

VITAVM[®]13

Working Instructions



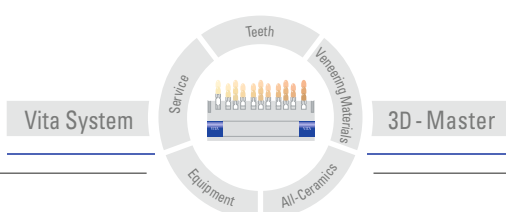
VITA shade taking

VITA shade communication

VITA shade reproduction

VITA shade control

Date of Issue: 09.08



VITA

For metal substructures in the conventional CTE range.
Available in VITA SYSTEM 3D-MASTER and VITAPAN classical A1–D4 shades.

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Restoring oral harmony.

The result of the teamwork of the dentist, Dr. Enrico Poli (Padua/Italy) and the dental technician, Maurizio Buzzo (Venice/Italy).

Photograph courtesy of: M. Buzzo



Situation after preparation of teeth 11 and 21.



Metal crown copings; cervical reduction for shoulder.



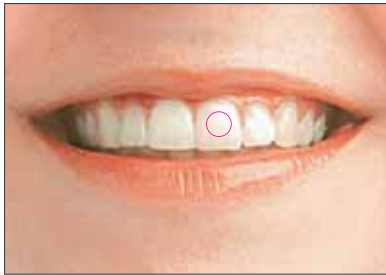
Crown copings prepared with opaque and shoulder porcelain.



Restoration in harmony with the patient's natural dentition.

Over 80 years of expertise

Shade competence is more than purely shade determination. For us, shade competence means taking on responsibility for better solutions within the context of an overall process. That is VITA's key objective: How can we achieve improvements in shade determination and reproduction? By means of standardized process steps for increasing efficiency. The demands on dental professionals today can be summed up as follows: Better results with less time, effort and expenditure. We are united by this common goal.



VITA shade taking

The clear and unambiguous determination of the basic shade of a tooth is the most important criterion for patient acceptance. The basic shade is to be found in the dentine center (middle to gingival area).

With the VITA Toothguide 3D-MASTER or the VITA Easyshade you can determine accurately, simply and quickly the most important parameter – the basic tooth shade.



Determining the effects

Natural teeth are unique and a true miracle of nature. That is why, after determining the basic shade of a tooth, it is important to recognize also the finer details of a tooth, for instance, translucent zones or anomalies, in order to get as close as possible to nature. We recommend a digital photograph for the effect or detail analysis.



The yes/no principle

With the VITA Toothguide 3D-MASTER shade determination consists of three systematic steps, which anyone can learn to use for the first time. In the first step the correct lightness level is determined by means of a simple yes/no decision with reference to the upper shade sample teeth (1M1, 2M1, 3M1, 4M1, 5M1). You have now determined 60 % of the shade. In the second step you determine the shade intensity, spreading out the shade samples like a fan according to the same principle. Now you have already determined 90 % of the correct shade. In the last step of the systematic shade determination procedure you check whether the hue is more yellowish – L, or more reddish – R. That's all there is to it.

Tips for shade taking

Always accept your first decision, since the eyes begin to tire after only 5 – 7 seconds. Keep the surroundings as neutral as possible with regard to shade. If possible, determine the tooth shade by daylight or under standardized daylight lamps such as OSRAM LUMILUX DELUXE daylight 12-950.

Shade taking should take place before the tooth preparation, since after preparation the tooth shade appears too white on account of dehydration of the teeth.



VITA color communication

For perfect reproduction of a particular tooth shade, loss-free communication with the dental laboratory is essential. Every misunderstanding leads to expensive, avoidable reworking. This is why we recommend the Color Communication Form for the description of the basic shade, and a digital photograph for the effect or detail analysis. The VITA Easyshade software offers a standard which makes it possible to have all data on one sheet – a laboratory shade recipe. With this information the reproduction can be achieved accurately and quickly and will harmonize perfectly with the patient's remaining natural dentition.

Tips on color communication

Compare the result of your shade determination with the wishes of the patient. Make sure the information you give to your dental laboratory is clear and unambiguous. A photograph of the patient's whole face can be of great assistance to the dental technician, since he does not often have the opportunity to see the patient himself. You should document your specifications in such a way that they are always reproducible.



VITA shade reproduction

In the process step of reproduction, the most important of all is to ensure that the basic shade which has been determined can also be correctly reproduced. Successful reproduction of the effects in a tooth results in a high quality dental restoration. VITA materials give you the certainty of meeting this requirement without any time-consuming mixing or testing, no matter which of the VITA materials are used.



Process steps matched to one another

Teeth, veneering ceramics, acrylic resins and all-ceramic materials are available in all 26 3D-MASTER shades. The necessary materials are available also for the reconstruction of bleached teeth. For the patient does not only expect his tooth shade to be determined, but an individual solution to his own particular problem – and that in best quality and esthetics.

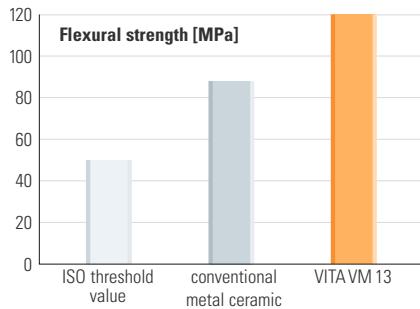


VITA shade control

In the last process step the qualitative shade determination should no longer be left to the subjective assessment of an individual person. The VITA process involves the objective measurement of the result of shade reproduction as the key criterion for a satisfied patient and no reworking.

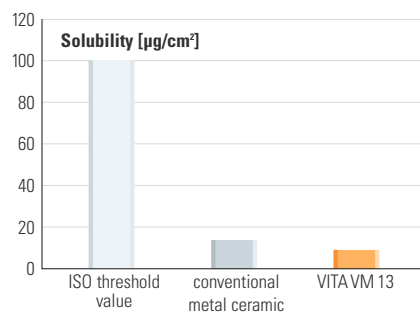
Improved physical properties

In addition to the lower firing temperature, VITA VM 13 demonstrates an improvement in flexural strength, its adhesive bonding and resistance to thermal cycling while retaining the same, low degree of solubility in acid compared with conventional metal ceramics.



Flexural strength

Flexural strength of VITA VM 13 compared with that of a conventional metal ceramic and the ISO threshold value according to ISO 6872.



Solubility

Solubility in acid of VITA VM 13 compared with that of a conventional metal ceramic and the ISO threshold value according to ISO 6872.

VITAVM [®] 13 – Physical properties	Unit of measurement	Value
CTE (25 – 500 °C) OPAQUE	10 ⁻⁶ · K ⁻¹	13.6–14.0
Transformation point OPAQUE	°C	approx. 570/577
CTE (25 – 500 °C) BASE DENTINE	10 ⁻⁶ · K ⁻¹	13.1–13.6
Softening point BASE DENTINE	°C	approx. 635
Transformation point BASE DENTINE	°C	approx. 560/565
Solubility BASE DENTINE	µg/cm ²	approx. 12
Density BASE DENTINE	g/cm ³	approx. 2.5
Flexural strength BASE DENTINE	MPa	approx. 120
Average particle size BASE DENTINE	µm	approx. 18
Adhesive bond testing (ISO 9693) BASE DENTINE	MPa	approx. 43

Similarity to natural tooth enamel

Like all VITA fine-structure ceramics, VITA VM 13 demonstrates behavior very similar to that of natural tooth enamel. This is confirmed by studies carried out with VITA VM 7 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.

