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CEREC Blocs

Industrially manufactured fine-structured feldspathic ceramic blocks
Operating Instructions

English



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1 Material

CEREC Blocs are industrially manufactured, fine-structured feldspathic ceramic blocks used to produce inlays, onlays, crowns and veneers with CEREC or inLab.

The key advantage of CEREC Blocs is that restorations can be inserted immediately after the milling operation. Dentists also appreciate the good polishability and outstanding enamel-like abrasion properties of CEREC Blocs.

The select composition, the fine microstructure and the industrial sintering process used in producing the ceramic blocks are the chief reasons for the good polishability and outstanding enamel-like abrasion properties of restorations produced from CEREC Blocs.

The outstandingly millable CEREC Blocs PC enable dentists to reproduce the color gradients characteristic of natural teeth with respect to both translucence and intensity chairside, thus achieving improved integration of the restoration in the remaining dentition as well.

The milling tool saving, fine-structured feldspathic ceramics are characterized by antagonist-friendly abrasion properties corresponding to those of natural tooth substance, as well as optimal light conducting effects and white fluorescence.

A special production process has made it possible to integrate three different color saturation levels (chroma) in the CEREC Blocs PC, and thus three different levels of translucence in a single ceramic layer block.

Through these three layers in a single CEREC Blocks PC, it is now possible to attain a unique naturalness in the restoration: The upper layer of enamel is the least intensive and, at the same time, most translucent one; the middle dentin layer corresponds to the normal level of intensity, while the lower cervical layer has the strongest pigmentation and, like a natural tooth, the least translucence.

Restorations made from CEREC Blocs PC thus resemble natural teeth more strongly without requiring any subsequent surface individualization or characterization. The use of CEREC Blocks PC also enables enhanced integration of the restoration in the remaining dentition.

The material and processing advantages of CEREC Blocs/CEREC Blocs PC feldspathic ceramics have been verified by scientific studies and correlated to the more than 14 million restorations produced with the VITABLOCS fine-structured feldspathic ceramic blocks from VITA in Bad Säckingen to-date.

The advantages of fine-structure feldspathic ceramics are:

- The material is ideally suited to the CEREC CAD/CAM system
- Many years of experience working with the material
- Maximum market acceptance
- Clinical acceptance
- Highly aesthetic appearance
- Very good translucence properties
- Chameleon effect
- Antagonist-friendly abrasion properties

2 Chemical composition

Oxide	% of total weight
SiO ₂	56 - 64
Al ₂ O ₃	20 - 23
Na ₂ O	6 - 9
K ₂ O	6 - 8
CaO	0,3 - 0,6
TiO ₂	0,0 - 0,1

The chemical composition values specified above are batch-dependent.

Oxides, contained in very low concentrations and used e.g. for coloring, are not specified here.

3 Technical Data

Physical properties¹

Property	Unit of measure	Value
Coefficient of thermal expansion CTE (20 - 500°C)	10^{-6} K^{-1}	9.4 ± 0.1
Density	g/cm^3	2.44 ± 0.01
flexural strength (Schwickerath) (ISO 6872)	MPa	154 ± 15
flexural strength (ISO 6872) (1.2x4x15mm surface prepared by the CEREC machine)	MPa	113 ± 10
Fracture toughness (SEVNB)	$\text{MPa} \cdot \sqrt{\text{m}}$	1.7 ± 0.1
Fracture toughness (Vickers indentation)	$\text{MPa} \cdot \sqrt{\text{m}}$	2.2 ± 0.1
Young`s modulus (Resonance Method)	GPa	45 ± 0.5
Transformation area	°C	780 - 790
Knoop hardness HK 0.2/30		521 ± 8
Vickers hardness HV 0.1/15		640 ± 20
Refractive index		1.501 ± 0.001
Mixture of feldspatic crystalline particles embedded in a glassy matrix	Vol %	~ 30

CEREC Blocs are available in up to six brightness steps: three areas for the value of the color saturation or chroma (translucent, medium and opaque) and three as polychromatic CEREC Blocs PC layer blocks.

The designation of the CEREC Blocs indicates the manufacturer, Sirona (S), the brightness step (0 - 5) and the area of the color saturation value (T, M, O).

More information concerning available block sizes and colors can be obtained from the two tables below:

1. The technical and physical values specified here are typical measurement results obtained by the manufacturer using internally available measuring equipment to measure internally produced samples. Different results can be expected when measuring samples produced elsewhere with other measuring instruments.

Block sizes

The following block sizes are available:

	Size	Dimensions
CEREC Blocs	8	8 x 8 x 15 mm
	10	8 x 10 x 15 mm
	12	10 x 12 x 15 mm
	14	12 x 14 x 18 mm
CEREC Blocs Polychromatic	PC12	10 x 12 x 15 mm
	PC14	12 x 14 x 18 mm
	PC14/14	14 x 14 x 18 mm

