

VENEERING MATERIAL

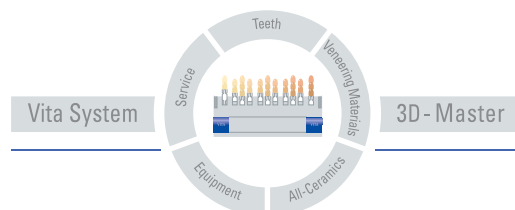
VITAVM[®]15

For metal substructures
made of multi-indication alloys



Working Instructions

Date of Issue: 03-07

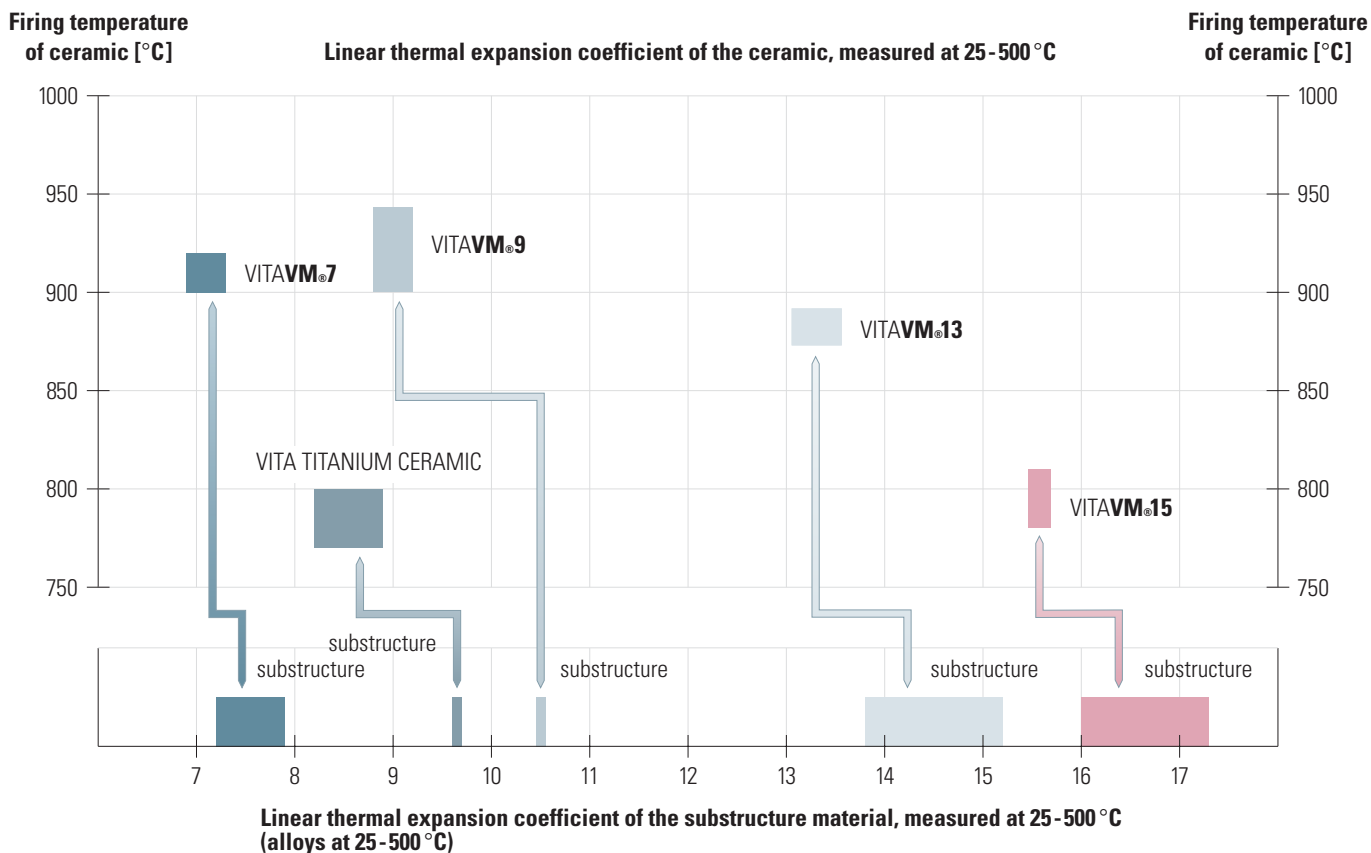


VITA

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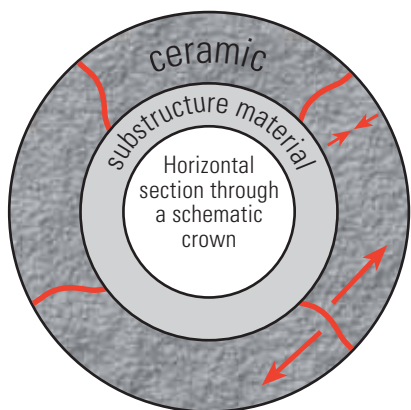
VITAVM.15 Area of Application

For alloys in the CTE range of approx $16.0 - 17.3 \cdot 10^{-6} K^{-1}$

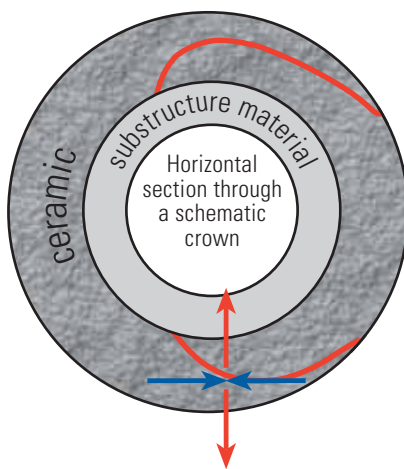


<p>VITAVM 7 CTE (25-500°C) $6.9 - 7.3 \cdot 10^{-6} K^{-1}$</p>	<p>VITA In-Ceram ALUMINA, CTE (25-500°C) $7.2 - 7.6 \cdot 10^{-6} K^{-1}$ VITA In-Ceram SPINELL, CTE (25-500°C) $7.5 - 7.9 \cdot 10^{-6} K^{-1}$ VITA In-Ceram ZIRCONIA, CTE (25-500°C) $7.6 - 7.8 \cdot 10^{-6} K^{-1}$ VITA In-Ceram AL for inLab, CTE (25-500°C) approx. $7.3 \cdot 10^{-6} K^{-1}$</p>
<p>VITA TITANIUM CERAMIC CTE (25-500°C) $8.2 - 8.9 \cdot 10^{-6} K^{-1}$</p>	<p>TITANIUM CTE (25-500°C) approx. $9.6 \cdot 10^{-6} K^{-1}$</p>
<p>VITAVM 9 CTE (25-500°C) $8.8 - 9.2 \cdot 10^{-6} K^{-1}$</p>	<p>VITA In-Ceram YZ for inLab CTE (25-500°C) approx. $10.5 \cdot 10^{-6} K^{-1}$</p>
<p>VITAVM 13 CTE (25-500°C) $13.1 - 13.6 \cdot 10^{-6} K^{-1}$</p>	<p>High gold content, reduced precious metal content, palladium-based and precious metal-free alloys CTE (25-600°C) $13.8 - 15.2 \cdot 10^{-6} K^{-1}$</p>
<p>VITAVM 15 CTE (25-500°C) $15.5 - 15.7 \cdot 10^{-6} K^{-1}$</p>	<p>Multi- indication alloys * CTE (25-600°C) $16.0 - 17.3 \cdot 10^{-6} K^{-1}$</p>

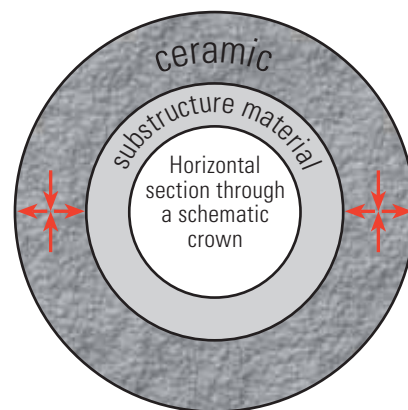
* see alloy list VITAVM 15 in internet



If the CTE of the substructure material is **very much lower** than the CTE of the veneering ceramic, tangential tensile stress will increase and form cracks that run to the outside. This may result in late cracks.



