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BASIC LINE / INDIVIDUAL LINE / TOUCH UP

ceraMotion® Ti

Photo: © Christian Ferrari®

Instructions for Use

ceraMotion® Ti – Titanium ceramic

DENTAURUM

Contents

The instruction manual is designed for practical use directly at the workbench. Put up the ring binder and turn to part one where you will find a shortened version of the basic instructions (Basic Line), which includes all the important information you will require. Turn the page over and you will find the information for the individualised layering technique on the back (Individual Line).

PART 1

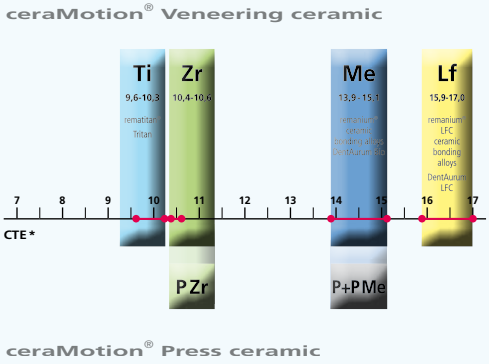
PART 2

Classification CE 0483

ceraMotion® Ti is a class 1a bonding ceramic (according to DIN EN ISO 6872:2008) for veneering titanium frameworks.

Indication

Allocation of ceramic to framework material



ceraMotion® Ti is suitable for veneering titanium and titanium alloys with a thermal expansion of 9.6 to 10.3 · 10^{-6} K^{-1}.

ceraMotion® Ti should not be used for veneering frameworks made of high-performance ceramic (Al_2O_3, ZrO_2) or dental alloys outside the prescribed CTE range.

ceraMotion® Ti must not be used if there is a known intolerance to any constituent.

*** CTE – Coefficient of thermal expansion of the framework material (10^{-6} K^{-1}, 25 – 500 °C / 77-932 °F)**

Framework design

The substructure is an anatomically reduced version of the finished tooth, whereby corners or edges within the framework must be avoided. The thickness of the fired ceramic material must not exceed 2 mm.

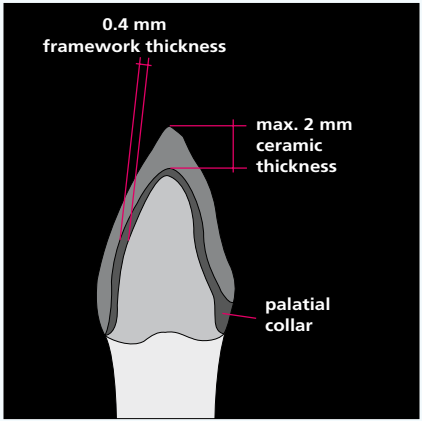


Fig. 1: framework design of an anterior crown

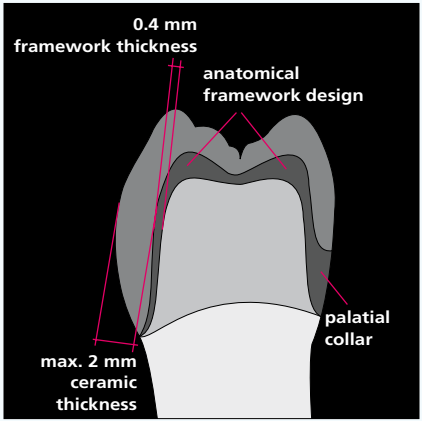


Fig. 2: framework design of a molar crown

Preparing the framework

Preparing and sandblasting: Please adhere to the titanium manufacturer's instructions.

Prepare titanium using a cross-cut tungsten carbide bur specially designed for titanium. Sandblast using Al_2O_3 (125 µm) and clean. An oxide firing is not required (Fig. 3).

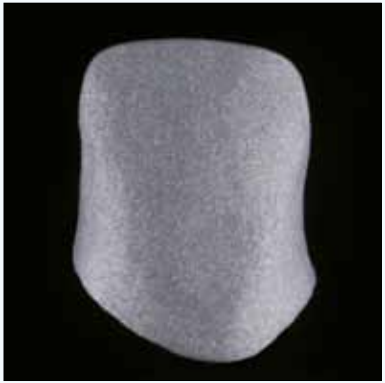


Fig. 3: framework

Note:
Prepare titanium using a cross-cut tungsten carbide bur in one direction using minimal pressure and a motor speed of 15000-20000 min^{-1}.
After preparation, sandblast the framework using aluminium oxide (125-250 µm) in a non-recycling sandblaster with 2-3 bar at a 45° angle.
Allow the framework to air passivate for 10 min, but not longer than 30 min. Then steam clean the framework.

