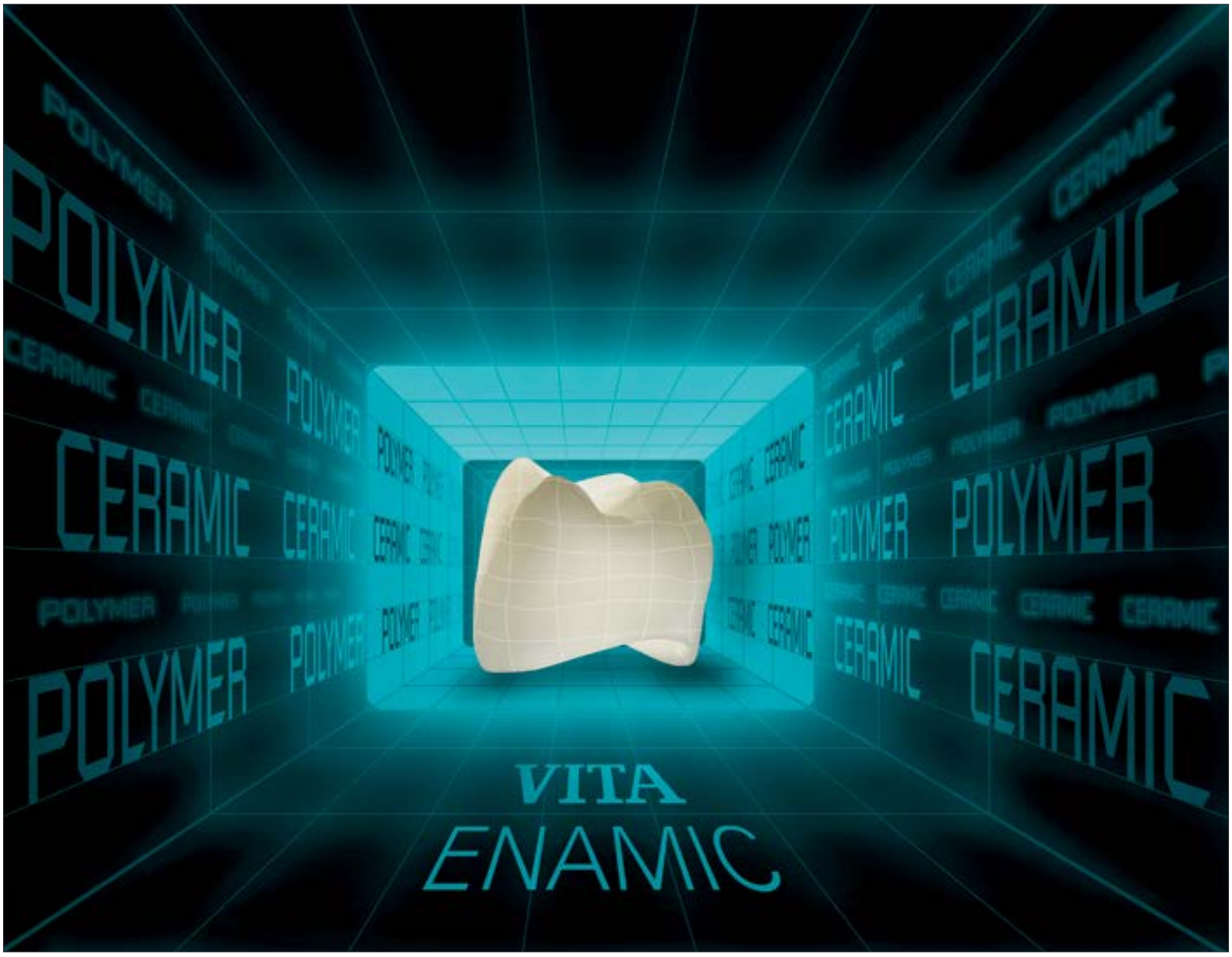
VITA ENAMIC® for CEREC®/ inLab®

Working Instructions



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

Date of issue: 05.14

VITA shade, VITA made.

