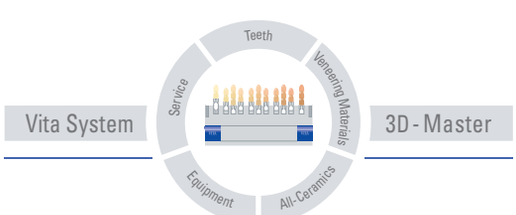
VITA All-Ceramics

VITA In-Ceram®
YZ for inLab®

yttrium partially stabilized zirconium oxide blocks
for high-tempertature sintering

Working Instructions
Manufacture of crown and bridge frameworks

Date of issue: 06-06



VITA In-Ceram® YZ for inLab® Contents

VITA In-Ceram YZ single crowns 36 veneered with VITA VM 9.
Photograph courtesy of Dr. A. Devigus
Restoration: G. Lombardi

VITA In-Ceram YZ bridge 35-37.
Photograph courtesy of Dr. A. Devigus
Restoration: G. Lombardi

VITA In-Ceram® / Indications

Indication / IC-Material										
VITA In-Ceram® **SPINELL**	○ [1]	○ [1]	–	–	●	○	–	–	–	–
VITA In-Ceram® **ALUMINA**	–	–	–	–	●	●	●	–	–	–
VITA In-Ceram® **ZIRCONIA**	–	–	–	–	○	●	●	●	–	–
VITA In-Ceram® **AL**	–	–	–	●	●	●	●	–	–	–
VITA In-Ceram® **YZ**	–	–	–	●	●	●	●	●	● [2]	● [2]

● recommended
○ possible

[1] slip-casting technique only
[2] larger bridges also possible (e.g. free-end bridges), but with no more than 2 pontics

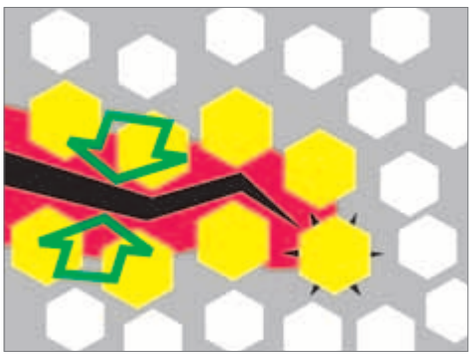


Fig. 1: Schematic diagram of the phase transformation processes of ZrO_2

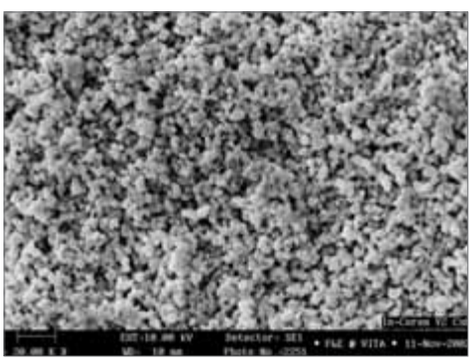


Fig. 2: SEM of the microstructure of unsintered VITA In-Ceram YZ (magnification 20,000 x)

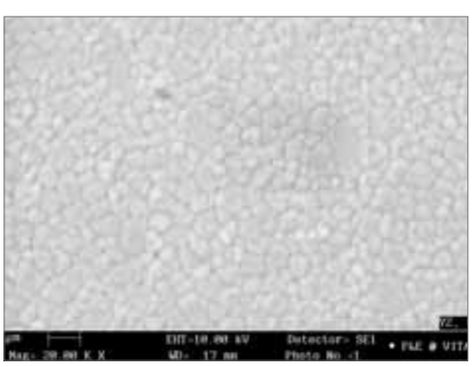
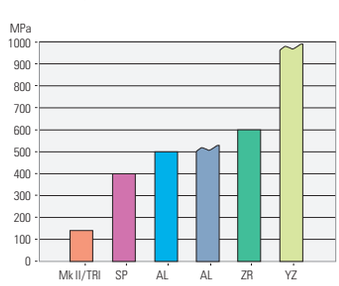
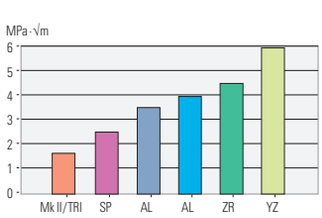


Fig. 3: SEM of the microstructure of sintered VITA In-Ceram YZ (magnification 20,000 x)



Flexural fracture strength



Fracture toughness (SEVNB Method)

Zirconium oxide (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 frequently finds application 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 ability of zirconium dioxide to be stabilized in its tetragonal high-temperature phase by means of suitable additives, e.g. yttrium oxide. Only when applying an external source of energy, as for example in the case of a beginning crack (see fig. 1), individual zirconium oxide grains are transformed, locally and accompanied by an increase in volume, to their stable monoclinic form at room temperature. 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 behavior results in a so-called tension expansion, a phenomenon otherwise known only in the case of steel. For this reason zirconium oxide is also referred to as "ceramic steel". This property is also reflected in the long life of zirconium dioxide under permanent loading.