Fig. 4: correctly fired material sample

Fig. 5: underfired material sample

Firing control

We recommend carrying out a test firing in order to assess the firing temperature of your furnace, as this is the only method of determining the firing procedure correctly.

The test sample is prepared by mixing transpa material T with the Modelling Liquid (REF 254-000-10).

Carry out the first dentin firing. When firing, place the test sample onto platinum foil and not onto a piece of firing wool, otherwise the results may appear cloudy.

The furnace temperature is correct if the fired test sample is clearly transparent and has sharp edges (see Fig. 4).

If the furnaces end temperature is too high, the fired test sample will be extremely shiny and has no sharp edges. If the end temperature is too low, the fired test sample will be milky white in colour (see Fig. 5).

Please increase/decrease the end temperature of the furnace in 10 °C / 50 °F steps. Subsequently re-fire the test sample.

Fig. 6: application of the Paste Bonder

Fig. 7: Paste Bonder after firing

Paste Bonder

Paste Bonder:

Uniformly apply a thin layer of Paste Bonder to the framework.

Note:

Before use, mix the Paste Bonder in its pot using a glass or agate spatula. The paste should have a creamy consistency. In order to achieve the correct consistency after mixing, it is possible to add Paste Liquid (REF 254-006-02) in very small quantities.

Avoid contact between Paste Bonder and water; clean the brush with Paste Liquid.

After firing, the Paste Bonder should have a uniform, shiny surface.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Paste Bonder	500 / 932	6	65 / 149	500 / 932	795 / 1463	795 / 1463	1 (with vacuum)

Powder Bonder

Mix the Bonder to a creamy consistency with BOL Liquid (REF 254-008-10) and uniformly apply a thin layer to the framework.

Fig. 8: application of the Bonder

Fig. 9: Bonder after firing

Note: Apply the Bonder using a glass instrument or a thin brush. After firing, the Bonder should have a uniform, shiny surface.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Powder Bonder	500 / 932	4	65 / 149	500 / 932	795 / 1463	795 / 1463	1 (with vacuum)

Opaque

Apply the Opaque in 2 firing cycles to cover the framework completely. No wash firing is required.

Fig. 10: application using a glass instrument

Fig. 11: Opaque after the first firing

Note: Mix the Opaque with Powder BOL Liquid (REF 254-008-10) to a creamy consistency. The Opaque can also be applied using the spray-on-technique. Apply the Opaque using a glass instrument or a thin brush.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Opaque 1	500 / 932	4	65 / 149	500 / 932	790 / 1454	790 / 1454	1 (with vacuum)

Opaque

Fig. 12: second application of Opaque

Fig. 13: Opaque after firing

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Opaque 2	500 / 932	4	65 / 149	500 / 932	790 / 1454	790 / 1454	1 (with vacuum)

Layering technique: Basic build-up

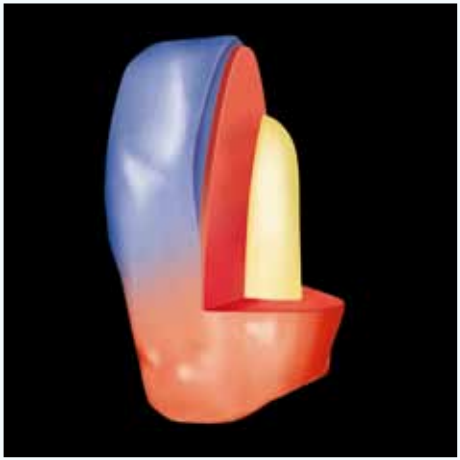


Fig. 14: basic build-up

Opaque

Dentin

Incisal

Build-up

Build-up the complete anatomical tooth shape in Dentin, cut back the Dentin in the region of the incisal third. Use standard Modelling Liquid (REF 254-000-10)!

Note:

Up to 10 % of Stains/Body Stains can be mixed into the ceramic material.

Fig. 15: complete anatomical tooth shape

Fig. 16: cutting back the Dentin in the incisal third

Build-up

Fig. 17: applying the incisal material

Fig. 18: build-up before the first firing

Incisal allocation table:

Dentin shade	Incisal Standard	Incisal Opal	Incisal Transpa
A1, A2, B1	I 1	IO 1	IT 1
A3, A3,5, B2, B3, B4, C1, C2, C3, D2, D3, D4	I 2	IO 2	IT 2
A4, C4	I 3	IO 3	IT 3

Build-up

Note:

Build the tooth slightly larger than the actual anatomical size in order to compensate for ceramic shrinkage during firing (Fig. 17 + 18).