Information about VITA ENAMIC hybrid ceramic is available at www.vita-enamic.de

Sirona CEREC AC system

Sirona inLab MC XL system

Information about the CEREC and inLab systems is available from:

Sirona Dental Systems GmbH
Fabrikstraße 31 D-64625 Bensheim

email: contact@sirona.de
www.sirona.com

Ceramic network structure

VITA ENAMIC is the first hybrid dental ceramic in the world with a dual-network structure.

In this dental material, the dominant fine-structure ceramic network (86% by wt.) is strengthened by a polymer network, with both networks fully integrated with one another.

Polymer network structure

Product characteristics and advantages

- Lower brittleness than pure ceramic and better abrasion behavior than composite.
- Compared to silicate ceramic, it is possible to mill restorations with thinner walls. Particularly suitable for minimally invasive restorations.

Integrated crack-stop function

Excellent edge stability

- Very accurate and precise milling results for restorations thanks to excellent marginal stability of the material.
- Can be perfectly milled with diamond instruments.
- Compared to silicate ceramic, the life of milling tools is increased by about 4–5-fold in the normal milling mode.
- Compared to silicate ceramic, milling times for molar crowns are reduced up to 45% in the fast milling mode.
- Simple bonding with self-adhesive composites is enabled.

Chemical composition of the fine-structure feldspar ceramic network*

Oxides	% by weight
SiO_2	58–63
Al_2O_3	20–23
Na_2O	6–11
K_2O	4–6
B_2O_3	0.5–2
CaO	< 1
TiO_2	< 1

* The values of the chemical composition listed above are dependent on the lot. Chemical elements (oxides) that are contained in very low concentrations and required, e.g. for coloring, are not listed.

Chemical composition of the polymer network

The polymer network consists of methacrylate polymer.

Material ratio - ceramic - polymer

Component	% by weight	% by volume
Fine-structure feldspar ceramic	86	75
Polymer	14	25

Physical data*

Property	Unit	Value
Flexural strength (ISO 6872)	MPa	150–160
Fracture toughness	MPa√m	1.5
Modulus of elasticity	GPa	30
Weibull modulus	–	20
Hardness	GPa	2.5

* The technical/physical values indicated are typical measuring results and refer to internal samples and measurement equipment available on site. If samples are prepared using different methods and measurement equipment, other measuring results may be obtained.

Indication

VITA ENAMIC for CEREC/inLab is indicated for the fabrication of fully anatomical, esthetic single tooth restorations if

- the preconditions for the adhesive or self-adhesive bonding technique are fulfilled.

Overview of indications	
Anterior and posterior crowns on implants*	
Anterior and posterior crowns	
Inlays / Onlays / Partial crowns	
Veneers	

* The abutments must be designed in a way to meet the requirements for ceramic-specific preparation and to observe the minimum wall thicknesses of crowns made of VITA ENAMIC. Please observe the processing instructions of the manufacturer of the implant and the adhesive bonding material. More information: Working Instructions - VITA ENAMIC crowns on implants, Prod. No. 10077.

Contraindication

- Bridge restorations
- Free-end restorations
- Parafunction (for example bruxism)

Processing requirements for VITA ENAMIC

Hardware requirements

- VITA ENAMIC can be processed with Sirona's CEREC und inLab milling systems.

Software requirements

- Software CEREC 3D >V4.0 or inLab 3D >V4.0.
- To be able to mill the material also in the small CEREC or inLab milling systems with previous software versions (< 4.0), please select VITABLOCS Mark II, I14 or I10.

Important!
Under no circumstances should restorations made from VITA ENAMIC be fired during processing. A polymerization process is used for characterizing and individualizing the shade.