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

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 demonstrate all the advantages of the physical properties of zirconium dioxide.

VITA Materials for CEREC® and inLab®

- VITABLOCS Mark II / TriLuxe } Fine-structure feldspar ceramic
- VITA In-Ceram SPINELL
- VITA In-Ceram ALUMINA
- VITA In-Ceram ZIRCONIA } Oxide ceramic, glass-infiltrated
- VITA In-Ceram YZ
- VITA In-Ceram AL } Oxide-ceramic, densely sintered

* Garvie, R.C.; Hannink, R.H.; Pascoe, R.T.: Ceramic steel? Nature, 258, 703-704 (1975)

Technical Data of the VITA In-Ceram® YZ for inLab®

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 %

Manufacturing process for a VITA In-Ceram® YZ restoration With the FrameWork / WaxUp software

- Manufacturing the master model
- Manufacturing the scan model *or modeling in wax*
- Attaching the scan model to the scan bracket
  or fixing the wax modeling to a special WaxUp holder
- Scanning
- Designing the substructure (CAD, FrameWork software only)
- Inserting the VITA In-Ceram YZ and scanning the bar code
- Milling the contour (CAM)
- Adjusting / finishing the substructure
- Removing grinding dust from the substructure
- Cleaning firing and coloration (optional)
- Sintering firing
- Seating of the substructure
- Veneering with VITA VM 9

* working time: approx. 0.5 hrs
Waiting time: approx. 9 hrs

* The calculation is based on the manufacture of the substructure for a 3-unit VITA In-Ceram YZ bridge manufactured with the inLab FrameWork software and the inLab scanner. The working steps in *italics* are those procedures which apply especially to the WaxUp method.

☞ ***Note:***
We recommend participation in an inLab / VITA In-Ceram course.
For further information see www.vita-kurse.de

What are the advantages of the VITA In-Ceram® YZ in conjunction with the inLab® system?
All-ceramic restorations made of VITA In-Ceram YZ for CEREC offer the following advantages:

Advantages for the patient
Excellent aesthetics and biocompatibility:

Zirconium dioxide has been used for 30 years in the field of implantology. It is distinguished by an outstandingly high resistance to functional loading, a high degree of corrosion resistance, 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 retraction of 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 degree of clinical safety
- Suitable for adhesive and non-adhesive cementation
- Radiopacity

Advantages for the dental technician
- By using VITA VM 9, a fine-structure veneering ceramic especially matched to zirconium dioxide substructures of the newest generation, outstanding aesthetic results can be achieved using a new layering technique.

- Milled substructures can be partially or completely colored in 5 different degrees of lightness with a special fluid (YZ coloring liquid) prior to sintering – and these are matched to the VITA SYSTEM 3D-MASTER.

- The extremely compact, space-saving and well-designed CAD/CAM system represents a comparatively low investment volume. The Sirona inLab system offers the option of designing substructures (CAD FrameWork 3D software) or modeling in wax and scanning (CAD WaxUp 3D software). Currently, 8 different VITA materials can be processed using this system, which offers yet further potential for future developments in the domain of materials technology and areas of application.

- Precise definition and complete reproducibility of wall thicknesses of substructures thanks to inLab CAD/CAM software.

- Documentation of substructure design by means of data storage.

- Minimization of processing risks also with regard to determining the indications required by a Wax-Up with the inLab WaxUp 3D software since the corresponding software automatically recognizes the areas in the substructure which were too thinly modeled and corrects these before the milling procedure starts.

- Excellent marginal accuracy thanks to high-precision milling and exact calculation of sintering shrinkage using the inLab 3D software.

- Full productivity in the dental laboratory since no working procedures need to be outsourced.