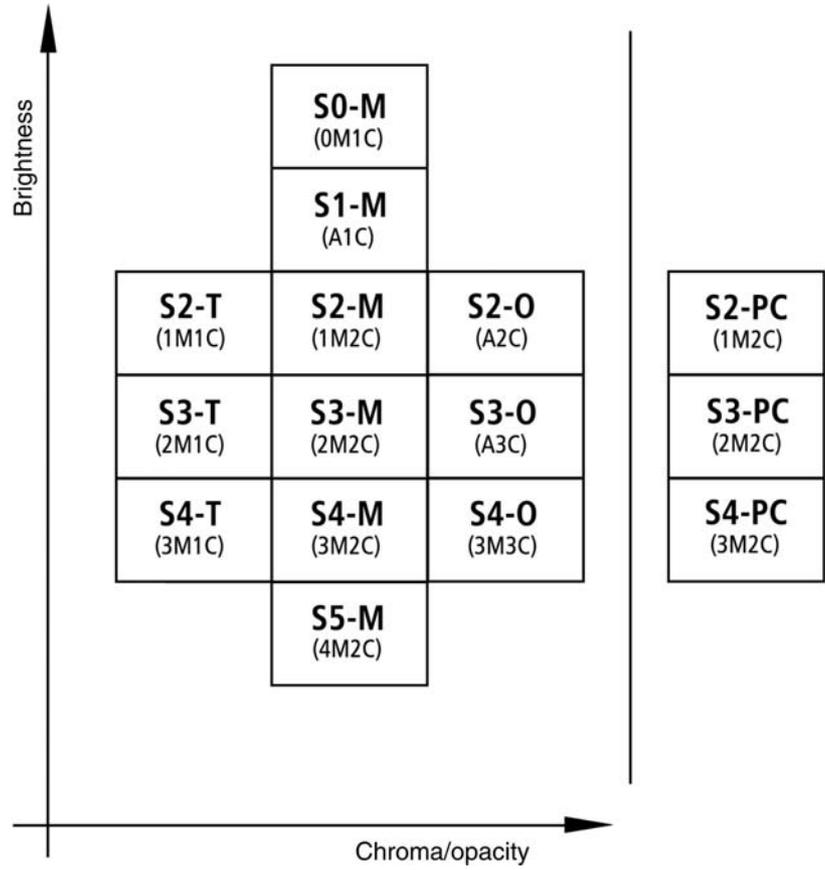
Block colors

CEREC Blocs are offered in the usual sizes, 8, 10, 12 and 14, and in the color saturation values translucent (T), medium (M) and opaque (O).

Furthermore, CEREC Blocs PC polychromatic layer blocks are available in sizes 12, 14 and 14/14 and colors S2-PC, S3-PC and S4-PC:

Block size Block color	CEREC Blocs				CEREC Blocs PC		
	8	10	12	14	PC12	PC14	PC14/14
S2-T	X	X	X	X			
S3-T	X	X	X	X			
S4-T	X	X	X	X			
S0-M			X	X			
S1-M	X	X	X	X			
S2-M	X	X	X	X			
S3-M	X	X	X	X			
S4-M	X	X	X	X			
S5-M	X	X	X	X			
S2-O	X	X	X	X			
S3-O	X	X	X	X			
S4-O	X	X	X	X			
S2-PC					X	X	X
S3-PC					X	X	X
S4-PC					X	X	X

The following chart (incl. the specification of the VITA reference colors) provides detailed information for color selection:



4 Indications and preparation instructions

4.1 Indication

CEREC Blocs are indicated for the CEREC/inLab CAD/CAM production of inlays, onlays, overlays, partial crowns, full crowns and endocrowns on molars as well as for the veneering structure in multilayer systems:

Material Indication	Finely structured feldspathic ceramics	
	CEREC Blocs	CEREC Blocs Polychromatic
Inlays	●	○
Onlays	●	○
Veneers	●	●
Partial crowns	●	●
Anterior tooth crowns	●	●
Posterior tooth crowns	●	●
Multilayer veneering structure (frame structure from inCoris ZI)	●	●

○ – possible

● – recommended

4.2 Contraindications

- Insufficient oral hygiene
- Insufficient preparation results
- Insufficient tooth structure
- Insufficient space available
- Bruxism

Hyperfunction: Patients diagnosed with excessive mastication, especially "gnashers" and "pressers" are contraindicated for restorations from CEREC Blocs. An absolute contraindication applies to the treatment of devital teeth of hyperfunction patients with CEREC Blocs restorations.

Endocrown premolars: Endocrowns on premolars are contraindicated due to their small adhesive surfaces and delicate root cross sections.

Bridges: Since CEREC Blocs are ceramic blocks made of finely structured feldspathic ceramics, they cannot be used to produce bridge restorations of any kind prior to processing due to their limited strength of approx. 120 MPa.

Fully ceramic frameworks: CEREC Blocs and CEREC Blocs PC must not be used as framework ceramics. A suitable veneer (e.g. VITA VM9) made of this material therefore must not be used as a full veneer of a crown cap.

4.3 General preparation instructions

The preparation can be optionally with a chamfer or a shoulder with rounded internal angle. A circular depth of cut of one millimeter should be aimed for. The vertical preparation angle should be at least 3°. All transitions from the axial to the occlusal or incisal areas must be rounded off. Uniform and smooth surfaces are advantageous. A WaxUp and the production of silicone keys to check the preparation are advantageous for diagnosis as well as for clinical implementation (defect-oriented preparation):



Shoulder preparation



Chamfer preparation



Over-contoured chamfer preparation



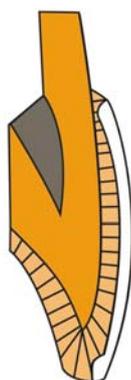
Tangential preparations are contraindicated.