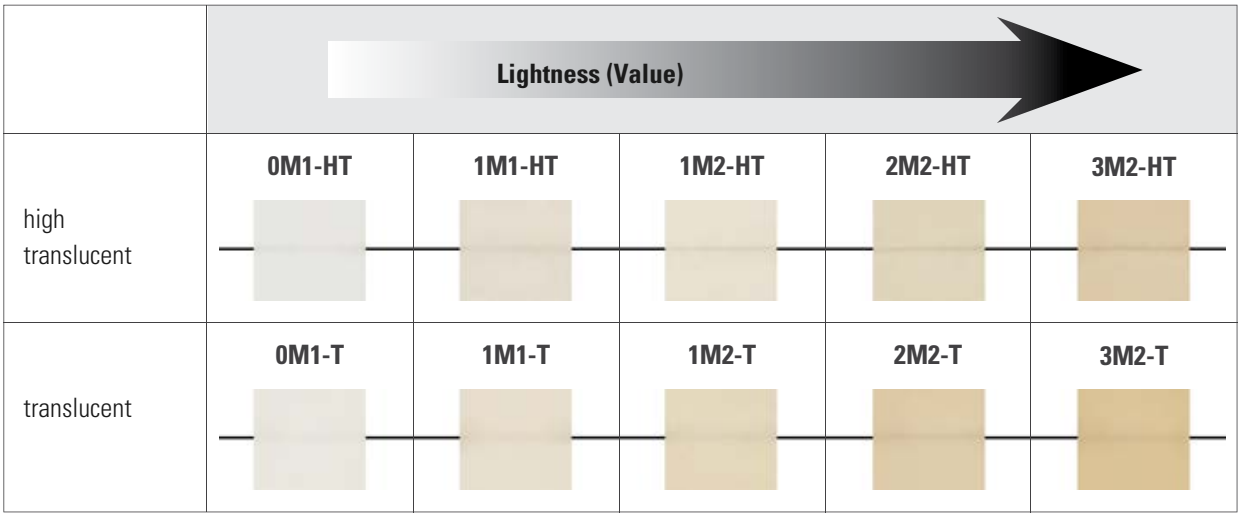
The shade concept

The shades of VITA ENAMIC have been matched with those of VITA SYSTEM 3D-MASTER, which is the only tooth shade system available on the market that takes all 3 color dimensions into account and integrates them into a systematic classification principle for shade determination and shade reproduction:

Value – Chroma – Hue

Overview of blocks

- Shades:



- Designation/size: EM-14 (12 x 14 x 18 mm)
  EM-10 (8 x 10 x 15 mm)

Primary indications of VITA ENAMIC T- and HT-blocks

The clinical situation needs to be specifically assessed when selecting the translucency. General rules:

HT (high translucent)

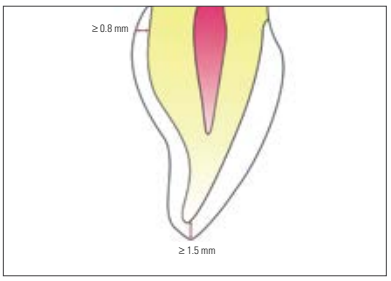
- Primarily suitable for inlays, onlays, full and partial crowns and veneers, cervical veneers, incisal edges.

T (translucent)

- Primarily suitable for full crowns intended to mask discolored or dark stumps, such as in cases of tetracycline discoloration, amalgam tattoos, metal core-build ups. Restorations of aged patients.

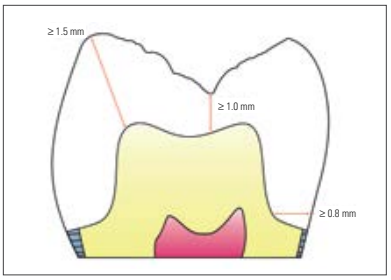
Layer thicknesses and preparation guidelines

To ensure clinical success of restorations made from VITA ENAMIC, the following **minimum layer thicknesses** must be adhered to:



