inCoris TZI, inCoris TZI C

Instructions for use

Dentsply Sirona

inCoris TZI / inCoris TZI C

Product description:
inCoris TZI / inCoris TZI C blanks are made of yttria-stabilized zirconia (Y-TZP).

They are used in fabricating frameworks for fixed prosthetic restorations.

Depending on the framework design, inCoris TZI / inCoris TZI C frameworks can be ceramically veneered or delivered as full contoured restorations. The blank selection will depend on the tooth shade to be reproduced and the space available for the veneering.

With fully contoured restorations, no space is required for the ceramic veneering, which may allow the dentist to preserve more of the tooth substance during preparation.

Framework Material	**Yttria-stabilized zirconium oxide (Y-TZP)**
Temporary cementation	· Maximum two weeks possible
Definitive cementation	· Adhesive cementing · Conventional cementing

Objects are individually fabricated to your digital design specifications such as anatomic contour, framework and wall thickness, connector diameter and cementing gap.

Technical specifications inCoris TZI / inCoris TZI C:
- Type II, class 5 (pursuant to DIN EN ISO 6872)
- CTE; 10.5 µm/m·K (25 – 500 °C)
- Modulus of elasticity: 210 GPa
- Flexural strength: approx. 1200 MPa (three-point flexural testing)

Composition (in % by mass) inCoris TZI / inCoris TZI C:
- Zirconium oxide
- Yttrium oxide 5%
- Hafnium oxide < 3%
- Aluminium oxide, Silicon oxide, other oxides < 2%

Intended purpose:
Ceramics for fixed dental prosthetic restorations

Indications:
inCoris TZI / inCoris TZI C is indicated in the anterior and posterior segments for:
- Crowns
- Telescopic primary crowns
- Multi-unit bridges (with no more than two pontics between abutment crowns)
- Two piece abutments

inCoris TZI / inCoris TZI C can be used as a substructure (framework) which is then veneered with a dental veneering ceramic or can be used for full-contour application (without veneering) as well. In the case of telescopic primary crowns, the substructure is not veneered.

Contraindications:
- This product may not be used in patient hypersensitivity to zirconia (Y-TZP) or one of the other ingredients
- Bruxism or recalcitrant parafunctional habits (for ceramically veneered frameworks)
- Insufficient available space
- Endodontic posts
- Endosseous implants
- Inlay bridges

Intended User:
Dental technicians.

Intended Patient Population and medical conditions:
The products are intended for patients in need of long-term restorative or prosthodontic dental therapy, or esthetic dental corrections. The use of ceramics is not limited to a specific patient population.

Warnings / Precautions

Warnings:
Possible cross-reactions or interactions of this product with other products or material already present in the oral environment must be taken into consideration by the dentist when selecting this product.

Precautions:
Please note:
- Keep product dust away from eyes.
- Avoid any contact with mucosa.
- After use, wash your hands and apply a hand cream.

- Do not smoke, eat or drink while handling the product.
- Do not swallow the product.
- Do not inhale dust particles during grinding.
- Use local vacuum suction and suitable mouth/face protection during manual machining at the workplace.
- To prevent contamination of the finished restoration, follow the recommended instructions found in the "Zirconia-based Restoration Hygiene Technique Guide" available on our webpage at www.dentsplysirona.com/ifu.

The safety and warning notes listed here describe how to use our product in a safe and risk-free manner. Notify the dentist in charge of all factors described above if you use this product for a custom design and make sure to comply with the pertinent Safety Data Sheets (SDS).

Adverse effects:

If properly processed and used, adverse effects of this product are highly unlikely. However, reactions of the immune system (such as allergies) to substances contained in the material or localized paraesthesia (such as taste disturbances or irritation of the oral mucosa) cannot be completely ruled out as a matter of principle. Should you hear or be informed of any adverse effects – even when doubtful – we would like to request notification.

Any serious incident involving the product shall be reported to the manufacturer and the competent authority in accordance with local requirements.

