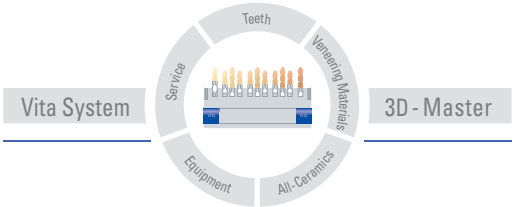
All-Ceramics Systems

VITA In-Ceram®
ALUMINA

Directions for use
Fabrication of the framework
in the slip-casting technique

Date of issue: 12-07



VITA

Contents

VITA In-Ceram® Indications

	Oxide ceramic				
	Infiltration ceramic			Sinter ceramic	
	VITA In-Ceram SPINELL	VITA In-Ceram ALUMINA	VITA In-Ceram ZIRCONIA	VITA In-Ceram AL	VITA In-Ceram YZ
	–	–	–	●	●
	○	–	–	–	–
	○	–	–	–	–
	–	–	–	–	–
	–	–	–	–	–
	●	●	○	●	●
	–	●	●	●	●
*	–	–	–	–	●
	○	●	●	●	●
	–	–	●	–	●
*	–	–	–	–	●
Veneering material	VITA VM 7	VITA VM 7	VITA VM 7	VITA VM 7	VITA VM 9

● recommended

○ possible

* no more than 2 pontics

Material properties of aluminium oxide (Al_2O_3)

Dr. Marc Stephan, Bad Säckingen

Aluminium oxide, also known by its mineralogical name corundum (in Tamil *korundam*), occurs naturally in several different varieties.
The most well-known form of corundum is the ruby, followed by the sapphire. The precious stone sapphire occurs in all colours except red. When speaking of sapphire without any more specified description, this always refers to the blue precious stone (coming from the Greek word *sappheiros*, meaning 'blue stone').
With a Mohs' hardness of 9, corundum is the next hardest natural mineral to diamond.
It is mostly formed in metamorphic rock and occurs most frequently in grainy limestone and precious stone placers. It is found in Burma, Sri Lanka and Thailand.
Natural corundum crystallizes trigonally, and frequently in barrel-shaped crystals (Fig. 1).
Corundum with all the properties of natural stone can be manufactured synthetically using the Verneuil process. Its melting point is 2054 °C.
Industrially utilized corundum is manufactured from bauxite in electric melting furnaces, demonstrates rhombohedral symmetry and has a wide range of technical applications. Its good high-temperature and wear resistance enable it to be used in gas turbines and turbo superchargers as well as for cutting and grinding apparatus and for sandblasting jets. Its good electrical insulation and heat conduction properties make itsuitable as a substrate for integrated circuits and insulating parts. Its excellent corrosion resistance makes it ideal also for chemical engineering, valves and slip rings. Not least on account of its good biocompatibility, corundum is predestined for use in the field of medical and dental implants. VITA In-Ceram ALUMINA now utilizes the advantages of colourless corundum.
In this system a bimodal grain distribution with a medium grain size of approx. 3 µm is used. At a temperature of 1120°C, far below the melting point of corundum, a sintering process takes place in which the Al_2O_3 particles, by means of diffusion processes at the surface, form a bond with their contact points (Fig. 2).
The structure thereby obtained exhibits a chalky consistency and at this stage is still easy to process.
It is only after a further processing step, namely that of glass infiltration, that the high strength (Fig. 4), typical tooth colour and translucency of VITA In-Ceram ALUMINA are obtained. For the glass infiltration a special glass is used which has an excellent wetting power to corundum and demonstrates a very low viscosity at the infiltration temperature of 1100 °C, in order to completely fill the free porosities between the Al_2O_3 particles (Fig. 3).

Fig. 1: Barrel-shaped natural corundum of the sapphire variety.

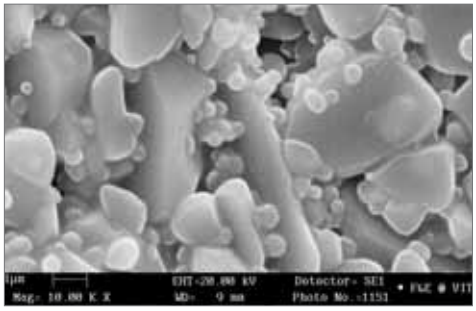


Fig. 2: Scanning electron micrograph (SEM) of porously sintered VITA In-Ceram ALUMINA, magnification x 10000

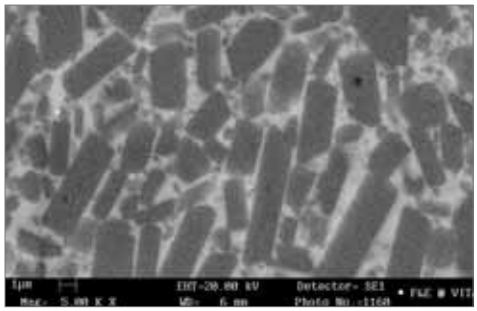


Fig. 3: Scanning electron micrograph showing traverse section of glass-infiltrated VITA In-Ceram ALUMINA, magnification x 5000