When building-up a bridge, the teeth should be separated interdentally all the way back to the framework before the first firing, in order to control the shrinkage.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Dentin firing 1	500 / 932	6	55 / 131	500 / 932	750 / 1382	750 / 1382	1 (with vacuum)

The given parameter is intended only as a guideline, each dental furnace should be individually adjusted due to deviations through different manufacturers and the age of the furnace.

The firing table is intended for furnaces which are regularly calibrated with fine silver.

All information has been compiled with care, it is, however provided, without guarantee.

Correction technique

Results after the first dentin firing and correction build-up.

Fig. 19: results after the first dentin firing

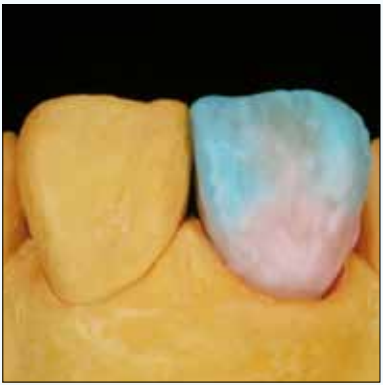


Fig. 20: shape correction with Dentin and Incisal after the first dentin firing

Correction technique

Fig. 21: shape correction with Dentin and Incisal after the first dentin firing

Note:

When working on a bridge construction, apply Dentin to the interdental spaces and basal areas on the pontics first.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Dentin firing 2	500 / 932	4	55 / 131	500 / 932	750 / 1382	750 / 1382	1 (with vacuum)

Processing

Shape correction and finishing

Use recommended burs for the shape correction.
Grind over the entire surface area evenly and clean thoroughly before the glaze firing.

Fig. 22: finishing

Glaze firing

Individual colour nuances can be applied to the surface using Stains/Body Stains (Fig. 23). If required, apply glaze material mixed with Stains Liquid (REF 254-010-02) to the entire piece of work.

Fig. 23: Stains/Glaze application

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Glaze firing	500 / 932	4	65 / 149	*	*	750 / 1382	1
Glaze firing with glaze liquid	500 / 932	6	55 / 131	500 / 932	750 / 1382	750 / 1382	1

* Glaze firing can be completed with or without vacuum

Finishing

The finished piece of work after glaze firing.

Fig. 24: labial view of the finished piece of work

Fig. 25: labial view of the finished piece of work

Firing table (universal)

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Paste Bonder	500 / 932	6	65 / 149	500 / 932	795 / 1463	795 / 1463	1 (with vacuum)
Powder Bonder	500 / 932	4	65 / 149	500 / 932	795 / 1463	795 / 1463	1 (with vacuum)
Opaque 1 + 2	500 / 932	4	65 / 149	500 / 932	790 / 1454	790 / 1454	1 (with vacuum)
Shoulder firing 1 + 2	500 / 932	6	55 / 131	500 / 932	785 / 1445	785 / 1445	1 (with vacuum)
Dentin firing 1	500 / 932	6	55 / 131	500 / 932	750 / 1382	750 / 1382	1 (with vacuum)
Dentin firing 2	500 / 932	4	55 / 131	500 / 932	750 / 1382	750 / 1382	1 (with vacuum)
Correction firing	500 / 932	4	55 / 131	500 / 932	715 / 1319	715 / 1319	1 (with vacuum)
Glaze firing	500 / 932	4	65 / 149	*	*	750 / 1382	1
Glaze firing with glaze liquid	500 / 932	6	55 / 131	500 / 932	750 / 1382	750 / 1382	1
Touch Up glaze and correction	500 / 932	6	55 / 131	500 / 932	730 / 1346	730 / 1346	1

* Glaze firing can be completed with or without vacuum

Note: Larger frameworks can be fired with an extended holding time.

Physical-chemical information (according to DIN EN ISO 6872) ceraMotion® Ti

	Coefficient of thermal expansion/CTE (25-500 °C / 77-932 °F)	Transformation temperature/Tg (°C / °F)	Chemical solubility (µg/cm²)	Flexural strength (Mpa)
Bonder	9.4	575 / 1067	30	125
Opaque	8.9	565 / 1049	35	130
Dentin	8.5	545 / 1013	20	115
Incisal	8.5	545 / 1013	20	115
Modifier	8.5	545 / 1013	20	-
Glaze, Stains	8.4	530 / 986	30	-

