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BASIC LINE / INDIVIDUAL LINE

ceraMotion® Lf

Photo: © Christian Ferrari®

Instructions for Use

ceraMotion® Lf – Low-fusing 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).

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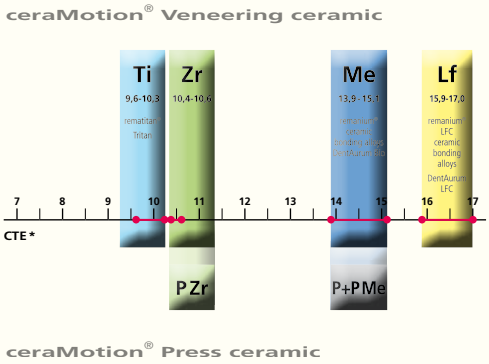
Classification CE 0483

ceraMotion® Lf is a class 1a bonding ceramic (according to DIN EN ISO 6872:2008) for veneering frameworks made from LFC precious metal alloys or LFC non-precious alloys.

Indication

Allocation of ceramic to framework material



ceraMotion® Lf is suitable for veneering dental alloys with a thermal expansion of 15.9 to 17.0 · 10^{-6} K^{-1} (25-500 °C / 77-932 °F).

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

ceraMotion® Lf 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.

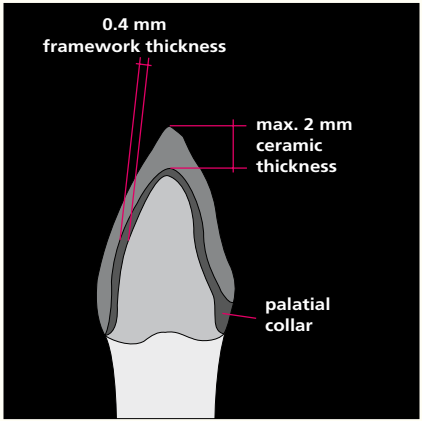


Fig. 1: framework design of an anterior crown

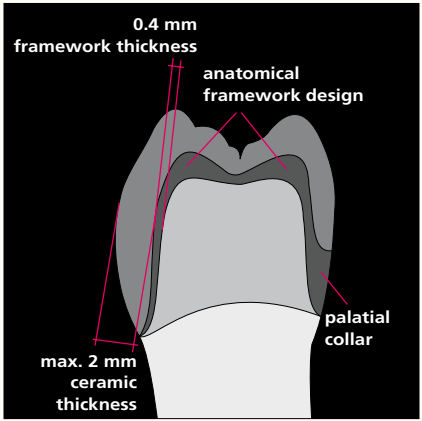


Fig. 2: framework design of a molar crown

Preparing the framework

When grinding, sandblasting and carrying out the oxide firing, please follow the alloy manufacturer's instructions.

Prepare remanium® LFC alloys using a cross-cut tungsten carbide bur, sandblast using Al_2O_3 (125 µm) blasting material and then clean. remanium® does not require an oxide firing (Fig. 3).

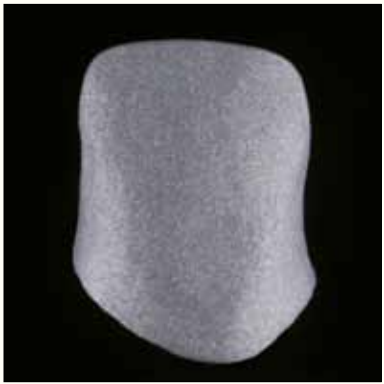


Fig. 3: framework

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.

Paste Opaque Base

The Paste Opaque Base has been specially developed for precious metal alloys with a copper content and ensures complete, shade-stabilising masking of the framework.

Apply Paste Opaque Base uniformly to cover the framework completely.

Fig. 6: Paste Opaque Base application

Note:

Before use, mix the Paste Opaque Base 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 Opaque Base and water; clean the brush with Paste Liquid.

	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 Opaque Base	500 / 932	8	75 / 167	500 / 932	800 / 1472	800 / 1472	1

Fig. 7: application with a brush

Fig. 8: Paste Opaque after the first firing

Paste Opaque

Paste Opaque:

Paste Opaque can be used for all LFC precious metal alloys or LFC non-precious alloys.

Apply an even covering of the Paste Opaque to the framework, a wash firing is not required (please observe the alloy manufacturer's instructions).

Note:

Before use, mix the Paste Opaque 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 254-006-10) in very small quantities.

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

Paste Opaque

Fig. 9: second layer of Paste Opaque

Fig. 10: Paste 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)
Paste Opaque 1 + 2	500 / 932	8	75 / 167	500 / 932	800 / 1472	800 / 1472	1

Layering technique: Basic build-up

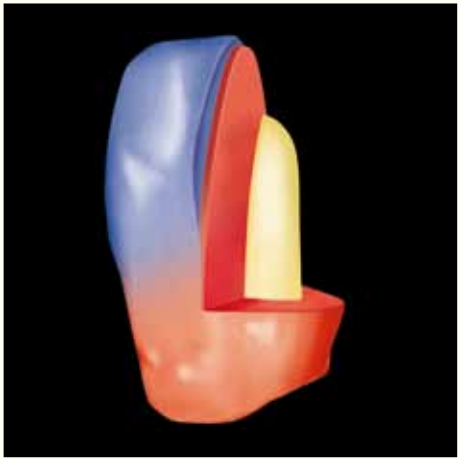


Fig. 11: basic build-up

- 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 Lf Stains/Lf Body Stains can be mixed into the ceramic material.

