



CE 0483

CARMEN®  
**CCS**  
COMPACT CERAMIC SYSTEM

# Instructions for Use

# Dear Customer,

Thank you for having chosen Dentaaurum products. With this decision you can enjoy and rely upon perfectly harmonizing, high quality components for the fabrication of aesthetical ceramic restorations.

When working with ceramic materials it is essential to follow the CCS instructions for use exactly.

In this brochure you will find many practical tips on how to use our products. For further directions on working with CCS ceramic please see our brochure „Handling Tips Carmen®“, REF 989-677-20.

Even so, if you should have any other questions regarding our products, we are there to support you.

Our dental technical advisors will be pleased to help you with any question regarding the use of our products.

**Hotline +49 72 31 / 803 - 410**

Information and instructions on using Dentaaurum ceramic systems can be found in the internet at

**[www.dentaaurum.com](http://www.dentaaurum.com)**

## The following symbols used by Dentaaurum mean



See Instructions for Use

$\alpha$

Symbol used for the coefficient of thermal expansion (CTE). Unless otherwise stated for the temperature interval of 25 °C / 77 °F to 400 °C / 752 °F after two main firings

$T_g$

Transformation temperature

LOT

Lot Number (CH.-B)



Please use by..... (expiry date)

CE 0483

Rx only

Caution: Fed. Law restricts this device to sale by or on the order of a certified dental technician.  
(Only to be used by qualified persons)

Date of Information 08/15, subject to alterations

# Contents

	Page
Indications . . . . .	3
CCS Systems - Characteristics . . . . .	4
CCS Product Components and Assortment . . . . .	5
Carmen® Product Components . . . . .	6
Firing test . . . . .	7
Furnace Cleaning / Furnace Soldering . . . . .	8
Metal framework design and preparation . . . . .	9
Applying the paste opaque . . . . .	10
How to use the Carmen® shoulder materials . . . . .	11
Applying the shoulder materials . . . . .	12
Layer diagramm . . . . .	13
Layer build-up (standard) step-by-step . . . . .	14
Individual layer build-up step-by-step . . . . .	15
Using the Stains Universal . . . . .	16
Standard firing recommendations . . . . .	16
Firing recommendations for selected furnaces . . . . .	17

## Indications

The CCS system is a bonding ceramic according to EN ISO 9693 and EN ISO 6872 (Typ I). This ceramic is suitable for bonding with precious and non-precious metal alloys with a coefficient of thermal expansion of  $a = 14.1 \times 10^{-6}/K$  to  $15.3 \times 10^{-6}/K$  at  $25\text{ °C} - 600\text{ °C}/77\text{ °F} - 1112\text{ °F}$  and  $13.9 \times 10^{-6}/K$  to  $15.1 \times 10^{-6}/K$  at  $25\text{ °C} - 500\text{ °C}/77\text{ °F} - 932\text{ °F}$ .

The ceramic system CCS is perfectly compatible with the refractory die material EspriVest Ultra which enables the production of inlays, onlays, veneers and metal-free crowns. It is essential that metal free restorations are fixed in the mouth with an adhesive cement.

Please note that the CCS system has been developed for dental application and must be used according to the manufacturing instructions. It is the user's obligation and responsibility to ensure this material is suitable for the intended application, especially when it is intended for use other than those described in the manufacturing instructions. The manufacturer does not accept any responsibility for damage resulting from improper use.

# CCS Systems – Characteristics

## Easy build-up technique

### Only a few steps to successful results

Laboratory life is determined by production. It is essential that every working step is completed quickly and successfully. There isn't always enough time for complicated build-up techniques which require a multitude of ceramic powders. The key to success is the ability to produce successful results in only a few working steps. The new CCS system from Dentaaurum is a manageable ceramic program which contains only a small number of essential components, which when used in the customary way...

- two opaque bakes
- an over dimensioned, anatomical tooth shape build-up in dentin
- the Incisal third is cut away and re-built with Incisal porcelain, first dentin bake
- the shape is corrected and then fired
- grinding, finishing, the occlusal situation is checked and then glazed and polished

...can be transformed into reliable dental restorations which are vital in appearance and natural in colour. Using simple layering techniques it is possible to reproduce teeth resembling that of natural dentition. The CCS system also includes materials required for individual characterization, enabling you to fulfil the unique aesthetical demands of each patient. This material's great working tolerance and reliability provide you with maximum working safety and flexibility.