If the CTE of the substructure material is **very much higher** than the CTE of the veneering ceramic, tangential compressive stress will increase and form cracks that run almost parallel to the substructure. This may result in flaking.







The ideal tangential and radial tensile stress is ensured if the CTE of the ceramic has been optimally matched to the CTE of the substructure material.

Optimum preconditions are given if the veneering ceramic features a somewhat lower CTE value than the substructure material. Due to the adhesive bonding, the ceramic must follow the thermal behavior of the substructure material. If cooled down, the ceramic is exposed to slight tangential compressive stress. Under these conditions, cracks that are beginning to form, and hence crack propagation, will be stopped.

If a substructure material is veneered with ceramic, the thickness of the veneer is a decisive factor in addition to the CTE value. Accordingly, differences in strain (radial tensile stresses) are obtained, which will grow in the case of increasing layer thickness.

Explanation of the firing parameters:

Predr. °C	Starting temperature
 min.	Pre drying time in min., closing time
 min.	Heating up time in min.
 °C/min.	Heating up time in degrees Celsius per min.
Temp. approx. °C	End temperature
 min.	Hold time for end temperature.
VAC min.	Hold time for vacuum (start simultaneous with temperature rise)



VITA VACUMAT 4000 PREMIUM T – now with VITA Photo Viewer

 **Important:**

The firing result obtained with dental ceramics largely depends on the user's individual firing procedure and substructure design, as well as other aspects: on the type of furnace, the age of the heating element, location of the temperature sensor, the firing tray and the size of the workpiece during the firing cycles. Our recommendations for the firing temperatures (regardless of whether these are given orally, in writing or in the form of practical demonstration) are based on our own practical experience and numerous internal tests.

The user, however, should consider this information only as a basic guideline. Should the surface, degree of transparency or degree of glaze not correspond to the firing result that is achieved under optimum conditions, the firing procedure must be adjusted accordingly.

The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface quality of the firing object after the firing process.

 **Attention:**

Firing supports likewise have a strong influence.

All VITA VM firing temperatures are based on the use of black ceramic firing supports.



A light glaze of the ceramic surface confirms the correct firing cycle. If, on the other hand, the ceramic is milky and inhomogeneous, this indicates that the temperature is too low. In this case gradually increase the temperature in steps of 10 °C until the correct firing temperature has been reached.

Crowns and bridge units which are to be veneered with ceramic must be modeled in reduced anatomical size. A minimum wall thickness of 0.4 mm is required order to ensure a minimum wall thickness of 0.3 mm after finishing. Avoid sharp edges, undercuts and deep grooves. The stability can be further increased by means of metal collars or inlay-type supports in the palatal area.

It is essential to follow the alloy manufacturer's instructions regarding the substructure modeling, investing, casting, deflasking, finishing, sandblasting and oxidation.

An overview of the alloys tested by VITA in combination with VITA VM 15 is available for download from the internet under www.vita-zahnfabrik.com



Preparation of the framework

The framework before sandblasting, finished according to the manufacturer's instructions with a fine, cross-cut tungsten carbide bur.

Sandblast at a pressure of 2 bar with 125 µm aluminium oxide.

For precious metal free alloys use 250 µm aluminium oxide at a pressure of 2 bar. Please adhere strictly to the manufacturer's instructions.



The framework oxidized according to the manufacturer's instructions

⚠ Important:

Bonding alloys containing zinc (Zn) must be sandblasted and oxidized, and after the oxidation firing, etched in a clean, warm acidic bath for approx. 5 min. Remove all etching residue by steam cleaning.



Wash opaque firing

Powder opaque

Using a brush, apply the powder opaque – which has been mixed with the VITA OPAQUE FLUID to a creamy consistency – in a thin layer to cover the clean, dry framework.



⚠ Important:

In order to obtain an optimum shade result the wash opaque must be applied to cover the surface completely.

The wash opaque firing has 3 functions:

1. To ensure the formation of adhesive oxides.
2. Formation of a bond to the alloy surface.
3. To enhance the chroma of the restoration; particularly in the case of dark oxides.



VITA SPRAY-ON procedure

The wash opaque can also be applied using the VITA SPRAY-ON procedure. Mix the powder wash opaque with VITA SPRAY-ON LIQUID in the appropriate glass container and spray on to the surface of the framework in a homogeneous layer. See separate working instructions for VITA SPRAY-ON (no. 492 M).



Paste opaque

Alternatively, paste wash opaque can be used. Apply in a thin layer, massaging it in to fully cover the surface of the framework.

Note:

The pastes should be stirred before use with a glass or plastic instrument. Should the OPAQUE PASTE be difficult to stir after longer periods of storage, its original consistency can be regained by adding VITA VM PASTE FLUID.

The PASTE OPAQUE requires a fairly long pre-drying time. Please see the recommended firing cycle. The PASTE OPAQUE must not come into contact with water, since this can lead to cracks and bubbles in the opaque during firing.



Recommended firing – wash opaque firing:

	Predr. °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
Powder	400	2.00	6.00	70	820	1.00	6.00
Paste	400	4.00	6.00	70	820	2.00	6.00

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.

The fired wash opaque on a ceramic firing support.

Classification table of the OPAQUE porcelains:

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5	3M1
OP0	OP0	OP0	OP1	OP1	OP2	OP2	OP2	OP2	OP2	OP2	OP2	OP3	OP3	OP3

3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
OP3	OP3	OP3	OP3	OP4	OP4	OP4	OP4	OP4	OP4	OP4	OP5	OP5	OP5



Opaque firing

Mix powder opaque to a creamy consistency with VITAVM OPAQUE FLUID. Apply with a brush or a glass instrument to cover the surface of the veneer and fire according to the appropriate firing cycle. Paste opaque is applied in the same way to cover the surface of the dry framework. Powder opaque can also be applied using the VITA SPRAY-ON procedure.

⚠ Important:

In order to obtain an optimum shade result the opaque must be applied to cover the surface completely.