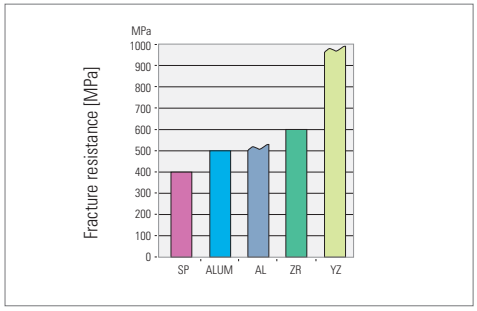


Fig. 3: SP: VITA In-Ceram SPINELL, ALUM: VITA In-Ceram ALUMINA, AL: VITA In-Ceram AL, ZR: VITA In-Ceram ZIRCONIA, YZ: VITA In-Ceram YZ

VITA In-Ceram® is based on many years of clinical experience and features the following advantages:

- optimum aesthetics and excellent biocompatibility, i.e.
  - no exposed metal margin
  - good light transmission properties
  - no retraction of the gingiva
  - accurate marginal fit (Fig. 5)
- withstands high functional stress due to excellent physical values
- no thermal irritations on account of low thermal conductivity
- offers the possibility of non-adhesive seating
- radiolucent
- high degree of acceptance among the patients
- positive cost/benefit ratio
  (e.g. no additional costs for high-quality alloys)
- standardized working procedures for the dental technician
- expandable system
- clinical experience since 1989

VITA In-Ceram® ALUMINA – indications

Substructures for anterior and posterior single crowns and 3-unit anterior bridges.

VITA In-Ceram® ALUMINA is not indicated in the following cases:

when the functionally appropriate design of the restoration is not ensured.

e.g. in the case of:

- insufficient hard tooth substance available
- inadequate preparation results
- bruxism

For information on preparation and cementation please refer to the booklet “Clinical Aspects” (order no. 808E).

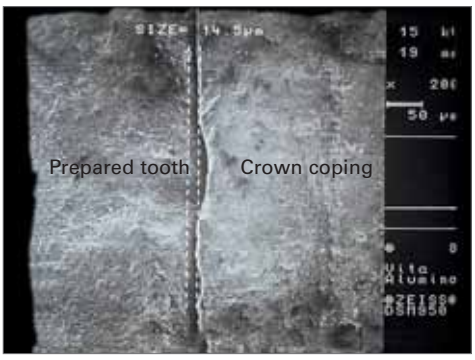
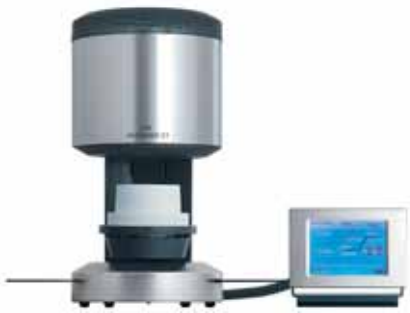


Fig. 5: Marginal gap measurement of VITA In-Ceram ALUMINA crown. The gap corresponds to a width of 14.5 µm (Prof. H. Kappert)

Assortment	VITA order no.:
VITA In-Ceram® ALUMINA assortment in module box, complete	**HSORALV2**
Contents (also available separately):	
VITA In-Ceram ALUMINA GLASS POWDER AL1*, 25g	HGAL125
VITA In-Ceram ALUMINA GLASS POWDER AL2, 25g	HGAL225
VITA In-Ceram ALUMINA GLASS POWDER AL3*, 25g	HGAL325
VITA In-Ceram ALUMINA GLASS POWDER AL4, 25g	HGAL425
VITA In-Ceram ALUMINA POWDER, 400g	HP400
VITA In-Ceram Special Plaster for crowns/bridges, 20 sachets of 20 g	HGN20
In-Ceram ALUMINA/ZIRCONIA Mixing Fluid, 20 ampoules of 5 ml	HAFN5
VITA In-Ceram Interspace Varnish, 30 ml	HD30
VITA In-Ceram Interspace Varnish Thinner, 30 ml	HDV30
VITA In-Ceram Testing Liquid, 6 ml	HP6
VITA In-Ceram ALUMINA Additive, 5 ml	HA5
Duplicating rings, ø 28mm, 2 pcs	B019
Vacuum Mixing Beaker, incl. rubber stopper and glass tube	B130
Plastic Mixing Beaker	B003
Spare plastic beaker with lid	B099
Pipette, gradations 1/10 ml	B052
Glass Spatula	B056
Brush no. IC 4	B092
Pack with 2 In-Ceram firing trays	B007
VITA In-Ceram GLASS POWDER blade	B271IC
Working instructions	820E

* materials not included in assortment



- The VITA INCERAMAT 3T as well as

- the VITA In-Ceram VITASONIC II ultrasonic unit are components of the VITA In-Ceram initial equipment.

- VITA VM 7 BASIC KIT, fine-structure ceramic for veneering VITA In-Ceram ALUMINA substructures.