## Compact firing program

### Increase your laboratory's productivity

The CCS system has a compact firing program which means less work for your ceramic furnace. We have optimized the length of the various firing stages which saves you precious working time and improves productivity in your laboratory. The high starting temperature at 550 °C/1022 °F and fast rate of heat increase of 65 K·min<sup>-1</sup> helps you to reach your goal – the finished restoration - quicker. Slow cooling at the end of a firing sequence is not necessary. The low firing temperature of 870 °C/1598 °F for dentin and main bakes means the alloy is placed under less stress.

## Perfectly in tune with one another

### Completely compatible with Carmen®

The new CCS system is completely compatible with the well proven Carmen® ceramic system and can be easily complemented with Carmen® product components. The difference lies in the simplified build-up technique (Opaque–Dentin–Incisal) due to the new ceramic colouration and the alteration to shorter firing times.

# CCS Product Components and Assortment

Products	Components
Universal-Paste opaque	A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
<b>Dentin D</b>	<b>A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4</b>
<b>Intensive Fluo Dentin IFD</b>	<b>creme, yellow, orange</b>
<b>Incisal I</b>	<b>1, 2, 3</b>
<b>Incisal transpa-opalescence ITO</b>	<b>1, 2, 3</b>
Neutral transparent	NT
Liquids	Universal paste, Stains universal, Modelling LV standard, Modelling LV+

The CCS product components are fully compatible with the Carmen® ceramic system. All CCS product components are emphasized in «**Bold Type**».



CCS shade guide



STARTER-Set



COMPACT-Set

## CCS assortment

### **COMPACT-Set** REF 270-112-00

16 Universal paste opaque A1-D4	3 g each
16 Dentin A1-D4	20 g each
3 Intensive Fluo Dentin	20 g each
3 Incisal I	20 g each
3 Incisal transpa-opalescent ITO	20 g each
1 Neutral transparent material NT	20 g
1 Universal paste liquid	20 ml
1 Modelling liquid LV universal	100 ml
1 CCS shade guide	
1 Opaque brush No. 6	



# Carmen® Product Components

Products	Components
Universal paste opaque	A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4, gingival, Bleach CO 1
Shoulder SM	A, B, C, D, white, yellow, orange, transparent
Cervical C	A, B, C, D
Opaque Dentin OD	A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
Dentin D	A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
Bleach	Bleach CO 1, Bleach CD 1, 2, Bleach CI 1
Opaque Dentin intensive ODI	yellow, ochre, salmon, caramel
Dentin intensive DI	orange
Arteline effect AL	ivory, yellow, golden yellow, honey yellow, lemon, olive
Incisal transparent IT	57, 58, 59, 60, Bleach CI 1
Incisal opalescent IO	57, 58, 59, 60
Neutral transparent NT	NT
Transparent opalescent TO	64
Neutral transparent opalescent NTO	65
Incisal intensive I	62, 63
Correction CM	CM
Gingival G, GD	light, dark
Stains Universal	A, B, C, 0, 1, 2, 3, 45, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Liquids Universal	Universal paste, Shoulder material, Stains universal, Modelling MV, Modelling LV standard, Modelling LV+, SM-Isosfit

All Carmen® product components are fully compatible with the CCS system.



Carmen® shade guide 1,  
basic materials



Carmen® shade guide 2,  
effect materials

# Firing Test

## Firing Test

In order for you to adjust your ceramic furnace correctly, we recommend using a firing sample as this is the only way to check the furnace's firing conduct.

To prepare the firing sample mix NT powder (Neutral transparent) with modelling liquid LV+ Universal.

Temperature of furnace for firing sample:

- Base temperature: 500 °C/932 °F
- Drying time: 8 min
- Heating rate: 50 °C/min / 122 °F/min
- Vacuum starts at 500 °C/932 °F
- Vacuum stops at final temperature 870 °C/1598 °F
- Holding time: 1 min without vacuum



Fig. 1: Optimal test results.



Fig. 2: Ceramic sample after low firing temperature.