Recommended firing – opaque firing:

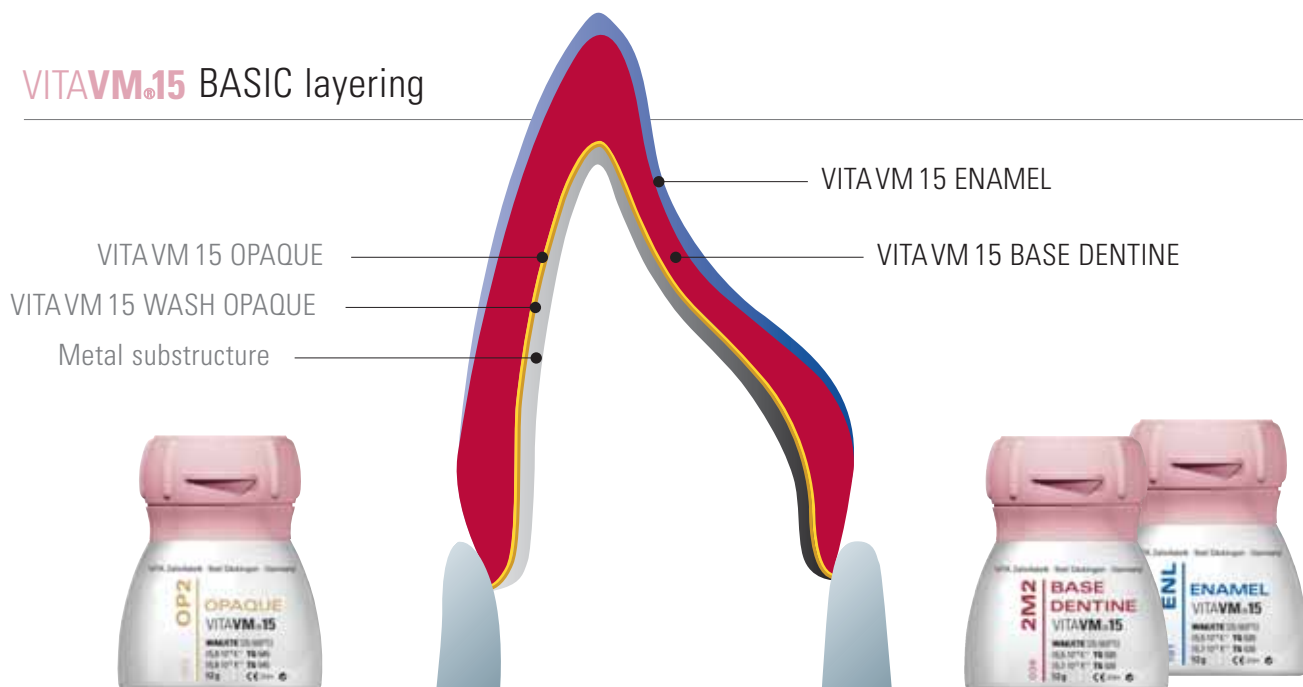
	Predr. °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
Powder	400	2.00	6.00	70	820	1.00	6.00
Paste	400	4.00	6.00	70	820	1.00	6.00



The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.

Correctly fired opaque on a ceramic firing support demonstrates a light surface glaze.

VITAVM[®]15 BASIC layering



After the application of WASH OPAQUE and OPAQUE, VITAVM 15 BASIC layering consists of the application of BASE DENTINE and ENAMEL.

The color-carrying VITAVM 15 BASE DENTINE porcelains give excellent coverage and provide ideal conditions for creating intensively shaded veneers. VITA offers a sure solution particularly for the reproduction of optimum shade results in the case of thin walls with this two-layer alternative. Additionally, the intensive shade effect of the BASE DENTINE permits a generous application of the ENAMEL porcelains, which results in the desired translucency. After applying the opaque, the user is able to create a true-nature restoration with a lifelike appearance using only two layers.

The intensity of the restoration can be influenced by means of the different conditions in the wall thickness of BASE DENTINE and ENAMEL. The thicker the BASE DENTINE layer, the more intensive the shade result. The thicker the ENAMEL layer, the less intensive the shade result.

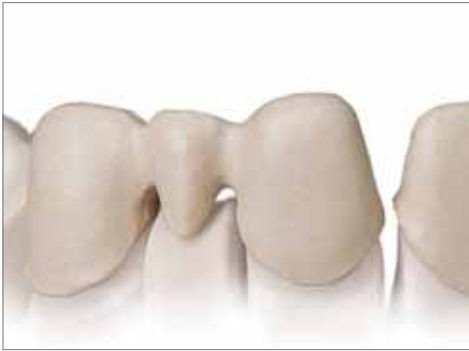
VITAVM[®]15 BASIC KIT */**

Quantity	Content	Material
1	12g	WASH OPAQUE WO
5	12g	OPAQUE OP1 - OP5
5	12g	CHROMA PLUS CP1 - CP5
26	12g	BASE DENTINE 1M1 - 5M3
2	12g	ENAMEL [^] ENL, END
1	12g	NEUTRAL [^] NT
1	12g	WINDOW [^] WIN
3	12g	CORRECTIVE COR1 - COR3
1	50ml	VITAVM MODELLING LIQUID
1	50ml	VITAVM OPAQUE FLUID
1		Shade indicator
1		VITA Toothguide 3D-MASTER
1		Working instructions

* Available as VITAVM 15 BASIC KIT SMALL with reduced assortment of porcelains.

** Also available as VITAVM 15 BASIC KIT/BASIC KIT SMALL with OPAQUE PASTE.

[^] ENL, END, NT, WIN are also available in 50g.



Metal substructure coated with OPAQUE

To enable the restoration to be lifted off easily at a later stage, first insulate the model with the VITA Modisol pen.



Application of VITAVM.15 BASE DENTINE

Apply the desired shade of BASE DENTINE starting from the neck to obtain the required complete tooth shape. The centric, lateral and protrusive occlusion should be checked in the articulator during this stage.

See page 12 for notes on the **BASIC layering!**



The required amount of the BASE DENTINE build-up is trimmed according to the layering pattern in order to allow sufficient space for the addition of ENAMEL.

Classification table of the VITAVM.15 ENAMEL porcelains

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
ENL	ENL	ENL	ENL	ENL	END	END	END	END	END	END	END	END	END	END



Application of VITAVM.15 ENAMEL

Apply several small portions of ENAMEL to complete the crown mould beginning from the middle third of the crown.
To compensate firing shrinkage, the size of the mould must be prepared somewhat larger.

Please see page 32 for notes on the layering structure!



Prior to the first dentine firing, the individual units of bridges must be separated in the interproximal areas down to the substructure.



The applied porcelains ready for first dentine firing.

Recommended firing – 1st dentine firing

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	6.00	8.00	50	800	1.00	8.00

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



Restoration after first dentine firing.



Corrections of shape/further layering

Insulate the model once more with the VITA Modisol pen. The interdental spaces and the basal surface of the pontic must be filled with BASE DENTINE.



Apply BASE DENTINE starting from the neck area and add ENAMEL in the body area up to the incisal area to perform subsequent corrections of the shape.



Recommended firing – 2nd dentine firing

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	6.00	7.48	50	790	1.00	7.48

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.

Bridge and crown after 2nd dentine firing.



Finishing

Finish the bridge or crown respectively. Prior to glaze firing the entire surface must be ground evenly and grinding dust removed thoroughly.

In case of dust formation, use an extraction system or wear a face mask. Additionally, protective goggles must be worn when grinding the fired ceramic.



Recommended firing - glaze firing

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	0.00	4.52	80	790	1.10	-

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



If required, the entire restoration can be coated with VITA AKZENT GLAZE and then individualized using the VITA AKZENT stains. (See VITA AKZENT working instructions no. 771).

Recommended firing – Glaze firing with VITA AKZENT®

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	4.00	4.52	80	780	1.00	-

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



Completed restoration on the model.

