Cercon

Tips for Success Sintering & More

Recommended processing plays an essential role in the quality of the restorations. Especially when sintering and firing zirconium oxide (Cercon), undesirable results may occur if these recommendations are not followed.

This can affect translucency, color and strength in particular.

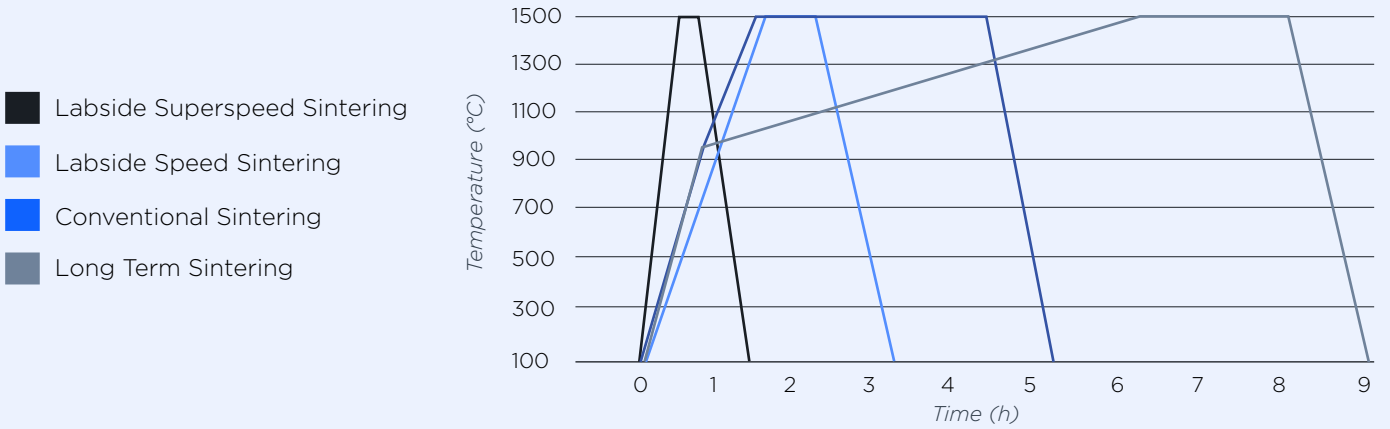
Tips for your success gives you an overview of possible undesirable results and possible reasons for them. This makes it easier for you to analyze if something does not go as you want and expect.

- → **The Base: Sintering Programs of Cercon**
- → **Sintering Programs Cercon Discs: For Third-Party Furnaces**
  - → Sintering Temperatures
  - → Contamination by Polymer Material
- → **Adjustments After Sintering**

The Base: Sintering Programs of Cercon Discs

Programs are valid for all Cercon discs:

Sintering Program	Number of Units	Duration	Temperature
Labside Superspeed Sintering	up to 4 units	≈ 90 minutes	1500°C
Labside Speed Sintering	up to 6 units	≈ 3 hours	1500°C
Conventional Sintering	up to 8 units	≈ 5 hours	1500°C
Long Term Sintering	9 or more units	≈ 9 hours	1500°C



Superspeed
Very fast, if time counts, with slightly lower esthetic outcome

Speed
Time-efficient program with slightly lower esthetic outcome

Conventional
Best compromise between time-efficiency and esthetic result

Long Term
Most esthetic result regarding translucency for all indications

Tip: Choice of sintering programs can slightly affect translucency.

Example Cercon ht ML A2 for 4 sintering programs.

Sintering Programs Cercon Discs
For third-party furnaces - IFU Recommendations

- 4 Cercon sintering programs, including cooling recommendations, are available depending on the program structure of the furnace
- The programming used for sintering furnace should be analogous to the Dentsply Sirona sintering programs
- For additional support, contact your furnace manufacturer

General Sinter programs Cercon® ht ML, Cercon® ht, Cercon® xt ML, Cercon® xt and Cercon® base all shades

Ramp time in minutes to reach Temp 1

		Superspeed Sinter program for bridge frameworks up to 4 units (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Speed Sinter program for bridge frameworks up to 6 units** (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Sinter program for bridge frameworks up to 8 units** (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Sinter program for bridge frameworks for 9 or more units** (Cercon® base, Cercon® ht, Cercon® ht ML)
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp Time	min	8	90	40	120
Temp. 1	°C	890	1540[2)]	900	860
Holding Time	min	0	35	0	0
Ramp Time	min	7	20	55	320
Temp. 2	°C	1100	1150	1500	1500
Holding Time	min	0	0	145	120
Ramp Time	min	17	35	65	65
Temp. 3	°C	1350	200	200	200
Holding Time	min	0	0	0	0
Ramp Time	min	19	--	--	--
Temp. 4	°C	1540[2)]	--	--	--
Holding Time	min	35	--	--	--
Ramp Time	min	5	--	--	--
Temp. 5	°C	750	--	--	--
Holding Time	min	0:00	--	--	--
Cooling		Gradual opening of the furnace within 5 minutes; Furnace opens at 750°C	Gradual opening of the furnace within 35 min down to 200 °C	With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C