Table of indications

Indication										
VITA In-Ceram® **YZ**	–	–	–	•	•	•	•	•	•[1)]	•[1)]

• recommended [1)] Larger bridges also possible (e.g. free-end bridges), but never more than 2 pontics

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

Contraindications

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

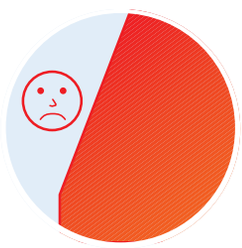
General notes on preparation

- A chamfer or shoulder with a rounded inner angle is suitable. The aim should be a circumferential depth of one millimeter.
  The vertical preparation angle should be at least 3°. All transitions from the axial to the occlusal or incisal surfaces should be rounded. Homogeneous, smooth surfaces are recommended.

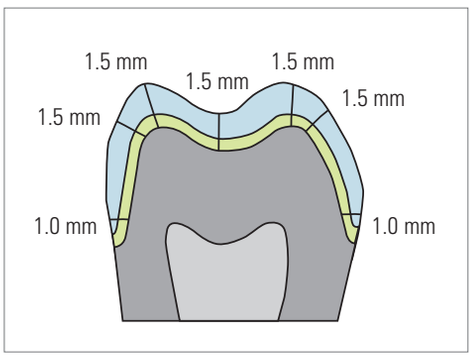
shoulder preparation

chamfer preparation

incorrect chamfer preparation

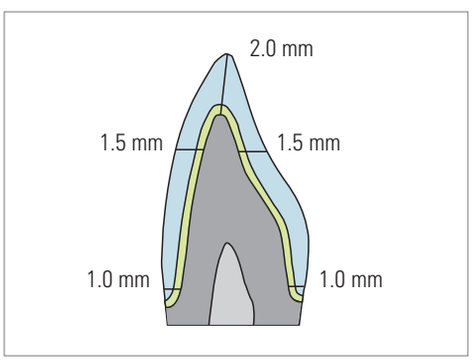


tangential preparations are not recommended



Preparation of premolars and molars

- In the case of posterior teeth a simplified occlusal relief is to be recommended in order to ensure sufficient space for the veneering ceramic. Occlusal reduction should be at least 1.5 mm.



Preparation of anteriors

- Incisal reduction should be 2 mm.

Examples of suitable preparation kits:

- Preparation kit according to Baltzer and Kaufmann, including abrasives with axial guiding pin for pre-defined preparation of chamfers and shoulders.
  (Hager & Meisinger, art. No. 2531)

- Preparation set according to Küpper for crown and bridge prosthetics.
  (Hager & Meisinger, art. No. 2560)

- All-Ceramics preparation kit with guiding instruments according to Brandes.
  (Komet/Gebr. Brasseler, art. no. 4410)

Notes on cementation

- Restorations made of VITA In-Ceram YZ for inLab can be cemented non-adhesively with glass ionomer or zinc phosphate 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 oxide 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. It is not advised to use resin-reinforced or modified glass ionomer cements, since no sufficient clinical data are available on this subject to date.

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

☞ *Please heed the instructions for use of the corresponding adhesive cement manufacturers.*

Removal of seated restorations

- In order to remove a fixed zirconium oxide restoration it is recommended to use cylindrical diamond instruments under maximum water cooling at a speed of 120,000 r.p.m.

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 boring 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" for further details art. no. 808E.

VITA In-Ceram® YZ for inLab®

CUBES for small crown substructures	**Art. No.**
Dimensions before sintering: 14 x 15 x 20 mm	ECYZ205
Dimensions after sintering, approx.: 11.2 x 12 x 16 mm	
Designation: YZ-20/15	
Pack of 5	

Large pack of 25	ECYZ2025

CUBES for large crown substructures	ECYZ20194
Dimensions before sintering: 15.5 x 19 x 20 mm	
Dimensions after sintering, approx.: 12.4 x 15.2 x 16 mm	
Designation: YZ-20/19	
Pack of 4	

Large pack of 24	ECYZ201924

CUBES for small bridge substructures	ECYZ402
With max. 2 pontics	
Dimensions before sintering: 14 x 15 x 40 mm	
Dimensions after sintering, approx.: 11.2 x 12 x 32 mm	
Designation: YZ-40/15	
Pack of 2	

Large pack of 10 pcs

Art. No.
ECYZ4010

CUBES for large-span bridge substructures ECYZ40192
with max. 2 pontics
Dimensions before sintering: 15.5 x 19 x 39 mm
Dimensions after sintering, approx.: 12.4 x 15.2 x 31.2 mm
Designation: YZ-40/19
Pack of 2

Large pack of 10 pcs ECYZ401910

CUBES for multi-unit bridge substructures* ECYZ551
with max. 2 pontics
Dimensions before sintering: 15.5 x 19 x 55 mm
Dimensions after sintering, approx.: 12.4 x 15 x 44 mm
Designation: YZ 55
Pack of 1

YZ COLORING LIQUID for VITA In-Ceram® YZ ECCLKIT
Special fluid for the coloration of substructures made of VITA In-Ceram YZ in 5 lightness levels (LL1-LL5) according to the VITA SYSTEM 3D-MASTER.