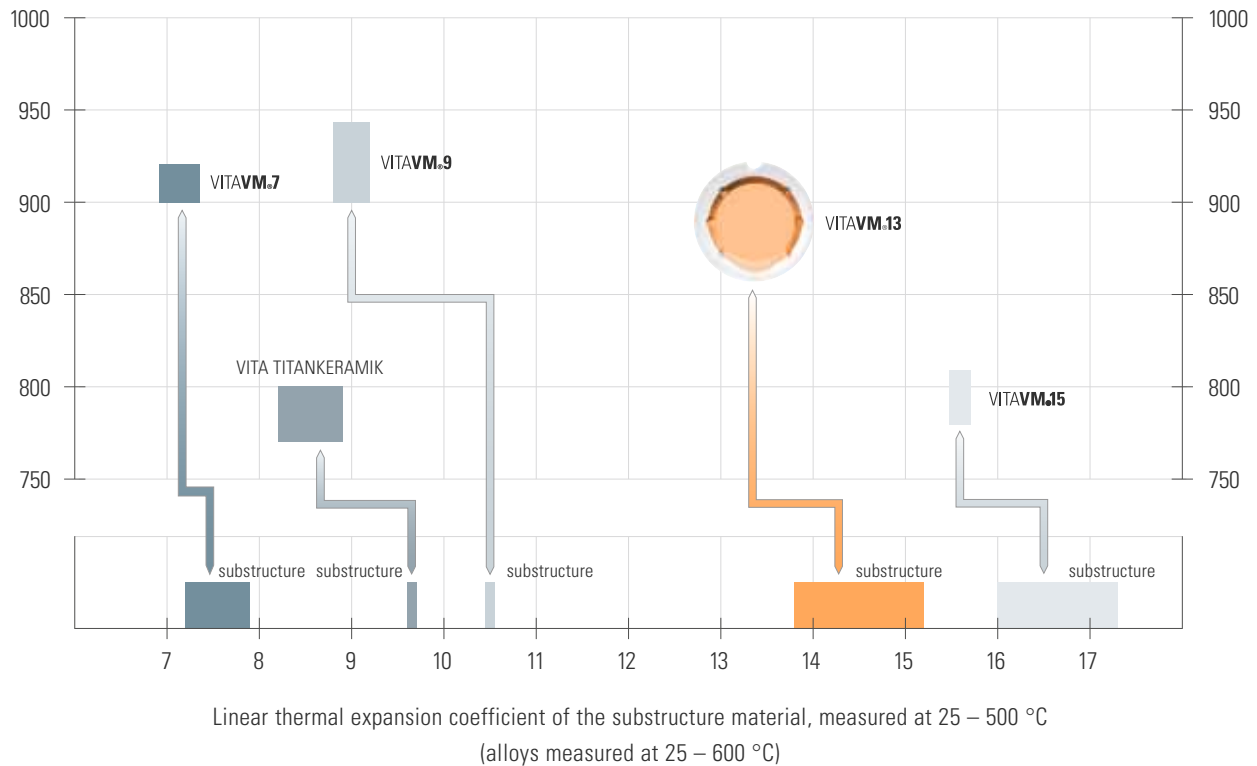
Literature: E. A. McLaren, R. A. Giordano II, R. Prober, B. Abozenada "Zweiphasige Vollglas-Verblendkeramik", (Quintessenz Zahntech 30, 1, 32-45 [2004])

For alloys in the CTE range of approx. $13.8\text{--}15.2 \cdot 10^{-6} \cdot \text{K}^{-1}$

Firing temperature
of ceramic [°C]

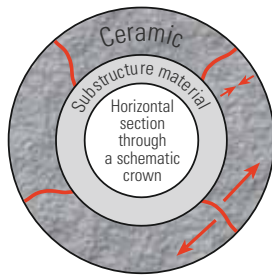
Linear thermal expansion coefficient of the ceramic, measured at 25 – 500 °C

Firing temperature
of ceramic [°C]

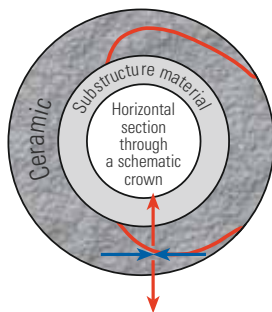


VITA VM 7 CTE (25–500°C) $6.9\text{--}7.3 \cdot 10^{-6} \cdot \text{K}^{-1}$	VITA In-Ceram ALUMINA, CTE (25–500°C) $7.2\text{--}7.6 \cdot 10^{-6} \cdot \text{K}^{-1}$ VITA In-Ceram SPINELL, CTE (25–500°C) $7.5\text{--}7.9 \cdot 10^{-6} \cdot \text{K}^{-1}$ VITA In-Ceram ZIRCONIA, CTE (25–500°C) $7.6\text{--}7.8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

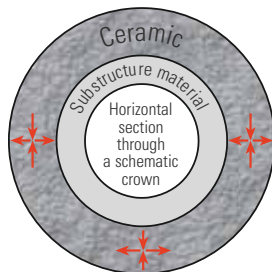
^{*} For further information on alloys see under downloads in the internet.



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



If the CTE of the substructure material is considerably 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 with the CTE of the substructure material.

Optimal preconditions are given if the veneering ceramic for Y-TZP substructures features a somewhat lower CTE value than the substructure material. Due to 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. Inhibition of cracks that are beginning to form is achieved and crack propagation will be stopped.

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

The firing result obtained with dental ceramics depends to a great extent on the individual user's firing procedure. The type of furnace, the location of the temperature sensor, the firing trays and the size of the workpiece during the firing cycles are decisive for the result of firing.

Our recommendations for the firing temperatures (regardless of whether these are given orally, in writing or by means of practical demonstration) are based on our own wide practical experience and test results. The user, however, should consider this information only as a general guideline. Should the surface quality or the degree of transparency or glaze not correspond to the firing result that is achieved under optimum conditions, the firing procedure must be adjusted accordingly.

The decisive factor for the firing procedure is not the firing temperature indicated on the furnace display, but the appearance and the surface quality of the firing object after firing.

⚠ Attention: Firing trays can also strongly influence the firing result. All VITAVM firing temperatures are based on the use of black ceramic firing trays. If light-colored firing trays are used the temperature must be increased by 10 – 20 °C depending on the type of furnace.



A light surface glaze confirms that the ceramic has been fired correctly. If, however, the ceramic surface has a milky and inhomogeneous appearance, the temperature is too low. In this case, increase the temperature gradually in steps of 10 °C until the correct firing temperature is reached.