Product overview

Bonder	B	Powder
Paste Bonder	PB	Paste
Opaque	O	A-D
Opaque Modifier	OM	gingival, orange
Shoulder	SM	A, B, C, D, white, transpa
Gingival	G	1, 2, 3, 4
Base Dentin	BD	A-D
Base Dentin Modifier	BDM	salmon, caramel, ochre, ivory, lemon, vanilla, brown
Dentin	D	A-D
Dentin Modifier Chroma	DM C	A, B, C, orange
Dentin Modifier Fluo	DM F	cream, yellow, orange
Incisal	I	1, 2, 3
Incisal Opal	IO	1, 2, 3
Incisal Transpa	IT	1, 2, 3
Transpa	T	transpa
Incisal Modifier	IM	opal honey, opal white, opal blue, grey, opal grey
Chroma Concept Opaque	CC O	1 (bleach), 2, 3, 4
Chroma Concept Dentin	CC D	1 (bleach), 2 (bleach), 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Chroma Concept Incisal	CC I	1 (bleach)
Touch Up Base Dentin	TU BD	light, medium, dark
Touch Up Dentin	TU D	light, medium, dark
Touch Up Incisal	TU I	medium, opal, transpa
Correction	C	transpa
Glaze	GL	transpa
Body Stains	B ST	A, B, C
Stains	ST	1 white, 2 vanilla, 3 yellow, 4 orange, 5 pink, 6 purple, 7 blue, 8 grey, 9 olive green, 10 olive yellow, 11 medium brown, 12 red brown, 13 black
Liquids		Modelling Liquid, Modelling Liquid +, Paste Liquid, Powder BOL Liquid, Shoulder Liquid, Stains Liquid, Contrast Marker

Preparing the framework for the ceramic shoulder

Preparing and sandblasting: Please adhere to the titanium manufacturer's instructions.

Prepare titanium using a cross-cut tungsten carbide bur specially designed for titanium, sandblast using Al_2O_3 (125 µm) and clean. An oxide firing is not required (Fig. 1).

Fig. 1: reduced framework, sandblasted

Note:

Bonder see Page 6-7 (Basic Line)

Opaque

Fig. 2: Opaque fired with inlaid white band

Fig. 3: Opaque fired with inlaid orange effects

Layering technique: Individual build-up

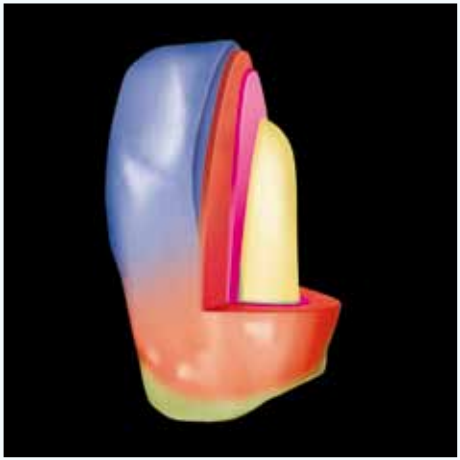


Fig. 4: individual build-up

- Opaque
- Shoulder
- Base Dentin
- Dentin
- Incisal

Mixing table shoulder materials

ceraMotion® Ti has four different shoulder materials which can be divided into the shade groups A-B-C-D. With the shoulder material "white" it is possible to individually mix all shade nuances from A1 to D4 by following the information in the mixing table. By adding the shoulder material "transparent", the translucence is increased in the shoulder. Use Shoulder Liquid (REF 254-004-02)!

Tooth shade	A	B	C	D	white
A1	50 %				50 %
A2	65 %				35 %
A3	70 %				30 %
A3,5	100 %				
A4	100 %				
B1		35 %			65 %
B2		80 %			20 %
B3		90 %			10 %
B4		100 %			
C1			50 %		50 %
C2			75 %		25 %
C3			85 %		15 %
C4			100 %		
D2				60 %	40 %
D3	60 %			30 %	10 %
D4				100 %	

Shoulder

Fig. 5: first shoulder material build-up

Fig. 6: results after the first shoulder firing

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Firing temp. (°C / °F)	Holding time (min)
Shoulder firing 1 + 2	500 / 932	6	55 / 131	500 / 932	785 / 1445	785 / 1445	1 (with vacuum)

Shoulder

Fig. 7: second shoulder material build-up

Fig. 8: fired shoulder

Build-up

Building-up the complete anatomical tooth shape in Dentin.

Fig. 9: complete anatomical tooth shape

Fig. 10: cutting back the Dentin in the incisal third

Build-up

Fig. 11: applying a seam of Transpa

Fig. 12: applying Dentin Modifier Fluo

Note: The individual build-up shown is a suggestion and should be adjusted according to the desired effect.

