# VITA In-Ceram® YZ

Working Instructions


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

Date of issue: 11.11

VITA shade, VITA made.

VITA

Partially yttrium-stabilized zirconium dioxide
for high-temperature sintering

Zirconium dioxide ($ZrO_2$) is an oxide ceramic with many fascinating properties, such as its translucency in the case of thin wall thicknesses, its bright color and its outstanding biocompatibility. It is no coincidence that this material is frequently used in the field of implantology. In addition to this, it features a high degree of crack resistance which distinguishes it among oxide ceramics.

The latter is a result of the so-called polymorphism of zirconium dioxide. The crystal lattice is stabilized in its tetragonal high-temperature phase by means of suitable additives, e.g. yttrium oxide which also avoids further transformation into the monoclinic phase which would otherwise automatically occur during the cooling process. Only when applying an external source of energy, as for example in the case of a beginning crack (see fig. 1), individual zirconium dioxide grains are transformed locally from their tetragonal to the monoclinic form, which is accompanied by an increase in volume (see yellow $ZrO_2$ particles in fig. 1). This procedure is described as transformation strengthening. The compressive stresses arising within the structure (see green arrows in fig. 1) prevent the unhindered growth of a crack and hence the failure of the ceramic. This property is also reflected in the long life of zirconium dioxide under permanent loading.

VITA In-Ceram YZ for inLab is porously presintered zirconium dioxide (see fig. 2) partially stabilized with yttrium oxide (YTZ-P = yttria stabilized Zirconia polycrystal). From this material, which is easy to process in this condition, enlarged crown and bridge substructures are milled in the CAD/CAM system.

The shrinkage which takes place during the subsequent sintering process in a special high-temperature furnace (the ZYrcomat) is exactly calculated.
The end result: substructures with a high degree of strength and marginal accuracy which feature all the advantages of the physical properties of zirconium dioxide. Substructures made of VITA In-Ceram YZ are veneered with the fine-structure ceramic VITA VM 9.

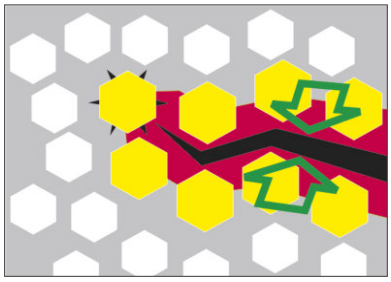


Fig. 1
Schematic diagram of the phase transformation process of $ZrO_2$

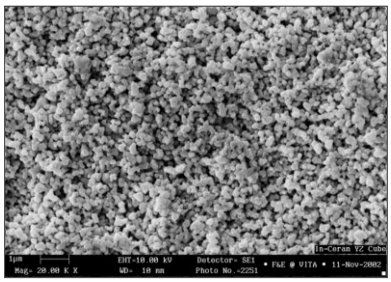


Fig. 2
SEM of the microstructure of unsintered VITA In-Ceram YZ (magnification 20,000 x)

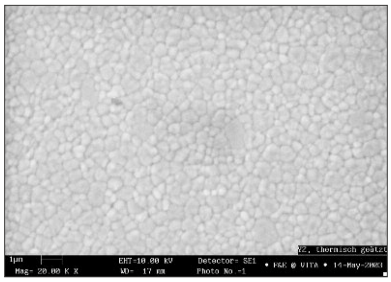
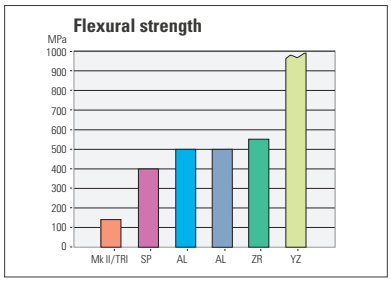
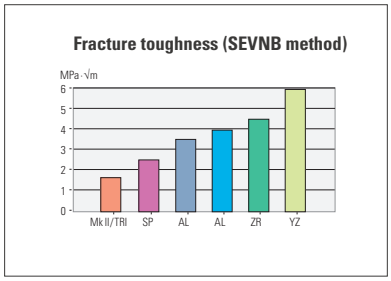


Fig. 3
SEM of the microstructure of sintered VITA In-Ceram YZ (magnification 20,000 x)




**VITA materials for CAD/CAM systems**

- VITABLOCS Mark II, TriLuxe, TriLuxe forte*
- VITA In-Ceram SPINELL**
- VITA In-Ceram ALUMINA**
- VITA In-Ceram ZIRCONIA**
- VITA In-Ceram YZ***
- VITA In-Ceram AL***

* Fine-structure feldspar ceramic
** Oxide ceramic, glass-infiltrated
*** Oxide ceramic, densely sintered

**Technical data of VITA In-Ceram® YZ**

| | |
|---|---|
| CTE (25 °C - 500 °C) | $10.5 \cdot 10^{-6} \cdot K^{-1}$ |
| Flexural strength | > 900 MPa |
| Fracture toughness (K IC) | 5.9 $MPa \cdot m^{1/2}$ |
| Modulus of elasticity (E) | 210 GPa |
| Composition | Zirconium dioxide ($ZrO_2$), yttrium oxide ($Y_2O_3$) 5 wt %, hafnium oxide ($HfO_2$) < 3 wt %, aluminium oxide ($Al_2O_3$) and silicon dioxide ($SiO_2$) < 1 wt % |