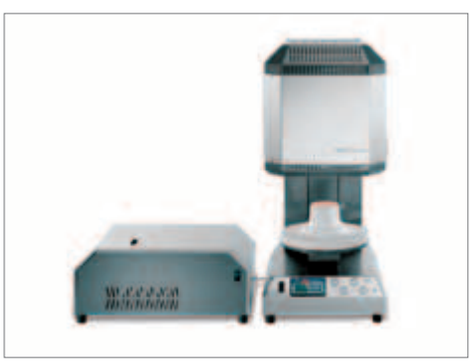
Full Assortment

* For YZ-55 CUBES inLab 3D software version V2.30 R1800 and hardware upgrade (gear-head) is required in the case of units with a serial no. below 11200.

One-color Assortment

Art. No.
ECCL1KIT-
ECCL5KIT

VITA**VM**®**9 Veneering Ceramic**
Fine-structure veneering ceramic for all-ceramic substructure materials in the CTE range of approx. 10.5, such as VITA In-Ceram YZ for inLab



VITA ZYrcomat DZY220
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 150g zirconium oxide spherical firing supports for supporting the restorations during the sintering procedure

Complete set consisting of sintering bowl and sintering container for VITA ZYrcomat E38011

Single pack sintering container for VITA ZYrcomat 30 mm x 80 mm E38010

Single pack sintering container for VITA ZYrcomat 10 mm x 74 mm E38006

Manufacture of a VITA In-Ceram® YZ substructure with the inLab® FrameWork software

☞ ***Note:***

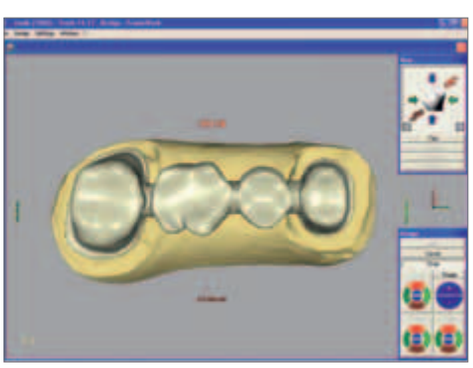
When using the WaxUp design procedure please heed the instructions in the CEREC inLab 3D manual from version 2.1X from 11.2003 onwards or the CD CEREC 3D manual from version V2.10 R1500 onwards.

Manufacturing the scan model

- Manufacture the model from a high-quality, dimensionally stable and scannable plaster (e.g. CAM base by Dentona).
- Mount the model on the inLab scan bracket (see illustration) or in the Eos scan holder.

Scanning

- Scan the model in the inLab unit (see illustration) or the inEos.



Designing

Designing the model in the inLab unit.

Minimum wall thicknesses in mm and minimum connector surfaces in mm²

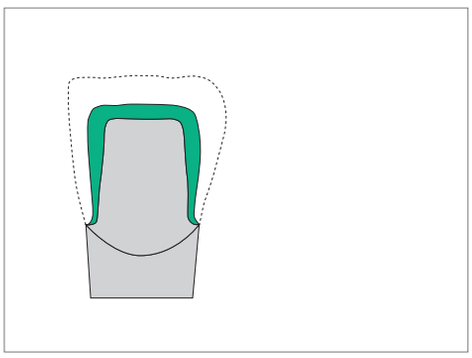
VITA In-Ceram YZ – Indication		mm/mm²
Incisal / occlusal wall thickness Primary parts of telescopic crowns		0,7
Incisal / occlusal wall thickness Single crown substructure		0,7
Incisal / occlusal wall thickness Abutment crowns of bridge substructure with one pontic		0,7
Incisal / occlusal wall thickness Abutment crowns of bridge substructure with two pontics		1,0
Circumferential wall thickness Primary parts of telescopic crowns		0,5
Circumferential wall thickness Single crown substructure		0,5
Circumferential wall thickness Abutment crowns of bridge substructure with one pontic		0,5
Circumferential wall thickness Abutment crowns of bridge substructure with 2 pontics		0,7
Connector surface[1] Anterior bridge substructure with one pontic		7
Connector surface[1] anterior bridge substructure with two pontics		9
Connector surface[1] posterior bridge substructure with one pontic		9
Connector surface[1] posterior bridge substructure with two pontics		12
Connector surface[1] [2] Free-end bridge substructure		12