Fig. 12: complete anatomical tooth shape

Fig. 13: cutting back the Dentin in the incisal third

Build-up

Fig. 14: applying the incisal material

Fig. 15: build-up before the first firing

Incisal allocation table:

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

Build-up

Note:

Build the tooth slightly larger than the actual anatomical size in order to compensate for ceramic shrinkage during firing (Fig. 14 + 15).

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	450 / 842	6	55 / 131	450 / 842	765 / 1409	765 / 1409	1 (with vacuum)

LFC non-precious metal alloys (NP)

Non-precious metal alloys have a lower degree of thermal conductivity. This is noticeable on the ceramic during heating up, firing and cooling down.

Firing results are strongly dependant on the framework design and firing sequence.

Larger frameworks can be fired with an extended holding time.

In order to reduce the amount of stress in the ceramic as much as possible and guarantee safe cooling, we recommend a cool-down phase of 5 min or to 500 °C / 932 °F for LFC CoCr bonding alloys.

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. 16: results after the first dentin firing

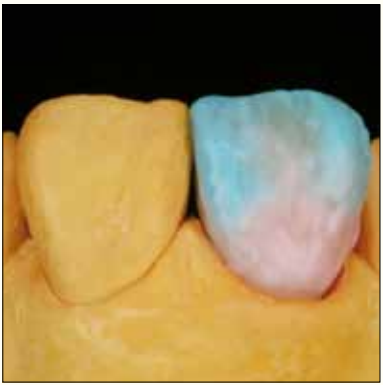


Fig. 17: shape correction with Dentin and Incisal after the first dentin firing

Correction technique

Fig. 18: 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	450 / 842	4	55 / 131	450 / 842	765 / 1409	765 / 1409	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. 19: finishing

Glaze firing

Individual colour nuances can be applied to the surface using Lf Stains/Lf Body Stains (Fig. 20). If required, apply glaze material mixed with Stains Liquid (REF 254-010-02) to the entire piece of work.

Fig. 20: Lf 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	450 / 752	4	75 / 167	-	-	765 / 1409	1
Glaze firing with glaze liquid	450 / 752	6	55 / 131	450 / 752	765 / 1409	765 / 1409	1

Finishing

The finished piece of work after glaze firing.

Fig. 21: labial view of the finished piece of work

Fig. 22: 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 Opaque Base	500 / 932	8	75 / 167	500 / 932	800 / 1472	800 / 1472	1
Paste Opaque 1 + 2	500 / 932	8	75 / 167	500 / 932	800 / 1472	800 / 1472	1
Shoulder firing 1 + 2	450 / 752	6	55 / 131	450 / 752	780 / 1436	780 / 1436	1 (with vacuum)
Dentin firing 1	450 / 752	6	55 / 131	450 / 752	765 / 1409	765 / 1409	1 (with vacuum)
Dentin firing 2	450 / 752	4	55 / 131	450 / 752	765 / 1409	765 / 1409	1 (with vacuum)
Correction firing	450 / 752	4	55 / 131	500 / 932	745 / 1373	745 / 1373	1
Glaze firing	450 / 752	4	75 / 167	-	-	765 / 1409	1
Glaze firing with glaze liquid	450 / 752	6	55 / 131	450 / 752	765 / 1409	765 / 1409	1

LFC non-precious metal alloys (NP)

Larger frameworks can be fired with an extended holding time.

In order to reduce the amount of stress in the ceramic as much as possible and guarantee safe cooling, we recommend a cool-down phase of 5 min or to 500 °C / 932 °F for LFC CoCr bonding alloys.

Preparing the framework for the ceramic shoulder

Please follow the alloy manufacturer's instructions for finishing, sandblasting and the oxide firing.

Prepare remanium® LFC alloys using a cross-cut tungsten carbide bur, sandblast with Al_2O_3 (125 µm) and clean. remanium® does not require an oxide firing (Fig. 1).

Fig. 1: reduced framework, sandblasted

Opaque

Fig. 2: individual Paste Opaque

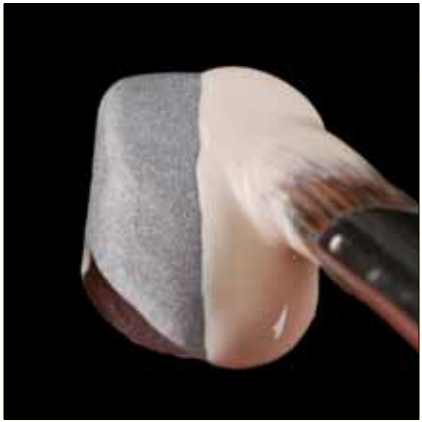


Fig. 3: application with a brush

Note:

Apply Paste Opaque Base before the opaque firing with LFC precious metal alloys with a copper content to ensure shade-stabilising masking of the framework.