**What are the advantages of VITA In-Ceram® YZ?**
All-ceramic restorations made of VITA In-Ceram YZ
offer the following advantages:

**Advantages for the patient**
Excellent esthetics and biocompatibility:
Zirconium dioxide has been used for more than 30 years in the fields of medical technology.
It features outstandingly high resistance to functional stress, high resistance to corrosion, excellent light conduction properties and low thermal conductivity. Both the substructure and the veneering material do not give rise to allergies.
This means that
- there is no irritation to the gingiva and
- the material has the thermal behavior of a natural tooth (reaction to warm/cold) and therefore feels natural, "like the patient's own teeth".

**Advantages for the dentist**
- High clinical reliability
- Suitable for adhesive and non-adhesive cementation
- Radiopacity

**Advantages for the dental technician**
- By using VITA VM 9, a fine-structure veneering material especially matched to zirconium dioxide substructures of the latest generation, outstanding esthetic results can be achieved using a new layering technique.
- Milled substructures can be partially or completely colored in 5 different degress of lightness using a special liquid (YZ COLORING LIQUID). Moreover, some industrially precolored geometries of VITA In-Ceram YZ are available to ensure a homogeneous shade, especially for bridge units.

## Indications

### VITA In-Ceram YZ

| | | | | | | | | | | | Veneering material |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | – | – | – | – | ● | ● | ● | ● | ● | ● | VITA VM 9<br>VITA PM 9 |

● recommended

- Primary telescopes for cones and telescopic crowns
- Anterior and posterior crown substructures
- Anterior and posterior bridge substructures with up to 2 pontics
- Free-end bridges (free-end unit = max. premolar size)

⚠ **Note:** We point out that, depending on the fabrication process of the abutments, sharp edges may exist which may cause fracture of the respective suprastructures of zirconium dioxide crowns and bridges during the period of wearing.

Sharp edges must generally be avoided for ceramic restorations.

### Contraindications

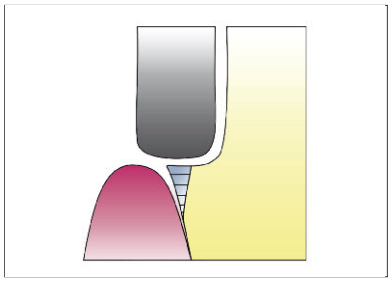
- Inadequate oral hygiene
- Insufficient results of preparation
- Insufficient remaining natural tooth substance
- Bruxism

VITA In-Ceram single crown 36 veneered with VITA VM 9
Photo: Dr. A. Devigus
Restoration: G. Lombardi

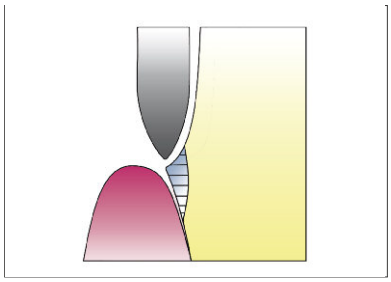
VITA In-Ceram bridge 35-37
Photo: Dr. A. Devigus
Restoration: G. Lombardi

**General information on preparation**

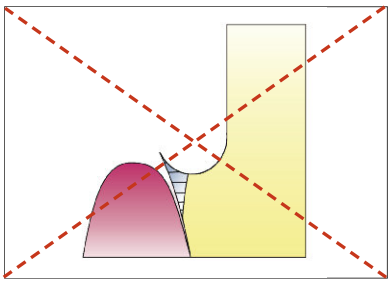
A chamfer or rounded innner angle are suitable.
The vertical preparation angle should be at least 3°.
All transitions from the axial to the occlusal or incisal surfaces should be rounded. Homogeneous and smooth surfaces are recommended.



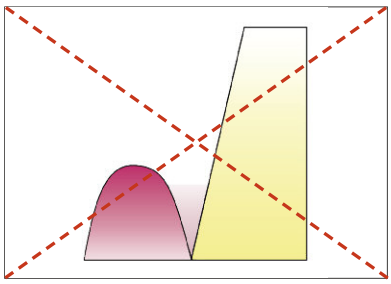
Indicated: Shoulder preparation



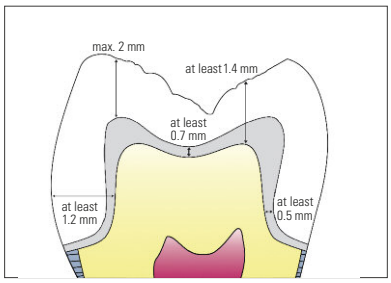
Indicated: Chamfer preparation



Contraindicated: "Gutter-shaped" or "J" preparation margin

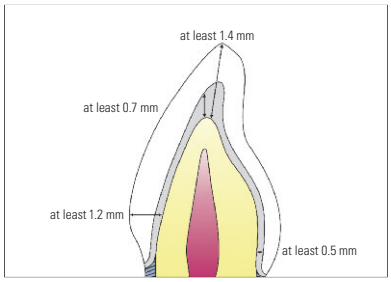


Contraindicated: Tangential or Feathered preparation




**Preparation for ceramic thicknesses (substructure and veneer)**

– Occlusal wall thickness: at least 1.4 mm (max. thickness of veneer: 2 mm)
– Circumferential wall thickness: at least 1.2 mm
– Crown margin: at least 0.5 mm