[1] Connector surface: connector surface abutment crown/pontic, i.e. between 2 pontics

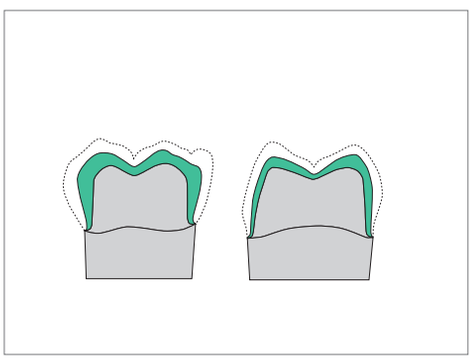
[2] Free-end bridge unit should be modeled approx. 1/3 narrower in its vestibular/oral dimension.

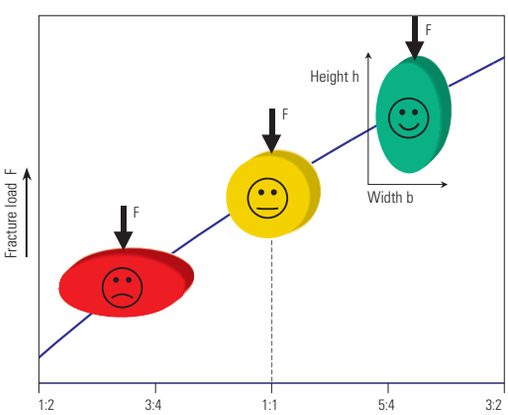
☞ ***Note:***

The WaxUp 3D software automatically recognizes the areas of the modellation which are less than the minimum wall thicknesses and corrects these automatically before the grinding process.



⚠ ***Important note:***
In order to guarantee the 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 tooth size to the tooth form to be replaced. Only then is a uniform layer thickness of the veneering ceramics guaranteed. Sharp edges on the framework should generally be avoided.

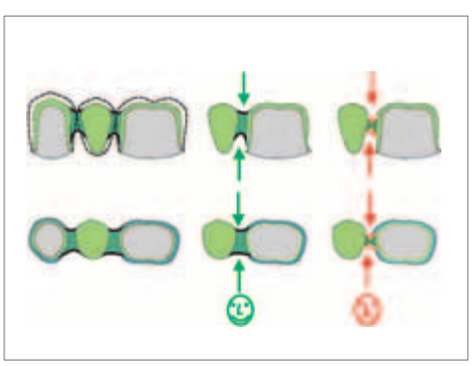




Aspects which should be taken into account when designing the connector surfaces of bridge substructures:

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).

Stability and function should be given priority over esthetics!



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

Placing the VITA In-Ceram® YZ in the inLab unit and reading the printed bar code

- VITA In-Ceram YZ displays a printed bar code which can be read by the scanner. This enables the shrinkage factor of the batch used to be automatically read and taken into account for the grinding process in order to achieve a marginally accurate end result.