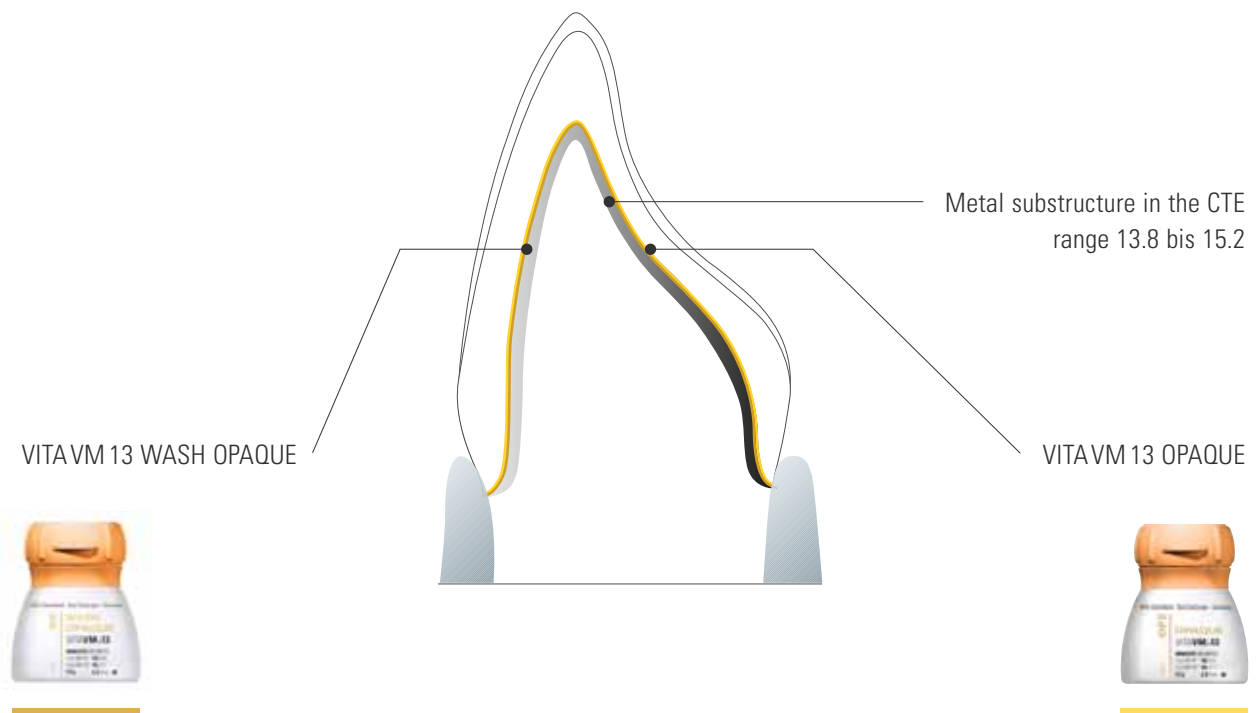
Crowns and bridge units which are to be veneered with ceramic must be modeled in reduced anatomical size. A minimum wall thickness of 0.4 mm is required order to ensure a minimum wall thickness of 0.3 mm after finishing. Avoid sharp edges, undercuts and deep grooves. The stability can be further increased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

Regarding the substructure, investing, casting, etching, finishing, sandblasting and oxidation please follow the alloy manufacturer's instructions.

⚠ **Note:** Our practical experience in the CTE range $13.8\text{--}15.2 \cdot 10^{-6} \cdot \text{K}^{-1}$ has shown that good results can be achieved when the CTE of the alloy (measured at $25\text{--}600\text{ }^{\circ}\text{C}$) is within the range $14.0\text{--}14.4 \cdot 10^{-6} \cdot \text{K}^{-1}$. In the case of alloys with a CTE ($25\text{--}600\text{ }^{\circ}\text{C}$) $>14.5 \cdot 10^{-6} \cdot \text{K}^{-1}$, slow cooling should be used from the 1st dentine firing onwards. If the alloy has a higher CTE value, cooling in the $900^{\circ}\text{C} - 700\text{ }^{\circ}\text{C}$ range should not be completed in less than 3 minutes. For further information see the list of alloys tested in combination with VITAVM 13. You will find this at www.vita-zahnfabrik.com under Download/Veneering Materials/Alloy List.

Layer thickness of ceramics

When designing a ceramic restoration, the layer thickness should be distributed homogeneously over the entire surface to be veneered. The thickness of the ceramic layer should not, however, exceed a total thickness of 2 mm.



To prepare the VITA VM 13 BASIC and BUILD UP layering, first apply WASH OPAQUE and OPAQUE to the substructure.

WASH OPAQUE fulfills the following functions:

1. Formation of the required adhesive oxides
2. Formation of a bond to the alloy surface
3. Enhancing the chroma of the restoration; particularly in the case of precious metal-free alloys



Substructure preparation

The framework before sandblasting, processed with a fine, cross-cut tungsten carbide bur.

Sandblast the substructures with 125 µm aluminum oxide at a pressure of 2 bar. In the case of precious metal-free alloys use a pressure of 250 µm and a pressure of 3 - 4 bar. Please adhere precisely to the manufacturer's instructions for preparation of the substructure.



The substructure oxidized according to the manufacturer's instructions.

⚠ Important: Bonding alloys containing zinc (Zn) must be sandblasted, oxidized, and after the oxidation firing etched in a clean, warm acidic bath for approx. 5 min. Steam off all traces of etching residue.



Wash opaque firing

Powder opaque

Mix the powder opaque with VITA VM OPAQUE FLUID to a thin, watery consistency and apply to the clean, dry substructure with a brush.

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 homogeneously onto the substructure surface. See separate working instructions for VITA SPRAY-ON (no. 492M).

Paste opaque

Alternatively, paste wash opaque can be used. To apply, massage it into the surface of the substructure in a thin layer.

⚠ 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 longer predrying time in order to dry. Please heed the recommended firing cycles. The paste opaque must not come into contact with water, since this may result in cracks and bubble formation in the opaque during firing.



Recommended firing – wash opaque firing:

	Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
Powder	500	2.00	5.12	75	890	2.00	5.12
Paste	500	4.00	5.12	75	890	2.00	5.12

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.

The fired wash opaque on a ceramic firing tray

Opaque firing:

Mix the opaque powder to a creamy consistency with VITA VM OPAQUE FLUID, apply with a brush or glass instrument to mask the surface to be veneered and fire as recommended.

As an alternative the opaque can be applied to the dry substructure.

The opaque can also be applied using the VITA SPRAY-ON procedure.

See page 28 for the classification table for opaque porcelains.



Recommended firing – opaque firing:

	Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
Powder	500	2.00	5.12	75	890	1.00	5.12
Paste	500	4.00	5.12	75	890	1.00	5.12

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.







The opaque on a ceramic firing tray shows a light surface glaze after firing.

Guidelines for the reliable veneering of NEM alloys

Since substructures made of precious metal-free alloys are poor heat conductors and demonstrate a different behavior to precious metal alloys, the following points must be heeded when veneering non-precious metal alloys with VITAVM 13:





- When veneering non-precious metal alloys use only special ceramic crucibles.
- Use only new material for casting.
- Sharp edges must be avoided when finishing the frameworks.
- Sandblast with 250 µm aluminum oxide at a pressure of 3 – 4 bar.
Please follow the alloy manufacturer's instructions!!!
- In order to avoid any discolorations which may occur, all surfaces which are not to be veneered should be sandblasted or rubber-insulated.
Subsequently clean thoroughly.
- In order to achieve secure bonding between a non-precious metal alloy and VITAVM 13 the wash opaque firing temperature must be increased by 50 °C and the opaque firing by 30 °C. This allows better coating of the surface and improves the bonding.

