Questions and Answers on VITA**VM**®**9**

VITA shade taking | VITA shade communication | VITA shade reproduction | VITA shade control

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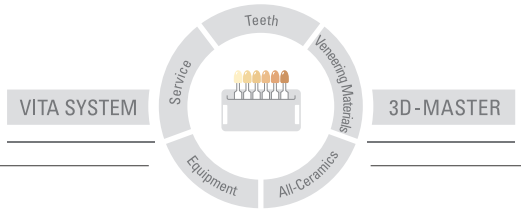


VITA

Available in VITA SYSTEM 3D-MASTER
and VITAPAN classical A1-D4 shades

You will find information on possible causes of porcelain problems (and the solutions) on the following pages.

1. Bonding problems - all-ceramic substructure to veneering ceramic

- Base dentine washbake must be applied in accordance with the working instructions to achieve good wetting of the surface. The required temperature must be adhered to in order to ensure correct melting of Base Dentine. Recently layered ceramic must not be preheated too quickly or at excessive temperatures.

- When filling interdental spaces during bridge correction, do not vibrate the material until dry, otherwise the material will not bond. Interdental spaces should be wetted with an oily liquid (e.g. VITA INTERNO Liquid, do NOT use baby oil) before filling.

2. Marginal shrinkage of the ceramic

- Model the substructure to a reduced tooth size to support and ensure a uniform layer thickness of the ceramic. Ensure cuspal support of the posterior area. Ensure U-shaped modellation of the interdental spaces.

- Ensure good marginal adaptation of the materials. If necessary, use a dry and clean brush (brush No. 10) to smooth these areas (from incisal to cervical) before firing.

- When firing bridges, always separate porcelain down to the substructure in the interdental spaces. Shrinkage of the ceramic always occurs in the thickest area; therefore a uniform layer thickness is recommended. Do not use dry or saw-toothed instruments. These may cause the ceramic to become detached and separate from the surface of the substructure.

- If a rubber polisher is used before finishing, the surface must not be wetted with liquid afterwards. It must first be cleaned. It is not sufficient to clean it with a steam cleaner or with water. Silicone residue at the surface must be removed mechanically using a goat-hair brush.

- Insulation material (separator) residue must not be left on the ceramic surface. Contact with freshly insulated antagonists (opposing teeth) can lead to problems.

3. Chipping

- When modelling the framework, the minimum layer thicknesses should be observed right from the beginning to ensure minimum wall thicknesses of 0.5 mm in the circumferential and 0.7 mm in the occlusal area. Follow manufacturers' instructions concerning the thickness of junctures.

- If minor corrections of the substructures need to be performed after sintering, work exclusively with diamonds and a turbine with water cooling.
  Do not sandblast the outer surfaces.
  Do not apply too much pressure and use the indicated speed (observe manufacturer's instructions).

- Avoid heat development at the surface. Do not use finishing instruments since their binders may adhere to the surface. After grinding, thermal treatment (regeneration firing) is recommended to reverse any phase transitions on the surface.
  Resulting microcracks cannot be regenerated.

- To support the structure, model in reduced tooth size in order to achieve a uniform layer thickness of the ceramic.
  Ensure cuspal support of the posterior area.
  Ensure U-shaped modellation of the interdental spaces.

- Substructure should exclusively be finished with diamond abrasives and turbine with water cooling. Do not sandblast the outer surfaces.
  Do not apply too much pressure and use the indicated speed (observe manufacturer's instructions).

- To achieve optimum wetting of the ZrO_2 surface, we recommend a Base Dentine washbake (alternatively, Transpa Dentine, Chroma Plus, Effect Liner, etc. may also be used).
  The material must be applied in accordance with the working instructions. To ensure proper melting of the Base Dentine, the correct temperature (+40 °C compared to the normal firing temperature) must be kept.
  The surface needs to exhibit a brilliant appearance.

- When preparing a ceramic veneer, a uniform layer thickness across the entire surface to be veneered must be ensured.

- Ensure correct firing parameters and firing temperature. A different heat-up rate (for example 45°C per minute), is recommended for large-span bridges and thick bridge units due to the low thermal conductivity.

- Ensure correct firing parameters and firing temperature. For checking carry out muffle test with mirror (optimum temperature range: 200 – 300 °C).