4.4 Preparation of veneers

The ceramic layer thickness of CEREC Blocs veneers should be at least 0.5 mm to enable reliable adhesive bonding:

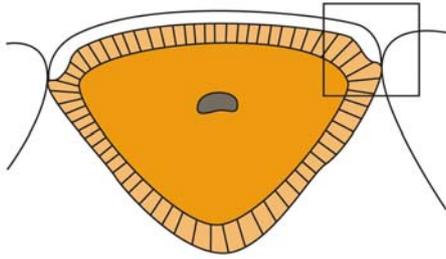
Labial

- Average labial reduction: 0.5 mm
- Progression of vestibular tooth contour maintained



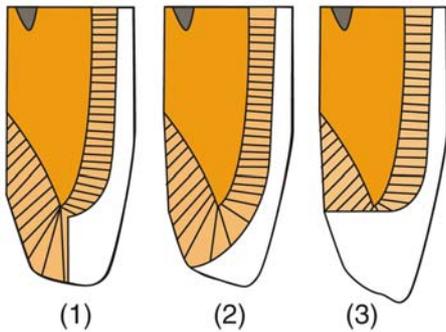
Cervical

- Lightly rounded shoulder or chamfer running parallel to the gingival margin, supragingival



Proximal

- Aim for proximal margins in the sense of a chamfer
- "Saddle-shaped" perimeter
- Natural contact points preserved where possible



Incisal

- Labial-incisal "chamfering" without extension (1)
- A slight reduction allows for a thicker ceramic layer for an individual characterization (2)
- For "extension", flatten incisal edge and round off edge (3)

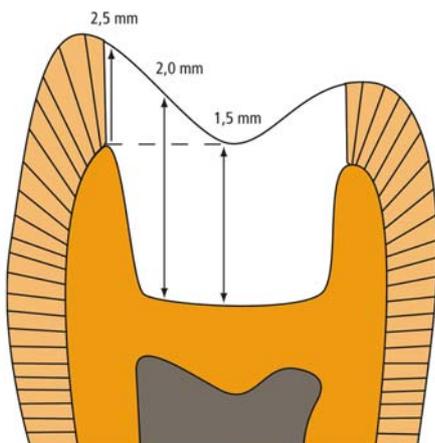
4.5 Preparation of inlays and onlays

The following guidelines apply to the production of inlays and onlays from CEREC Blocs finely structured feldspathic ceramics:

- Minimum depth at bottom of fissure: 1.5 mm
- Minimum depth at edge of cavity: 2 mm
- If the edge of the cavity comes to rest near the cusp tip: 2.5 mm
- The cervical step must be detached from the neighboring tooth.
- Minimum width of proximal step: 1.5 mm
- Angle between lateral wall of proximal box and proximal surface: $\geq 60^\circ$

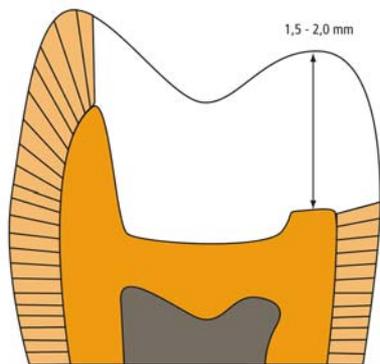
Preparation of inlays

The minimum layer thickness of CEREC Blocs ceramics below the bottom location of the fissure should be 1.5 mm.



Preparation of onlays

For onlay restorations from CEREC Blocs, make sure that the minimum thickness of the ceramic material in the area of the cusp overcoupling is 1.5 - 2 mm.



4.6 Preparation of anterior and posterior tooth crowns

Occlusal ceramic layer thicknesses for crowns

In the main fissure: While the occlusal margins taper off thin, the minimum layer thickness of the ceramic material under the lowest point of the fissure is 1.5 mm.

Check the cavity for sufficient dimensions while making the preparation.

The establishment of functional dentin adhesion makes the laying of a subfilling unnecessary and prevents reduction of the ceramic material thickness at a specified preparation depth.

The layer thickness must be checked in the milling preview of the 3D software.

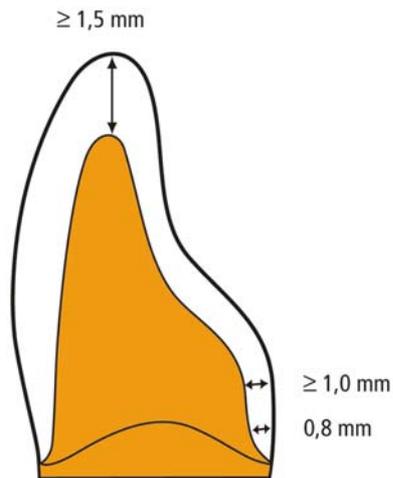
Reduction below the minimum layer thickness via manual reworking of the fissure following insertion must be avoided.

To ensure the clinical success of crowns made from CEREC Blocs, always observe the following **minimum ceramic layer thicknesses**:

Preparation of anterior teeth

The incisal wall thickness should be at least 1.5 mm, the circular wall thickness at least 1.0 mm.

The tapering crown edge should be 0.8 mm thick.



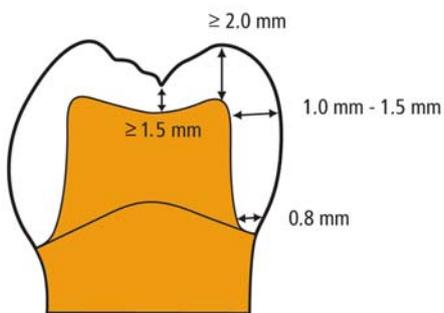
Preparation of posterior teeth (premolars and molars)

At the lowest point of the main fissure, the material thickness should be 1.5 mm.