Recommended firing – wash opaque firing of precious metal-free alloys:

	Predr: °C	 min.	 min.	 °C/min.	Temp. approx. °C	 min.	VAC min.
Powder	500	2.00	5.52	75	940	2.00	5.52
Paste	500	4.00	5.52	75	940	2.00	5.52

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.

Recommended firing – opaque firing of precious metal-free alloys:

	Predr: °C	 min.	 min.	 °C/min.	Temp. approx. °C	 min.	VAC min.
Powder	500	2.00	5.36	75	920	1.00	5.36
Paste	500	4.00	5.36	75	920	1.00	5.36

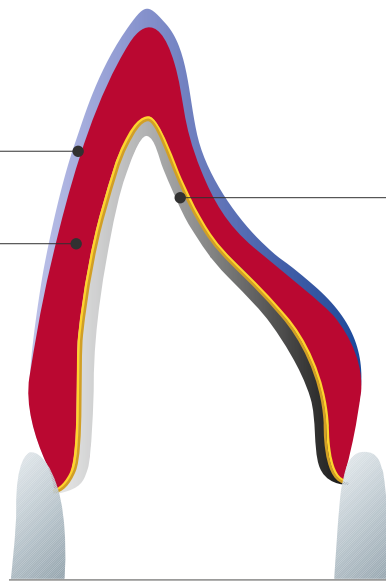
The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.

Note: The fired opaque demonstrates a high degree of surface glaze and a glassy, transparent appearance.

VITAVM 13 ENAMEL



VITAVM 13 BASE DENTINE



OPAQUE-coated metal
substructure in the CTE
range 13.8 – 15.2

VITAVM 13 BASIC layering consists of the application of VITA VM 13 BASE DENTINE and VITA VM 13 ENAMEL following the application of WASH OPAQUE AND OPAQUE.

The color-carrying VITA VM 13 BASE DENTINE porcelains with their excellent masking properties provide perfect conditions for creating veneers with intensive shades. This two-layer system offers a reliable solution for achieving optimal shade reproduction particularly in the case of thin walls.

Furthermore, the intensive shade effect of the BASE DENTINES allows generous use of the ENAMEL porcelains in order to achieve the desired translucency. The user is now able to create a natural-looking, lifelike restoration with only two layers.

⚠ Note: By means of the different conditions resulting in the wall thicknesses of BASE DENTINE and ENAMEL, the intensity of the restoration can be influenced. The thicker the BASE DENTINE layer, the more intensive the shade result. The thicker the ENAMEL layer, the less intensive the shade result



OPAQUE-coated metal substructures

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®13 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 already during this stage.

See page 18 for notes on the BASIC layering!



To obtain adequate space for the enamel, remove the corresponding amount of BASE DENTINE porcelain according to the layering scheme.



Application of VITAVM®13 ENAMEL

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

See page 29 for notes on the labial layering scheme!

The classification tables for the VITAVM 13 ENAMEL porcelains are to be found on page 28.



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



Restoration after completion of layering, ready for first dentine firing.

Recommended firing – 1st dentine firing:

Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	6.00	6.55	55	880	1.00	6.55

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



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.



Now apply BASE DENTINE starting from the neck area and add ENAMEL in the body area up to the incisal area.

Recommended firing – 2nd dentine firing:

Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	6.00	6.44	55	870	1.00	6.44

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



Bridge and crown after 2nd dentine firing.



Finishing

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

In the 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

Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	0.00	4.45	80	880	2.00	—

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



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

Recommended firing – glaze firing with VITA AKZENT[®]

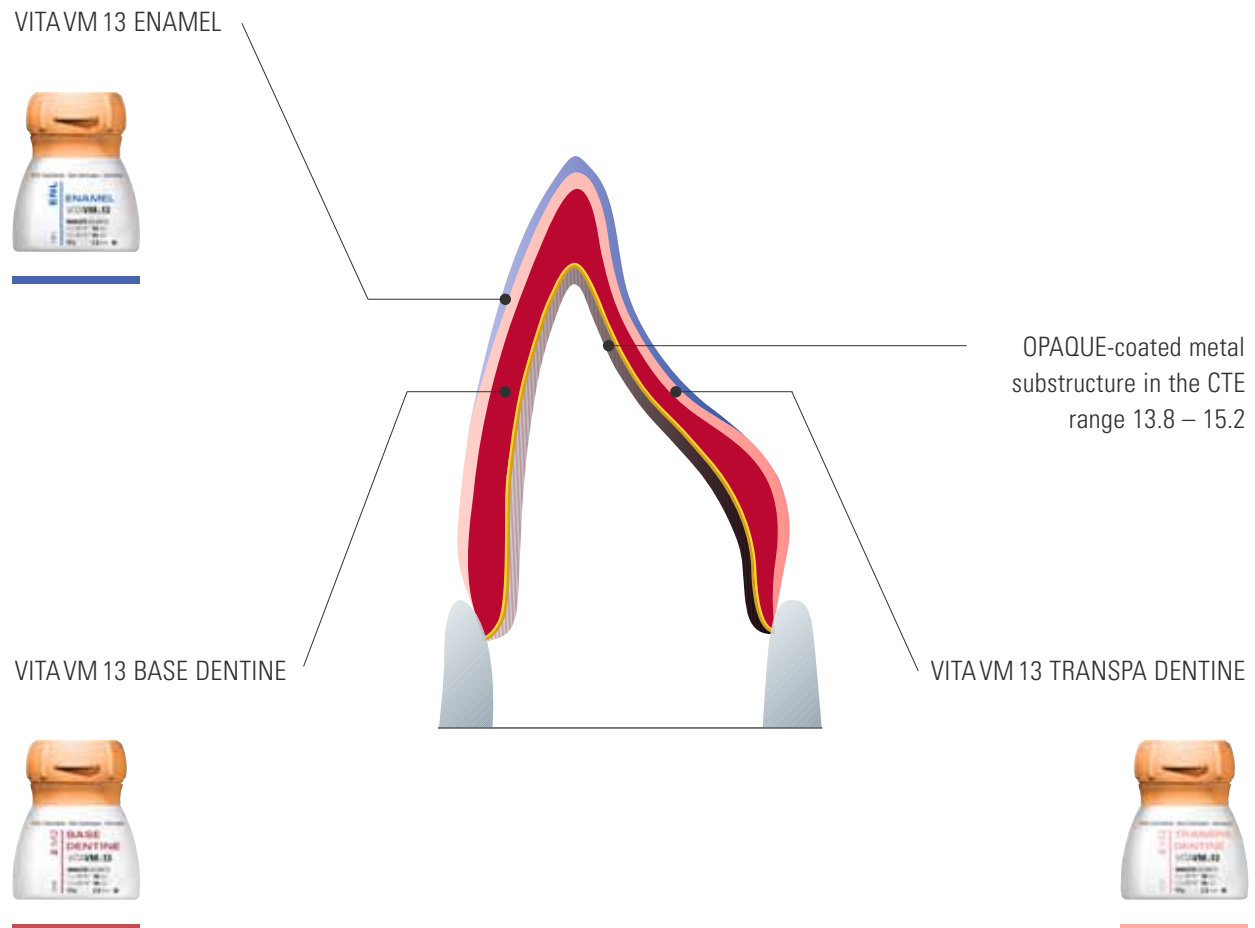
Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	4.00	4.45	80	880	1.00	—

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



Completed restoration on the model.