- Grind the surface of the ceramic with diamond abrasives. Avoid developing heat during grinding.
  When using blunt diamonds, do not increase the grinding pressure but replace the abrasive instrument. When using a turbine, water cooling must always be ensured.

- 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 entire thickness of the ceramic layer should not exceed 2 mm.

- To avoid any residual thermal stress in the veneering material, in particular in large restorations such as large molars, pontics or bridges, we recommend slow cooling down to the transformation temperature of the veneering material (approx. 600°C for VITA VM 9). This should be accomplished during the final firing of the restoration, whether that be a dentine, enamel or glaze firing.

	Predr. temp.	→	↗	°C/min	Temp. °C	→	↘	→
Dentine firing	500°	6.00 min	7.27 min	55°	910°	1.00 min	600°	0.00 min

Lift position during cooling down 75% so that the rim of rim of the firing tray is still in the firing chamber

4. Tearing

- To support the structure, model in reduced tooth size in order to achieve a uniform layer thickness of the ceramic. Ensure cuspal support of the posterior area. Ensure U-shaped modellation of the interdental spaces.
- When mixing all ceramic materials ensure that no bubbles are formed. Make sure that the liquid is added to the powder from the side and stir the mixture thoroughly using a glass or agate spatula. The use of metal spatulas can lead to metal abrasion and discoloration of the ceramic.
- Keep workplace clean; dust and dirty brush water may cause problems (such as formation of bubbles).
- Do not apply insulating (separating) liquids too thickly.
- When firing bridges, always separate down to the sub-structure. Shrinkage of the ceramic always occurs only in the thickest area. Therefore a uniform layer thickness is recommended. Do not use any dry or saw-toothed instruments. The use of these instruments can cause the ceramic to become detached and separated from the surface.
- Ensure correct firing parameters and firing temperature. For the muffle test, use a mirror to look into the firing chamber and check whether the muffle is firing properly.
- If a rubber polisher is used before the final finishing, the surface must not be wetted with liquid again. It must first be cleaned. It is not sufficient to clean it using a steam cleaner or with water. Silicone residue at the surface must be removed mechanically using a goat-hair brush.
- Insulation material residue must not be left on the ceramic surface. Contact with the freshly insulated antagonists (opposing jaw) can lead to problems.
- When filling the interdental spaces during bridge correction, do not vibrate the material until dry, otherwise the material will not bond. Interdental spaces should be wetted with an oily liquid (e.g. VITA Interno) before filling.

5. Cracking

- To support the structure, model in reduced tooth size in order to achieve a uniform layer thickness of the ceramic. Ensure cuspal support of the posterior area. Ensure U-shaped modellation of the interdental spaces.
- Avoid heat development at the surface.
- Base dentine washbake must be applied in accordance with the working instructions to achieve good wetting of the surface. The required temperature must be adhered to in order to ensure correct melting of Base Dentine.
- When firing bridges, always separate down to the substructure. Shrinkage of the ceramic always occurs only in the thickest area. Therefore a uniform layer thickness is recommended. Do not use any dry or saw-toothed instruments. The use of these instruments can cause the ceramic to become detached and separated from the surface.
- Ensure correct firing parameters and firing temperature. For the muffle test, use a mirror to look into the firing chamber and check whether the muffle is firing properly.
- Grind the surface of the ceramic with diamond abrasives. Avoid developing heat when grinding. When using blunt diamonds, do not increase the grinding pressure but replace the abrasive instrument. When using a turbine, water cooling must always be ensured.
- Do not use firing trays with metal pins.

6. Bubbles

- Use only diamond instruments and a water-cooled turbine for processing the substructure. Do not apply too much pressure and use the indicated speed (observe manufacturer's instructions). Avoid heat development at the surface during finishing. Do not use finishing instruments unless necessary. Thermal (heat) treat substructure after grinding.
- When mixing all ceramic materials ensure that no bubbles are formed. Make sure that the liquid is added to the powder from the side and stir the mixture thoroughly using a glass or agate spatula. The use of metal spatulas must be avoided since it may lead to metal abrasion and discoloration of the ceramic. Keep workplace clean; (metal) dust and dirty brush water may cause problems (such as formation of bubbles). Insulating liquids must not be applied too thickly.
- Ceramic materials should not be mixed with modelling liquid but with distilled water when remixing them. It must also be ensured that the mixture is free from bubbles. A homogeneous moisture level of the layered ceramic must be achieved. Do not keep re-wetting or allow it to dry out.
- Sandblasting the structure with AL_2O_3 after the first firing may cause the formation of bubbles.