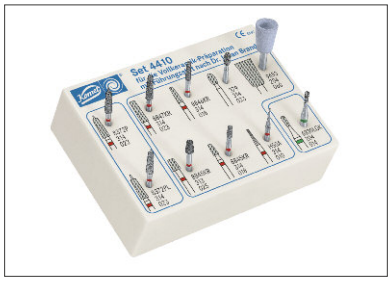

**Preparation of anterior teeth**

– Incisal wall thickness: at least 1.4 mm (max. thickness of veneer: 2 mm)
– Circumferential wall thickness: at least 1.2 mm
– Crown margin: at least 0.5 mm

**Examples of suitable preparation sets:**

Preparation set according to Arnetzl
Instruments require minimum widths and layer thicknesses
of the ceramic and are supplied in the Intensiv Hygienice tray
(Intensiv SA)


Preparation set according to Arnetzl
(Hager & Meisinger)




Preparation set with guide instruments according to Brandes
(Komet/Gebr. Brasseler, Prod. No. 4410)



**Information on cementation**

Restorations made of VITA In-Ceram YZ for inLab can be cemented non-adhesively with glass ionomer cements or adhesively with self-curing composite PANAVIA 21 TC or the dual curing composite PANAVIA F (Kuraray). Both products contain the special MDP monomer which enters into a durable chemical bond with the sandblasted surface of the zirconium dioxide substructures without the need for silication and silanization of the surfaces.*
Before adhesive cementation with PANAVIA we recommend sandblasting the surfaces to be cemented with max. 50 µm $Al_2O_3$ at a sandblasting pressure of < 2.5 bar. Self-adhesive or self-conditioning cementation materials (e.g. RelyX Unicem) can also be used.

Etching with hydrofluoric acid does not result in a retentive surface.**

⚠ **Important:** Please observe the instructions for use of the corresponding adhesive cement manufacturers.

**Removal of integrated restorations**
In order to remove a fixed zirconium dioxide restoration, it is recommended to use cylindrical diamond instruments under maximum water cooling at a speed of 120,000 rpm.

**Trepanation**
The veneering ceramic is removed with a diamond instrument. The substructure can then be trepanated with a coarse-grained, spherical diamond under maximum water cooling at a speed of 120,000 r.p.m. When drilling through the substructure it is recommended to hold the instrument at an angle of 45°.

* Wegner, St.M.; Kern, M.: Long-term Resin Bond Strength to Zirconia Ceramic. J Adhesive Dent 2, 139-147 (2000).

** See the brochure "Clinical Aspects", No. 808E, for further details.

| | Designation | Size/pieces per pack | Shades | Standard pack | Large pack | CAD-CAM system |
|---|---|---|---|---|---|---|
| VITA In-Ceram YZ | YZ-14 | 13 x 13 x 14 mm 20 pieces | – non-colored – LL1p | – | EC4YZ1420 EC4YZ14120 | Holder/Sirona |
| | YZ-20/15 | 14 x 15 x 20 mm 5/20 pieces | – non-colored – LL1p | EC4YZ205 EC4YZ201515 | EC4YZ201520 EC4YZ2015120 | Holder/Sirona |
| | YZ-40/15 | 14 x 15 x 40 mm 2/10 pieces | – non-colored – LL1p | EC4YZ402 EC4YZ401512 | EC4YZ4010 EC4YZ4015110 | Holder/Sirona |
| | YZ-20/19 | 15,5 x 19 x 20 mm 5/16 pieces | – non-colored – LL1p | EC4YZ20194 EC4YZ201914 | EC4YZ201916 EC4YZ2019116 | Holder/Sirona |
| | YZ-40/19 | 15,5 x 19 x 39 mm 2/10 pieces | – non-colored – LL1p | EC4YZ40192 EC4YZ401912 | EC4YZ401910 EC4YZ4019110 | Holder/Sirona |
| | YZ-55-Flip | 15,5 x 19 x 55 mm 1/4 pieces | – non-colored – LL1p | ECYZ551 ECYZ5511 | ECYZ554 ECYZ5514 | Holder/Sirona |
| | YZ-55 | 15,5 x 19 x 55 mm 1/4 pieces | – non-colored – LL1p | EC4YZ551 EC4YZ5511 | EC4YZ554 EC4YZ5514 | Holder/Sirona |
| | YZ-65/25 | 22 x 25 x 65 mm 1/3 pieces | – non-colored – LL1p | EC4YZ65251 EC4YZ652511 | EC4YZ65253 EC4YZ652513 | Holder/Sirona |
| | YZ-65/40 | 20 x 40 x 65 mm 1 piece | – non-colored – LL1p | EC4YZ65401 EC4YZ654011 | – | Holder/Sirona |
| | YZ-85/40 | 22 x 40 x 85 mm 1 piece | – non-colored – LL1p | EC4YZ85401 EC4YZ854011 | – | Holder/Sirona |
| | YZ-85/40 | 22 x 40 x 85 mm 1 piece | – non-colored | ECRYZ85401 | – | without holder/ Reitel |
| | YZ-DISC | Ø 98 x 10 mm 1 piece | – non-colored | ECYZD98101 | – | circumferential groove/ open CAD/CAM systems |
| | YZ-DISC | Ø 98 x 14 mm 1 piece | – non-colored | ECYZD98141 | – | circumferential groove/ open CAD/CAM systems |
| | YZ-DISC | Ø 98 x 18 mm 1 piece | – non-colored | ECYZD98181 | – | circumferential groove/ open CAD/CAM systems |
| | YZ-DISC | Ø 98 x 20 mm 1 piece | – non-colored | ECYZD98201 | – | circumferential groove/ open CAD/CAM systems |
| | YZ-DISC | Ø 98 x 25 mm 1 piece | – non-colored | ECYZD98251 | – | circumferential groove/ open CAD/CAM systems |