Note: If the restoration needs to be adjusted (ground) when it is tried in, it must be smoothed again. Polishing or glaze firing have proved to be highly suitable.



The VITAVM 13 BUILD UP layering consists of the application of BASE DENTINE, TRANSPA DENTINE and ENAMEL after applying WASH OPAQUE and OPAQUE.

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. With the three-layer method, this permits a reduced, and more individual application of the ENAMEL porcelains. This results in an extraordinarily close resemblance to what nature intended.

The shade intensity can be individually adjusted by the combination of ENAMEL and TRANSPA DENTINE porcelains in relation to the layer thickness of BASE DENTINE. An increased proportion of BASE DENTINE results in a more intensive shade, whereas a greater amount of TRANSPA DENTINE and ENAMEL reduces the intensity of the shade.

⚠ Note: The BASE DENTINE is what decisively influences the shade effect of the restoration. The TRANSPA DENTINE, like its natural counterpart, only has the function of creating a harmonious transition to the ENAMEL.



OPAQUE-coated metal substructures

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[®]13 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 already during this stage.

See page 22 for notes on the BUILD UP layering!



Application of VITAVM[®]13 TRANSPA DENTINE

DENTINE is applied in the required complete tooth shape.



To obtain sufficient space for the enamel, the volume of the TRANSPA DENTINE must be reduced correspondingly.



Application of VITAVM[®]13 ENAMEL

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

See also page 29 for notes on the labial layering scheme!

The classification tables for the VITA VM 13 ENAMEL porcelains are to be found on page 28.



Before 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:

Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	6.00	6.55	55	880	1.00	6.55

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



Restoration after first dentine firing.



Corrections to shape / further layering

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



Further corrections to shape in the body of the tooth with TRANSPA DENTINE ...



... and the incisal area with ENAMEL.

Recommended firing – 2nd dentine firing:

Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	6.00	6.44	55	870	1.00	6.44

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



Bridge and crown after the 2nd dentine firing.

Finishing

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

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 glaze firing

Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	0.00	4.45	80	880	2.00	—

The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.



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 glaze firing with VITA AKZENT[®]


Predr: °C	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
500	4.00	4.45	80	880	1.00	–



The user should consider this information as a basic guideline only. If the surface, transparency and degree of glaze do not correspond to the firing result achieved under optimal conditions, the firing procedure must be adjusted accordingly. The decisive factors for the firing procedure are not the firing temperature displayed by the furnace, but the appearance and the surface texture of the workpiece after firing.

Completed restoration on the model.

⚠ Note: If the restoration needs to be adjusted (ground) when it is tried in, it must be smoothed again. Polishing or glaze firing have proved to be highly suitable.

	Predr: °C	 min.	 min.	 °C/min.	Temp. approx. °C	 min.	VAC min.
Oxidation firing	Please heed alloy manufacturer's instructions !!!						
WASH OPAQUE firing	500	2.00	5.12	75	890	2.00	5.12
WASH OPAQUE PASTE firing	500	4.00	5.12	75	890	2.00	5.12
OPAQUE firing	500	2.00	5.12	75	890	1.00	5.12
OPAQUE PASTE firing	500	4.00	5.12	75	890	1.00	5.12
WASH OPAQUE firing for precious metal-free alloys**	500	2.00	5.52	75	940	2.00	5.52
WASH OPAQUE PASTE firing for precious metal-free alloys**	500	4.00	5.52	75	940	2.00	5.52
OPAQUE firing for precious metal-free alloys**	500	2.00	5.36	75	920	1.00	5.36
OPAQUE PASTE firing for precious metal-free alloys**	500	4.00	5.36	75	920	1.00	5.36
MARGIN* firing	500	6.00	7.05	55	890	2.00	7.05
EFFECT LINER* firing	500	6.00	7.05	55	890	1.00	7.05
1 st dentine firing	500	6.00	6.55	55	880	1.00	6.55
2nd dentine firing	500	6.00	6.44	55	870	1.00	6.44
Glaze firing	500	0.00	4.45	80	880	2.00	—
Glaze firing VITA AKZENT	500	4.00	4.45	80	880	1.00	—
Correction firing with CORRECTIVE*	500	4.00	6.00	50	800	1.00	6.00

* Area of indication see pages 30 / 31

** Note: For further information on the procedure with substructures made of precious metal-free alloys see p. 17

The firing result obtained with dental ceramics depends to a great extent on the individual user's firing procedure. The type of furnace, the location of the temperature sensor, the firing trays and the size of the workpiece during the firing cycles are decisive for the result of firing.

Our recommendations for the firing temperatures (regardless of whether these are given orally, in writing or by means of practical demonstration) are based on our own wide practical experience and test results. The user, however, should consider this information only as a general guideline.

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

Explanation of firing parameters:

Pedr. Starting temperature



Predrying time in min., closing time



Heating up time in min.



Temperature rise in °C per min.

Temp approx. °C End temperature



Hold time for end temperature

VAC min. Hold time for vacuum in min.

The following classifications are intended only as a general guideline!

VITA SYSTEM 3D-MASTER shades	ENAMEL	OPAQUE	CHROMA PLUS**	EFFECT LINER**	MARGIN**
0M1	ENL	OP0	—	EL1	M1
0M2	ENL	OP0	—	EL1	M1
0M3	ENL	OP0	—	EL1/EL2*	M1
1M1	ENL	OP1	CP1	EL1/EL2*	M1/M7*
1M2	ENL	OP1	CP1/CP2*	EL2	M1/M7*
2L1.5	ENL	OP2	CP1/CP2*	EL1/EL2*	M1/M7*
2L2.5	ENL	OP2	CP2/CP3*	EL1/EL3*	M1/M4*
2M1	ENL	OP2	CP1/CP5*	EL1/EL6*	M1/M7*
2M2	ENL	OP2	CP1/CP3*	EL1/EL3*	M1/M4*
2M3	ENL	OP2	CP3	EL2/EL4*	M4
2R1.5	ENL	OP2	CP1/CP5*	EL1/EL6*	M1/M7*
2R2.5	ENL	OP2	CP1/CP3*	EL2/EL4*	M1/M4*
3L1.5	ENL	OP3	CP2/CP5*	EL2/EL6*	M4/M7*
3L2.5	ENL	OP3	CP2/CP5*	EL4/EL6*	M4/M7*
3M1	ENL	OP3	CP1/CP5*	EL1/EL6*	M7
3M2	ENL	OP3	CP3/CP5*	EL2/EL6*	M4/M7*
3M3	ENL	OP3	CP4/CP5*	EL4/EL6*	M4/M9*
3R1.5	ENL	OP3	CP1/CP5*	EL2/EL3*	M7
3R2.5	ENL	OP3	CP4/CP5*	EL5/EL6*	M4/M7*
4L1.5	END	OP4	CP5	EL6	M7
4L2.5	END	OP4	CP4/CP5*	EL3/EL4*	M4/M9*
4M1	END	OP4	CP5	EL6	M7
4M2	END	OP4	CP3/CP5*	EL2/EL3*	M7/M9*
4M3	END	OP4	CP4/CP5*	EL5/EL6*	M9
4R1.5	END	OP4	CP5	EL2/EL3*	M7/M8*
4R2.5	END	OP4	CP4/CP5*	EL3/EL4*	M7/M9*
5M1	END	OP5	—	EL3/EL6*	M7/M8*
5M2	END	OP5	—	EL5/EL6*	M7/M9*
5M3	END	OP5	—	EL3/EL4*	M5/M9*