7. Shade too grey / too pale

- When mixing all ceramic materials ensure that no bubbles are formed. Make sure that the liquid is added to the powder from the side and stir the mixture thoroughly using a glass or agate spatula. The use of metal spatulas must be avoided since it may lead to metal abrasion and discoloration of the ceramic.
  Keep workplace clean; dust and dirty brush water may cause problems (such as formation of bubbles).
  Insulating liquids must not be applied too thickly.

- Insulation (separating) material residue must not be left on the ceramic surface. Do not use baby oil or similar liquids for insulating. Contact with the freshly insulated antagonists (opposing jaw) can lead to problems.

- Firing temperature too high or too low: ensure correct firing parameters and firing temperature.

- Too much TRANSPA DENTINE and/or ENAMEL used. Not enough BASE DENTINE used.

- Veneer thickness insufficient; thickness of the ceramic layer of ≥ 0.6 is required to ensure reliable shade reproduction.

- Ceramic materials should not be mixed with modelling liquid but with distilled water when remixing them. It must also be ensured that the mixture is free from bubbles. A homogeneous moisture level of the layered ceramic must be achieved. Do not keep re-wetting or allow it to dry out.

- Incomplete predry; liquid did not completely evaporate during firing.

8. Clouding

- Ensure correct firing parameters and firing temperature. For checking carry out muffle test with mirror (optimum temperature range: 200 to 300°C).

- Insulation (separating) material residue must not be left on the ceramic surface. Do not use baby oil or similar liquids for insulating. Contact with the freshly insulated antagonists (opposing jaw) can lead to problems.

- The correction material should not be applied in insufficient portions. Make sure it does not dry out too much; if necessary use a liquid which keeps it moist over an extended period (VITA MODELLING FLUID or add a drop of VITA Interno Fluid).

- Firing temperature too low.
  Tip: Carry out WINDOW test

- Avoid frequent removal (suction) and rewetting of the material; ensure homogeneous moisture level.

- Incomplete predry; liquid did not completely evaporate during firing.

9. Pinholing in the surface

- When mixing all ceramic materials ensure that no bubbles are formed. Make sure that the liquid is added to the powder from the side and stir the mixture thoroughly using a glass or agate spatula. The use of metal spatulas must be avoided since it may lead to metal abrasion and discoloration of the ceramic.
  Keep workplace clean; dust and dirty brush water may cause problems (such as formation of bubbles).
  Insulating (separating) liquids must not be applied too thickly.

- Ceramics should not be mixed with modelling liquid but with distilled water when remixing them. It must also be ensured that the mixture is free from bubbles. A homogeneous moisture level of the layered ceramic must be achieved. Do not keep re-wetting or allow it to dry out.

- The correction porcelain should not be applied in insufficient portions. Make sure it does not dry out too much. If necessary use a liquid which keeps it moist over an extended period.

- Avoid frequent removal (suction) and rewetting of the material; ensure homogeneous moisture level.

- Wet ground surfaces before applying ceramic material (do not use oily liquids such as Interno Liquid).

10. Black specks in the ceramic

- When mixing all ceramic materials ensure that no bubbles are formed. Make sure that the liquid is added to the powder from the side and stir the mixture thoroughly using a glass or agate spatula. The use of metal spatulas must be avoided since it may lead to metal abrasion and discoloration of the ceramic.

- Keep workplace clean; (metal) dust and dirty brush water may cause problems.

- Do not apply insulation (separating) liquids too thick.
  Do not use baby oil or similar liquids.

11. Errors during firing

- Ensure good marginal adaptation of the materials. If necessary, use a dry and clean brush to smooth these areas before firing.

- When firing bridges, always separate down to the substructure in the interdental spaces prior to the first dentine firing. Shrinkage of the ceramic always occurs in the thickest area; therefore a uniform layer thickness is recommended. Do not use any dry and saw-toothed instruments. These may cause the ceramic to become detached and separate from the surface of the sub-structure.