**Place the sample onto a piece of platinum foil, not onto a soft firing cushion due to danger of clouding.**

The furnace temperature is correct when the ceramic sample is clear with sharp edges after firing (Fig. 1). The furnace temperature is too high when the ceramic sample is extremely shiny and has no sharp edges after firing. The furnace temperature is too low when the ceramic sample is milky white (Fig. 2) after firing. Increase or reduce the final furnace temperature in 10 °C/50 °F steps. Repeat the test once again.

# Furnace Cleaning / Furnace Soldering

## Furnace Cleaning

Ceramic furnaces should be cleaned on a regular basis in order to remove impurities from the inner walls of the firing chamber. For this reason we recommend:

- a regular furnace cleaning bake using carbon fibre platelets REF 260-317-00
- Base temperature: 600 °C / 1112 °F
- Drying time: 1 min
- Heating rate: 100-120 °C/min / 212-248 °F/min
- Final temperature: 1050 °C / 1922 °F
- Including the firing tray with pins
- Holding time: 10 min

Firing program without vacuum. Please follow the furnace manufacturer's instructions!

## Furnace soldering

Soldering after firing:

- 2nd Solder (745 °C / 1373 °F)
- Base temperature: 200 °C / 392 °F
- Drying time: 8 min
- Heating rate: 55 °C/min / 131 °F/min
- Final temperature: 810 °C / 1490 °F
- Holding time: 30 s
- without vacuum
- no slow cooling

### **Please note:**

Keep the furnace in order to avoid moisture from entering the firing chamber. Always close the furnace after use, if necessary switch to the night modus.

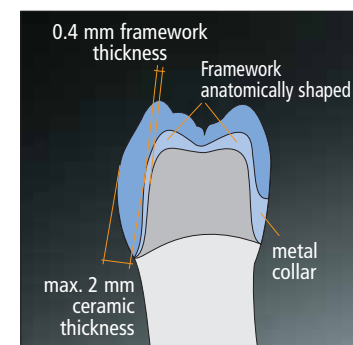
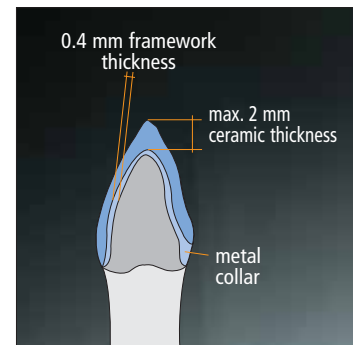


# Metal framework design and preparation

Dental ceramics and dental alloys are usually designed to suit each other thermally so that the stress created when the materials cool down after firing is advantageous to each. This stress is also affected by the shape and design of the metal framework and build-up.

For this reason, when fabricating the metal framework please be sure to follow these basic guidelines:

- The metal framework is a smaller anatomical version of the final tooth shape. Missing mass must be compensated for with metal and not with ceramic.
- Avoid sharp edges and corners. Rounded shapes and soft transitions are preferential. Avoid overlapping.
- A strong metal framework can not only withstand forces created during mastication but also remains stable after firing without deforming. Large bridges can be strengthened by the addition of a metal collar in the same alloy and by including inlay type reinforcements.
- The framework wall thickness should be at least 0.4 mm for precious metal alloys and at least 0.3 mm for non-precious alloys. Please check these thicknesses at the wax-up stage.
- The framework should be designed so that an even layer of ceramic can be built-up.
- The fired ceramic should not exceed a thickness of max. 2 mm.



In order to guarantee a strong bond between ceramic and metal alloy, de-gas and sandblast the framework after grinding in accordance with the manufacturer's recommendations. Before the ceramic build-up the framework must be steam cleaned or boiled so that any impurities attached to the surface may be removed.



Fig. 1:  
Metal surface ground with a cross-cut tungsten carbide bur before sandblasting.



Fig. 2:  
Surface sandblasted with 110 – 150 µm at 2 – 3 bar pressure.

Clean using a steam cleaner or under running water. De-gas and sandblast or pickle, according to the manufacturer's instructions for use.

# Applying the paste opaque

The Universal paste opaque can be used universally for all precious and non-precious bonding alloys and for Galvanogold.

Apply the universal paste opaque in an even layer to cover the metal framework.

**Please note:**

Mix the universal paste opaque thoroughly before use. The paste should have a creamy consistency.