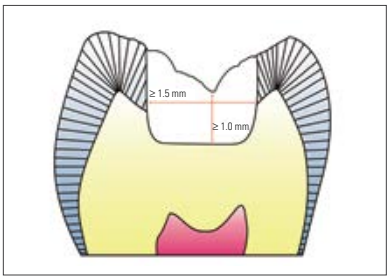
Anterior crowns

Incisal:	**at least 1.5 mm**
Circumferential:	**at least 0.8 mm**



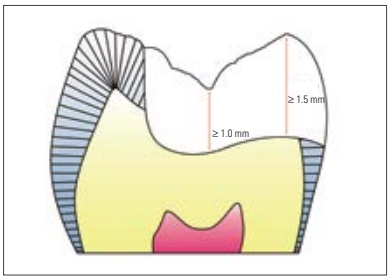
Posterior crowns

At the bottom of the fissure:	**at least 1.0 mm**
In the area of the cusps:	**at least 1.5 mm**
Circumferential:	**0.8–1.5 mm**



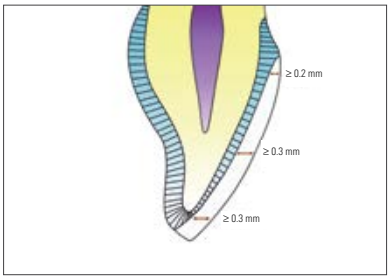
Inlays

At the bottom of the fissure:	**at least 1.0 mm**
In the area of the isthmus:	**at least 1.5 mm**



Onlays

At the bottom of the fissure: **at least 1.0 mm**
In the area of the cusps: **at least 1.5 mm**



Veneers

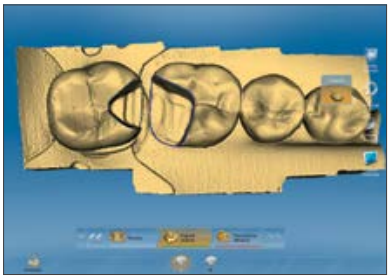
Labial:	**on average at least 0.3 mm**
Incisal third:	**at least 0.3 mm**
Central third:	**at least 0.3 mm**
Cervical third:	**at least 0.2 mm**

Application of VITA Powder Scan Spray

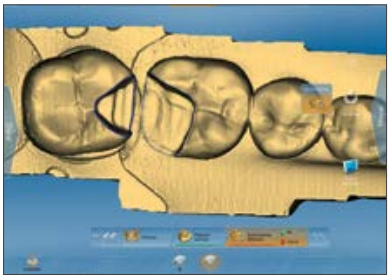
- Matting the tooth substance with VITA Powder Scan Spray before taking the optoelectronic impression.

Designing the restoration
with the CEREC or inLab 3D > V4.0x software.

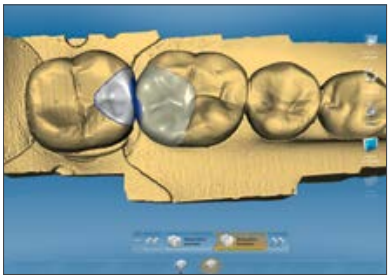
- Selecting VITA ENAMIC in the material menu.



- Drawing the preparation margin



- Defining the insertion axis



- Editing the restoration

Reworking (extraoral)

Do not rework VITA ENAMIC restorations using carbide instruments since these instruments may damage the material. Use only diamond-coated milling tools or special polishers. When reworking, use water and exert only slight pressure.

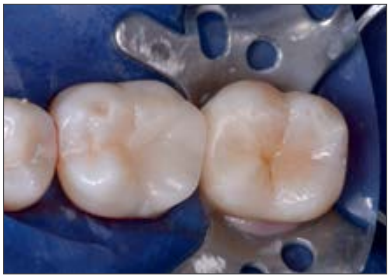
Special 2-stage polishing assortments were developed for intraoral and extraoral polishing of VITA ENAMIC. The use of these assortments allows for successful high-gloss polishing:

- **VITA ENAMIC Polishing Set technical**
- **VITA ENAMIC Polishing Set clinical**