For the cusp design, a material thickness of at least 2 mm should be ensured.

The circular wall thickness should be 1.0 - 1.5 mm.

The tapering crown edge should be 0.8 mm thick.



5 Producing a restoration

Producing a restoration in a dental practice	Producing a restoration in a dental laboratory
1) Following preparation, dry the tooth directly or indirectly and then apply contrast power or contrast spray.	1) Produce a master model.
2) Take an optical impression with the CEREC 3D camera.	2) Create a scan model. Alternatively: Create a wax model.
3) Check the quality of the optical impressions. Avoid camera shake.	3) Scan preparation
4) Initiate a 3D model reconstruction. Check the 3D model for irregularities.	4) Fasten scan model to scan holder. Alternatively: Fix wax model on special WaxUp holder.
5) Design of the desired restoration with CEREC 3D.	5) Scanning
6) Milling	6) Design of restoration with CEREC/inLab 3D software.
7) Fit check	7) Check of restoration data quality
8) Polishing of proximal areas Alternatively: Individualization/ glazing	8) Production of restoration with inLab
9) Adhesive bonding in the mouth	9) Possible monitoring
	10) Polishing of restoration Alternatively: Individualization/ characterization

5.1 Use of the multilayer technique

5.1.1 Introduction

The multilayer technique is an extremely rational method of manufacturing all-ceramic bridges and crowns. The fully anatomical suggestion is split into two parts in the software here.

The framework structure is manufactured from zirconia (inCoris ZI) and the veneer structure from feldspathic ceramics (CEREC Blocs). Starting with inLab 3D software 3.86, it is also possible to use this innovative approach for bridges with CEREC Blocs 40.

5.1.2 Processing steps

The following processing steps must be followed when using the multilayer technique.

1. A fully anatomical bridge or crown can be produced following a single scan using patented biogenics in conjunction with the inLab MC XL, inEos Blue or CEREC AC milling unit and inLab 3D software.
 - ↳ The software automatically splits these fully anatomical restorations into a defined optimal material layer thickness with an anatomically reduced, undercut-free geometry and in a veneer structure which also shows defined minimum layer thicknesses.
2. Then the framework (= primary structure) is first milled out of an inCoris ZI block and sintered in the inFire HTC high temperature sintering furnace.
3. The morphological veneer structure is then milled out of the CEREC Blocs.
 - ↳ As a result, the two structures fit each other so that they can be interconnected.
4. The veneer structure is then finalized (polished or painted).
5. In the final processing step, the veneer structure made of silicate ceramics is positively bonded to the zirconia framework structure using a commercially available bonding material.
 - ↳ The result is high-strength and esthetic bridges and crowns which can be perfectly integrated in the residual dentition from a functional perspective.

5.1.3 Advantages of the multilayer technique

- Use of biogenic design of occlusal surfaces for crowns and bridges, which is preferable to manual wax modeling regarding its speed and correct, patient-specific occlusal morphology, since it enables the reconstruction of completely destroyed occlusal surfaces as well. This enhances the integration in the individual remaining tooth substance and in the residual dentition.
- Consideration of patient-specific biomechanics and the functioning of initially coherent occlusion/articulation, without time-consuming fitting at the treatment chair.

- Use of ceramics which have been clinically tried and tested over a million times for both the framework and the veneer structures.
- High clinical dependability of restorations through the use of industrially prefabricated, flawless and homogeneous blanks.
- Easy, positive and pore-free joining of the veneer structure onto the framework without using special equipment such as furnaces etc.
- Freedom of tension between zirconia framework and veneer structure due to composite buffer. The occurrence of damaging thermal inhomogeneities inside of the restoration and the risk of veneer chipping is thus avoided.
- Automatic compliance with the minimum ceramic layer thicknesses of the framework and of the veneer structure via software control.
- Consistent, highly efficient use of CAD/CAM technology for the veneer as well. Improved utilization of the inLab system is thus achieved.
- Manual operating time is thus replaced by machining time. A drastic reduction of production costs per unit is thus achieved.

5.1.4 Indication of the multilayer technique

5.1.4.1 General indication

Highly esthetic single-tooth crowns for the anterior and posterior tooth regions and bridge restorations for the posterior tooth region can be manufactured using the multilayer technique.

Indication overview

Sirona multilayer technique			
	Anterior tooth crowns	Posterior tooth crowns	Posterior tooth bridges
Dentist	●	●	●
Laboratory	●	●	●

● – recommended

5.1.4.2 Dentist indication

Single crowns and bridges comprising up to four units (limited by mounting area and block size).

5.1.4.3 Laboratory indication

Single crowns and bridges comprising up to four units (limited by block size).

5.1.5 Contraindication of the multilayer technique

IMPORTANT

For strength reasons, CEREC Blocs for the manufacture of veneer structures for bridges must not be used to manufacture bridges which are not supported by zirconia frameworks.

5.1.5.1 General contraindication

- Insufficient oral hygiene
- Insufficient preparation results
- Insufficient tooth structure
- Insufficient space available

5.1.5.2 Hyperfunction

Patients diagnosed with excessive mastication (especially "gnashers" and "pressers") are contraindicated for restorations with occlusal surfaces machined from finely structured feldspathic ceramic CEREC Blocs.

5.1.6 Available block sizes and colors

The block is available in 4 monochromatic colors and in three polychromatic colors.

