Cercon® yo ML

Dentsply Sirona

Instructions for use

Cercon® yo ML

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Product Description:
Cercon® yo ML blanks are made of yttrium oxide-(yttria-) stabilized zirconium oxide (zirconia) (Y-TZP). They are built out of different shade layers and yttrium oxide contents which create a natural gradient of the restoration after sintering.

They are used in fabricating frameworks for fixed prosthetic restorations.

Depending on the framework design, Cercon® yo ML frameworks can be ceramically veneered or delivered as fully contoured restorations. Which blank is selected will depend on the tooth shade to be reproduced and the space available for the veneer.

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

Framework Material	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 Cercon® yo ML:
- Type II, class 5 (pursuant to DIN EN ISO 6872:2015+ Amd.1:2018.)
- CTE; 10.3 µm/m·K (25 – 500 °C)
- Modulus of elasticity: 210 GPa
- Flexural strength: 900 – 1000 MPa (three-point flexural testing)

Composition (in % by mass) Cercon® yo ML:
- Zirconium oxide
- Yttrium oxide 7 – 9%
- Hafnium oxide < 3%
- Aluminum oxide, Silicon oxide, other oxides < 2%

Intended purpose
Ceramics for fixed dental prosthetic restorations.

Indication
Cercon® yo ML is indicated in the anterior and posterior segments for:
- Crowns
- Multi-unit bridges (with a maximum of two pontics between abutment crowns)
- Inlays, onlays and veneers

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

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.

Precaution
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.

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 life 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.

Framework dimensions for the anterior and posterior region

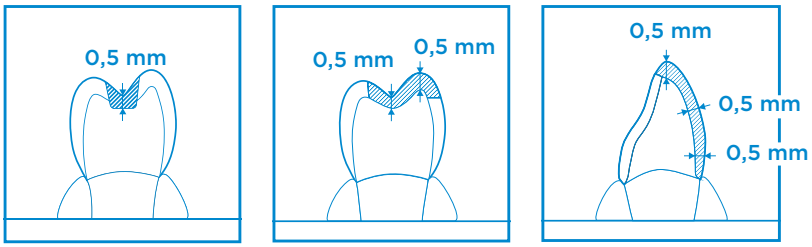
Wall and border thickness:	Cercon® yo ML
Wall thickness, single crowns	0.4mm
Margin thickness, single crowns	0.2mm
Wall thickness, bridges	0.5mm
Margin thickness, bridges	0.2mm

Additional dimensional requirements for the anterior region:	Cercon® yo ML
Number of pontics	2
Connector cross-section	6mm²

Additional dimensional requirements for the posterior region:	Cercon® yo ML
Number of pontics	2
Connector cross-section	9mm²
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	12mm²

Minimum wall thickness for inlays, onlays and veneers: The following pictures show the specified minimum wall thickness for inlays, onlays and veneers.

The minimum wall thickness must still be ensured after all manual adjustments have been made.



Inlays *Onlays* *Veneers*

Inlays: minimum 1.0 mm Isthmus width, depth and minimum 1.0 mm wide gingival floor.
Onlays: minimum 1.0 mm wide gingival floor

Nesting
Please consider the 4 different layers for an optimal nesting:

Disc Height	14 mm	100 %	18 mm	100 %	25 mm	100 %
Incisal	2.7 mm	19 %	2.7 mm	15 %	2.7 mm	11 %
Transition Layer 2	1.35 mm	10 %	1.35 mm	7.5 %	1.35 mm	5 %
Transition Layer 1	1.35 mm	10 %	1.35 mm	7.5 %	1.35 mm	5 %
Dentin	8.6 mm	61 %	12.6 mm	70 %	19.6 mm	79 %

Positioning as an example in an 18 mm disc, unsintered.

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.

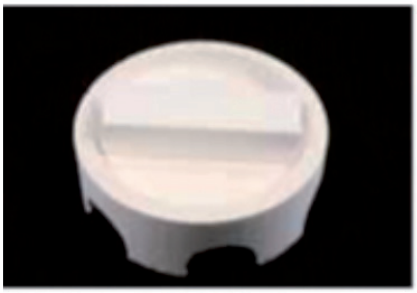
Finishing
Special notes on finishing:
Please read the respective Instructions for Use for your device regarding further processing.

Separating
Notes on separating the objects:
Separate the objects from the disc 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 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:
- 1500 °C in the Cercon® heat plus P8
  - Program #4 for bridges up to 8 units, Tmax = 1500 °C
  - Program #5 for bridges of 9 units or more, Tmax = 1500 °C

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


Sinter tray 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 learance of the Cercon® heat plus P8 (130 mm) and the need to facilitate contraction without any mechanical constraints.