For a summary of the safety and clinical performance of this product, see https://ec.europa.eu/tools/eudamed.

Special notes on framework design

Framework design for fully contoured restorations:

Indicated especially where limited occlusal space is available, for frameworks that are not to be veneered or for frameworks with body stains.

The surface of fully contoured frameworks can carefully be optimized with rotary tools such as fine cutters prior to sintering.

Make sure that the occlusal surface is not changed by subsequent deepening of fissures, as notching action may compromise the strength of the material. Please note that flat occlusal reliefs can extend the live expectancy of fully contoured restorations. When making manual adjustments, make sure never to separate the interdental spaces of the frameworks with cutting discs or other rotary instruments, doing so might damage the framework and compromise the strength of the material!

Important note: Please ensure that the minimum wall thickness of the framework in the area of the occlusal surface is respected even after occlusal adjustments.

Framework design for veneered restorations:
Frameworks to be ceramically veneered are designed to reduced anatomical contour to provide maximum support for the veneer.

The frameworks can be veneered using the press-on technique or the build-up technique.

Wall and margin thickness:	**inCoris TZI/inCoris TZCI C**
Wall thickness, single crowns	0.4 mm
Margin thickness, single crowns	0.2 mm
Wall thickness, bridges	0.5 mm
Margin thickness, bridges	0.2 mm
Additional dimensional requirements for the anterior region:	**inCoris TZI/inCoris TTZI C**
Number of pontics	2
Connector cross-section	6 mm^2
Additional dimensional requirements for the posterior region:	**inCoris TZI/inCoris TZi C**
Number of pontics	2
Connector cross-section	9 mm^2
Cantilever pontic at tooth position (only one pontic, up to one premolar width)	Up to the second premolar
Connector cross-section for this cantilever pontic	12 mm^2

Nesting

Special nesting notes for large-span bridges (9 units or more, only for inCoris TZI/inCoris TZI C)

For distortion-free sintering of long-span bridges (9 units or more) when nesting the object in a inCoris TZI/inCoris TZI C 98 disk, make sure to add a sintering reinforcement in the form of a “tongue” to create.

Always place objects (single copings, three-unit frameworks) within the sintering reinforcement (“tongue”) in order to achieve a homogeneous shrinkage of large-span objects during sintering.

Entering the shrinkage factor for the milling unit:

In CAM software allowing the entry of 3 dimensions, enter X, Y and Z values.

In CAM software allowing the entry of 2 dimensions, enter X or Y and Z values.

In CAM software allowing the entry of 1 dimension, enter the X value.

Finishing

Special notes on finishing:

Please read the respective Instructions for Use for your device regarding further processing.

Separating

Notes on separating the objects:

Separate the objects from the disk by sandblasting with aluminium oxide (50 µm, max. 1.5 bar).

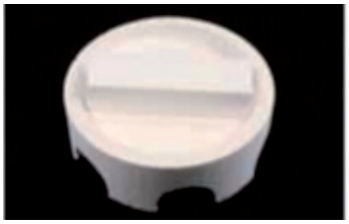
For large-span bridges (9 units or more), separate only the labial and buccal sprues of the objects and keep the “tongue” connector, because the objects must be sintered together with that “tongue”. Any protruding ridges at the bottom of the “tongue” must be removed in order to assure that the objects will stay firmly put on the sintering tray. The smaller objects nested inside the “tongue” are detached completely and sintered separately.

Sintering

Sintering in the Cercon® heat plus P8:

- 1 500 °C in the Cercon® heat plus P8
  - Program #4 for bridges up to 8 units, T_{max} = 1 500 °C
  - Program #5 for bridges of 9 units or more, T_{max} = 1 500 °C

Special sintering notes for large-span bridges (9 units or more)



Sintertray with sintering block



Correct position on the sintering tray

Two wide-span bridges (9 or more units) can be sintered in the Cercon® heat plus P8 at one time. Place the objects on the sintering block with due regard to the internal vertical clearance of the Cercon® heat plus P8 (130 mm) and the need to facilitate contraction without any mechanical constraints.