Designation	REF
CEREC Blocs 40 S2-T Size: 40/19, color: S2-T, 2 pcs	6273895
CEREC Blocs 40 S2-M Size: 40, color: S2-M, 2 pcs	6273887
CEREC Blocs 40 S3-M Size: 40, color: S3-M, 2 pcs	6273879
CEREC Blocs 40 S4-M, size: 40, color: S4-M, 2 pcs	6273861
CEREC Blocs 40 S2-PC, size: 40, color: S2-PC, 2 pcs	6273929
CEREC Blocs 40 S3-PC, size: 40, color: S3-PC, 2 pcs	6273911
CEREC Blocs 40 S4-PC, size: 40, color: S4-PC, 2 pcs	6273903

5.1.7 Processing conditions for the multilayer technique

Hardware requirements

Veneer structures can be machined from CEREC Blocs for the Sirona multilayer technique only with inLab MC XL and CEREC MC XL milling units.

A high-temperature sintering furnace such as e.g. inFire HTC speed is required for sintering zirconia frameworks.

IMPORTANT

If a high-temperature sintering furnace is not available in the practice or laboratory, the zirconia framework can be ordered from the Sirona infiniDent production center.

Software requirements

inLab 3D software, Version 3.86 or higher, must be installed for processing with the multilayer technique.

Milling instruments

The following use of the milling instruments is recommended:

	Required milling instruments	
	left	right
Framework structure: inCoris ZI	 Step Bur 20 REF 6259597	 Cylinder Pointed Bur 20 REF 6259589
Veneer structure: CEREC Blocs	 Step Bur 12 REF 6260025	 Cylinder Pointed Bur 12S REF 6240159
	 Step Bur 12S REF 6240167	
Milling additive DENTATEC	75 ml per tank filling	

Preparation guidelines

The preparation guidelines usually applicable to full ceramic restorations apply (see "Preparation of anterior and posterior tooth crowns [→ 13]").

Ceramic layer thickness

In order to ensure the lasting clinical success of restorations made with the Sirona multilayer technique, the correct minimum ceramic layer thicknesses of framework and veneer structures are stored in the inLab 3D software (Version 3.86 and higher).

5.1.8 Designing a restoration

5.1.8.1 General information

In order to design a restoration with CEREC Blocs 40, you will require inLab 3D software, Version 3.86 or higher.

Individual tooth restorations using e.g. CEREC Blocks 14 are also possible with inLab 3D software Version 3.80 and higher.

5.1.8.2 Recommended parameter settings

Spacer

Framework structure on the preparation: No change for conventional frameworks

Framework structure – veneer structure: + 60 µm

5.1.8.3 Designing with the multilayer technique

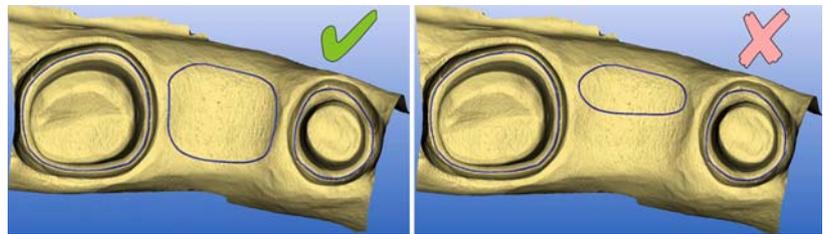
Designing a restoration

- ✓ You have selected a patient from the database or created a new patient.
- 1. In the New dialog, select e.g. *"Bridge"* as the restoration, and the *"Multilayer"* design technique.
- 2. Take exposures of the preparation and (if applicable) of the antagonist as usual as well as further images, depending on the selected bite registration technique.
- 3. After the model has been reconstructed, select Sirona inCoris ZI for the framework structure or CEREC Blocs-40 for the veneer structure in the material selection dialog.
- 4. Trim the model and the antagonist (if applicable).

IMPORTANT

The base line always must be drawn in larger for the multilayer technique than e.g. is usually the case for a fully anatomical bridge.

- 5. Draw in the preparation lines and base lines. Draw in the base line so that the position and size correspond approximately to the pontic to be replaced.



6. Using the parameter "*Lingual opening angle*", you can adapt the pontic on the lingual side to guarantee accessibility when cleaning. This parameter must be set prior to the calculation of the first suggestion.
7. Set the insertion axis and click the "*Next*" icon.
 - ↳ A selection menu appears in which the type of tooth shape can be selected.
8. Select "*Individual*" for biogeneric calculation based on the neighboring teeth. If no suitable neighboring teeth are available, select a preferential tooth shape: "*adult*", "*youth*", "*lepto*", "*athlet*", "*pykno*" or "*asia*".
9. Confirm your choice by clicking the "*OK*" button.
10. This suggestion can be changed individually using the usual tools. For bridges, ensure that you set a sufficiently large connector cross-section. The connector cross-sections for the current active tooth position are displayed in the status bar.
 - ↳ If a connector cross-section that is too small has been selected, the corresponding field in the status bar turns red. For precise checking of connectors, select the "*Contact*" button in the View window.