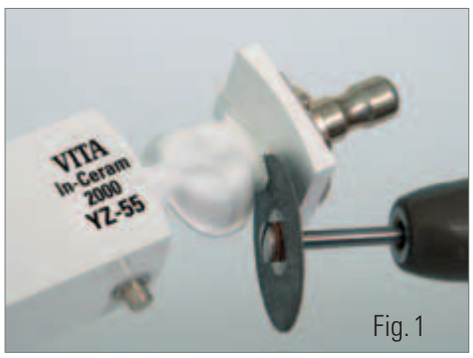


Fig. 1

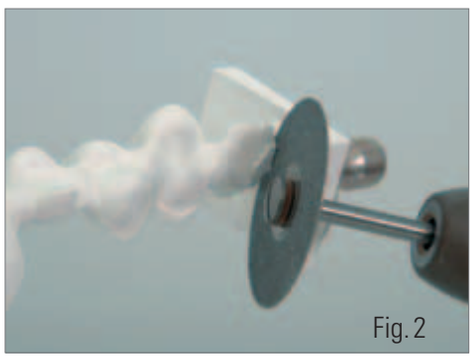


Fig. 2

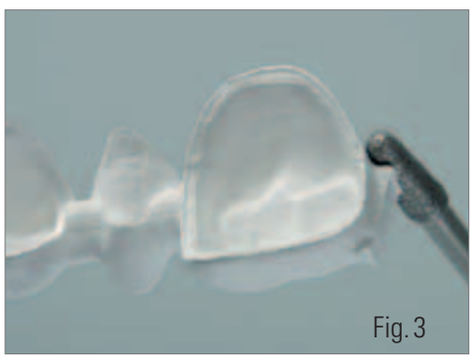


Fig. 3

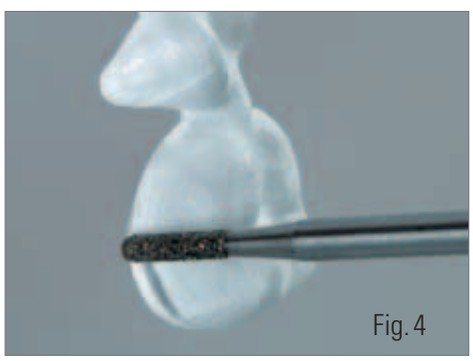


Fig. 4

☞ ***Note:***
Should the bar code not be readable, it can be entered manually on the computer keyboard.

Milling the restoration

⚠ ***Important:***
Please use the appropriate grinding instruments for VITA In-Ceram YZ (cone-shaped Diamond XL for YZ-20/15 and YZ-40/15 and/or for YZ-20/19, YZ-40/19 and YZ-55 CUBES the long cone LK 14*).*
The following should be heeded particularly in the case of the YZ-55 CUBE: the inLab unit first mills a part of the restoration and interrupts the procedure automatically. Then carefully take the CUBE out of the unit and carefully separate the block holder on the milled side (fig. 1). Do not grind the restoration. Now insert the CUBE into the remaining part of the block holder and continue the milling procedure. The calibrating body to the side enables the unit to recognize the area which has already been milled. After the milling procedure remove the calibrating body from the milling chamber in order to avoid blocking the connections. When batch milling, the crown substructures should be removed from the milling chamber, since the gear-head could be crushed during subsequent milling procedures.

* Sirona art. no. 593 566 8, Cone-shaped Diamond XL
no. 599 977 1, Long-cone Flip-Block LK 14

Processing the milled restoration

• After completion of the milling process and **before sintering** the restoration must be separated with a diamond cutting instrument (fig. 2). the separated edge ground (fig. 3) and the more thickly milled margins reduced (fig. 4).

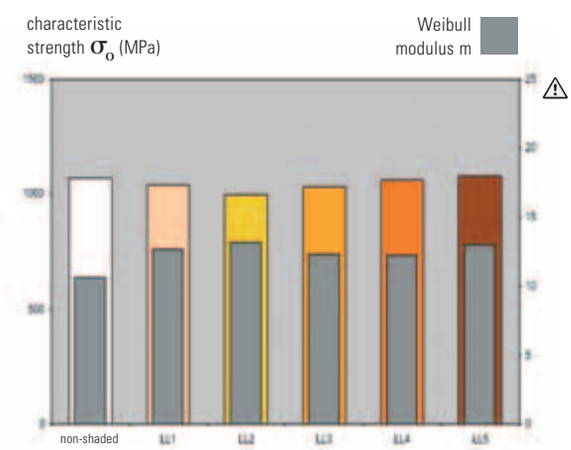
• **After the sintering firing no more adjustments should be made by grinding.**

Important:
On account of dust formation when grinding dental ceramic products it is necessary to wear a dust mask or grind the ceramic when wet. Work behind a safety screen and use a suction unit.

Shading the substructures with VITA COLORING LIQUID for VITA In-Ceram® YZ

Areas of application

- Fluid for the complete or partial coloration of milled VITA In-Ceram YZ substructures before sintering. **YZ COLORING LIQUID is suitable for coloring substructures made of VITA In-Ceram® YZ only.**
  YZ COLORING LIQUID is available in 5 lightness levels (LL1-LL5), which are matched to the VITA SYSTEM 3D-MASTER.
  This shading enhances the accurate shade reproduction of VITA VM 9.
  Please heed the instructions on page 20.