VITA In-Ceram® ALUMINA working procedure:		Waiting times
1.	Producing working model and master model	Hardening of the special plaster in the duplication mould 2 hrs
2.	Blocking out the working model	
3.	Applying VITA In-Ceram Interspace Varnish	Hardening 20 min.
4.	Duplicating	Hardening approx. 20 min.
5.	Deflasking duplicating mould	Recovery time at least 30 min.
6.	Producing firing tray model	Hardening 2 hrs
6a.	for bridges: Gluing firing tray model onto the firing support and sawing	Hardening 10 min.
7.	Mixing and applying VITA In-Ceram ALUMINA POWDER	
8.	Sintering firing in the VITA INCERAMAT	approx. 4.5 hrs
9.	Reworking sintered substructure	
10.	Applying VITA In-Ceram ALUMINA GLASS POWDER	
11.	Glass infiltration firing in the VITA INCERAMAT (crown coping)	approx. 2.5 hrs
12.	Removing / sandblasting excess glass	
13.	1st glass control firing	approx. 10 min.
14.	2nd glass control firing	approx. 10 min.
15.	Veneering the substructure with VITA VM 7	

Model fabrication

- Produce a master model with removable dies from a high-quality, dimensionally stable model stone.

- Also produce a second (unsectioned) master model for positioning, transferring and checking the crowns and bridges.

⚠ ***Important:***

The preparation must fulfil the requirements for all-ceramic restorations. Please see booklet "Clinical Aspects", order no. 808E for notes on preparation and cementation.

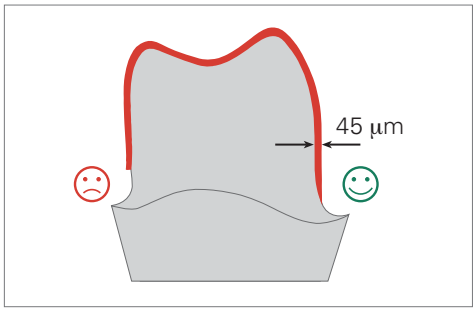
Preparation for duplicating – blocking out

- Check the sawed die carefully.
- Block out defects and undercuts in the die.

Applying the interspace varnish

- VITA In-Ceram interspace varnish must be applied to **plaster dies** in 2 – 3 coats (approx. 45 µm).
- **Epoxy or galvanized dies** require 4 coats (approx. 60 µm).

- The waiting time after each application is at least 5 minutes. After applying the last coat, wait 20 min.



ⓘ ***Attention:***

Do not extend the interspace varnish over the shoulder! The safety advice for working with VITA In-Ceram Interspace Varnish and Interspace Varnish Thinner must be heeded.

Waxing up the prop

- When fabricating bridgework a prop must be waxed up palatally in the area of the pontic. The prop facilitates the application of the slip material and allows increased absorption of liquid and quicker extraction during the application of the slip.

⚠ ***Important:***

The waxed prop must not have any undercuts.

- **Duplication**
  Duplicate with an addition polymerizing silicone in a ratio of 1:1 using the dual impression technique or

- using the pouring method with the help of a duplicating mould.

- **Deflasking**
  After deflasking allow the finished impressions to harden for approx. 30 minutes according to the recovery time (depending on the duplicating material – please adhere to the manufacturer's instructions).

- Spray wetting agent (e.g. KKD Release Spray) onto the impression and allow the agent to take effect.

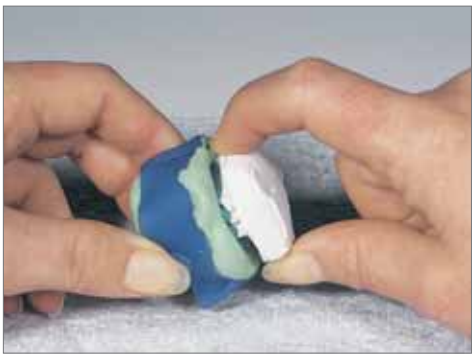
Stirring the VITA In-Ceram® Special Plaster

Mixing ratio:
VITA In-Ceram Special Plaster **20 g : 4.6** ml distilled water

- Pour 4.6 ml of distilled water into the mixing beaker. Then mix in the content of the sachet of VITA In-Ceram Special Plaster by hand. After that mix under vacuum for **20 sec.**

☞ ***Note:***
Make sure the mixing unit is clean and dry. The processing time can be lengthened by adding "chilled distilled water".

- Pour the plaster into the mould on the vibrator, avoiding the formation of bubbles.



Deflasking – preparing for the application of the slip

- After filling the VITA In-Ceram Special Plaster into the special plaster mould deflask **after 2 hours.**

Grinding the special plaster model smooth

- After deflasking, the base must be ground flat; during this models must be kept **dry.**

⚠ ***Important:***
Any absorption of water by the hardened special plaster model must be avoided. Water absorption has a negative effect on the expansion behaviour.

Manufacturing sintering firing supports for bridges

Separating the bridge model

- Partly section the special plaster model from beneath using a separating disc.

Attaching the bridge model

- Glue the special plaster bridge model onto a VITA In-Ceram firing tray using cyanoacrylate adhesive.

Sectioning the bridge units

- After approx. 10 min section the special plaster model carefully between the abutment teeth with a sharp saw blade in order to prevent damage to the bridge substructure due to the shrinkage in the plaster during sintering firing.

Preparation margin

- Mark the preparation margin with a colour superpolymer cartridge.

Manufacturing the slip

- Weigh out **exactly 38 g** of VITA In-Ceram ALUMINA Powder.