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

General Sinter programs Cercon® ht ML, Cercon® ht, Cercon® xt ML, Cercon® xt and Cercon® base all shades

Ramp time in C°/minute to reach Temp 1

		Superspeed Sinter program for bridge frameworks up to 4 units (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Speed Sinter program for bridge frameworks up to 6 units** (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Sinter program for bridge frameworks up to 8 units** (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Sinter program for bridge frameworks for 9 or more units** (Cercon® base, Cercon® ht, Cercon® ht ML)
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp Time	°C/min	120	17	22	7
Temp. 1	°C	890	1540[2)]	900	860
Holding Time	min	0	35	0	0
Ramp Time	°C/min	30	18	11	2
Temp. 2	°C	1100	1150	1500	1500
Holding Time	min	0	0	145	120
Ramp Time	°C/min	15	27	20	20
Temp. 3	°C	1350	200	200	200
Holding Time	min	0	0	0	0
Ramp Time	°C/min	10	--	--	--
Temp. 4	°C	1540[2)]	--	--	--
Holding Time	min	35	--	--	--
Ramp Time	°C/min	155	--	--	--
Temp. 5	°C	750	--	--	--
Holding Time	min	0	--	--	--
Cooling		Gradual opening of the furnace within 5 minutes; Furnace opens at 750°C	Gradual opening of the furnace within 35 min down to 200 °C	With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C

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

General Sinter programs Cercon® ht ML, Cercon® ht, Cercon® xt ML, Cercon® xt and Cercon® base all shades

Ramp time in C°/hour to reach Temp 1

		Superspeed Sinter program for bridge frameworks up to 4 units (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Speed Sinter program for bridge frameworks up to 6 units** (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Sinter program for bridge frameworks up to 8 units** (Cercon® base, Cercon® ht, Cercon® ht ML) and bridge frameworks up to 3 units (Cercon® xt, Cercon® xt ML)	**Sinter program for bridge frameworks for 9 or more units** (Cercon® base, Cercon® ht, Cercon® ht ML)
Start-Temp.	°C	RT[1)]	RT[1)]	RT[1)]	RT[1)]
Ramp Time	°C/h	7200	1020	1320	420
Temp. 1	°C	890	1540[2)]	900	860
Holding Time	h:min	0:00	0:35	0:00	0:00
Ramp Time	°C/h	1800	1080	660	20
Temp. 2	°C	1100	1150	1500	1500
Holding Time	h:min	0:00	0:00	2:15	2:00
Ramp Time	°C/h	900	1620	1200	1200
Temp. 3	°C	1350	200	200	200
Holding Time	h:min	0:00	0:00	0:00	0:00
Ramp Time	°C/h	600	--	--	--
Temp. 4	°C	1540[2)]	--	--	--
Holding Time	h:min	0:35	--	--	--
Ramp Time	°C/h	9300	--	--	--
Temp. 5	°C	750	--	--	--
Holding Time	h:min	0	--	--	--
Cooling		Gradual opening of the furnace within 5 minutes; Furnace opens at 750°C	Gradual opening of the furnace within 35 min down to 200 °C	With closed furnace cooling down to 200 °C	With closed furnace cooling down to 200 °C

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

Sources of 3rd Party Furnace Manufacturer for DS Sintering & Firing Programs

DEKEMA

For Cercon products available with login / registration:

https://www.dekema.com/en/login/
https://www.dekema.com/en/login/register-lab

Nabertherm
MORE THAN HEAT 30-3000 °C

For Cercon products expected to be available from Q1/2024:

https://nabertherm.com/en/hersteller/dentsply-sirona

Wrong Sintering Temperature: **Effects of under or oversintering**

Sintering Temperature **Too Low**		• Opaque result • No diffusion between layers, layers can be easily distinguished
Sintering Temperature **Accurate**		• Shade is perfect • Excellent chroma in dentin • Seamless diffusion between layers
Sintering Temperature **Too High**		• Shade too bright • Loss of chroma in dentin