Influence of the YZ COLORING LIQUID on the 3-point bending strength and the Weibull modulus of VITA In-Ceram YZ

⚠ ***Important note:***
YZ COLORING LIQUID has no adverse effects on the physical properties of the material such as flexural strength, fracture toughness and the Weibull modulus of VITA In-Ceram YZ.

Application

- The restorations should be cleaned in distilled water and grinding dust removed before use. To this purpose a cleansing firing in a ceramic furnace (e.g. VITA VACUMAT) should be carried out in order to remove the cooling and lubricating liquid DENTATEC from the porous substructure. Place the substructure on a fibrous pad firing support.

Cleansing firing in the VITA VACUMAT®

Pre-drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx.°C	→ min.	VAC
600	3.00	3.00	33	700	5.00	0.00

- The restoration can be immersed in the YZ COLORING LIQUID according to the desired lightness level of the shade LL1(light) to LL5 (dark). The recommended immersion time is 2 minutes. During immersion, vacuum or pressure (2 bar) can be used additionally.

⚠ ***Important:***
Use only the acrylic tweezers for immersion.

- Subsequently remove excess YZ COLORING LIQUID with a paper tissue and allow to dry. Do not sinter in a wet condition.
- YZ COLORING LIQUID can also be sprayed on using the VITA SPRAY-ON 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 without and 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 art. 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 (art. no. E38011, sintering crucible with air vent). As an alternative, the lid can be omitted. This guarantees unhindered burning out of the organic residue.
- Further processing according to the working instructions VITA In-Ceram YZ for CEREC (no. 1128).

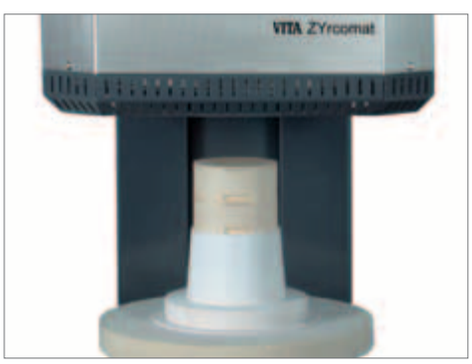
- VITA In-Ceram YZ substructure shaded with YZ COLORING LIQUID

Sintering in the high-temperature furnace VITA ZYrcomat

⚠ ***Important:***
The sintering firing is authorized only in the high-temperature furnace authorized by VITA. Only in this furnace is correct sintering with the resulting physical properties of the substructures guaranteed.

- 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 bowl either on the labial or lingual surface and posterior crowns and posterior bridge substructures on the occlusal surface.

☞ ***Note:***
It is recommended to sinter bridge substructures in the sintering bowl (VITA art. 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.



- Place the sintering bowl in the centre of the firing tray and cover with sintering containers. "Two-storied" sintering by stacking the containers is possible.
- 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.

⚠ ***Important:***
Do not open the firing chamber until the temperature has cooled down to less than 200 °C! This leads to a longer life of the sintering bowl and crucible.

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

Processing the sintered substructures

- The surface structure of ceramic materials is decisive for their flexural strength. The 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 over-critical quantities of energy to the substructure. This can lead to a 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).

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:

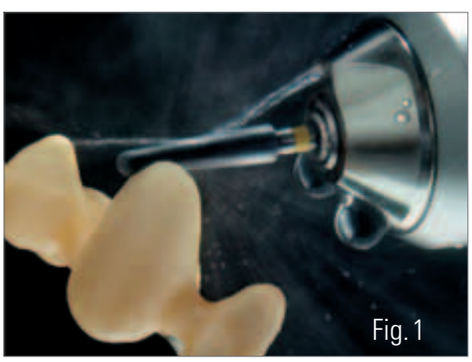


Fig. 1

- 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 must not "rattle about".

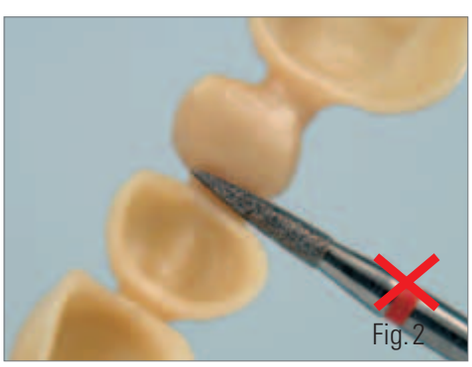


Fig. 2

- The use of 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).
- 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 arisen cannot be regenerated.