Explanation of the firing parameters:

- Predr. °C Starting temperature

- min. Predrying time in min., closing time
- ↗ min. Heating up time in min.
- ↗ °C/min. Heating up time in degrees Celsius per min.
- Temp. approx. °C End temperature

- min. Hold time for end temperature in min.
- VAC min. Hold time for vacuum (start simultaneous with temperature rise)

Firing chart for VITAVM.15

	Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. * approx. °C	→ min.	VAC min.
Oxidation firing	Please heed alloy manufacturer's instructions !						
WASH OPAQUE firing	400	2.00	6.00	70	820	1.00	6.00
WASH OPAQUE PASTE firing	400	6.00	6.00	70	820	1.00	6.00
OPAQUE firing	400	2.00	6.00	70	820	1.00	6.00
OPAQUE PASTE firing	400	4.00	6.00	70	820	1.00	6.00
MARGIN* firing	400	6.00	8.12	50	810	1.00	8.12
EFFECT LINER* firing	400	6.00	8.12	50	810	1.00	8.12
1 st dentine firing	400	6.00	8.00	50	800	1.00	8.00
2 nd dentine firing	400	6.00	7.48	50	790	1.00	7.48
Glaze firing	400	0.00	4.52	80	790	1.00	-
Glaze firing VITA AKZENT	400	4.00	4.52	80	790	1.00	-
Glaze firing VITA Glaze LT	400	4.00	4.45	80	780	1.00	-
Correction firing with CORRECTIVE*	400	4.00	7.00	50	750	1.00	7.00

* area of indication see page 25

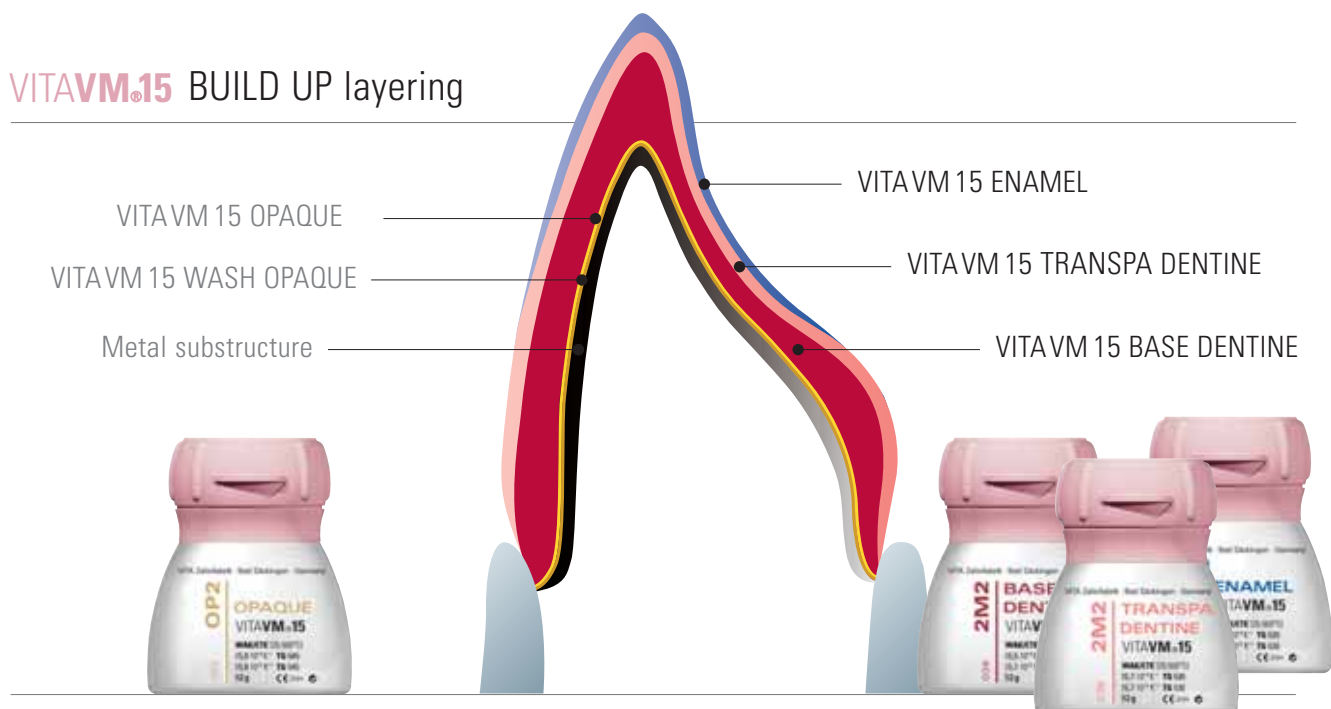
The firing result obtained with dental ceramics largely depends on the user's individual firing procedure and substructure design, i.e., among other aspects, on the type of furnace, the age of the heating element, location of the temperature sensor, the firing tray and the size of the workpiece during the firing cycles.

Our recommendations for the firing temperatures (regardless of whether these are given orally, in writing or in the form of practical demonstration) are based on our own practical experience and numerous internal tests. The user, however, should consider this information only as a basic guideline.

Should the surface, degree of transparency or degree of glaze not correspond to the firing result that is achieved under optimum conditions, the firing procedure must be adjusted accordingly. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface quality of the firing object after the firing process.

Notes on alloys: See alloy list VITAVM 15 at: www.vita-zahnfabrik.com

VITAVM.15 BUILD UP layering



The VITAVM 15 BUILD UP layering consists of the application of the three materials BASE DENTINE, DENTINE and ENAMEL after applying the WASH OPAQUE and OPAQUE materials.

In conjunction with the shade-carrying BASE DENTINE and the translucent TRANSPA DENTINE, the BUILD UP layering enables an increased impression of depth to be created in the restoration. The use of the three-layer method permits a reduced – and more individual – application of the ENAMEL porcelains. This results in an even closer resemblance to nature.

By combining ENAMEL and TRANSPA DENTINE in relation to the layer thickness of BASE DENTINE, the shade intensity can be individually adjusted. An increased proportion of BASE DENTINE results in a more intensive shade, whereas a greater amount of TRANSPA DENTINE and ENAMEL reduces the chroma of the color.

Note:

BASE DENTINE has a considerable influence on the shade effect of the restoration. TRANSPA DENTINE, as in natural teeth, merely serves the specific purpose of creating a harmonious transition to the enamel.

For the **BUILD UP layering**, in addition to the VITAVM.15 BASIC KIT (s. p. 12) the VITAVM.15 BUILD UP KIT* is required.

Quantity	Content	Material
26	12g	TRANSPA DENTINE 1M1-5M3
1	50ml	VITAVM MODELLING LIQUID

* Also available as VITAVM15 BUILD UP KIT SMALL with a reduced selection of porcelains.



Metal substructures coated with OPAQUE

To enable the restoration to be lifted off easily at a later stage, first insulate the model with the VITA Modisol pen.



Application of VITAVM.15 BASE DENTINE

Apply BASE DENTINE over the whole surface starting from the neck in reduced tooth size. The centric, lateral and protrusive occlusion should be checked in the articulator during this stage.

See page 18 for notes on the **BUILD UP layering!**



Application of VITAVM.15 TRANSPA DENTINE

TRANSPA DENTINE is applied in the required complete tooth form.



TRANSPA DENTINE build-up is trimmed to provide for application of ENAMEL.

Classification tables of the VITAVM.15 ENAMEL porcelains

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
ENL	ENL	ENL	ENL	ENL	END	END	END	END	END	END	END	END	END	END



Application of VITAVM.15 ENAMEL

Apply several small portions of ENAMEL starting from the upper third of the crown to complete the crown mould.
To compensate firing shrinkage the size of the mould must be modeled slightly larger.