**YZ COLORING LIQUID for VITA In-Ceram® YZ** **Prod. No.**

Special liquid for coloring substructures made of VITA In-Ceram YZ in 4 degrees of lightness.

| | | |
|---|---|---|
| Complete assortment | | ECYZLKIT |
| One-color assortment | light: | ECYZLLKIT250* |
| | medium: | ECYZCLMKIT250* |
| | intense: | ECYZCLIKIT100* |
| | neutral: | ECYZCLNKIT100* |

**Color correlation**

| COLORING LIQUID | VITA SYSTEM 3D-MASTER | VITA classical A1–D4 |
|---|---|---|
| Light | 1M1, 1M2 | A1, B1, C1 |
| | 2L1.5, 2M1, 2M2, 2M3, 2R1.5 | |
| | 3M1 | |
| | 4M1 | |
| | | |
| Medium | 2L2.5, 2R2.5 | A2, A3, A3.5, A4 |
| | 3L1.5, 3L2.5, 3M2, 3R1.5, 3R2.5 | B2, B3, B4 |
| | 4L1.5, 4L2.5, 4M2, 4M3, 4R1,5, 4R2.5 | C2, C3, C4 |
| | 5M1, 5M2, 5M3 | D2, D3, D4 |

* 1 container 90 ml and 1 plastic for ceps for COLORING LIQIUD


**VITA VM 9 veneering ceramic** **Prod. No.**

Fine-structure veneering ceramic for all-ceramic substructure materials in the CTE range of approx. 10.5, such as VITA In-Ceram YZ.


**VITA PM 9**

Press ceramic system for overpressing yttrium-stabilized zirconium oxide frameworks in the CTE range of approx. 10.5, such as VITA In-Ceram YZ.

**VITA ZYrcomat** DZYT220

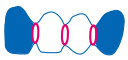
High-temperature sintering furnace for sintering VITA In-Ceram YZ and AL.
4 molybdenum silicate thermocouples ensure homogeneous temperature distribution. Temperature in the firing chamber: max. 1600°C.


**Sintering accessories** E38002

Pack of 150 g zirconia spheres for supporting the restorations during the sintering procedure.

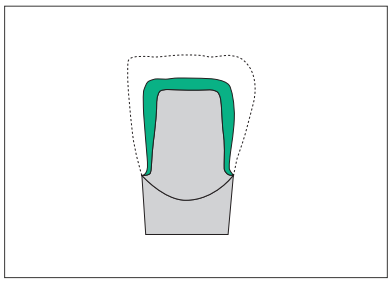
| | |
|---|---|
| Set of sintering dish and sintering crucible, small, Ø 74 mm | E38011 |
| Set of sintering dish and sintering crucible, large, Ø 92 mm | E38014 |
| Single pack sintering dish, Ø 74 x 10 mm | E38006 |
| Single pack sintering crucible, Ø 80 x 30 mm | E38011 |
| Single pack sintering dish, Ø 92 x 13 mm | E38012 |
| Single pack sintering crucible, Ø 100 x 35 mm | E38013 |