Sintering in the heat DUO / Multimat2Sinter (Sinering cycles with closed sintering bowls):
- Program #6: Speed program for bridges up to 6 units, Tmax = 1540 °C
- Program #7: Standard sintering for bridge frameworks up to 8 units, Tmax = 1520 °C
- Program #8: Sintering program for bridges of 9 units or more, Tmax = 1520 °C

Sintering in the inLab Profire:
- #1 Cercon base_ht_xt Speed: Speed program for bridges up to 6 units
- #2 Cercon base_ht_xt Standard: Standard sintering for bridge frameworks up to 8 units
- #3 Cercon base_ht 8-x units: Sintering program for bridges of 9 or more units
- #4 Cercon_base_ht_xt_Superspeed: Superspeed program for bridges up to 4 units

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 Cercon® yo ML. 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 1

		Sinter program for bridge frameworks 9 or more units	Sinter program for bridge frameworks up to 8 units	Sinter program for bridge frameworks up to 6 units	Sinter program for bridge frameworks up to 4 units	Sinter program for bridge frameworks up to 3-units	Sinter program for single unit crowns
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp time	min	120	40	90	8	9	8
Temp. 1	°C	860	900	1540[(2)]	890	950	1000
Holding Time	min	0	0	35	0	2	0
Ramp time	min	320	55	20	7	10	9
Temp. 2	°C	1500	1500	1150	1100	1450	1450
Holding Time	min	120	145	0	0	6	2
Ramp time	min	65	65	35	17	4	4
Temp. 3	°C	200	200	200	1350	1550	1550
Holding Time	min	0	0	0	0	15	10
Ramp time	min	-	-	-	19	6	6
Temp. 4	°C	-	-	-	1540[(2)]	1100	1100
Holding Time	min	-	-	-	35	0	0
Ramp time	min	-	-	-	5	7	7
Temp. 5	°C	-	-	-	750	750	750
Holding Time	min	-	-	-	0	-	-
Cooling		With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C	Gradual opening of the furnace within 35 Min down to 200 °C	Gradual opening of the furnace within 5 minutes; Furnace opens at 750°C	Open	Open

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

Ramp time in C°/minute to reach Temp 1

		Sinter program for bridge frameworks 9 or more units	Sinter program for bridge frameworks up to 8 units	Sinter program for bridge frameworks up to 6 units	Sinter program for bridge frameworks up to 4 units	Sinter program for bridge frameworks up to 3-units	Sinter program for single unit crowns
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp time	°C/min	7	22	17	120	100	120
Temp. 1	°C	860	900	1540[(2)]	890	950	1000
Holding Time	min	0	0	35	0	2	0
Ramp time	°C/min	2	11	18	30	50	50
Temp. 2	°C	1500	1500	1500	1100	1450	1450
Holding Time	min	120	145	0	0	6	2
Ramp time	°C/min	20	20	27	15	25	30
Temp. 3	°C	200	200	200	1350	1550	1550
Holding Time	min	0	0	0	0	15	10
Ramp time	°C/min	-	-	-	10	70	70
Temp. 4	°C	-	-	-	1540[(2)]	1100	1100
Holding Time	min	-	-	-	35	0	0
Ramp time	°C/min	-	-	-	155	50	50
Temp. 5	°C	-	-	-	750	750	750
Holding Time	min	-	-	-	0	0	0
Cooling		With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C	Gradual opening of the furnace within 35 Min down to 200 °C	Gradual opening of the furnace within 5 minutes; Furnace opens at 750°C	Open	Open

Ramp time in C°/hour to reach Temp 1

		Sinter program for bridge frameworks 9 or more units	Sinter program for bridge frameworks up to 8 units	Sinter program for bridge frameworks up to 6 units	Sinter program for bridge frameworks up to 4 units	Sinter program for bridge frameworks up to 3-units	Sinter program for single unit crowns
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp time	°C/hour	420	1320	1020	7200	6000	7200
Temp. 1	°C	860	900	1540[(2)]	890	950	1000
Holding Time	h:min	0:00	0:00	0:35	0:00	0:02	0:00
Ramp time	°C/hour	20	660	1080	1800	3000	3000
Temp. 2	°C	1500	1500	1150	1100	1450	1450
Holding Time	h:min	2:00	2:15	0:00	0:00	0:06	0:02
Ramp time	°C/hour	1200	1200	1650	900	1500	1800
Temp. 3	°C	200	200	200	1350	1550	1550
Holding Time	h:min	0:00	0:00	0:00	0:00	0:15	0:10
Ramp time	°C/hour	-	-	-	600	4200	4200
Temp. 4	°C	-	-	-	1540[(2)]	1100	1100
Holding Time	h:min	-	-	-	0:35	0:00	0:00
Ramp time	°C/hour	-	-	-	9300	3000	3000
Temp. 5	°C	-	-	-	750	750	750
Holding Time	h:min	-	-	-	0:00	-	-
Cooling		With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C	Gradual opening of the furnace within 35 Min down to 200 °C	Gradual opening of the furnace within 5 minutes; Furnace opens at 750°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 of bridge frameworks up to 8 units:

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

Smart sintering for single unit crowns: 45 min

Step	Heating rate	Temperature	Holding time
	°C/min	°C	min
S1	120	1000	0
S2	50	1450	2
S3	30	1550	10
S4	70	1100	0
S5	50	750	0

Smart sintering up to 3-unit bridges: 59 minutes

Step	Heating rate	Temperature	Holding time
	°C/min	°C	min
S1	100	950	2
S2	50	1450	6
S3	25	1550	15
S4	70	1100	0
S5	50	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 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 Cercon® yo ML 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 dental office:
Extensive studies have shown that the abrasive action of Cercon® yo ML 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 of in accordance with local and national regulations.

Shelf-Life
Shelf life of Cercon® yo ML is 7 years from date of manufacture.

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Manufacturer:
DeguDent GmbH
Rodenbacher Chaussee 4
63457 Hanau-Wolfgang
Germany
Tel. +49/6181/5950
dentsplysirona.com

Rx only