Sintering in third-party furnaces:

Sintering results may be adversely affected by e.g.:

- Incorrect sintering temperatures
- Insufficient heating power
- Incorrect temperature curves
- Incorrect object placement
- Insufficient heat-storing capacity of the furnace over the time of the sintering cycle
- Manufacturer-related or age-related variations in heating performance
- Object contamination by oxidation products emitted by non-enclosed heating elements

Any of these factors by itself or in combination may reduce the maximum strength of our above-mentioned zirconium oxide materials and compromise the life expectancy of the frameworks.

For these reasons, we cannot grant general approval for the use of third-party furnaces for sintering two-piece abutments (mesostructures) and crown and bridge frameworks made of inCoris TZI / inCoris TZI C. We will, however, open the system technically for the use of furnaces of third-party furnaces only on condition that the following requirements are met:

Additional notes:

The programming you use for your sintering furnace should be analogous to the Dentsply Sirona sintering program.

General Sinter programs for all shades

Ramp time in minutes to reach Temp

		Long-term Sintering > 9-units	Conventional Sintering up to 8-units	Speed Sintering up to 6-units	Superspeed Sintering up to 4-units
Approx. sintering time (can vary by furnace)		> 10 hours	5 hours	3 hours	90 min
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp time	min	120	40	47	8
Temp. 1	°C	860	880	1100	890
Holding Time	min	10	0	0	0
Ramp time	min	320	55	18	7
Temp. 2	°C	1500	1500	1350	1100
Holding Time	min	120	135	0	0
Ramp time	min	65	65	24	17
Temp. 3	°C	200	200	1540[2)]	1350
Holding Time	min	0	0	50	0
Ramp time	min	-	-	6	19
Temp. 4	°C	-	-	1100	1540[2)]
Holding Time	min	-	-	0	35
Ramp time	min	-	-	7	7
Temp. 5	°C	-	-	750	750
Holding Time	min	-	-	0	0
Cooling		With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C	Open	Open

[1)] Room temperature
[2)] Valid for closed sinter bowls, otherwise 1525 °C

Heating rate in °C/minutes to reach Temp

		Long-term Sintering > 9-units	Conventional Sintering up to 8-units	Speed Sintering up to 6-units	Superspeed Sintering up to 4-units
Approx. sintering time (can vary by furnace)		> 10 hours	5 hours	3 hours	90 min
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Heating rate	°C/min	7	22	23	120
Temp. 1	°C	860	880	1100	890
Holding Time	min	10	0	0	0
Heating rate	°C/min	2	11	14	30
Temp. 2	°C	1500	1500	1350	1100
Holding Time	min	120	135	0	0
Heating rate	°C/min	20	20	7	15
Temp. 3	°C	200	200	1540[2)]	1350
Holding Time	min	0	0	50	0
Heating rate	°C/min	-	-	70	10
Temp. 4	°C	-	-	1100	1540[2)]
Holding Time	min	-	-	0	35
Heating rate	°C/min	-	-	50	110
Temp. 5	°C	-	-	750	750
Holding Time	min	-	-	0	0
Cooling		With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C	Open	Open

Heating rate in °C/hour to reach Temp

		Long-term Sintering > 9-units	Conventional Sintering up to 8-units	Speed Sintering up to 6-units	Superspeed Sintering up to 4-units
Approx. sintering time (can vary by furnace)		> 10 hours	5 hours	3 hours	90 min
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Heating rate	°C/hour	420	1320	1380	7200
Temp. 1	°C	860	880	1100	890
Holding Time	h:min	0:10	0:00	0:00	0:00
Heating rate	°C/hour	120	660	840	1800
Temp. 2	°C	1500	1500	1350	1100
Holding Time	h:min	2:00	2:15	0:00	0:00
Heating rate	°C/hour	1200	1200	420	900
Temp. 3	°C	200	200	1540[2)]	1350
Holding Time	h:min	0:00	0:00	0:50	0:00
Heating rate	°C/hour	-	-	4200	600
Temp. 4	°C	-	-	1100	1540[2)]
Holding Time	h:min	-	-	0:00	0:35
Heating rate	°C/hour	-	-	3000	6600
Temp. 5	°C	-	-	750	750
Holding Time	h:min	-	-	0:00	0:00
Cooling		With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C	Open	Open