Build-up

Fig. 13: inlaid white band, orange effect in the cervical area

Fig. 14: alternate layering with I 2 and IO 2

Build-up

Fig. 15: cutback, application of Dentin Modifier Fluo orange, delicately spread up to the incisal edge

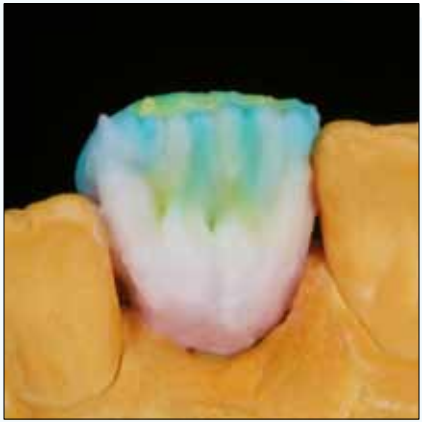


Fig. 16: addition of Dentin and Incisal Opal

Build-up

Fig. 17: results after the first dentin firing

Fig. 18: results after the first dentin firing

Correction technique and finishing

Fig. 19: build-up with Dentin, Incisal and Transpa 1/1

Fig. 20: grinding and finishing the surface

Finishing

Fig. 21: individual Stains/Glaze application

Fig. 22: finished piece of work

Finishing

Fig. 23: finished piece of work

Fig. 24: finished piece of work

Creative firing

- very natural marginal and incisal ridges
- customised degrees of glaze on a single restoration
- adjustment and glaze firing in one

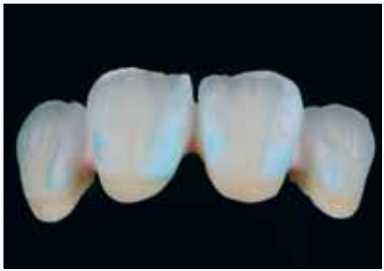


Fig. 25: application of Touch Up material Dentin/ Incisal, mixed with Modelling Liquid

Fig. 26: finished restoration

Note: Adjustments can be made with or without glaze material. When using glaze material, first cover the entire surface with glaze material, stain the restoration and then apply Touch Up material over the glaze material and staining.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Final temp. (°C / °F)	Holding time *
Glaze and adjustment with glaze material	500 / 932	6	55 / 131	500 / 932	730 / 1346	730 / 1346	1 min
					730 / 1346	760 / 1400	20 s
Glaze and adjustment without glaze material	500 / 932	6	55 / 131	500 / 932	730 / 1346	730 / 1346	1 min
					730 / 1346	760 / 1400	20 s

* the required degree of glaze can be attained using a higher firing temperature and shorter holding time, or a lower firing temperature and longer holding time

Additional firing

- adding occlusal contact points at a later stage
- adding to the fitting surface

Fig. 27: application of Touch Up for missing occlusion

Fig. 28: adding to the fitting surface

Note: Adjustments can be made with or without glaze material. When using glaze material, first cover the entire surface with glaze material, stain the restoration and then apply Touch Up material over the glaze material and staining.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Final temp. (°C / °F)	Holding time *
Glaze and adjustment with glaze material	500 / 932	6	55 / 131	500 / 932	730 / 1346	730 / 1346	1 min
					730 / 1346	760 / 1400	20 s
Glaze and adjustment without glaze material	500 / 932	6	55 / 131	500 / 932	730 / 1346	730 / 1346	1 min
					730 / 1346	760 / 1400	20 s

* the required degree of glaze can be attained using a higher firing temperature and shorter holding time, or a lower firing temperature and longer holding time

Repair

☐ repair of a restoration worn by a patient

Note: Restorations that have been worn intraorally must be dried out in the preheat furnace. Clean the restoration, the surface must be roughened or sandblasted. Heat the restoration in the preheat furnace from room temperature to 400 °C / 752 °F at a rate of 5 °C / 41 °F/min. Hold time 4 hours minimum, allow to cool slowly.

Then apply the Touch Up materials Base Dentin, Dentin and Incisal, mixed with Modelling Liquid.

	Start temp. (°C / °F)	Drying time (min)	Heat rate (°C / °F/min)	Vacuum start (°C / °F)	Vacuum end (°C / °F)	Final temp. (°C / °F)	Holding time (min)
Dentin firing during repair	500 / 932	6	55 / 131	500 / 932	700 / 1292	700 / 1292	1
Glaze firing during repair without glaze material	500 / 932	4	75 / 167	-	-	700 / 1292	1
Glaze firing during repair with glaze material	500 / 932	6	55 / 131	500 / 932	690 / 1274	690 / 1274	1

Notes

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ceramotion® Ti

Further information about Dentaurum products is available in the Internet.

www.dentaurum.de

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