**Minimum wall thicknesses in mm and minimu connector surfaces in mm²**

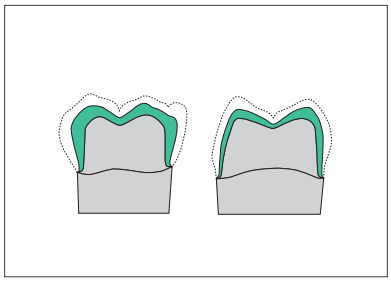
| VITA In-Ceram YZ – Indication | | mm/mm² |
|---|---|---|
| Incisal/occlusal wall thickness<br>Primary elements - double crowns |  | 0.7 |
| Incisal/occlusal wall thickness<br>Single crown substructure |  | 0.7 |
| Incisal/occlusal wall thickness<br>Abutment crowns of bridge substructures with one pontic |  | 0.7 |
| Incisal/occlusal wall thickness<br>Abutment crowns of bridge substructures with two pontics |  | 1,0 |
| Circumferential wall thickness<br>Primary elements - double crowns |  | 0.5 |
| Circumferential wall thickness<br>Single crown substructure |  | 0.5 |
| Circumferential wall thickness<br>Abutment crowns of bridge substructures with one pontic |  | 0.5 |
| Circumferential wall thickness<br>Abutment crowns of bridge substructures with two pontics |  | 0.7 |
| Connector surface [1]<br>Anterior bridge substructure with one pontic |  | 7 |
| Connector surface [1]<br>Anterior bridge substructure with two pontics |  | 9 |
| Connector surface [1]<br>Posterior bridge substructure with one pontic |  | 9 |
| Connector surface [1]<br>Posterior bridge substructure with two pontics |  | 12 |
| Connector surface [1] [2]<br>Cantilever bridge substructure |  | 12 |

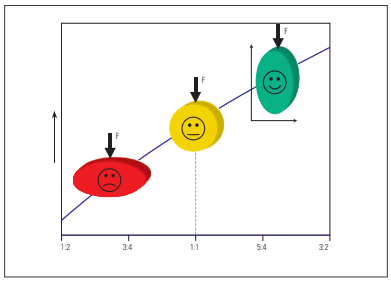
[1] Connector surface: juncture of abutment crown - pontic or between 2 pontics

[2] Cantilever bridge unit should be modelled approx. 1/3 narrower in its vestibular/oral dimension



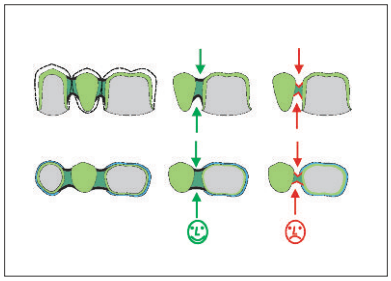
⚠ **Important:**
In order to ensure lasting clinical success of restorations made of VITA In-Ceram YZ, it is urgently recommended to design the substructures in such a way that they correspond in reduced size to the tooth form to be replaced. Only then is a uniform layer thickness (between 0.7 - 1.2 mm) of the veneering ceramics guaranteed. Sharp edges on the framework should generally be avoided.





**Aspects which should be taken into account when designing the connector surfaces of bridge substructures:**
1. The height (h) of the connector surfaces should be as large as possible.
2. The height (h) should be larger than, or at least equal the width (b).

⚠ **Important:**
**Stability and function always take priority over esthetics!**



The connector surfaces of bridge substructures must be concavely rounded. Sharp corners and edges are to be avoided.

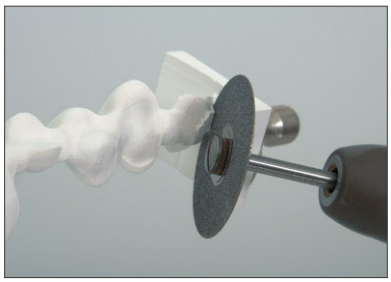


Fig. 1

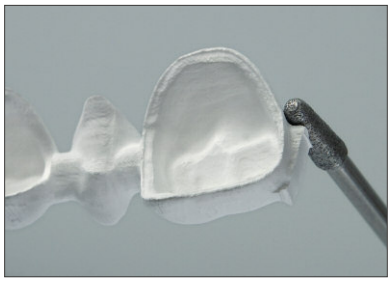


Fig. 2

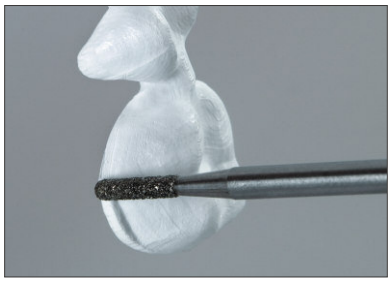


Fig. 3

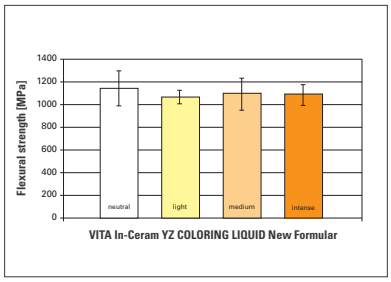
**Processing the milled restoration**
**(Example for the Sirona inLab system)**

After completion of the milling process and **before sintering** the restoration must be cut off with a diamond cutting instrument (fig. 1), the cut-off edge ground and the more thickly milled margins reduced (fig. 3).

⚠ **Important:**
**After the sintering firing no more adjustments should be made by grinding.**

⚠ **Important:**
Since dust is formed when grinding sintered dental ceramic products, always wear a face mask or grind when wet.

Additionally, it is recommended to work behind a safety shield and use an extraction unit.




## Coloring the substructures with YZ COLORING LIQUID for VITA In-Ceram® YZ*

### Application areas

Liquid for complete or partial coloring of milled VITA In-Ceram YZ substructures before sintering. YZ COLORING LIQUID is suitable for coloring substructures made of VITA In-Ceram® YZ. Coloring with this liquid enhances the accurate shade reproduction of VITA VM 9 and/or PM 9.

