ESPE™, Lava™, RelyX™, Filtek™ and Scotchbond™ are trademarks of 3M or 3M Deutschland GmbH. Used under license in Canada.
IPS e.max® and IPS Empress® are registered trademarks of Ivoclar Vivadent AG, Liechtenstein.
VITA® is a registered trademark of VITA Zahnfabrik H. Rauter GmbH & Co. KG, Germany.
iTero™ among others, is a trademark and/or service mark of Align Technology, Inc. or one of its subsidiaries or affiliated companies and may be registered in the U.S. and/or other countries.
Zenostar® is a registered trademark of Wieland Dental + Technik GmbH & Co. KG

© Institut Straumann AG, 2013. All rights reserved.
Straumann® and/or other trademarks and logos from Straumann® mentioned herein are the trademarks or registered trademarks of Straumann Holding AG and/or its affiliates.

Straumann products are CE marked 08/13 152.821/en B10313