- Pour the contents of

  1 ampoule of VITA In-Ceram ALUMINA/ZIRCONIA Mixing Fluid and **1 drop of VITA In-Ceram ALUMINA Additive**

  into the glass beaker and premix briefly in the VITASONIC.

- Place the glass beaker on a vibrator and spatulate the 38 g of VITA In-Ceram ALUMINA Powder slowly into the liquid in several small portions.
- Mixing must be interrupted at least 3 times in order to place the glass beaker in the VITASONIC ultrasonic unit for 2 minutes each time.

⚠ ***Important:***
The water in the VITASONIC must be chilled with ice-cubes.

- After the entire powder has been added, place the glass beaker in the VITASONIC ultrasonic unit for 7 minutes.

⚠ ***Important:***
After mixing, the slip must exhibit a homogeneous consistency.

- The mixture is then evacuated for 1 min (e.g. with a vacuum investment unit).

⓵ ***Attention:***
Protective goggles must be worn and a cloth wrapped around the glass beaker during evacuation. Only undamaged glass beakers must be used.

Pouring the slip into a plastic mixing cup

- Pour the mixed slip from the glass beaker into the enclosed plastic mixing cup.

Applying the slip

- Start to apply the slip in the area of the pontic.
- Build up to half of the height of the pontic.

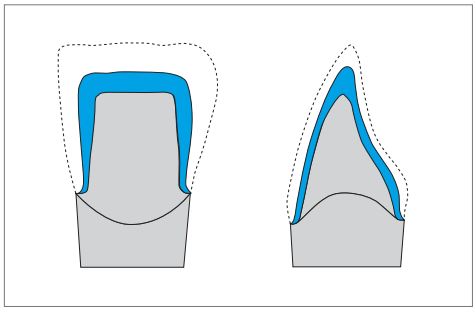
- Then coat the abutment dies fully and connect them to the pontic.

☞ ***Note:***

Proceed rapidly when building up the remaining slip. Do not interrupt this process so that drying out of the layers that have already been built up is prevented ("onion-skin effect").

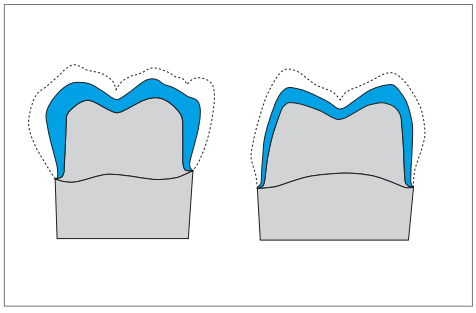
⚠ ***Attention:***

Since fine reworking is always required after sintering, the slip should be applied more richly prior to sintering firing.



Substructure design of a VITA In-Ceram® ALUMINA crown/anterior bridge

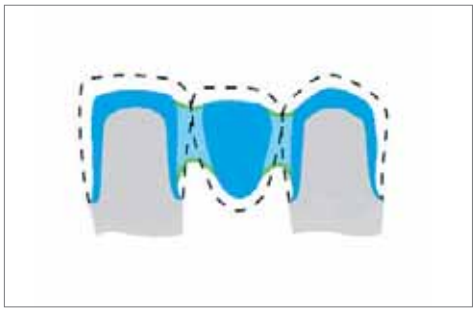
- In the VITA In-Ceram ALUMINA technique, all crown copings must be designed in such a way that they correspond on a reduced scale to the form of the tooth to be replaced. In this way, during veneering with VITA VM 7, a uniform layer thickness of the ceramic material is achieved.



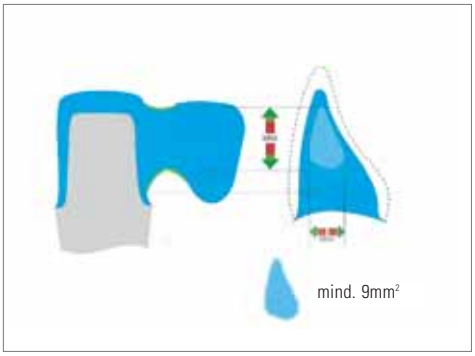
⚠ ***Important:***

Wall thickness for single crown copings:

Occlusal/incisal wall thickness	***0.7 mm***
Circumferential wall thickness	***0.5 mm***



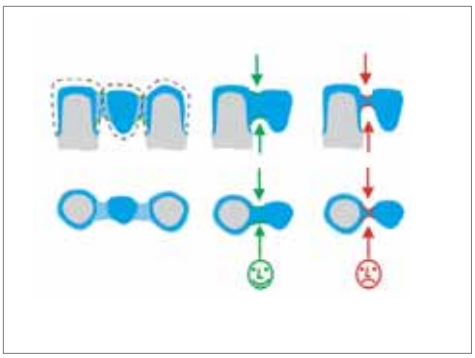
- In the VITA In-Ceram ALUMINA technique, all 3-unit anterior bridge substructures must be designed in such a way that they correspond on a reduced scale to the form of the tooth to be replaced. In this way, during veneering with VITA VM 7, a uniform layer thickness of the ceramic material is achieved.