Opaque

Fig. 4: Paste Opaque fired with inlaid white band

Fig. 5: Paste Opaque fired with inlaid orange effects

Layering technique: Individual build-up

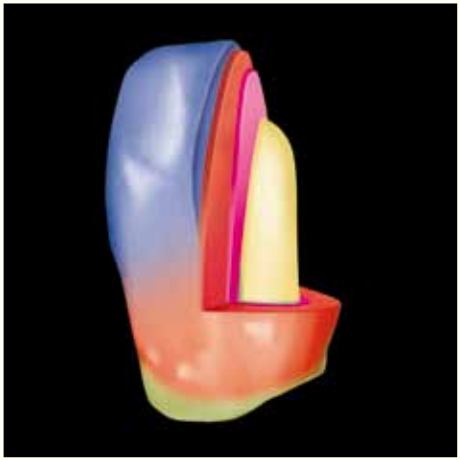


Fig. 6: individual build-up

- Opaque
- Shoulder
- Base Dentin
- Dentin
- Incisal

Mixing table shoulder materials

ceraMotion® Lf 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. 7: first shoulder material build-up

Fig. 8: 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	450 / 842	6	55 / 131	450 / 842	780 / 1436	780 / 1436	1 (with vacuum)

Shoulder

Fig. 9: second shoulder material build-up

Fig. 10: fired shoulder

Build-up

Building-up the complete anatomical tooth shape in Dentin.

Fig. 11: complete anatomical tooth shape

Fig. 12: cutting back the Dentin in the incisal third

Note: Adhere to the following mixing instructions when using Base Dentin.

A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
BD1	1/3 BD1 + 2/3 BD3	BD2	BD3	1/3 BD1 + 2/3 DMCA	BD4	2/3 BD4 + 1/3 BD5	BD5	2/3 BD1 + 1/3 DMCB	BD6	1/3 BD6 + 2/3 BD7	BD7	1/3 BD7 + 2/3 DMC	BD8	BD9	BD10

Build-up

Fig. 13: applying a seam of Transpa

Fig. 14: 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. 15: inlaid white band, orange effect in the cervical area

Fig. 16: alternate layering with I 2 and IO 2

Build-up

Fig. 17: cutback, application of Dentin Modifier Fluo orange, delicately spread up to the incisal edge

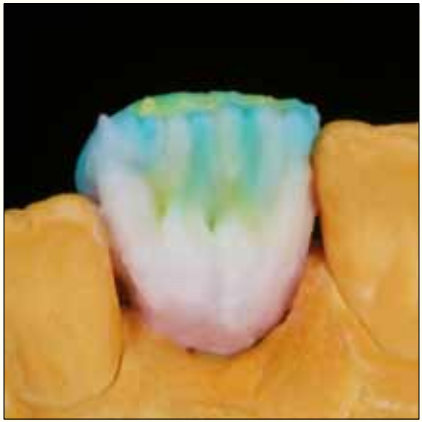


Fig. 18: addition of Dentin and Incisal Opal

Build-up

Fig. 19: results after the first dentin firing

Fig. 20: results after the first dentin firing

Correction technique and finishing

Fig. 21: build-up with Dentin, Incisal and Transpa 1/1

Fig. 22: grinding and finishing the surface

Finishing

Fig. 23: individual Lf Stains/Glaze application

Fig. 24: finished piece of work

Finishing

Fig. 25: finished piece of work

Fig. 26: finished piece of work

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

	Coefficient of thermal expansion/CTE (25-500 °C / 77-932 °F)	Transformation temperature/Tg (°C / °F)	Chemical solubility (µg/cm²)	Flexural strength (Mpa)
Opaque	13.3	520 / 968	25	135
Dentin	14.7	475 / 887	25	115
Incisal	14.7	475 / 887	25	115
Modifier	14.7	475 / 887	25	100
Glaze, Lf Stains	11	495 / 923	45	-

Product overview

Paste Opaque	PO	base, A-D
Paste Opaque Modifier	POM	gingival, orange
Shoulder	SM	A, B, C, D, white, transpa
Gingival	G	light, dark
Base Dentin	BD	1-10
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
Transpa	T	transpa
Chroma Concept Paste Opaque	CC PO	1 (bleach)
Chroma Concept Dentin	CC D	1 (bleach), 2 (bleach)
Chroma Concept Incisal	CC I	1 (bleach)
Correction	C	transpa
Glaze	GL	transpa
Lf Body Stains	LF BST	A, B, C
Lf Stains	LF ST	1 white, 4 orange, 7 blue, 9 olive green, 12 red brown, 13 black
Liquids		Modelling Liquid, Paste Liquid, Shoulder Liquid, Stains Liquid, Contrast Marker

Notes

ceramotion® Lf

Further information about Dentaurum products is available in the Internet.

www.dentaurum.de

www.dentaurum.de
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