Please observe the information on page 20.

**⚠ Important:**
YZ COLORING LIQUID does not affect the physical material properties, such as flexural strength, resistance to fracture and Weibull coefficient, of VITA In-Ceram YZ.

### Application

The restorations should be cleaned in distilled water and grinding dust removed before use. For this purpose a cleaning firing in a ceramic furnace (e.g. VITA VACUMAT) should be carried out to remove the cooling and lubricating liquid of the CAD/CAM system from the porous substructure.

### Cleaning firing in the VITA VACUMAT®

| Predr. °C | → min. | ↗ min. | ↗ °C/min. | Temp. approx. °C | → min. |
|---|---|---|---|---|---|
| 500 | 3.00 | 6.00 | 33 | 700 | 5.00 |

* Not to be used with pre-shaded VITA In-Ceram YZ substructures

| **Labelling requirements** | | |
|---|---|---|
| **VITA In-Ceram YZ COLORING LIQUID** | **Caustic**<br>Causes burns. When using do not eat and drink. Do not inhale gas/fume/vapor/aerosol. In case of contact with eyes, rinse thoroughly with water and consult a doctor. |  |
| **Personal protective equipment** | When working with the product, wear suitable safety goggles/face protection, safety gloves and safety clothing. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible). This material and its container must be disposed of as hazardous waste. |  |

The restoration can be immersed in the YZ COLORING LIQUID according to the desired lightness degree of the shade.
The recommended immersion time is 2 minutes. During immersion, vacuum or pressure (2 bar) can be used additionally.

⚠ **Important:**
Use only acrylic or plastic tweezers for immersion.

Subsequently remove excess YZ COLORING LIQUID with a paper tissue and allow to dry. Do not sinter in a wet condition.

Alternatively, YZ COLORING LIQUID can also be sprayed on using the VITA SPRAYON system or applied in a thin, homogeneous layer with a brush onto the areas of the restoration to be colored. Avoid the formation of puddles. The liquid is absorbed rapidly.

The substructure can be colored from the outside or from within at the margins in order to ensure complete penetration of the color.

⚠ **Important:**
The application brush should be used only for the application of YZ COLORING LIQUID. We recommend the flat brush for PASTE OPAQUE (VITA Prod. No. B297). Do not use for layering the ceramic – danger of discoloration! Clean the brush only with distilled water.

Restorations colored with YZ COLORING LIQUID must be sintered only in a sintering crucible with an air-vent (Prod. No. E38011/E38014, sintering crucible with air vent). As an alternative, the lid can be omitted. This way unhindered burning out of the organic residue is ensured.

Processing is continued subsequently.

**Sintering parameters**

The sintering program for VITA In-Ceram YZ has been predetermined and includes the following parameters:

| | |
|---|---|
| Rising time | 1.5 h |
| End temperature | 1530°C |
| Holding time for end temperature | 2 h |

Cooling down to 400°C with firing chamber being closed (lift key can only be activated from a temperature of 400°C)

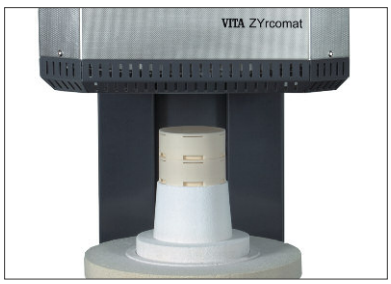
☞ **Note:**
Do not open the firing chamber until the temperature is below 200°C! This will increase the service life of the sintering dish and crucible.

- After the sintering process the fit of the substructure can be checked on the die.

- Switch on the VITA ZYrcomat furnace and control unit.
- Move the lift downwards to its lowest position using the lift key.
- Place anterior crowns and anterior bridge substructures into the sintering dish either on the labial or the lingual surface and posterior crowns and posterior bridge substructures on the occlusal surface.

⚠ **Important:**
VITA In-Ceram YZ can be sintered in all high-temperature furnaces which are able to use the sintering parameters indicated above. The user must observe the respective instructions of the furnace manufacturer. VITA does not grant a warranty or accept any liability for damage resulting from sintering of VITA In-Ceram YZ in furnaces of other manufacturers.

⚠ **Important:**
It is recommended to sinter bridge substructures in the sintering dish (VITA Prod. No. E38002). Ensure that the entire surface of the substructure is supported by the firing support. This avoids deformation. Care should be taken to prevent sintering spheres becoming "jammed" in the connector areas. Do not push the framework into the spheres.




- Place the sintering dish in the centre of the firing tray and cover with sintering crucible. "Two-storied" sintering by stacking crucibles and the sintering dishes is possible (see fig.).
- Close the lift using the lift key. Hold the key pressed until the firing chamber is completely closed.
- Start the sintering firing by pressing the "START" key.
- The sintering program will then run automatically; the duration of the program run is approx. 7.5 hours including the cooling phase to 200°C.