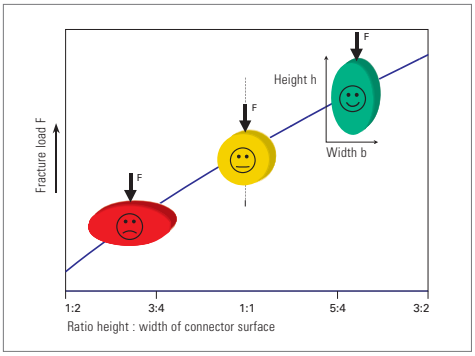
⚠ ***Important:***

Wall thickness for bridge abutment copings:
Occlusal/incisal wall thickness ***1.0 mm***
Circumferential wall thickness ***0.7 mm***

- Junctions must be designed as large as possible – to make maximum use of the space available.
- The connector surfaces must be **at least 9 mm².**



- Junctions must be concavely rounded. Deep grooves (e.g. with a diamond separating disc) must be avoided since they would necessarily result in cracks. Deep grooves necessarily lead to cracks and must therefore be avoided.



Aspects of the design of connectors for bridge substructures

⚠ ***Important:***

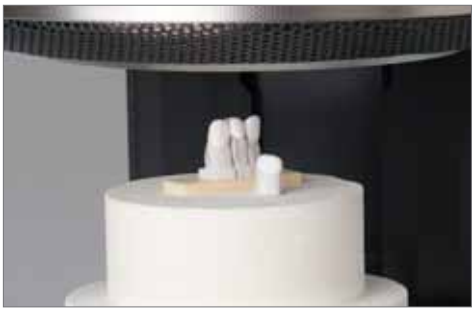
1. The height (h) of the connector surface should be as high as possible.
2. The height (h) should be at least as large as, or larger than the width (b).

Stability and function have priority over aesthetics!

Defining the preparation margin

- Carefully expose the preparation margin with a scalpel until the marking can be seen (if required use a microscope).

☞ ***Note:***
The final shaping of the substructure is not carried out until after sintering.



Sintering firing

- sintering firing in the VITA INCERAMAT as follows:

Time 1 h:min.	Time 2 h:min.	Time 3 h:min.	Time 4 h:min.	Temp. 1 approx. °C	Temp. 2 approx. °C
6:00	0:00	2:00	2:00	120	1120

- After firing allow the substructures to cool down to 400 °C in the **closed** firing chamber, and then down to room temperatures with the furnace door opened.

Sintered substructure:

- Since the special plaster model has contracted during firing, the sintered substructure can be easily removed from it.

Checking the fit of the restoration on the working model

- Before continuing work on the working model, remove the interspace varnish.

- In order to check the accuracy of fit, **carefully** place the sintered substructure on the working model again. **Do not exert pressure.**

- Check the fit (e.g. mark die with lipstick).

⚠ ***Important:***

Due to dust formation when grinding sintered dental ceramic products, always wear a face mask. Work behind a safety shield and use a suction unit

- Adjust contours and functioning by grinding slightly. It is recommended to use fine-grained diamond instruments, rotating at a low speed and exerting minimum pressure.

☞ ***Note:***

Be careful in the marginal area, use very fine-grained diamonds or rubber discs!

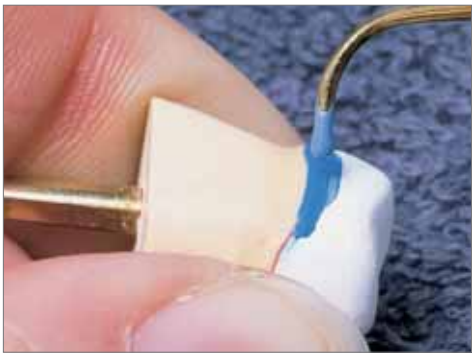
⚠ ***Important:***

Contours and functioning must be controlled now and – if required – adjusted, since no further adjustments can be performed after the glass infiltration firing.

Small defective spots in the marginal area can now be filled up with VITA In-Ceram ALUMINA OPTIMIZER:

VITA IN-Ceram® ALUMINA OPTIMIZER

The VITA In-Ceram ALUMINA OPTIMIZER is a mixture of Al_2O_3 powder and wax and is used to fill up small defects in ground or slip-coated and sintered VITA In-Ceram crown and bridge substructures.



I. Repairing small defective spots in the marginal area:

- Apply plaster/wax separating agent onto the die and blow completely dry.
- Take up VITA In-Ceram ALUMINA OPTIMIZER with an electric wax knife and apply to the crown margin. The temperature must be adjusted so that the mixture becomes sufficiently liquid and the wax, however, will not evaporate.
- Remove excess wax with a paper handkerchief and the hot wax knife.
- Remove the substructure from the die.
- Place the substructure on the model again and check the VITA In-Ceram ALUMINA OPTIMIZER that has been applied.

II. Sintering

- Fix the substructure on a platinum rod or place it on a fibrous pad firing support so that the VITA In-Ceram ALUMINA OPTIMIZER will not come into contact with it.

Sintering firing in the VITA VACUMAT

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
200	10.00	12.00	76	1120	40.00	0.00

- Checking the fit of the restoration on the working model.

Material testing

⚠ ***Important:***
Remove grinding dust from the substructures.