- Crown has a "lifeless" appearance or insufficient trans-lucency (incorrect liquid may have been used).

- Crown has a glassy appearance or round edges after firing: check firing muffle!

- Incorrect furnace parameters or defective vacuum pump.

- Incorrect predrying; clouding, greyish discoloration.

12. Questions and answers

- *Which substructure materials can be veneered with VITA VM 9?*

  If the information in the working instructions and the guidelines on substructure fabrication/design provided by VITA are adhered to, VITAVM 9 can be used for substructures made from 3Y-TZP (-A) – regardless of the respective manufacturer. Since the function depends on a variety of different parameters, the quality of the individual restoration can only be ensured by the user.

  Moreover, VITA VM 9 is perfectly suited for individualizing all VITABLOCS and PM 9.

- *What is the purpose/indication range of the VITA VM 9 EFFECT LINER?*

  VITA VM 9 EFFECT LINER must not be mixed up with LINER materials of competitors. VITA VM 9 EFFECT LINER is not used for coloring the zirconium dioxide substructure.

  The EFFECT LINER has demonstrated particularly high fluorescence and is used to control the fluorescence from the depth.

- *What do you recommend for coloring the zirconium dioxide substructure material?*

  We recommend the use of VITA In-Ceram YZ COLORING LIQUID. For non-colored VITA In-Ceram YZ substructures we recommend the application of VITA VM 9 EFFECT BONDER to ensure reliable shade reproduction.
  A very thin coat (similar to wash application for metal ceramics) of EFFECT BONDER mixed with VITA VM 9 EFFECT BONDER FLUID is applied.

  Alternatively, precolored VITA In-Ceram YZ Color blocks can be used.

- *Can the zirconium oxide substructure be completely sandblasted before it is veneered with VITA VM 9?*

  No, mechanical surface treatment such as grinding with diamond instruments and sandblasting may supply hypercritical quantities of energy to the zirconium oxide substructure, which may result in deformation of large areas of the crystal lattice or even in the phase transition of ZrO_2. As a consequence, complex stress can be formed at the interface of the veneer which may result in the immediate failure or also in subcritical crack growth and consequential latent damage to the restoration.
  This effect can be detected e.g. by radiographic phase analysis (fig. 1). Compared with tetragonal ZrO_2, monoclinic, ZrO_2 features a lower CTE.

  If the zirconium oxide restoration is to be cemented using a phosphate monomer containing composite (e.g. PANAVIA), sandblasting of the adhesion surfaces with AL_2O_3 (max. 50 µm) at a pressure of ≤ 2.5 bars will create a permanent bond between the composite and the oxide ceramic.

- *What is the purpose of the BASE DENTINE washbake?*

  The BASE DENTINE washbake is used to achieve good bonding of the veneering material to the substructure material.

- *Are there any special shoulder materials for VITA VM 9 and are these used analogously to the metal-ceramic shoulder veneering materials, such as VITA VM 13?*

  VITA VM 9 MARGIN materials are available; however, these materials are only used for minor corrections of margins.

- *In the case of bridge pontics - how can the intensity of the COLORING LIQUID be influenced?*

  The intensity of the COLORING LIQUID can be changed by applying it with a brush.

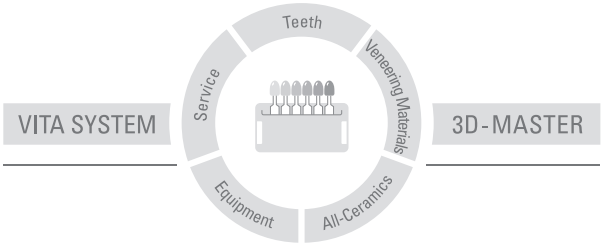
  Use a brush to wet the substructure with distilled water and then dip it into COLORING LIQUID to reduce the color saturation of the substructure.

- *Excellent match with the shade guide but considerable deviation after seating (appears too dark).*

  A discolored die may be the cause. Therefore the shade of the die must be checked and the die must be coated or bleached if necessary. Use of Vita Simulate (prep shade) material is highly recommended.

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

VITA VM veneering materials are available in VITA SYSTEM 3D-MASTER and Classical shades. Shade compatibility with all VITA materials is ensured.



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