Fig. 1:  
Application with a brush.



Fig. 2:  
Paste opaque after the first bake.



Fig. 3:  
2<sup>nd</sup> application of paste opaque.



Fig. 4:  
Paste opaque after the 2<sup>nd</sup> bake.

**Please note:**

Only clean the paste opaque brush with the universal paste opaque liquid, not with water!

# How to use the Carmen® shoulder materials

Carmen® ceramic has four shoulder materials which are divided into colour groups A-B-C-D. The shoulder material „white“ can be mixed and used to adjust all shades from A1 to D4, see table below. By mixing in the colour „transparent“ the shoulder can be made more transparent. Other individual modifications can be made with the colour „yellow“ and „orange“. Use the universal shoulder liquid to mix.

<b>Tooth shade</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>white</b>
A 1	50 %				50 %
A 2	65 %				35 %
A 3	70 %				30 %
A 3.5	100 %				
A 4	100 %				
B 1		35 %			65 %
B 2		80 %			20 %
B 3		90 %			10 %
B 4		100 %			
C 1			50 %		50 %
C 2			75 %		25 %
C 3			85 %		15 %
C 4			100 %		
D 2				60 %	40 %
D 3	60 %			30 %	10 %
D 4				100 %	

# Applying the shoulder material

Protect the die in the shoulder region with the separating medium SM-Isosfit (REF 260-324-01). Select the shoulder material to match the chosen tooth shade, mix with the universal shoulder liquid and commence with the application immediately.

Apply the shoulder material by starting at the framework and working towards the prepared margin. Allow the material to dry (blow dry or use a liner) and then remove the die and fire according to the recommended program.

The sintering process will cause the shoulder material to shrink after the first bake. A second application and bake will compensate for this. Again protect the shoulder region with separating medium SM-Isosfit, apply the shoulder material to the areas to be corrected and fire using the same settings as the first time. After the second bake, trim using suitable grinding instruments (Watch the speed! Max. 15 000 min<sup>-1</sup>).

Continue with the build-up as usual.



Fig. 1:  
Coping shortened after the  
opaque bake.



Fig. 2:  
1<sup>st</sup> application of shoulder material.



Fig. 3:  
Coping with the corrective  
shoulder material, before  
the 2<sup>nd</sup> bake.



Fig. 4:  
Coping after fitting.

# Layer diagram

Select the ceramic material to match the chosen tooth shade. Build the various layers using this diagram as a guide.

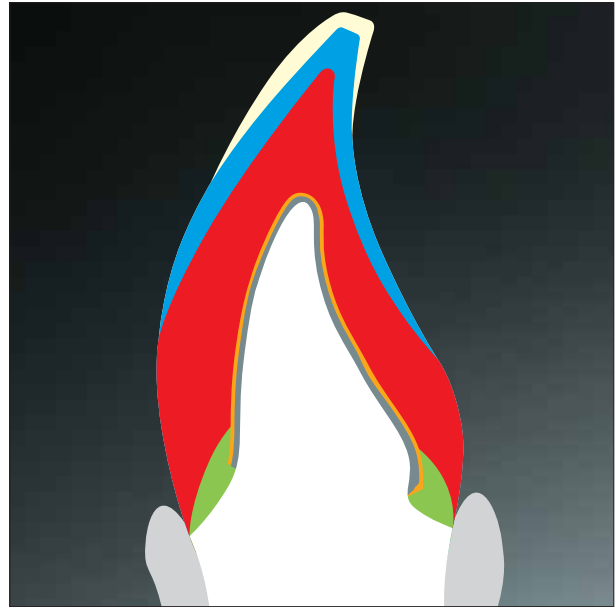
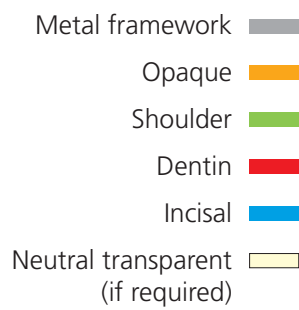


Fig. 1: diagram showing layers

Allocation of incisal material

Tooth shade	Incisal mat.	Tooth shade	Incisal mat.
A 1	I 1	B 4	I 3
A 2	I 1	C 1	I 3
A 3	I 2	C 2	I 2
A 3.5	I 2	C 3	I 2
A 4	I 3	C 4	I 3
B 1	I 1	D 2	I 3
B 2	I 2	D 3	I 2
B 3	I 2	D 4	I 2

# Layer build-up (standard) step-by-step



Fig. 1:  
The complete anatomical tooth shape is built-up in dentin.