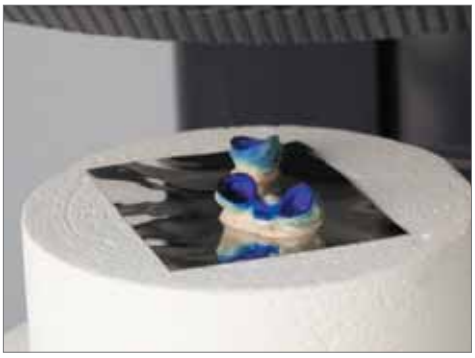
- Check the sintered substructures for possible micro-cracks using the VITA In-Ceram testing fluid.

- Should a micro-crack be found, manufacture the substructures once again.

☞ ***Note:***
The crown on the left is ok.
The crown on the right must be manufactured once again.

Application of glass powder
Determination table for VITA In-Ceram® ALUMINA GLASS POWDER see page 20.

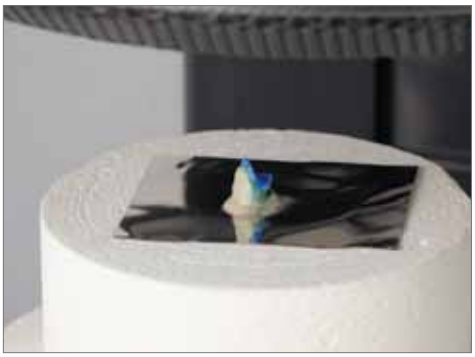
- Mix VITA In-Ceram ALUMINA GLASS POWDER with distilled water to obtain a thin consistency.
- Apply 1 – 2 rich coats with a thickness of 1 – 2 mm **only to the outer surfaces** of the sintered substructure using a brush.
- The margin of the crown must not be coated.



⚠ ***Important:***
*During the glass infiltration of **bridge substructures on platinum foil**, the **basal surface** of the pontic must **not** be covered with GLASS POWDER to enable the air in the sintered pontic to escape. Otherwise no complete glass infiltration can take place.*

Glass infiltration firing of crown copings in the VITA INCERAMAT

- Place the coated crown coping on a platinum pin in the VITA firing tray W. Make sure that the crown margins do not come into contact with the platinum pin in order to prevent the glass from penetrating into the interior of the crown.



Alternatively the glass infiltration firing of crown copings can be carried out on platinum foil:

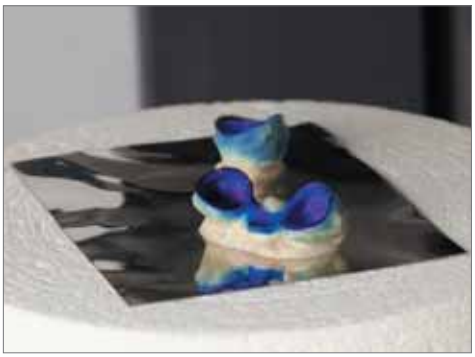
- Place the coated crown coping onto a piece of platinum foil with a thickness of 0.1 mm (Pt/Au foil 95/5 Heraeus Kulzer – available in two sizes, 60 x 100 x 0.1 mm (Pt/Au foil 95/5 large) or 60 x 50 x 0.1 mm (Pt/Au foil 95/5 small) on a firing tray W in order to carry out the glass infiltration firing.
  The crown margins must not come into contact with the platinum foil in order to prevent the glass which has been applied from penetrating into the interior of the crown.

Glass infiltration firing of crown copings in the VITA INCERAMAT

Time 1 h:min.	Time 2 h:min.	Time 3 h:min.	Time 4 h:min.	Temp. 1 approx. °C	Temp. 2 approx. °C
0:00	0:00	0:30	2:00	200	1110

Glass infiltration firing of crown copings in the VITA VACUMAT
The glass infiltration of crown copings can also be carried out in the dental ceramic furnace under vacuum.

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
600	6.00	10.00	51	1110	40.00	40.00

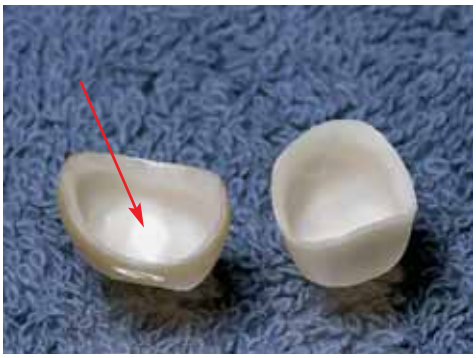


⚠ ***Important:***
In the case of bridges the glass infiltration firing ***must*** *be carried out on platinum foil.*

- **Glass infiltration firing of bridge substructures in the VITA INCERAMAT**
  Place the coated bridge substructure on platinum foil on a firing support W to carry out the glass infiltration firing. The crown margins must not come into contact with the platinum foil in order to prevent the glass which has been applied from penetrating into the interior of the abutment copings.

Glass infiltration firing of bridge substructures in the VITA INCERAMAT

Time 1 h:min.	Time 2 h:min.	Time 3 h:min.	Time 4 h:min.	Temp. 1 approx. °C	Temp. 2 approx. °C
0:00	0:00	0:30	6:00	200	1110



ⓘ ***Attention:***
In the case of incomplete infiltration – if there are chalk-like areas – the infiltration process should be repeated.