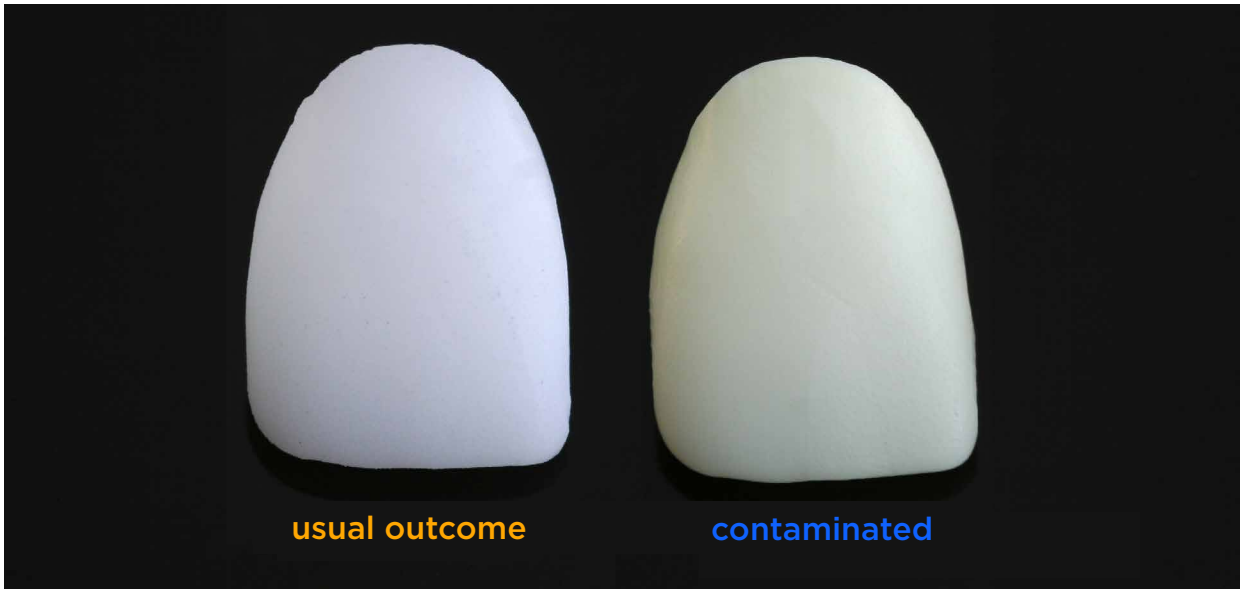
Tip: Calibration and/or service of furnace is necessary.

Example: Cercon ht ML A2

Contamination of Sintering Temperature: **Effects of contamination**

Due to heating elements (MoSi2)	• Yellow discoloration (see image below)
Due to coloring liquids	• Discoloration, opaque result

Tip: Run cleaning cycles* twice or call service of furnace.



Due to sintering trays and/ or beads	• Discoloration, opaque result

Tip: Removal of sintering trays and/or beads and run cleaning cycles.*

*: e.g. cycle with highest possible sintering temperature with no units, sintering trays & beads.

Contamination by Polymer Material

Burs were used for polymer material (PMMA, composite, resin) and afterwards for Cercon discs.



Contamination due to polymer material or contaminated sintering beads.

Tip: Use milling and grinding tools exclusively for Cercon.

Adjustments after Sintering
Potential Sources of Fractures

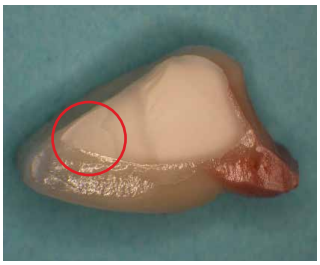
- Massive grinding of the whole restoration
- No water cooling during grinding/cutting
- Additional seperation in the connector areas
- After veneering: Seperation down to the framework
- Sandblast pressure (> 3 bar) is too high
- Usage of abrasive particles for sandblasting

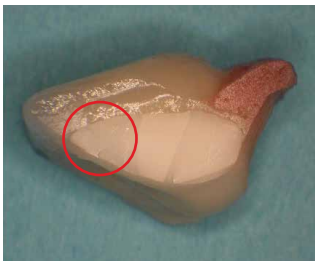
Fractured Bridges:
1 day after finalization

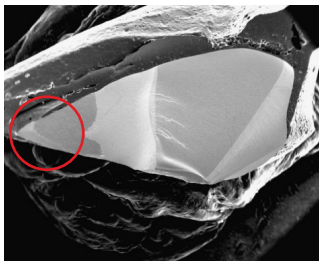
What happened

The framework was heavily grinded in the area of the connectors, which led to the development of cracks. Due to multiple firings of veneering ceramic and gingiva materials, the cracks grew due to thermal stresses and led to fractures of the restoration.

Fracture surface, processing marks (grinding) down to the framework







Tip: Avoid massive grinding of the sintered framework / restoration, especially in the connector area.

All detailed instructions for use are available at:
https://lp.dentsplysirona.com/en/download-center.html