Fig. 2:  
Cut away the dentin in the incisal area so that it can be re-built in incisal material.



Fig. 3:  
Apply the incisal material to the prepared incisal area.



Fig. 4:  
Build the overall tooth size slightly larger than required in order to compensate for shrinkage during sintering in the furnace.



Fig. 5:  
Crown after the 1<sup>st</sup> dentin firing.



Fig. 6:  
Correct the tooth shape using dentin and incisal material after the first firing.



Fig. 7:  
Finished crown in preparation for the glaze.



Fig. 8:  
Individual characterization can be applied on the surface using stains mixed with stains universal liquid.



Fig. 9:  
Finished crown after glaze firing.

# Individual layer build-up step-by-step



Fig. 1:  
The complete anatomical tooth shape is built-up in dentin.



Fig. 2:  
Cut away the dentin giving the incisal area a structured appearance.



Fig. 3:  
Individual characterization of the Incisal area with intensive fluo dentin.



Fig. 4:  
Complete the tooth shape by layering Incisal transpaescence.



Fig. 5:  
Crown after the 1<sup>st</sup> dentin firing.



Fig. 6:  
Shape corrections after the first firing.



Fig. 7:  
Finished crown in preparation for the glaze firing.



Fig. 8:  
Crown covered in silver powder in order to check the surface contours and characterization before the final glaze.




Fig. 9:  
Finished crown with dentin and Incisal after glaze firing.

# Using the Stains Universal

The stains materials are available to enhance colour modifications within the crown. They can be used as they are or mixed. It is possible to mix ratio of 10 % of stains colour into the ceramic materials (SM, OD, D, IT, IO, NT + G). Furthermore the stains can be mixed in a pure state together with the stains universal liquid in order to characterize the ceramic surface of the crown.

These stains materials have unique qualities such as individual characteristics and depth of colour.

 Body ST A	 ST 7 dark pink
 Body ST B	 ST 8 lilac
 Body ST C	 ST 9 blue
 ST 0 neutral	 ST 10 grey
 ST 1 white	 ST 11 olive green
 ST 2 vanilla	 ST 12 olive yellow
 ST 3 yellow	 ST 13 mid brown
 ST 45 orange plus	 ST 14 red brown
 ST 6 pink	 ST 15 black

## Standard firing recommendations

	Base temperature	Drying time	Heating rate	Vacuum start	Vacuum finish	Final temperature	Holding time
De-gas according to manufacturer's instructions							
Opaque 1+2 bake universal paste opaque	500 °C 932 °F	6 min	75 °C/min 167 °F/min	500 °C 932 °F	930 °C 1706 °F	930 °C 1706 °F	1 min without vacuum
Shoulder bake 1 + 2	550 °C 1022 °F	6 min	65 °C/min 149 °F/min	550 °C 1022 °F	900 °C 1652 °F	900 °C 1652 °F	1 min without vacuum
Dentin bake 1	550 °C 1022 °F	6 min	65 °C/min 149 °F/min	550 °C 1022 °F	870 °C 1598 °F	870 °C 1598 °F	1 min without vacuum
Dentin bake 2 / Correction bake	550 °C 1022 °F	5 min	65 °C/min 149 °F/min	550 °C 1022 °F	870 °C 1598 °F	870 °C 1598 °F	1 min without vacuum
Glaze firing	550 °C 1022 °F	4 min	75 °C/min 167 °F/min	–	–	870 °C 1598 °F	1 min without vacuum

These recommendations are based upon silver calibrated furnaces. Longer drying times will enhance results.

### Please Note:

The firing temperatures indicated are approximate values, deviations due to manufacturer or age of equipment must be individually adjusted.

The firing recommendations are based upon silver calibrated furnaces.

All recommendations have been carefully adjusted, and are presented subject to change.

Our dental technical advisors are available to answer any questions you may have regarding your ceramic furnace.