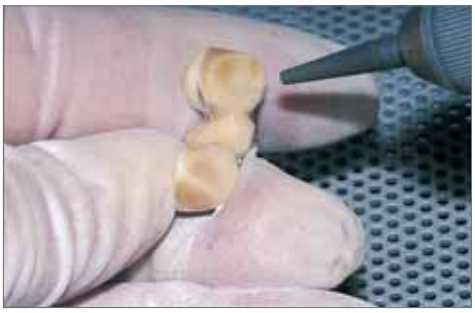
⚠ ***Important:***
For crown copings apply the GLASS POWDER from the outside ***to the areas which have not been infiltrated****.*

For bridge units, even when applying additional material, the ***basal surface*** *of the pontic must* ***not*** *be covered with GLASS POWDER so that the air can escape from the substructure. Only then is correct glass infiltration ensured.*

Removing excess glass

- Remove the excess glass with a coarse-grained diamond instrument or HEATLESS abrasive almost down to the substructure surface.

- Sandblast residual material in a sandblasting unit (disposable abrasive procedure with 30 - 50 µm Al_2O_3) at a pressure of 6 bar (3 bar cervically).



Attention:
The glass dust consists of sharp particles!
Always wear protective glasses and a face-mask, use an extraction unit and work behind a protective screen.

Glass control firing

- Place the substructure on a fibrous pad firing support on the VITA firing support W and carry out the glass control firing as follows:

Glass control firing in the VITA VACUMAT

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
600	0.00	5.00	80	1000	5.00	0.00

Finishing

- After the glass control firing, sandblast the crown with 50 µm Al_2O_3 at a maximum pressure of 3 bar.

Important:
*At least 2 glass control firings must be carried out. The last firing before veneering **must** be a glass control firing.*

- Final check on the master model.
- Finished substructures on the model.

- Then veneer with VITA VM 7 according to the working instructions 1110E.

Important:
The unveneered areas of the VITA In-Ceram substructure must be sealed with glaze.

- **Hardening of the interspace varnish:**
  approx. 5 minutes after each application
  Final hardening approx. 20 min.

- **Hardening of the duplicating material**
  Heavy body: 10 min.
  Light body: 15 min.

- **Recovery time of the silicone duplicating material:**
  at least 30 min. depending on the manufacturer's instructions

- **Mixing ratio for special plaster:**
  20 g/4.6 ml distilled water

- **Mixing time of plaster:**
  approx. 20 sec.

- **Hardening of the special plaster in the duplicate mould:**
  2 hrs

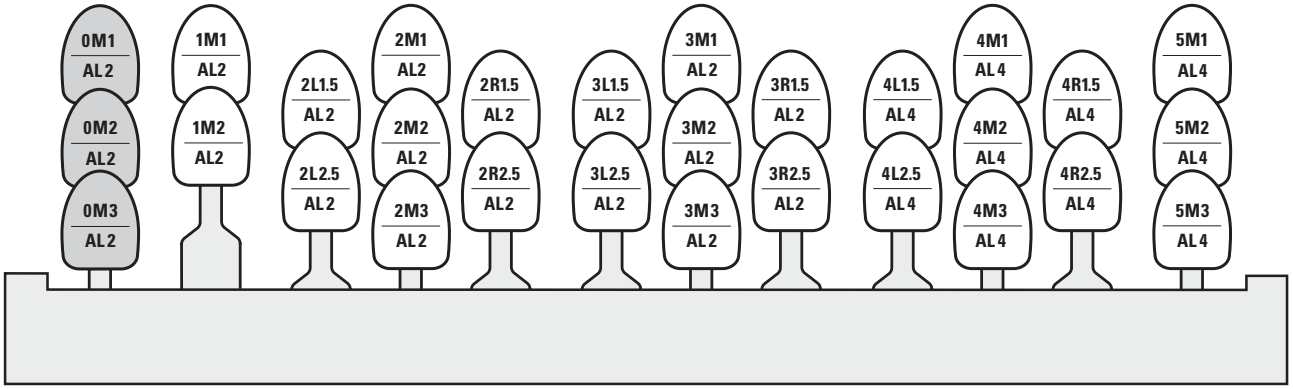
- **Drying of the cyanoacrylate adhesive:**
  10 min.

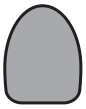
- **Mixing ratio of the slip:**
  38g ALUMINA POWDER/
  1 ampoule ALUMINA/ZIRCONIA mixing fluid
  + 1 drop ALUMINA additive

- **Mixing the slip in the (ice) chilled VITASONIC:**
  2 min., 2 min., 2 min., 7 min.

  under vacuum: 1 min.