Prior to firing, the individual units of bridges must be separated in the interdental areas down to the substructure.



Restoration ready for the 1st dentine firing.

Recommended firing – 1st dentine firing

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	6.00	8.00	50	800	1.00	8.00

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



Restoration after 1st dentine firing.



Corrections of shape/further layering

Again apply Modisol to the ridge of the model under the pontic. BASE DENTINE is then used to fill out the interdental spaces and the basal surface of the pontic.



Subsequent corrections of shape in the body area using TRANSPA DENTINE ...



... ENAMEL is used for incisal contour corrections.

Recommended firing – 2nd dentine firing

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	6.00	7.48	50	790	1.00	7.48

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



Bridge and crown after 2nd dentine firing.



Finishing

Finish the bridge or crown respectively. To prepare for the glaze firing, grind the entire surface evenly and thoroughly to remove grinding dust.*

Recommended firing – Glaze firing

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	0.00	4.52	80	790	1.10	-

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



If required, the entire restoration can be coated with VITA AKZENT GLAZE and then individualization can be carried out using the VITA AKZENT stains. (See VITA AKZENT working instructions, no. 771).

Recommended firing – Glaze firing with VITA AKZENT®:

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
400	4.00	4.52	80	790	1.00	-

The user should consider this information only as providing basic values. If surface, transparency and degree of gloss should not correspond to the firing result that is achieved under optimal conditions, the firing procedure must be adjusted. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface condition of the firing object after the firing process.



The finished restoration on the model.

* In the case of dust formation use and extractor or wear a dust protection mask. Wear protective goggles when grinding the fired ceramic.



Firing chart for VITAVM.15

	Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
Oxidation firing	Please heed alloy manufacturer's instructions !						
WASH OPAQUE firing	400	2.00	6.00	70	820	1.00	6.00
WASH OPAQUE PASTE firing	400	6.00	6.00	70	820	1.00	6.00
OPAQUE firing	400	2.00	6.00	70	820	1.00	6.00
OPAQUE PASTE firing	400	4.00	6.00	70	820	1.00	6.00
MARGIN* firing	400	6.00	8.12	50	810	1.00	8.12
EFFECT LINER* firing	400	6.00	8.12	50	810	1.00	8.12
1 st dentine firing	400	6.00	8.00	50	800	1.00	8.00
2 nd dentine firing	400	6.00	7.48	50	790	1.00	7.48
Glaze firing	400	0.00	4.52	80	790	1.00	-
Glaze firing VITA AKZENT	400	4.00	4.52	80	790	1.00	-
Glanzbrand VITA Glaze LT	400	4.00	4.45	80	780	1.00	-
Correction firing with CORRECTIVE*	400	4.00	7.00	50	750	1.00	7.00

* area of indication see pages 25

The firing result obtained with dental ceramics largely depends on the user's individual firing procedure and substructure design, i.e., among other aspects, on the type of furnace, the age of the heating element, location of the temperature sensor, the firing tray and the size of the workpiece during the firing cycles.

Our recommendations for the firing temperatures (regardless of whether these are given orally, in writing or in the form of practical demonstration) are based on our own practical experience and numerous internal tests. The user, however, should consider this information only as a basic guideline.

Should the surface, degree of transparency or degree of glaze not correspond to the firing result that is achieved under optimum conditions, the firing procedure must be adjusted accordingly. The firing temperature displayed by the furnace is decisive for the firing procedure, but not for the appearance and the surface quality of the firing object after the firing process.

Notes on alloys: See alloy list VITAVM 15 at: www.vita-zahnfabrik.com

VITAVM.15 ENAMEL porcelains

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL	ENL

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
ENL	ENL	ENL	ENL	ENL	END	END	END	END	END	END	END	END	END	END

VITAVM.15 OPAQUE porcelains

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
OP0	OP0	OP0	OP1	OP1	OP2	OP2	OP2	OP2	OP2	OP2	OP2	OP3	OP3

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
OP3	OP3	OP3	OP3	OP3	OP4	OP4	OP4	OP4	OP4	OP4	OP4	OP5	OP5	OP5

VITAVM.15 CHROMA PLUS porcelains° (area of application see page 25)

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
-	-	-	CP1	CP1/CP2*	CP2	CP2/CP3*	CP1/CP5*	CP1/CP3*	CP3	CP1/CP3*	CP1/CP4*	CP2/CP5*	CP2/CP5*

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
CP1/CP5*	CP4/CP5*	CP3/CP4*	CP1/CP5*	CP4/CP5*	CP5	CP4/CP5*	CP5	CP3/CP5*	CP5	CP5	CP4/CP5*	-	-	-

* mixing ratio 1:1 ° The classification tables serve only as a guideline!

VITAVM.15 EFFECT LINER porcelains° (area of application see page 25)

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
EL1	EL1	EL1/EL2*	EL1/EL2*	EL2	EL1/EL2*	EL1/EL3*	EL1/EL6*	EL1/EL3*	EL2/EL4*	EL1/EL6*	EL2/EL4*	EL2/EL6*	EL4/EL6*

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
EL1/EL6*	EL2/EL6*	EL4/EL6*	EL2/EL3*	EL5/EL6*	EL6	EL3/EL4*	EL6	EL2/EL3*	EL5/EL6*	EL2/EL3*	EL3/EL4*	EL3/EL6*	EL5/EL6*	EL3/EL4*

* mixing ratio 1:1 ° The classification tables serve only as a guideline!

VITAVM.15 MARGIN porcelains° (area of application see p. 25)

OM1	OM2	OM3	1M1	1M2	2L1.5	2L2.5	2M1	2M2	2M3	2R1.5	2R2.5	3L1.5	3L2.5
M1	M1	M1	M1/M7*	M1/M7*	M1/M7*	M1/M4*	M1/M7*	M1/M4*	M4	M1/M7*	M1/M4*	M4/M7*	M4/M7*

3M1	3M2	3M3	3R1.5	3R2.5	4L1.5	4L2.5	4M1	4M2	4M3	4R1.5	4R2.5	5M1	5M2	5M3
M7	M4/M7*	M4/M9*	M7	M4/M7*	M7	M4/M9*	M7	M7/M9*	M9	M7/M8*	M7/M9*	M7/M8*	M7/M9*	M5/M9*

* mixing ratio 1:1 ° The classification tables serve only as a guideline!

VITAVM[®]15 EFFECT LINER

- To control the in-depth fluorescence in the restoration.
- To enhance and intensify the basic color; universally applicable.
- Applied in the gingival area, they enhance the distribution of light.

VITAVM[®]15 CHROMA PLUS

- Color-intensive materials preferably used in combination with BASE DENTINE.
- In the case of thin walls they effectively enhance the shade (see also pages 12 and 18).

VITAVM[®]15 EFFECT CHROMA

- Color-intensive modifier porcelains.
- To accentuate certain color areas of the tooth.
- To individualize the lightness level (value) in the neck, dentine and enamel areas.

VITAVM[®]15 MAMELON

- Highly fluorescent porcelain which is mainly used in the incisal area.
- For color characterization between dentine and enamel.

VITAVM[®]15 MARGIN

- MARGIN porcelains were specially developed to create an optimum esthetic transition between crown and prepared tooth in the case of labially shortened metal coping in the area of the crown margin.
- The applied, plastified MARGIN porcelain must be hardened by heat application. It is recommended to stabilize the shoulder using a hairdryer or by means of radiant heat at the furnace opening.