VITAPAN classical A1–D4 shades	OPAQUE	MARGIN**	EFFECT LINER**	CHROMA PLUS**	ENAMEL
A1	A1	M1/M7*	EL2	CP1	ENL
A2	A2	M4/M7*	EL1/EL3*	CP2	ENL
A3	A3	M4	EL4/EL6*	CP2/CP3*	ENL
A3,5	A3,5	M4/M9*	EL5/EL6*	CP2/CP3*	END
A4	A4	M4/M9*	EL1/EL3*	CP2/CP4*	END
B1	B1	M1/M4*	EL1/EL2*	CP1	END
B2	B2	M1/M4*	EL1/EL4*	CP1	END
B3	B3	M4	EL2/EL4*	CP2/CP3*	END
B4	B4	M4/M9*	EL4/EL6*	CP3	END
C1	C1	M1/M4*	EL1/EL6*	CP1	END
C2	C2	M4/M7*	EL2/EL6*	CP1/CP5*	END
C3	C3	M4/M7*	EL6	CP1/CP5*	ENL
C4	C4	M4/M7*	EL3/EL6*	CP5	ENL
D2	D2	M1/M9*	EL2/EL6*	CP1/CP5*	END
D3	D3	M4/M7*	EL2/EL3*	CP2/CP5*	END
D4	D4	M1/M4*	EL2/EL6*	CP2/CP5*	END

* mixing ratio 1:1

** areas of application see p. 30 / 31



VITAVM[®]13 BASIC layering

Please also heed the layering scheme on page 18!



VITAVM[®]13 BUILD UP layering

Please also heed the layering scheme on page 22!



VITAVM[®]13 Fluids

VITAVM[®] MODELLING LIQUID

for mixing the BASE DENTINE, DENTINE, TRANSPA DENTINE, ENAMEL and additional porcelains. The VITA VM MODELLING LIQUID makes excellent stability characteristics possible during layering and allows faster evaporation of the liquid. In this way VITA VM MODELLING LIQUID accommodates technicians wishing to produce smaller restorations or who work without constant drying/suction unit.



VITAVM[®] OPAQUE FLUID

especially for mixing the VITA VM powder opaque.

⚠ **Note:** Cannot be used for mixing the dentine porcelains!



VITAVM[®] PASTE FLUID



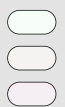





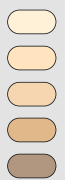



fluid for mixing the VITA VM paste opaque



VITA MODELLING FLUID (not included in the assortment)

for mixing BASE DENTINE, TRANSPA DENTINE and ENAMEL porcelains and all additional porcelains. The VITA MODELLING FLUID prevents the ceramic from drying out too quickly, and is therefore particularly suitable for larger restorations and multi-unit bridges. This is used for longer and moister processing. VITA MODELLING FLUID allows a higher degree of plasticity and elasticity during layering, but with a lower degree of stability.

<div>VITAVM-13 EFFECT LINER</div> <div><div>– to control the in-depth fluorescence of the restoration</div><div>– can be used universally to enhance and intensify the basic shade</div><div>– to enhance light distribution in the gingival area</div></div>	<div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div>	<div><div>EL1</div><div>snow</div></div> <div><div>EL2</div><div>cream</div></div> <div><div>EL3</div><div>tabac</div></div> <div><div>EL4</div><div>golden fleece</div></div> <div><div>EL5</div><div>papaya</div></div> <div><div>EL6</div><div>sesame</div></div> <div></div>	<div><div><div>EL1</div><div>EFFECT LINER</div><div>VITAVM-13</div></div></div>
<div>VITAVM-13 EFFECT CHROMA</div> <div><div>– shade-intensive modifier porcelains</div><div>– to emphasize particular shaded areas of the tooth</div><div>– for the individual adjustment of the lightness level in the neck, dentine and enamel area</div></div>	<div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div>	<div><div>EC1</div><div>ghost</div></div> <div><div>EC2</div><div>linen</div></div> <div><div>EC3</div><div>pale banana</div></div> <div><div>EC4</div><div>lemon drop</div></div> <div><div>EC5</div><div>golden rod</div></div> <div><div>EC6</div><div>sunflower</div></div> <div><div>EC7</div><div>light salmon</div></div> <div><div>EC8</div><div>toffee</div></div> <div><div>EC9</div><div>doe</div></div> <div><div>EC10</div><div>larch</div></div> <div><div>EC11</div><div>gravel</div></div> <div></div>	<div><div><div>EC1</div><div>EFFECT CHROMA</div><div>VITAVM-13</div></div></div>
<div>VITAVM-13 MAMELON</div> <div><div>– highly fluorescent porcelain mainly used in the incisal area</div><div>– for shade characterization between dentine and enamel</div></div>	<div><div><div></div></div><div><div></div></div><div><div></div></div></div>	<div><div>MM1</div><div>ecru</div></div> <div><div>MM2</div><div>mellow buff</div></div> <div><div>MM3</div><div>peach puff</div></div> <div></div>	<div><div><div>MM1</div><div>MAMELON</div><div>VITAVM-13</div></div></div>
<div>VITAVM-13 GINGIVA</div> <div><div>– for reproducing the individual gingival situation</div><div>– are applied and fired after the first or the second dentine firing respectively</div><div>– the shade nuances range from orange-red to reddish to brownish red</div></div>	<div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div>	<div><div>G1</div><div>rose</div></div> <div><div>G2</div><div>nectarine</div></div> <div><div>G3</div><div>pink grapefruit</div></div> <div><div>G4</div><div>rosewood</div></div> <div><div>G5</div><div>cherry brown</div></div> <div><div>GOL</div><div>light flesh</div></div> <div><div>GOD</div><div>dark flesh</div></div> <div></div>	<div><div><div>G1</div><div>GINGIVA</div><div>VITAVM-13</div></div></div>
<div>VITAVM-13 CORRECTIVE</div> <div><div>– with reduced firing temperature (800 °C) for corrections after the glaze firing</div><div>– in three nuances for the neck, dentine and enamel area</div></div>	<div><div><div></div></div><div><div></div></div><div><div></div></div></div>	<div><div>COR1</div><div>neutral</div></div> <div><div>COR2</div><div>sand</div></div> <div><div>COR3</div><div>ochre</div></div> <div></div>	<div><div><div>COR1</div><div>CORRECTIVE</div><div>VITAVM-13</div></div></div>