Contact

Ceramic layer thicknesses and connector cross-sections

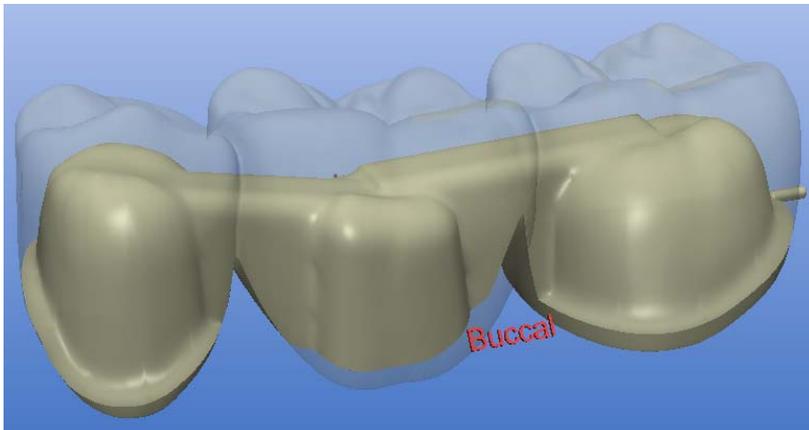
IMPORTANT

Please observe the minimum ceramic layers and minimum connector cross-sections specified in the software in mm and mm².

Minimum layer thicknesses		Crown	Posterior bridge	
Sirona inCoris ZI Framework structure	occlusal	0,7	0,7	
	circular	0,5	0,5	
CEREC Blocs Veneer structure	Bottom of fissure	1,0	1,0	
	circular	1,0	1,0	
Minimum connector cross- sections	-		1 pontic	2 pontics
			9	12

Milling preview and milling process

1. Change to the milling preview.
 - ↳ The restoration is graphically divided into a framework and the veneer structure located above it.



IMPORTANT

The suggestion for the framework structure generated by the software should not be further edited, in order to ensure a perfect fit with the veneer structure.

2. Start the milling process of the framework by clicking the "Mill" icon.
3. To also mill the veneer structure, select the "Edit veneering structure..." option in the "Design" menu in the milling preview. This opens the inLab 3D software again and loads the veneer structure in the milling preview.

5.1.9 Reworking the framework and veneer structure

Removing the neck part



- Carefully remove the neck part (between the restoration and the block) with a diamond bur. At the same time, make sure that the cervical step remains intact, that not too much material is removed and that the veneer structure thus remains hollow.

Tip: Measure the wall thickness of the adjacent area using a caliper and reduce/mill the wall thickness underneath the neck part to this dimension.

Contact between the veneer structure and the framework structure may exist only on the cervical margin.

Sintering the zirconia framework structure

- Sinter the framework made of Sirona inCoris ZI as specified in the inCoris ZI processing instructions.

inCoris ZI comes in four precolored versions.

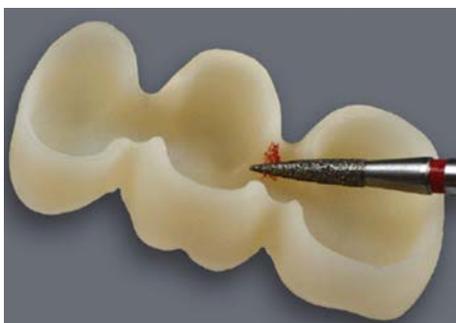
Fitting and reworking the veneer structure

⚠ CAUTION

Milling dust

The milling of sintered dental ceramic products results in dust which can damage one's health if inhaled frequently.

- Always wear a dust mask during milling operations.
- Use wet milling.
- Work behind safety glass and with suction.



1. Carefully fit the veneer structure on the framework structure using lipstick, checking pastes or occlusion spray (e.g. Occluspray from Hager & Werken) **applying little pressure**.
2. Check for a perfect fit.
3. You might try making a fit sample using low-viscosity silicone (e.g. Fit Checker from GC).
4. Use only a fine-grain diamond bur (40 µm) for subsequent contouring.
5. The morphology of the veneer structure for the multilayer technique is generated biogenically. Less manual reworking is therefore usually required in the occlusal.
6. Note the following regarding manual reworking: Never perform reworking with hard metal instruments, but always use diamond burs to prevent damage to the ceramic material. It is advisable to use a laboratory turbine or highspeed handpiece for processing.

Color check

In order to check for an esthetic result ("fired restoration") prior to the adhesive bonding of the two structures, we recommend mounting the veneer structure on the framework using try-in paste (VITA-OXY-PREVENT). This can also be done in situ. You can then correct the color result if necessary.

Color characterization / Individualization of the veneer structure



IMPORTANT

Since the bonding of the veneer and framework structures is achieved using composite, any desired color characterization (painting technique) or individualization (layer technique) of the veneer structure must take place before it is bonded to the framework structure!

We recommend applying a thin layer of glaze before bonding the basal surfaces of the framework structure.

1. Carry out the surface characterizations (painting technique) e.g. with VITA AKZENT paints or VITA SHADING PASTE.
2. Also perform an individualization with VITA VM 9 (layer technique) if required.

Tip: A harmonious cervical color transition from the veneer structure to the framework structure can be achieved by mounting the veneer structure on the framework structure for painting and then simultaneously painting the cervical margin of the framework.

IMPORTANT

Remove the veneer structure again prior to firing and fire it separately from the framework structure.