VITAVM[®] OPAQUE FLUID

- Only for mixing the powder opaques!
Must not be used for mixing the dentine porcelains!
- Gives the powder a creamy consistency which provides easy and accurate application; prevents the mixture running off during application.

VITAVM[®] PASTE FLUID

- Use only for altering the consistency of the paste opaque!

VITAVM[®]15 EFFECT ENAMEL

- Can be used for all enamel areas as in a natural tooth.
- Universally suitable, translucent enamel effect materials.
- To achieve a natural impression of depth.

VITAVM[®]15 EFFECT PEARL

- Only suitable for effects on the surface, not for internal layering.
- Perfectly suitable for "bleached" reproductions.
- To obtain nuances of yellow and red.

VITAVM[®]15 EFFECT OPAL

- To obtain the opalescent effect in restorations of young and highly translucent teeth.

VITAVM[®]15 GINGIVA

- To restore the original gingival situation.
- Are applied and fired during the first and second dentine firing.
- Color nuances range from orange-red and reddish to brown-red.

VITAVM[®]15 CORRECTIVE

- With reduced firing temperature (750 °C) for corrections after glaze firing.
- In 3 nuances for neck, dentine and enamel area.

VITAVM[®]15 GINGIVA OPAQUE

- Opaque specially matched to the GINGIVA porcelains.

VITAVM[®]15 MODELLING LIQUID

- Modeling liquid for mixing BASE DENTINE, TRANSPA DENTINE, ENAMEL and all additional porcelains.
- Also for mixing MARGIN porcelains.
- Not suitable for opaque porcelains!

Color classification

Description

VITAVM.15 EFFECT LINER



	EL1	snow	white
	EL2	cream	beige
	EL3	tabac	brown
	EL4	golden fleece	yellow
	EL5	papaya	orange
	EL6	sesame	greenish-yellow

VITAVM.15 EFFECT CHROMA



	EC1	ghost	white
	EC2	linen	sand beige
	EC3	pale banana	light yellow
	EC4	lemon drop	soft lemon yellow
	EC5	golden rod	light orange
	EC6	sunflower	orange
	EC7	light salmon	pink
	EC8	toffee	beige-brown
	EC9	doe	brown
	EC10	larch	greenish-brown
	EC11	gravel	greenish-grey

VITAVM.15 MAMELON



	MM1	ecru	beige
	MM2	mellow buff	warm yellow-brown
	MM3	peach puff	soft shade of orange

VITAVM.15 GINGIVA



	G1	rose	old rose
	G2	nectarine	orange-red
	G3	pink grapefruit	pink
	G4	rosewood	brown-red
	G5	cherry brown	black-red
	GOL	light flesh	light red
	GOD	dark flesh	dark red

VITAVM.15 CORRECTIVE



	COR1	neutral	neutral
	COR2	sand	beige
	COR3	ochre	brown

Color classification

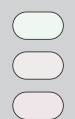
Description

VITAVM.15 EFFECT ENAMEL



EE1	mint cream	whitish translucent
EE2	pastel	pastel
EE3	misty rose	pink translucent
EE4	vanilla	yellowish
EE5	sun light	yellowish translucent
EE6	navajo	reddish translucent
EE7	golden glow	orange translucent
EE8	coral	red translucent
EE9	water drop	bluish translucent
EE10	silver lake blue	blue
EE11	drizzle	grayish translucent

VITAVM.15 EFFECT PEARL



EP1	pearl	nuance in pastel yellow
EP2	pearl blush	nuance in pastel orange
EP3	pearl rose	nuance in pastel rosé

VITAVM.15 EFFECT OPAL



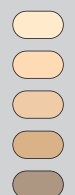
EO1	opal	neutral, universally applicable
EO2	opal whitish	whitish
EO3	opal bluish	bluish

VITAVM.15 MARGIN



M1	icy beige	white
M4	wheat	yellow
M5	amber	amber
M7	seashell	light beige
M8	tan	pastel brown
M9	beach	light orange

VITAVM.15 CHROMA PLUS



CP1	ivory	ivory
CP2	almond	beige
CP3	moccasin	light orange-brown
CP4	caramel	orange
CP5	burlywood	greenish brown

VITAVM 15 was developed as a veneering ceramic for metal substructures with a CTE of $16.0\text{--}17.3 \cdot 10^{-6} \text{ K}^{-1}$. The CTE range and the firing temperatures of VITAVM 15 are therefore optimally matched to high-expansion alloys.

With VITAVM 15, by means of a new production process, it is possible to achieve a dental ceramic material with a structure which, in contrast to traditional ceramics, demonstrates a considerably more homogeneous distribution of the crystal and glass phase after firing. This type of structure is described as a “fine-structure ceramic”. In figs. 1 and 2 the fine structure of VITAVM 15 is compared with the structure of a traditional ceramic.

Figure 1

The etched surface of a traditional metal ceramic (etched for 20 sec. with VITA CERAMICS ETCH) shows agglomerations of leucite crystals with diameters of up to $30 \mu\text{m}$. The differences between the CTE values of the leucite agglomerations and those of the glass phase frequently lead to tension cracks.

Figure 2

The etched surface of the VITAVM 15 (etched for 20 sec. with VITA CERAMICS ETCH) shows an extremely fine distribution of the leucite crystals in the glass matrix. By means of localized balancing of the differing CTE values of the leucite and the glass phase, it is possible to avoid larger tension cracks.

Good surface structure

In addition to its improved physical properties, the fine structure of the VITAVM15 offers a whole set of advantages to both dental technician and patient. VITAVM 15 demonstrates excellent grinding and polishing characteristics after firing, which enables very smooth surfaces to be achieved. This reduces plaque adhesion at the ceramic surface and results in a pleasant sensation of cleanliness for the patient.

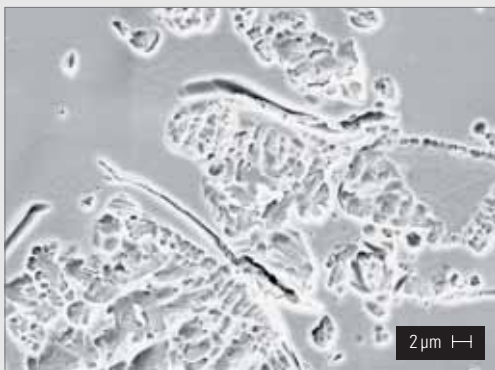


Fig. 1: SEM of the surface of a conventional metal ceramic (magnification 5000 x).

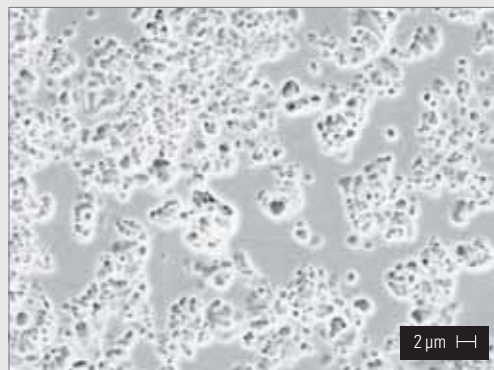


Fig. 2: SEM of the surface of VITAVM 15 (magnification 5000 x).

Improved physical properties

On account of its fine structure, compared with conventional metal ceramics, VITAVM 15 demonstrates outstanding physical properties, e.g. increased flexural strength, improved adhesive bond strength, increased resistance to thermal cycling and a low degree of solubility in acid.