VITAVM[®]13 EFFECT ENAMEL – can be used for all enamel areas found in natural teeth – universally applicable translucent enamel effect porcelains – to create a natural impression of depth		<table><tr><td>EE1</td><td>mint cream</td></tr><tr><td>EE2</td><td>pastel</td></tr><tr><td>EE3</td><td>misty rose</td></tr><tr><td>EE4</td><td>vanilla</td></tr><tr><td>EE5</td><td>sun light</td></tr><tr><td>EE6</td><td>navajo</td></tr><tr><td>EE7</td><td>golden glow</td></tr><tr><td>EE8</td><td>coral</td></tr><tr><td>EE9</td><td>water drop</td></tr><tr><td>EE10</td><td>silver lake blue</td></tr><tr><td>EE11</td><td>drizzle</td></tr><tr><td></td><td></td></tr></table>	EE1	mint cream	EE2	pastel	EE3	misty rose	EE4	vanilla	EE5	sun light	EE6	navajo	EE7	golden glow	EE8	coral	EE9	water drop	EE10	silver lake blue	EE11	drizzle			
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EE11	drizzle																										
VITAVM[®]13 EFFECT PEARL – only suitable for surface, not inlaid effects – ideal for "bleached" restorations – for yellow and red nuances		<table><tr><td>EP1</td><td>pearl</td></tr><tr><td>EP2</td><td>pearl blush</td></tr><tr><td>EP3</td><td>pearl rose</td></tr><tr><td></td><td></td></tr></table>	EP1	pearl	EP2	pearl blush	EP3	pearl rose																			
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EP2	pearl blush																										
EP3	pearl rose																										
VITAVM[®]13 EFFECT OPAL – to create an opalescent effect in restorations of youthful and very translucent teeth		<table><tr><td>E01</td><td>opal</td></tr><tr><td>E02</td><td>opal whitish</td></tr><tr><td>E03</td><td>opal bluish</td></tr><tr><td></td><td></td></tr></table>	E01	opal	E02	opal whitish	E03	opal bluish																			
E01	opal																										
E02	opal whitish																										
E03	opal bluish																										
VITAVM[®]13 MARGIN – to create an esthetic transition in the case of a labially shortened metal coping – heat must be applied to the applied, plastified MARGIN porcelain; it is recommended to stabilize the shoulder by applying heat with a hairdryer or the heat radiation at the furnace opening		<table><tr><td>M1</td><td>icy beige</td></tr><tr><td>M4</td><td>wheat</td></tr><tr><td>M5</td><td>amber</td></tr><tr><td>M7</td><td>seashell</td></tr><tr><td>M8</td><td>tan</td></tr><tr><td>M9</td><td>beach</td></tr><tr><td></td><td></td></tr></table>	M1	icy beige	M4	wheat	M5	amber	M7	seashell	M8	tan	M9	beach													
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M9	beach																										
VITAVM[®]13 CHROMA PLUS – shade-intensive porcelains, best used in combination with BASE DENTINE – to effectively enhance the shade in the case of thin wall thicknesses		<table><tr><td>CP1</td><td>ivory</td></tr><tr><td>CP2</td><td>almond</td></tr><tr><td>CP3</td><td>moccasin</td></tr><tr><td>CP4</td><td>caramel</td></tr><tr><td>CP5</td><td>burlywood</td></tr><tr><td></td><td></td></tr></table>	CP1	ivory	CP2	almond	CP3	moccasin	CP4	caramel	CP5	burlywood															
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CP4	caramel																										
CP5	burlywood																										
VITAVM[®]13 COLOR OPAQUE – shade-intensive opaque porcelains for the characterization of enamel and cervical areas		<table><tr><td>CO1</td><td>gold</td></tr><tr><td>CO2</td><td>brown</td></tr><tr><td>CO3</td><td>lilac</td></tr><tr><td></td><td></td></tr></table>	CO1	gold	CO2	brown	CO3	lilac																			
CO1	gold																										
CO2	brown																										
CO3	lilac																										


VITAVM®13 BASIC KIT*//****

Basic Assortment for the BASIC layering

Quantity	Content	Material
1	12 g	WASH OPAQUE W0
5	12 g	OPAQUE° OP1 – OP5
5	12 g	CHROMA PLUS CP1 – CP5
26	12 g	BASE DENTINE° 1M1 – 5M3
2	12 g	ENAMEL° ENL, END
1	12 g	NEUTRAL° NT
1	12 g	WINDOW° WIN
3	12 g	CORRECTIVE COR1 – COR3
1	50 ml	VITA VM MODELLING LIQUID
1	50 ml	VITA VM OPAQUE FLUID
1	–	Shade indicator
1	–	VITA Toothguide 3D-MASTER
1	–	Working instructions

* also available as a reduced assortment BASIC KIT SMALL

** also available as VITAVM 13 BASIC KIT classical in the VITAPAN classical shades A1–D4 and as the VITAVM 13 BASIC KIT SMALL classical with the following 6 shades: A1, A2, A3, A3.5, B3, D3

*** each assortment also available with PASTE OPAQUE

° also available in 50 g


VITAVM®13 BUILD UP KIT*/**

Supplementary assortment for the BASIC layering

Quantity	Content	Material
26	12 g	TRANSPA DENTINE° 1M1 – 5M3
1	50 ml	VITA VM MODELLING LIQUID

* also available in the following 15 shades as BUILD UP KIT SMALL: 1M1, 1M2, 2M1, 2M2, 2M3, 2L1.5, 3L2.5, 3M1, 3M2, 3M3, 3R1.5, 3R2.5, 4M1, 4M2, 4M3

** also available as VITAVM 13 BUILD UP KIT classical in the VITAPAN classical shades A1–D4 and as VITAVM 13 BUILD UP KIT SMALL classical with 6 shades

° also available in 50g


VITAVM®13 CLASSICAL COLOR KIT*/**

Add-on assortment for VITAVM 13 3D-MASTER users

Quantity	Content	Material
16	12 g	OPAQUE A1–D4
16	12 g	BASE DENTINE° A1–D4
16	12 g	TRANSPA DENTINE° A1–D4
1	50 ml	VITA VM MODELLING LIQUID
1	50 ml	VITA VM OPAQUE FLUID
1	–	shade indicator
1	–	VITAPAN classical shade guide
1	–	Working instructions

* also available with OPAQUE PASTE

** Assortment for VITAVM 13 3D-MASTER customers wishing to add VITAPAN classical shades to their assortment

° also available in 50 g


VITAVM®13 PROFESSIONAL KIT*
For inlaid natural effects and characteristics

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

* available as PROFESSIONAL KIT SMALL in the following shades:
EC1, EC4, EC6, EC8, EC9, MM2, EP1, EO2, EE1, EE3, EE7, EE8, EE9, EE10, EE11


VITAVM®13 BLEACHED COLOR KIT*
Ultra-light shades for the reproduction of bleached teeth

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

* Also available with OPAQUE PASTE


VITAVM®13 GINGIVA KIT*
Natural-looking gingiva porcelains

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





* Also available with OPAQUE PASTE



VITA[®]VM.13 MARGIN KIT
For ceramic shoulder design

Quantity	Content	Material
6	12 g	MARGIN M1, M4, M5, M7, M8, M9
1	—	Shade sample blade MARGIN