Overview of the firing programs recommended for characterization (painting technique)

Firing programs	Vt. °C	⇨ min.	↗ min.	↗ °C/min.	Approx. temp. °C	⇨ min.	VAC min.
Paint fix firing with SHADING PASTE / AKZENT	500	4.00	4.45	80	880	1.00	-
Glaze firing SHADING PASTE / SHADING PASTE Glaze / AKZENT / AKZENT Glaze / AKZENT Glaze Spray / AKZENT finishing agent	500	4.00	5.37	80	950	1.00	-

Overview of the firing programs recommended for individualization (layer technique)

Firing programs	Vt. °C	⇨ min.	↗ min.	↗ °C/min.	Approx. temp. °C	⇨ min.	VAC min.
Paint fix firing with SHADING PASTE / AKZENT	500	4.00	4.45	80	880	1.00	-
1. Individualization firing VM9	500	6.00	7.49	55	930	1.00	7.49
2. Individualization firing VM9	500	6.00	7.38	55	920	1.00	7.38
Glaze firing SHADING PASTE / SHADING PASTE Glaze / AKZENT / AKZENT Glaze / AKZENT Glaze Spray / AKZENT finishing agent	500	4.00	5.15	80	920	1.00	-
GLAZE LT powder glaze firing	500	4.00	3.30	80	780	1.00	-
GLAZE LT paste glaze firing	500	6.00	3.30	80	780	1.00	-
Correction firing with VM 9 COR	500	4.00	4.40	60	780	1.00	4.40

5.1.10 Adhesive bonding of the veneer and framework structures

Important information

The framework and veneer structures must be bonded extraorally, i.e. before the restorations are inserted in situ.

Always wear a suitable pair of goggles or a face mask and gloves when working.

Observe the processing instructions provided by the manufacturers of the recommended luting composites.

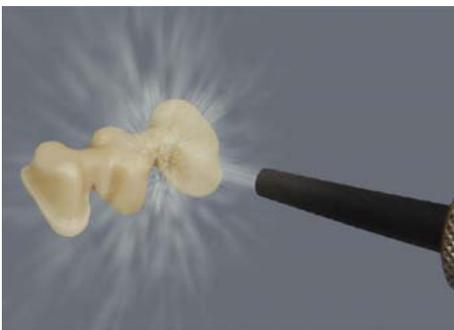
Recommended composites

Adhesive bonding	Phosphate-modified composite	Self-adhesive composite
Product name	PANAVIA 21 PANAVIA F 2.0	RelyX Unicem Clicker
Color	TC	Translucent or A2 universal
Polymerization	- Self-curing (anaerobic) - Dual-curing (anaerobic)	- Self-curing - Dual-curing

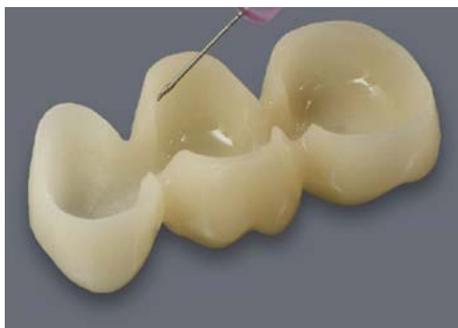
PANAVIA 21® is a registered trademark of KURARAY Medical Inc., Japan.

RelyX® Unicem Clicker® is a registered trademark of 3M ESPE Dental AG, D-Seefeld.

Adhesive bonding of the veneer and framework structures



1. Blast the outer surfaces of the framework structure with Al₂O₃, max. 50µm and a blasting pressure of max. 2.5 bar.
2. Clean the veneer structure thoroughly. Degrease it with alcohol and dry it with oil-free air if necessary.
3. Etch the veneer structure with VITA CERAMICS ETCH hydrofluoric acid gel (hydrofluoric acid gel, 5%) by applying it to the inner surfaces using a disposable brush. Etching time: 60 seconds.
4. **NOTICE! Risk of contamination! Do not brush off.** Remove the acid residues completely by rinsing the veneer structure off (60 seconds) or cleaning it in an ultrasonic bath. Then let the veneer structure dry for 20 seconds.
 - ↳ The etched surfaces have a whitish opaque appearance after the structure has dried.



5. Apply silane (e.g. VITASIL) to the etched surfaces and let it evaporate completely.



6. Apply a thin film of the composite to the veneer structure using a spatula or a microbrush.

IMPORTANT

Working with surplus

The composite must ooze out at the shoulder and/or at the base in a circular pattern between the veneer and framework structures in order to subsequently attain the homogeneous, bubble-free and positive connection between these structures that is essential for the lasting strength of the restoration.



7. Then insert the zirconia framework in the veneer structure by applying gentle and uniform pressure.



8. Remove coarse surpluses before they harden using a scaler, a disposable brush or a foam pellet. Leave small surpluses to prevent insufficient amounts after curing and reworking due to the oxygen inhibition layer on the surface of the composite.

or

- Alternative procedure for RelyX Unicem 2: Cover the composite with glycerine gel. No oxygen inhibition layer will then form on the surface.

Recommended procedure

	PANAVIA 21	PANAVIA F 2.0	RelyX Unicem Clicker
Type of curing	Anaerobic self-curing The application of Oxyguard II is mandatory	Anaerobic dual curing The application of Oxguard II is mandatory without light curing	Self-curing The application of glycerine gel is recommended
Mixing (at 25°C)	20 - 30 sec.	20 - 30 sec.	20 sec.
Working time (at 25°C)	max. 4 min.	max. 3 min.	2 min. ¹⁾
Curing	> 10 min. (without ED Primer)	> 10 min. (without ED Primer II)	Start of polymerization: 2 min. after start of mixing Curing: > 10 min. ¹⁾

¹⁾ The actual processing and setting times depend on the ambient and oral temperatures. The specified times are based on practice-relevant conditions. As with every composite cement, the setting time of RelyX Unicem is considerably slower at room temperature. The processing time can be reduced considerably if an operating light is used!