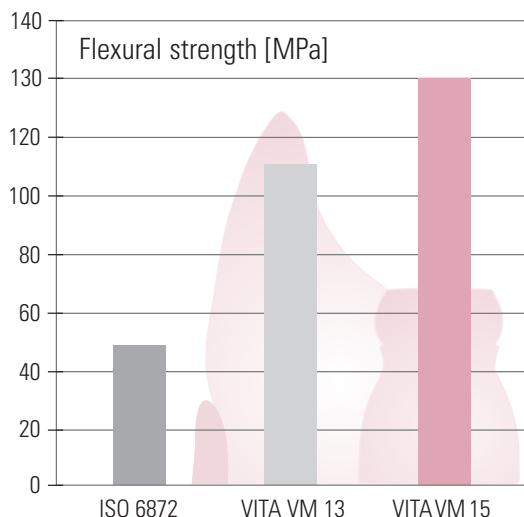


Fig. 3: Flexural strength of VITAVM 15 compared to a conventional metal ceramic such as VITAVM 13 and the ISO threshold value according to ISO 6872.

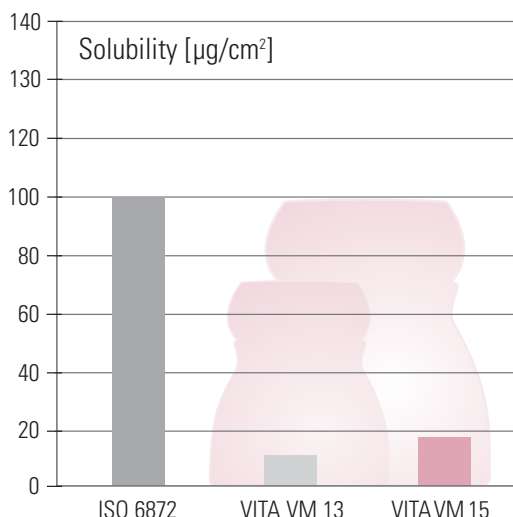


Fig. 4: Solubility in acid of VITAVM 15 compared to a conventional metal ceramic such as VITAVM 13 and the ISO threshold value according to ISO 6872.

VITAVM.15 – Physical properties	Unit of measurement	Value
CTE (25-500 °C) OPAQUE	10 ⁻⁶ K ⁻¹	approx. 15.9
Transformation point OPAQUE	°C	approx. 545
CTE (25-500 °C) BASE DENTINE	10 ⁻⁶ K ⁻¹	15.5 - 15.7
Transformation point BASE DENTINE	°C	approx. 530
Softening poin BASE DENTINE	°C	approx. 595
Solubility BASE DENTINE	µg/cm ²	< 20
Density BASE DENTINE	g/cm ³	approx. 2.5
Flexural strength BASE DENTINE	MPa	approx. 130
Average grain size BASE DENTINE	µm	approx. 20
Bond testing ISO 9693	MPa	approx. 40

Close resemblance to natural tooth enamel

Like all fine-structure ceramics from VITA, VITAVM 15 demonstrates behavior very closely resembling that of natural tooth enamel. This is confirmed by the excellent results of studies carried out by the Dental Clinic of the University of Zurich in Switzerland and Dr. Giordano from the Goldman School of Medicine of the University of Boston/USA together with DR. McLaren (UCLA School of Dentistry, UCLA Center for Esthetic Dentistry, Los Angeles CA) on the basis of VITAVM 7 and VITAVM 9.

Literature: E. A. McLaren, R. A. Giordano II, R. Pober, B. Abozenada "Two-Phased, Full Glass Veneering Ceramic", (Quintessenz Zahntech 30, 1, 32-45 [2004]) E. A. McLaren, DDS; R. A. Giordano II, DMD, DMedSc:
 "Zirconia Based Ceramics: Material Properties, Esthetics and Layering Technology of a new Veneering Porcelain, VM 9" (Quintessenz of Dental Technology 28, 99–111 [2005])

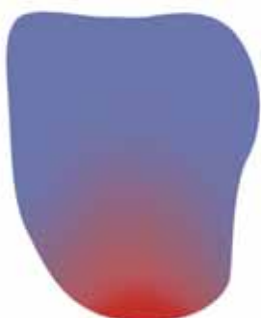
Problem	Cause	Solution
Crack formation in paste opaque	<p>Paste opaque applied too thickly</p> <p>Too rapid burning out of organic residue in paste opaque</p> <p>Furnace retains too much heat from previous firing cycle</p>	<p>First apply wash opaque and fire, then repeat application until opaque layer fully covers substructure</p> <p>Increase pre-drying time</p> <p>Allow furnace to cool to standby temperature</p>
Crack formation in opaque	<p>Opaque applied too thickly/has formed puddles in grooves, e.g. interdental spaces, metal collars</p> <p>Opaque dried too quickly</p>	<p>Apply in thin, homogeneous layer, do not vibrate too strongly</p> <p>Adjust predrying times and pre-drying temperature according to firing chart</p>
Air impactions in opaque	<p>Incorrect casting</p> <p>Incorrect sandblasting</p> <p>Impurities in the metal surface</p> <p>Sintering of Al₂O₃ into the metal surface</p>	<p>Refer to manufacturer's working instructions</p> <p>Heed manufacturers' instructions regarding alloy types</p> <p>Careful cleaning of the metal surface</p> <p>Reduce sandblasting pressure/alter sandblasting angle</p>
Incomplete opaque coating	<p>Opaque applied too thinly/in a too watery consistency</p>	<p>Mix to a thicker (creamy) consistency, do not apply in too watery consistency</p>

Problem	Cause	Solution
Cracks in surface	Layered in too dry state Air unable to escape fully from the ceramic during predrying Pre-drying positions altered Firing chamber still too hot	1. Layer in a more moist state, do not vibrate 2. Heed Predrying temperature (400 °C) Slower heating-up Heed VITA factory settings Wait until standby temperature is reached
Cracks and detachment of material from the ceramic surface after the correction firing or second dentine firing.	Layered in a too dry condition Surface was not ground before the correction firing Impurities in the surface, e.g. insulation by the antagonist	see above. Grind surface homogeneously with stones or diamonds or sandblast at a low pressure Clean the models and restorations thoroughly before applying the next ceramic
Microporosities in the surface	Layered in a too dry condition or extraction too strong	Moisten the ceramic and place it on the firing tray in a moist state
Cracks	CTE was not heeded Incorrect framework design Impurities in the metal	Check CTE of the alloy Model framework appropriately (reduced tooth form; heed manufacturer's instructions!) Clean substructure thoroughly before firing (heed manufacturer's instructions)
Cracks parallel to tooth axis	Incomplete interdental separation of the ceramic Metal bridge connectors modeled too thinly	Separate down to the opaque. Note: moisten the knife blade and pull it through completely Model the metal framework with sufficient wall thickness (heed alloy manufacturers' instructions).