**Hotline +497231/803-410**



# Firing recommendations for selected furnaces

## Austromat 3001

Opaque bake 1 + 2 – universal opaque	C500 T360 · L9 V9 T075 · C930 V0 T60 CO LO T2 C500
Shoulder bake 1 + 2	C550 T360 · L9 V9 T050 · C900 V0 T60 CO LO T2 C550
Dentin bake 1	C550 T360 · L9 V9 T050 · C870 V0 T60 CO LO T2 C550
Dentin bake 2 / Correction	C550 T300 · L9 V9 T050 · C870 V0 T60 CO LO T2 C550
Glaze bake	C550 T240 · L9 T075 · C870 T120 CO LO T2 C550

## Austromat M

	START	□	↑	→	VAC LEVEL	°C ↗ min	END	→ min:sec	(V)	↘ 1	↘ 2
Opaque bake 1 + 2 universal opaque	500 °C	6	2	0	9	75 °C	930 °C	1:00		0	0
Shoulder bake 1 + 2	550 °C	2	4	2	9	65 °C	900 °C	1:00		0	0
Dentin bake 1	550 °C	3	3	2	9	65 °C	870 °C	1:00		0	0
Dentin bake 2 / Correction	550 °C	3	3	2	9	65 °C	870 °C	1:00		0	0
Glaze bake	550 °C	0	2	0	0	75 °C	870 °C	2:00		0	0

## Multimat MCII (Mach1/Mach2)

	Pre-heating temperatur	Drying time (min)	Pre-heating time (min)	Vacuum (min)	Firing time (min)	Firing temperature	Heating rate (min)	Vacuum
Opaque bake 1 + 2 universal opaque	500 °C	5	1	1.0	2.0	930 °C*	75 °C	50 °C
Shoulder bake 1 + 2	500 °C	5	1	1.0	2.0	920 °C*	50 °C	50 °C
Dentin bake 1	500 °C	5	1	1.0	2.0	880 °C*	50 °C	50 °C
Dentin bake 2 / Correction	500 °C	4	1	1.0	2.0	880 °C*	50 °C	50 °C
Glaze bake	500 °C	3	1	–	1.5 - 3.0	880 °C*	75 °C	–

### Notes:

- Alloys with a high gold content may require pickling to remove the oxide after having been de-gassed. (Please see manufacturer's instructions).
- CCS does not require glaze powder. To increase the surface shine, lengthen the holding time.

# Firing recommendations for selected furnaces

<b>P90/P95</b>							
	Stand-by temperature	Heating rate (min)	Firing temperature	Closing time (min)	Holding time (min)	Vacuum ON	Vacuum OFF
Opaque 1 + 2 Universal paste opaque	400 °C	75 °C	930 °C	8 *	1	400 °C	929 °C*
Shoulder bake 1 + 2	550 °C	65 °C	900 °C	5	1	550 °C	899 °C*
Dentin bake 1	550 °C	65 °C	870 °C	6	1	550 °C	869 °C*
Dentin bake 2 / Correction	550 °C	65 °C	870 °C	6	1	550 °C	869 °C*
Glaze	550 °C	75 °C	870 °C	4	1 - 3	–	–

<b>Vacumat</b>						
	Final temperature	Drying time (min)	Heating rate (min)	Holding time (min)	Vacuum (min)	Cooling
Opaque 1 + 2 Universal paste opaque	930 °C	6	7	1	7	–
Shoulder bake 1 + 2	900 °C	5	7	1	7	–
Dentin bake 1	870 °C	6	6	1	6	–
Dentin bake 2 / Correction	870 °C	6	6	1	6	–
Glaze	870 °C	4	5	1 - 3	–	–

\* 8 min closing time (depending on furnace)

## Notes:

- Alloys with a high gold content may require pickling to remove the oxide after having been de-gassed. (Please see manufacturer's instructions).
- CCS does not require glaze powder. To increase the surface shine, lengthen the holding time.



# Dentaurum Group

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DENTAURUM  
QUALITY  
WORLDWIDE  
UNIQUE

➔ For more information on our products and services, please visit [www.dentaurum.de](http://www.dentaurum.de) or contact your local dealer.

Date of information: 08/15

Subject to modifications



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**D**  
DENTAURUM