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

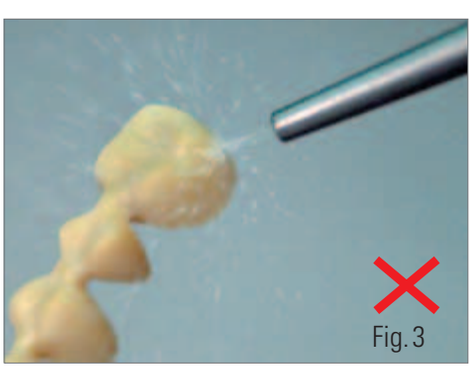
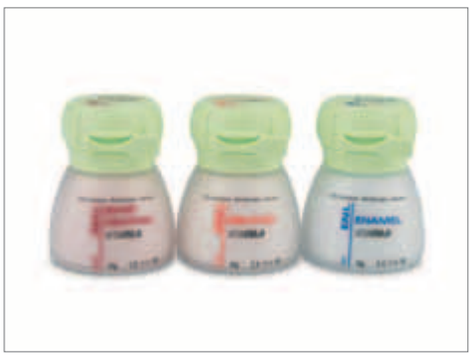


Fig. 3

⚠ ***Important:***

The VITA In-Ceram® YZ surfaces to be veneered must not be ground (fig. 3). Sandblasting can lead to an 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 heed the working instructions VITA VM 9, no. 1190E.



Veneering with VITA VM 9

- Substructures made of VITA In-Ceram YZ for inLab 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 (1 shade for each VITA SYSTEM 3D-MASTER lightness level) serves to shade the milled VITA In-Ceram YZ substructures in the desired lightness level. This coloration enhances the accurate shade reproduction with VITA VM 9.
- In order to achieve good bonding between the shaded VITA In-Ceram YZ substructures and VITA VM 9 we recommend a BASE DENTINE wash opaque firing according to the following firing cycle:

Pre-Drying °C	→ min.	↗ min.	↗ °C/min.	Temp. approx.°C	→ min.	VAC
500	2.00	7.27	60	950	1.00	7.27

- In the case of thin wall thicknesses the wash opaque firing can also be carried out with CHROMA PLUS in order to enhance the basic shade.
- In the case of non-shaded VITA In-Ceram YZ substructures as well as non-shaded, densely sintered zirconium oxide substructures of other manufacturers see instructions in the working instructions VITA VM 9, no. 1190E.

Recommended instruments and materials

- **Modeling wax**
  - Scan Wax (Sirona)

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

- **Abrasive instruments for processing with the wet grinding turbine/with handpiece**
  - ZR set of abrasives for the manufacture of 2° primary crowns (Komet/Gebr. Brasseler, art. no. 4432)
  - ZR cutters for the processing of zirconium oxide substructures, 7 different forms (Komet/Brasseler)
  - IMAGO Grind System, abrasives for wet grinding turbines for the processing and manufacture of primary crowns (Steco-System-Technik)
  - Diamond polishers for handpiece, green-orange (Hager & Maisinger, art. no. HP 803 104 372 170)

- **Preparation sets**
  - Preparation sets according to Küpper (Hager & Meisinger, art. no. 2560)
  - Preparation sets according to Baltzer and Kaufmann (Hager & Maisinger, art. no. 2531)
  - All-Ceramics preparation set with guidance instruments according to Brandes (Komet/Gebr. Brasseler, art. no. 4410)
  - Crown preparation set with guidance instruments according to Günay (Komet/Gebr. Brasseler, art. no. 4384A)

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

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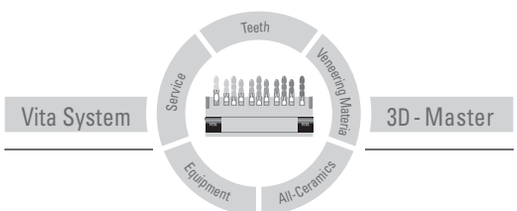
With the unique VITA SYSTEM 3D-MASTER all natural tooth shades are systematically determined and completely reproduced.

The VITA VM 9 veneering ceramic is available in the VITA SYSTEM 3D-MASTER shades. Shade compatibility with all VITA 3D-MASTER® materials is guaranteed.



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Date of issue of these instructions for use: 06-06

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VITA Zahnfabrik has been certified according to the law concerning medical devices and the following products bear the CE mark CE 0124 :

VITA**VM 9**
VITA In-Ceram® YZ for inLab®
YZ COLORING LIQUID for VITA In-Ceram® YZ

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