**Processing the sintered substructures**

The surface structure of ceramic materials is decisive for their flexural strength. Subsequent processing of sintered VITA In-Ceram YZ substructures with abrasive instruments is to be avoided, particularly in the connector area. Mechanical surface processing can add hypercritical quantities of energy to the substructure. This can lead to phase transformation over a large surface area of the $ZrO_2$, and to surface tensions due to distortion of the crystal lattice and to cracks and late cracks in the veneer after seating the restoration. **For this reason the surfaces of VITA In-Ceram® YZ to be veneered must not be sandblasted** (see notes below).

⚠ **Important:**
Corrections of the milled substructure should therefore be made, if possible, before the sintering firing. Should subsequent corrections be required, however, the following general rules apply:

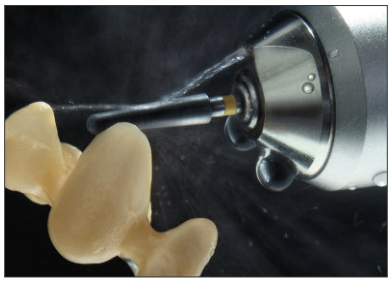


Fig. 1

Corrections after sintering should be made only with a rotary instrument for wet grinding (fig. 1), and in the case of primary telescopes with a grinding unit under water cooling and at a low pressure. It is also possible to process the substructure using soft, diamond rubber polishers and a handpiece with slow speeds and low pressure. The instrument must lie flat on the surface and chattering must be avoided.

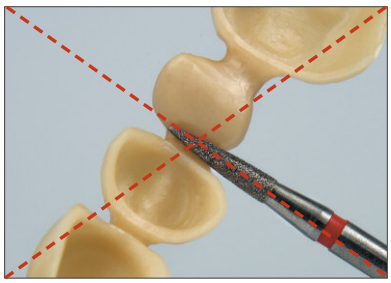


Fig. 2

Use fine-grained diamonds in a nearly-new condition with red color coding (fine = 27-76 µm) or less (extra-fine, yellow 10–36 µm or ultra-fine, white 4– 14 µm).

Areas which are subjected to tensile stress in clinical use, i.e. mainly the connectors in bridge constructions, should not be ground (fig 2).

⚠ **Important:** After grinding we recommend thermal treatment (regeneration firing) of the substructure in order to reverse any phase transformations which may have taken place at the surface. Any microcracks which have resulted cannot be regenerated.

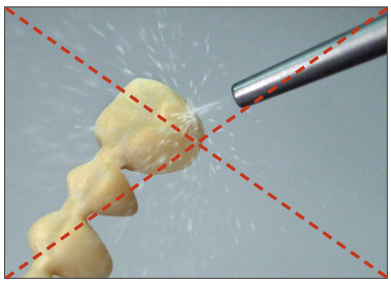


Fig. 3

| Predr. °C | → min. | ↗ min. | ↗ °C/min. | Temp. approx. °C | → min. | VAC min. |
|---|---|---|---|---|---|---|
| 500 | - | 5.00 | 100 | 1000 | 15.00 | - |

⚠ **Important:**
The VITA In-Ceram® YZ surfaces to be veneered must not be ground (fig. 3). Sandblasting can lead to undesired phase transformation of the zirconium dioxide. This results in the buildup of complex tensions at the interface, which can lead to cracks and late cracks after seating the restoration. Please observe the working instructions VITA VM 9, No. 1190E.


**Veneering with VITA VM 9**

Substructures made of VITA In-Ceram YZ are veneered with VITA VM 9 fine-structure veneering ceramic [CTE (25-500°C) 8.8 - 9.2 $\cdot 10^{-6} \cdot K^{-1}$].

YZ COLORING LIQUID serves to color the milled VITA In-Ceram YZ substructures in the desired lightness level. Coloring enhances the accurate shade reproduction with VITA VM 9.

For information on veneering non-colored zirconium dioxide substructures and general information on veneering with VITA VM 9 refer to the working instructions VITA VM 9, No. 1190E.

Scientific studies and ongoing market observation have formed the basis of VITA Zahnfabrik's recommendations for decades in order to offer customers the best possible solution for dental restorations. New results confirm that great care is required particularly when veneering and handling zirconium dioxide substructures. On the basis of this, the following procedures are recommended in order to offer even greater safety: Owing to the poor thermal conductivity of both materials (Y-TZP and veneering ceramic), more severe residual tension can occur in this compound system than is known to occur in the case of metal ceramics. This residual thermal tension in the veneering ceramic, particularly in the case of large restorations, can be counteracted by means of slow cooling to below the transformation temperature of the veneering ceramic during the last firing cycle (approx. 600 °C for VITA VM 9). Such a firing procedure with expansion cooling is well known as a metal ceramic technique to dental technicians; a step of this nature is necessary to reduce tension in the case of some gold alloys.


**Alternatively, VITA PM 9 can be pressed onto VITA In-Ceram YZ substructures.**
VITA PM 9 was developed from the established fine-structure ceramic VITA VM 9 and is used for overpressing of $ZrO_2$ substructures in the CTE range of 10.5 x $10^{-6}$ x $K^{-1}$, such as VITA In-Ceram YZ, as well as the fabrication of inlays with one and more surfaces, onlays, partial crowns, veneers and anterior crowns by means of the substructure-free staining and layering technique. Please observe the information in the working instructions VITA PM 9, No. 1450E.