Problem	Cause	Solution
Lacking translucency/brilliance (ceramic has dull, lifeless appearance)	<ol style="list-style-type: none"> 1. Too strongly vibrated 2. Error in vacuum system 3. Firing temperature too low (incorrect) 4. Predrying/heating-up time too short 5. Use of oily modeling liquids 6. Too much enamel 	<ol style="list-style-type: none"> 1. Less or no vibration 2. Check the vacuum pump 3. Firing sample with transparent ceramic, e.g. WIN or EE9 4. Heed firing instructions (check furnace setting) 5. Use original VITAVM15 modeling liquid 6. Heed layering pattern
Substructure shows through	<p>BASE dentine applied too thinly</p> <p>BASE DENTINE ends at incisal edge of metal substructure</p>	<p>Apply BASE DENTINE to cover the entire labial surface; layering pattern must be heeded</p> <p>Apply BASE DENTINE beyond the top edge of the substructure</p>
Shade too pale or too grey	<ol style="list-style-type: none"> 1. Insufficient BASE DENTINE applied 2. Ceramic overfired/underfired 3. Incorrect modeling liquid 	<ol style="list-style-type: none"> 1. Heed layering pattern 2. Firing sample with a transparent ceramic, e.g. WIN or EE9 3. Use VITAVM15 modeling liquid
Opal effect/pearl effect insufficient/opal ceramic has too whitish appearance	Opal effect/pearl effect no longer visible or appears whitish after several firings	<p>Max. 2 firings of opal ceramics</p> <p>Use pearl effect ceramics only at the surface</p>
Hue too warm/shade intensity too high	<p>Ceramic overfired</p> <p>Too much BASE DENTINE was used</p>	<p>Firing sample with transparent ceramic such as WIN or EE9</p> <p>See notes to page 12 and page 18</p>
Streaks in the ceramic	<p>Brush water soiled with opaque residue</p> <p>Incorrectly mixed ceramic</p> <p>Incorrect liquids used</p>	<p>Change water after opaque application</p> <p>Always mix ceramics thoroughly, even when re-moistening</p> <p>Ensure correct liquid is used</p>

VITAVM.15 labial view of layering

VITAVM 15 BASIC layering



Please see also layering pattern on page 12!

VITAVM 15 BUILD UP layering



Please see also layering pattern on page 18!

VITAVM.15 Trouble Shooting – After firing

Problem	Cause	Solution
Black dots in the ceramic	Brush water soiled Incorrect fluid used 1. Contamination of ceramics by metal grinding dust 2. Silicone residue from rubber polishers	Use clean water Use VITA Modeling Liquid 1. Keep workplace clean 2. Clean thoroughly
Streaks after glaze firing	Grinding dust residue on the surface Glaze applied too thickly Glaze incompletely mixed	Clean thoroughly before glaze firing Apply glaze thinly but cover entire surface Allow mixed glaze to stand overnight
Discolorations	Incorrect modeling liquid Firing chamber contaminated by metal deposits (Ag, Cu, etc.)	Use VITA VM 15 modeling liquid Cleaning of the firing chamber at 1150 °C, hold time 15 min., no vacuum

VITAVM.15 VITA Modelling Liquid

The VITAVM 15 MODELLING LIQUID is specially adjusted to the firing temperature of the VITA VM 15 ceramic and thus guarantees an optimum firing result. In addition to this, excellent stability characteristics and modeling properties are achieved.

VITAVM.15 PROFESSIONAL KIT *

Quantity	Content	Material
11	12g	EFFECT CHROMA EC1- EC11
11	12g	EFFECT ENAMEL EE1- EE11
6	12g	EFFECT LINER EL1- EL6
3	12g	MAMELON MM1- MM3
3	12g	EFFECT PEARL EP1- EP3
3	12g	EFFECT OPAL EO1- EO3
3		VITAVM Shade sample blades

* Also available as VITAVM 15 PROFESSIONAL KIT SMALL (EC1, EC4, EC6, EC8, EC9, MM2, EP1, E02, EE1, EE3, EE7, EE8, EE9, EE10, EE11)

Special porcelains for the dental technician aiming for customer satisfaction by providing highly individual, layered restorations that reflect the spectrum of the natural tooth.

VITAVM.15 BLEACHED COLOR KIT

Quantity	Content	Material
1	12g	OPAQUE OPO
3	12g	BASE DENTINE OM1- OM3
3	12g	DENTINE OM1- OM3
1	12g	ENAMEL ENL
1	12g	NEUTRAL NT
1	12g	WINDOW WIN
1	50ml	OPAQUE FLUID
1	50ml	MODELLING LIQUID
1		BLEACHED SHADE GUIDE SHADE GROUP OM
1		Working instructions

For creating brilliant white teeth for the the perfect white smile.

VITAVM.15 GINGIVA KIT

Quantity	Content	Material
2	12g	GINGIVA OPAQUE GOL, GOD
5	12g	GINGIVA G1- G5
1		VITAVM Shade sample blade

For natural gingival areas and harmonious shade reproduction.

VITAVM.15 MARGIN KIT

Quantity	Content	Material
6	12g	MARGIN M1, M4, M5, M7- M9
1		VITAVM Shade sample blade

For manufacturing a ceramic shoulder as an aesthetic transition between crown and prepared tooth.

The following products are subject to obligatory labeling:

VITA OPAQUE FLUID



Corrosive

Causes severe burns. Store under lock and key.
Do not eat and drink while working.
In case of eye contact rinse immediately and thoroughly with water and consult physician. Wear appropriate protective clothing. Wear protective gloves and protective goggles / face mask.

VITA SPRAY-ON LIQUID



Flammable

Keep container tightly closed and store in a well-ventilated place.
Do not inhale vapors / aerosol.
In case of insufficient ventilation wear respiratory protection.
In case of accident or unwellness consult physician (if possible show label).
Avoid exposure – obtain specific directions before use.

VITA SPRAY-ON INDICATOR LIQUID



Toxic, Flammable

Avoid exposure – obtain specific directions before use.
Keep container tightly closed and store in a well-ventilated place.
Keep away from sources of ignition – Do not smoke.
At work do not eat and drink. In case of accident or unwellness consult physician. This product and its container must be disposed of according to the regulations for hazardous waste.
Do not inhale vapors / aerosol. Can cause cancer.

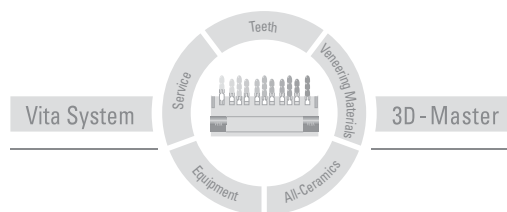
For more details please see Material Safety Data Sheets!

Wear suitable protective goggles / face mask,
protective gloves and protective clothing when working.



With the unique VITA SYSTEM 3D-MASTER all natural tooth shades are systematically determined and completely reproduced.

The VITA VM 15 veneering ceramic is available in the VITA SYSTEM 3D-MASTER shades. Shade compatibility with all 3D-MASTER materials is guaranteed.



US 5498157 A
AU 659964 B2
EP 0591958 B1

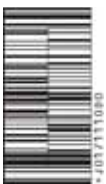
Please note: Our products should be used according to the working instructions. We cannot be held liable for damages resulting from incorrect handling or usage. The user is furthermore obliged to check the product before use with regard to its suitability for the intended area of applications. We cannot accept any liability if the product is used in conjunction with materials and equipment from other manufacturers which are not compatible or not authorized for use with our product. Furthermore, our liability for the correctness of this information is independent of the legal ground and, in as far as legally permissible, is limited to the invoiced value of the goods supplied excluding turnover tax. In particular, as far as legally permissible, we do not assume any liability for profit loss, for indirect damages, for consequential damages or for claims of third parties against the purchaser. Claims for damages based on fault liability (fault in making the contract, breach of contract, unlawful acts, etc.) can only be made in the case of intent or gross negligence.
Date of issue of these instructions for use: 03-07

VITA Zahnfabrik has been certified according to the Guideline for Medical Devices and the following products bear the CE mark  0124 :

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