Problem	Cause	Solution
Crack formation in the paste opaque	<p>Paste opaque applied too thickly</p> <p>Too rapid burning out of organic substances in paste opaque</p> <p>Predrying temperature too high</p> <p>Furnace still retains too much heat from the previous firing</p>	<p>First apply wash opaque and fire, then repeat application until opaque layer completely covers substructure</p> <p>Increase predrying time</p> <p>Lower predrying temperature (450 °C)</p> <p>Allow furnace to cool down to standby temperature</p>
Crack formation in the opaque	<p>Opaque applied too thickly and/or opaque accumulation in grooves (e.g. interdental areas, between metal supports)</p> <p>Opaque dried too quickly</p>	<p>Ensure more thin, homogeneous opaque application, do not vibrate too strongly</p> <p>Set predrying times and predrying temperature according to firing chart</p>
Bubble formation in the opaque	<p>Incorrect casting</p> <p>Incorrect sandblasting</p> <p>Impurities in the metal surface</p> <p>Sintering of Al_2O_3 into the metal surface</p> <p>Porcelain applied in too thin / too watery consistency</p> <p>Paste opaque not stirred properly</p>	<p>See working instructions of metal manufacturers</p> <p>Heed manufacturers' instructions with regard to alloy types</p> <p>Clean metal surface thoroughly</p> <p>Reduce sandblasting pressure / sandblasting angle</p> <p>Mix to a thicker (creamy) consistency, do not apply in a too watery consistency</p> <p>Fluid deposits at the surface / opaque paste was thinned too often</p>

Problem	Cause				Solution			
Cracks appear in surface	Layered in too dry state				Firing chamber still too hot 1. Layer in more moist state, do not compact 2. Heed predrying temperature (500 °C)			
	Ceramic dried out too much before firing				Use VITA MODELLING FLUID (BMF50) (keeps moisture longer in the ceramic)			
	Gas unable to escape completely from ceramic during predrying				Slower heating-up (alter firing parameters according to firing chart)			
		Predr: °C	 min.	 min.	 °C/min.	Temp. approx. °C	 min.	VAC min.
	1 st dentine firing	500	6.00	8.27	45	880	1.00	8.27
	Pre-drying position altered				Heed VITA factory settings			
	Firing chamber still too hot				Wait until standby temperature is reached			
Chipping off / detachment of material at ceramic surface after correction firing or 2 nd dentine firing	Layered in too dry state				See above.			
	Surface not ground over before correction firing				Grind surface homogeneously with stones/diamond abrasives or sandblast at a low pressure			
	Surface impurities, e.g. insulation by the antagonist				Clean the models and restorations thoroughly before applying the next layer of ceramic. If substructure material is made of precious metal-free alloy: Heed specific instructions on page 17			
Microporosities in the surface	Layered in too dry state or suction too strong				Moisten the ceramic and place it in a moist condition on the firing tray			
Cracks	CTE not heeded				Check CTE of alloy and adjust cooling if necessary			
	Incorrect framework design				Model framework accordingly (reduced tooth size; heed manufacturer's instructions !!!)			
	Contamination of the metal				Thoroughly clean substructure before firing (heed manufacturers' instructions)			


Problem	Cause	Solution
Cracks parallel to tooth axis	<p>Insufficient interdental separation of the applied ceramic</p> <p>Metal bridge connections too small / insufficient</p>	<p>Separate the ceramic down to the opaque layer. Please note: moisten the blade and pull it through completely</p> <p>Sufficiently dimension the metal framework (heed alloy manufacturers' instructions)</p>
Insufficient translucency / brilliance (lifeless appearance of ceramic)	<ol style="list-style-type: none"> 1. Too strongly compacted 2. Error in vacuum system 3. Firing temperature too low (incorrect) 4. Predrying and/or heating-up time too short 5. Oily modeling liquids used 6. Too much enamel 	<ol style="list-style-type: none"> 1. Less or no compaction 2. Check the vacuum pump 3. Firing sample with transparent ceramic, e.g. WIN or EE9 4. Heed firing cycle chart (check furnace settings) 5. Use original VITA Modelling Liquid 6. Heed layering structure
Substructure shines through	<p>BASE DENTINE applied too thinly</p> <p>BASE DENTINE ends at incisal edge of metal framework</p>	<p>Apply BASE DENTINE to cover entire labial surface, layering structure must be heeded</p> <p>Model BASE DENTINE beyond the upper edge of the substructure</p>
Shade too pale / 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 structure 2. Firing sample with transparent ceramic such as WIN or EE9 3. Use VITA Modelling Liquid
Opalescent effect / pearl effect insufficient/ opalescent ceramic appears whitish	Opalescent effect /pearl effect no longer visible after repeated firing cycles.	Do not fire opalescent porcelains more than twice. Use pearl effect ceramics only at the surface
Shade too intensive, has too warm hue	<p>Ceramic overfired</p> <p>Too much BASE DENTINE used</p>	<p>Shade sample with a transparent ceramic, e.g. WIN or EE9</p> <p>See notes page 18 and page 22</p>

Problem	Cause	Solution
Smear marks in the ceramic	Opaque residue in brush water Ceramic not properly mixed Incorrect liquids used	Use fresh water for the next opaque application Always mix ceramics thoroughly, even when re-moistening Ensure correct liquids are used
Black dots in the ceramic	Brush water dirty Wrong liquid used 1. contamination of the ceramics with metal grinding dust 2. silicone residue from rubber polishing	Use fresh water Use VITA Modelling Liquid 1. Make sure ceramic workplace is clean 2. Clean thoroughly Use VITA Modelling Liquid
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 Muffle contaminated by metal deposits (Ag, Cu, etc.)	Cleaning the firing muffle with graphite tablet firing at 1000 °C 15 min, hold, no vacuum

For further information see our FAQs on metal ceramic in the internet or under the order number 1521.

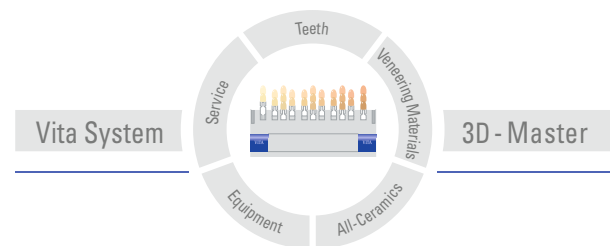
The following products are subject to obligatory labeling:		
VITAVM [®] OPAQUE FLUID	Corrosive Causes severe burns. Store under lock and key and out of the reach of children. Do not eat and drink while working. In case of eye contact rinse immediately and thoroughly with water and consult physician. Do not allow to penetrate the sewage system; this product and its container must be disposed of according to the regulations for hazardous waste. Wear appropriate protective clothing when working. Wear protective gloves and protective goggles/face mask. In case of accident or unwellness consult physician immediately (if possible, show this label).	
VITA SPRAY-ON INDICATOR LIQUID and VITA SPRAY-ON LIQUID	Flammable Keep container tightly closed and store in a well-ventilated place. Keep away from sources of ignition – do not smoke. Do not allow to enter into the sewage system. This product and its container must be disposed of according to the regulations for hazardous waste.	

For more details please see the corresponding Material Safety Data Sheets!

Protective clothing	Wear suitable protective goggles/face mask, protective gloves and protective clothing when working. In case of dust formation use a suction unit or wear a dust mask.	
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VITA VM 13 veneering ceramic is available in VITA SYSTEM 3D-MASTER and VITAPAN classical A1 – D4 shades. Shade compatibility with all VITA 3D-MASTER and VITAPAN classical materials is ensured.

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



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: 09.08

After the publication of these working instructions any previous versions become obsolete. The current version can be found at www.vita-zahnfabrik.com

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

VITA VM[®]13
VITA AKZENT[®]

US 5498157 A
AU 659964 B2
EP 0591958 B1

VITA

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