**Extended firing program for VITA VM 9**

| | Predr. °C | → min. | ↗ min. | ↗ °C/min. | Temp. approx. °C | → min. | ↘ °C | → min. | VAC min. |
|---|---|---|---|---|---|---|---|---|---|
| Cleaning firing | 500 | 3.00 | 6.00 | 33 | 700 | 5.00 | – | – | – |
| Regeneration firing | 500 | 0.00 | 5.00 | 100 | 1000 | 15.00 | – | – | – |
| EFFECT BONDER firing | 500 | 6.00 | 6.00 | 80 | 980 | 1.00 | – | – | 6.00 |
| EFFECT BONDER PASTE firing | 500 | 6.00 | 6.00 | 80 | 980 | 2.00 | – | – | 6.00 |
| BASE DENTINE wash firing | 500 | 2.00 | 8.11 | 55 | 950 | 1.00 | – | – | 8.11 |
| MARGIN firing | 500 | 6.00 | 8.21 | 55 | 960 | 1.00 | – | – | 8.21 |
| EFFECT LINER firing | 500 | 6.00 | 7.49 | 55 | 930 | 1.00 | – | – | 7.49 |
| 1st dentine firing | 500 | 6.00 | 7.27 | 55 | 910 | 1.00 | **600*** | – | 7.27 |
| 2nd dentine firing | 500 | 6.00 | 7.16 | 55 | 900 | 1.00 | **600*** | – | 7.16 |
| Glaze firing | 500 | 0.00 | 5.00 | 80 | 900 | 1.00 | **600*** | – | – |
| Glaze firing VITA AKZENT | 500 | 4.00 | 5.00 | 80 | 900 | 1.00 | **600*** | – | – |
| Correction firing with COR | 500 | 4.00 | 4.20 | 60 | 760 | 1.00 | **500*** | – | 4.20 |

***** Long-term cooling down to the respective temperature is recommended for the respective last firing cycle of the veneering ceramic; the lift position for VITA VACUMAT furnaces should be > 75%. Firing objects must be protected against direct supply of air.

Additional information on all-ceramics:
K.H. Kunzelmann, M. Kern, P. Pospiech, A. Mehl, R. Frankenberger, B. Reiss und K. Wiedhahn: Vollkeramik auf einen Blick – 3. Edition, published by AG Keramik, ISBN-Nr. 3-00-017195-0.

## Recommended tools and materials

**Turbines for grinding in a wet state and accessories**
- KaVo K-AIR plus (KaVo)
- NSK Presto Aqua (Girrbach Amann)
- Turbo-Jet (Acurata)
- IMAGO Shelter System, protective units for wet processing of all-ceramic materials (Steco-System-Technik)

**Pump milling machine**
- D-FK20, Harnisch + Rieth

**Abrasive instruments for processing with the wet grinding turbine/ with handpiece**
- ZR set of abrasives for the fabrication of 2° primary crowns (Komet/Gebr. Brasseler, Prod. No. 4432)
- ZR cutters for processing zirconium oxide substructures, 7 different shapes (Komet/Brasseler)
- IMAGO Grind System, abrasives for wet grinding turbines for processing and fabrication of primary crowns (Steco-System-Technik)
- Diamond polishers for handpiece, green-orange (Hager & Meisinger, Prod. No. HP 803 104 533 170)

**Preparation sets**
- Preparation set according Arnetzl (Intensiv SA)
- Preparation sets according to Baltzer and Kaufmann (Hager & Maisinger, Prod. No. 2531)
- All-Ceramics preparation set with guide instruments according to Brandes (Komet/Gebr. Brasseler, Prod. No. 4410)
- Preparation set according to Arnetzl (Hager & Meisinger)

**Other**
- Fit-checker, lipstick for checking the fit of substructures

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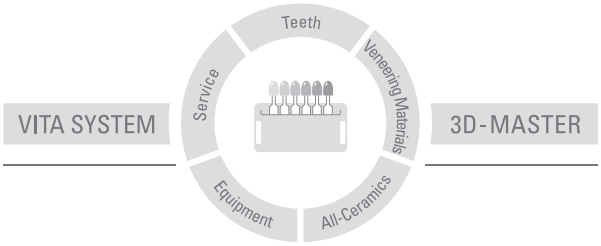
With the unique VITA SYSTEM 3D-MASTER all natural tooth shades are systematically determined and completely reproduced.

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Date of issue of these working instructions: 11.11

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 is certified according to the Medical Device Directive
and the following products bear the CE mark CE 0124:
VITA**VM**®**9**
VITA**PM**®**9**
VITA In-Ceram® YZ COLORING LIQUID for VITA In-Ceram® YZ

US 5498157 A · AU 659964 B2 · EP 0591958 B1

VITA

VITA Zahnfabrik H. Rauter GmbH & Co.KG
Postfach 1338 · D-79704 Bad Säckingen · Germany
Tel. +49(0)7761/562-0 · Fax +49(0)7761/562-299
Hotline: Tel. +49(0)7761/562-222 · Fax +49(0)7761/562-446
www.vita-zahnfabrik.com · info@vita-zahnfabrik.com

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