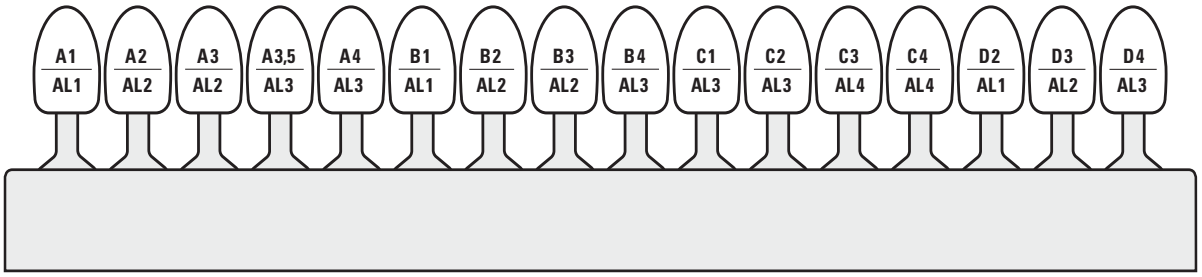
VITA SYSTEM 3D-MASTER® / VITA**VM®7**





Shades for reproducing bleached teeth

VITAPAN® classical / VITADUR® ALPHA



⚠ ***Important:***

We strongly recommend the use of ceramic furnaces in which no alloys are fired (risk of contamination).

Sintering firing in the VITA INCERAMAT

Time 1 h:min.	Time 2 h:min.	Time 3 h:min.	Time 4 h:min.	Temp. 1 approx. °C	Temp. 2 approx. °C
6:00	0:00	2:00	2:00	120	1120

Sintering firing of OPTIMIZER in the VITA VACUMAT®

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
200	10.00	12.00	76	1120	40.00	0.00

Glass infiltration firing of crown copings in VITA INCERAMAT

Time 1 h:min.	Time 2 h:min.	Time 3 h:min.	Time 4 h:min.	Temp. 1 approx. °C	Temp. 2 approx. °C
0:00	0:00	0:30	2:00	200	1110

Glass infiltration firing of anterior bridge substructures in the VITA INCERAMAT

Time 1 h:min.	Time 2 h:min.	Time 3 h:min.	Time 4 h:min.	Temp. 1 approx. °C	Temp. 2 approx. °C
0:00	0:00	0:30	6:00	200	1110

Glass infiltration firing of crown copings on VITA firing tray W with platinum pins in the VITA VACUMAT®

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
600	6.00	10.00	51	1110	40.00	40.00

Glass control firing in the VITA VACUMAT®

Pre-drying	→ min.	↗ min.	↗ °C/min.	Temp. approx. °C	→ min.	VAC min.
600	0.00	5.00	80	1000	5.00	0.00

Possible sources of errors in the **VITA In-Ceram® ALUMINA** slip-casting technique

Inadequate fit:	• insufficiently or incorrectly blocked out • interspace varnish applied to shoulder • dies were not repositioned correctly after the application of interspace varnish • recovery time for silicone was not adhered to • distorted impression • mixing ratios were not adhered to • setting times were not adhered to • firing temperatures were not adhered to • preparation margin not exposed accurately after the application of the slip • glass was incompletely sandblasted • marginal areas were sandblasted using excessive pressure
Fractured bridges:	• prop was not waxed up correctly • prop has undercuts • special plaster model was not sawed • insufficient exposure of prop after application of slip (clamp effect) • slip-coated substructures feature micro-cracks (worked too heavily with scalpel before sintering).
Sintering problems/ loose flakes in the crown after sintering firing:	• die was not wetted sufficiently or too thinly during the application of the first slip coat (rapid drying-up resulting in 'onion skin' effect) • brush was too wet
Glazings, greenish discolorations in the crown/ different hardness levels at the surface	• furnace temperature too high
Sintering has not taken place:	• furnace chamber was not closed during the program start • check furnace heating • check program sequence
Problems during glass infiltration/insufficient infiltration:	• furnace temperature too low • selection of holding times that were too short • insufficient amount of GLASS POWDER was applied • capillaries clogged by grinding dust
Interior of the crown filled with glass:	• perforation or extremely thin spots in the sintered substructure • crown or bridge was put onto the platinum foil at an angle that was too small • crown touched the platinum rod in the marginal area

VITA Zahnfabrik is certified according to the Guideline on Medical Devices and the following products bear the CE mark CE 0124

VITA In-Ceram® ALUMINA POWDER
VITA In-Ceram® ALUMINA GLASS POWDER
VITA In-Ceram® ALUMINA OPTIMIZER
VITA**VM®7**

The following products of the VITA In-Ceram® system must be labelled.

VITA In-Ceram® Testing Liquid

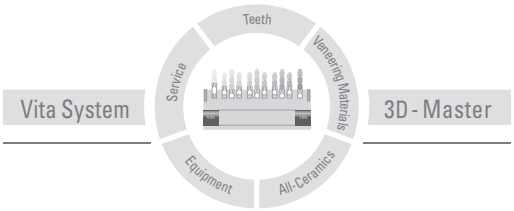
highly flammable

VITA In-Ceram® Interspace Varnish
VITA In-Ceram® Interspace Varnish Thinner

hazardous to health, highly flammable, irritating to eyes.
Avoid contact with skin and eyes, use an extraction unit.

Please see the material safety data sheets for further details!

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



US 5498157 A
AU 659964 B2
EP 0591958 B1

The VITA In-Ceram All-Ceramics materials are an integral part of the VITA SYSTEM 3D-MASTER. Shade compatibility with all other VITA materials is guaranteed.

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 useris 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: 12-07
This is the now valid issue of these working instructions. All previous issues are hereby rendered invalid.

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VITA

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