NOTICE! Keep the restoration pressed together during the curing phase!

Tip: Immobilize the restoration with a clothespin during the curing phase.

Final processing of the restoration



1. Carefully remove the surplus composite from the shoulders and base with a fine-grain diamond bur (max. 40 µm) and diamond rubber polishers. Check for smooth transitions to prevent irritations of the gums in situ.Fi
2. Use diamond finishing burs (8 µm) for prepolishing.
3. Use polishing brushes and diamond polishing paste (e.g. VITA Karat diamond polishing paste) for the final polishing step.



4. Perfect high-gloss polishing of the zirconia basal surface of the bridge elements is clinically essential, since the latter are not covered by the veneer structure, unless a layer of glaze was already fired on prior to adhesive bonding!

5.1.11 Clinical bonding of the restoration

IMPORTANT

The restoration no longer may be fired (e.g. glazed) following adhesive bonding.

If the restoration must be ground in situ, polish it again carefully afterwards.

The following bonding materials are recommended for the clinical bonding of restorations manufactured via the multilayer technique:

Type of bonding	Conventional	Adhesive*	
Materials	Glass-ionomer cements	Phosphate-modified composites	Self-adhesive composite
Product examples	Ketac Cem (3M ESPE) Fuji I (GC)	PANAVIA 21 PANAVIA F 2.0 (Kuraray)	RelyX Unicem (3M ESPE)
Recommended colors of the bonding material	Standard color	TC	Translucent or A2 universal

* Recommended for stumps with a length of < 4 mm.

We recommend blasting the adhesive surfaces with Al₂O₃, max. 50 µm and a blasting pressure of < 2.5 bar prior to adhesive bonding.

Observe the processing instructions provided by the manufacturers of the respective products.

5.2 Scanning, designing and milling

Exact instructions can be found in the corresponding documents, "CEREC 3D Operator's Manual" and "inLab 3D Operator's Manual".

5.3 Reworking/Polishing

CEREC Blocs restorations from finely structured feldspathic ceramics must not under any circumstances be reworked with hard metal instruments, as they could damage the ceramics and cause microcracks; the following therefore applies:

- Reworking of the material should be performed applying minimal force and with ample water cooling.
- Only fine-grain diamond burs (40µm) should be used for contouring and diamond finishing burs (8µm) should be used for prepolishing.
- The polishing is best performed with flexible disks coated with Al₂O₃, polishing brushes and diamond polishing paste.

5.4 Characterization/Individualization

Especially with restorations with large surface areas from Sirona CEREC Blocs, an additional finishing for color surface characterization should be performed with a final firing with the VITA Shading Paste paints (or VITA accent paints). In addition, these finely structured feldspathic ceramic blocks are optimally suited to individualization using VITA VM 9 veneer ceramics.

It is here essential that you observe the manufacturer's relevant processing instructions.

5.5 Bonding

The indications for ceramic restorations made from CEREC Blocs mentioned above apply solely to adhesive bonding using a recognized and correctly applied functional enamel-dentin adhesive system (total bonding).

Preparing ceramics

Finely structured feldspathic ceramics are inserted with luting composites. These adhesive materials create an adhesive bond between the hard tooth substance and the ceramic restoration which guarantees a positive bond. The bonding mechanism on the tooth and on the ceramic surface is decisive for clinical success.

Etching

One important prerequisite for bonding is enlargement of the adhesive area. The surface of finely structured feldspathic ceramics can be enlarged by partially dissolving the glass matrix with hydrofluoric acid (e.g. for 60 sec. with approx. 5 % HF) to create a microretentive pattern.

Silanizing

In addition to micromechanical anchoring between ceramics and luting composite, an additional bond can be created via silanization. The silane is applied to the ceramic surface following the etching process. It is important here that the solvent can evaporate completely.

Bonding

In order to improve the moistening of the ceramic surface when using luting composites of higher viscosity, a thin layer of bonding material can be spread over the ceramic surface. This bonding layer is not cured. It polymerizes together with the luting composite.

5.6 Removal of inserted restorations

Diamond instruments must be used to remove full ceramic restorations. Hard metal instruments are not suitable.

Removal of adhesively bonded partial restorations

The problem with these restorations is that it is difficult to discern the borders between the restoration, the luting composite material and the tooth when performing the required wet milling. Since it is not desirable to penetrate further into the tooth substance than is absolutely necessary, it is helpful to intermittently stop milling and blow the tooth dry. The bond to the enamel is usually so good that the entire restoration must be milled out, while those parts that border the dentin automatically come loose.

Recommendation: standard-grain diamond bur (105 - 124 µm) with cylindrical shape.

5.7 Trepination

To create a trephination opening, the coarse-grained diamond cylinder must be applied transversely. Once the opening has been milled, the conventional treatment can be resumed.

6 Certification

Sirona CEREC Blocs/CEREC Blocs PC are manufactured under the responsibility of VITA Zahnfabrik.

VITA Zahnfabrik is certified according to the Medical Device Directive.

VITA Zahnfabrik
Spitalgasse 3
79713 Bad Säckingen
Germany

CE mark

The products CEREC Blocs and CEREC Blocs PC are certified and bear the identification mark  ⁰¹²⁴



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We reserve the right to make any alterations which may be required due to technical improvements.

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