[1)] Room temperature
[2)] Valid for closed sinter bowls, otherwise 1525 °C

Sintering programs, Multimat2Sinter/heat DUO/Sirona HTC-speed sintering furnace:

Speed sintering of bridge frameworks with up to 6 units:

Step	Heating rate	Temperature	Holding time
	°C/min	°C	min
S4	99	750	0
S3	7	1520	35
S2	14	1350	0
S1	23	1100	0

Standard sintering:

Step	Heating rate	Temperature	Holding time
	°C/min	°C	min
S4	25	0	0
S3	99	300	0
S2	11	1500	135
S1	22	880	0

Standard sintering of bridge frameworks with 9 or more units:

Step	Heating rate	Temperature	Holding time
	°C/min	°C	min
S4	99	200	0
S3	10	900	0
S2	2	1500	135
S1	7	860	10

Only suitable for inLab Profire:

Superspeed sintering for bridge frameworks up to 4 units:

Step	Heating rate	Temperature	Holding time
	°C/min	°C	min
S1	120	890	0
S2	30	1100	0
S3	15	1350	0
S4	10	1525	35
S5	120	750	0

Sintering temperatures are recommendations. If necessary, carry out a trial sintering cycle and adapt the sintering temperatures or times as needed.

Separating the sintering reinforcement in the case of large-span bridges:
Objects are separated from the “tongue” after sintering using irrigated rotary diamond cutters.

Manual finishing after sintering:
- Sandblast the inside and outside of the framework with aluminium oxide (110–125 µm, max. 2–3 bar, 45° angle).
- Eliminate premature contacts one by one until the framework has reached its final position on the die(s).
- During the try-on and fitting of the framework, keep the dies on the cast and try on the framework as a whole.
- Once the try-on and fitting has been completed, do not perform any additional adjustments such as finishing the entire framework.

Note: Sintered zirconia should be finished using diamond instruments under proper irrigation only. Keep the pressure on the framework material to a minimum and work only in one direction.
- Sandblast the finished areas once again with aluminium oxide (110–125 µm, max. 2–3 bar, 45° angle).
- Finally, clean the framework using a steam cleaner.

Staining technique:
For tooth-coloured staining of fully contoured inCoris TZI/inCoris TZI C restorations we recommend Dentsply Sirona Universal Stain & Glaze.

Layering technique:
We recommend Cercon® ceram Kiss/Celtra® Ceram ceramic veneering materials for veneering zirconia frameworks. Make sure to follow the applicable Instructions for Use.

Annealing:
Based on the results of our scientific testing of zirconia frameworks, we consider a separate annealing (“healing”) step both unnecessary and inappropriate.

Polishing in the laboratory:
Unveneered inCoris TZI/inCoris TZI C frameworks should be highly polished or glazed with a high-gloss ceramic glaze. This also makes the restoration more amenable to proper oral hygiene procedures.

Polishing in the dental office:
Extensive studies have shown that the abrasive action of inCoris TZI/inCoris TZI C on antagonists is less than that of conventional ceramic veneers and not more than standard lithium disilicate ceramics even after finishing and polishing.
Important: After making minor final occlusal adjustments at chairside, we recommend prophylactic polishing of the adjusted sites to a high luster or adding glaze with a smooth surface prior to temporary or definitive cementing to protect the antagonists from possible abrasion. This also makes the restoration more amenable to proper oral hygiene procedures.
Tooth surfaces whose shade was obtained by staining may present brighter spots where occlusal adjustments were made.

Transport and storage:
No particular requirements.

Disposal:
Dispose in accordance with local and national regulations.

Shelf Life:
Shelf life of inCoris TZI/inCoris TZI C is 7 years from date of manufacture.

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