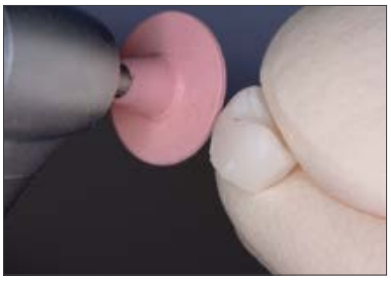
VITA ENAMIC Polishing Set technical

VITA ENAMIC Polishing Set clinical

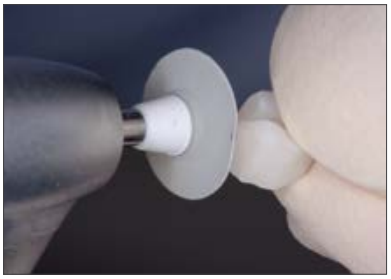
- Use diamond tool to remove the sprue.

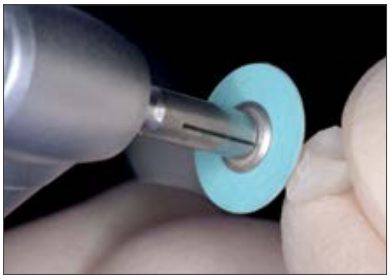


- Fit in and check proximal and occlusal contacts.



- Use the instruments of the VITA ENAMIC Polishing Set technical or clinical for contouring or pre- and high-gloss polishing.





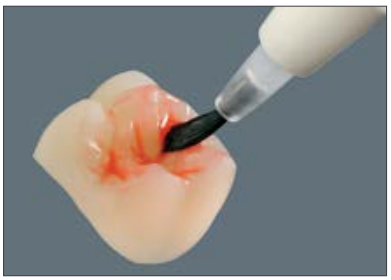
Tip: If Sof-Lex polishing discs are used for prepolishing, use only the medium grain (M) and very fine grain (SF) types.

Important note:
Since dust is formed when grinding sintered dental ceramic products, always wear a face mask or grind when wet. Use an extraction unit in the laboratory.

Optional: shade characterization (staining technique)

The shade of VITA ENAMIC restorations can be easily characterized (staining technique) with the special VITA ENAMIC STAINS (polymerization).
Then the surface is sealed with a special varnish. For this purpose, the special **VITA ENAMIC STAINS KIT**, including 6 shades and accessories, is available.

Please observe the detailed working instructions, No. 1931.



Conditioning the surface

The surface of the VITA ENAMIC restoration to be characterized needs to be rough and free from grease to optimize wetting and the retentive bond of the stain.
Do not use on polished surfaces!

The surface should be conditioned in the following way:

Etch with 5% hydrofluoric acid gel, such as VITA CERAMICS ETCH, for 60 seconds or sandblast with Al_2O_3, max. 50 µm and a pressure of max. 1 bar to remove any residues carefully.

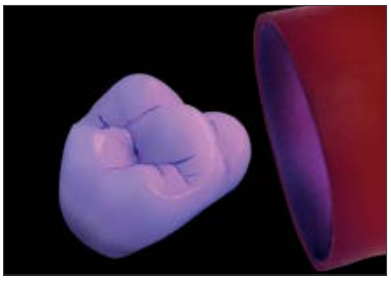
Then silanize the roughened surface, for example with VITASIL.
The surface must not be touched any longer!

Mixing the stain

Mix stain powder with VITA ENAMIC STAINS LIQUID on the porcelain mixing plate. The mixing ratio can be varied depending on the desired intensity of the shade: from aqueous-transparent to opaque.

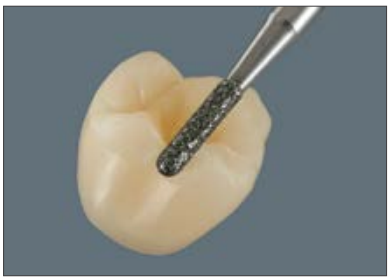
Application of the stain

Apply the shade and polymerize in steps.
Then use VITA ENAMIC GLAZE to seal the applied stain.



Final polymerization

VITA ENAMIC GLAZE can be polymerized with all standard dental light-curing devices **with a spectral range of 350 - 500 nm**.
All coated surfaces must be completely polymerized.



Adjustments of the shape

For smaller intraoral and extraoral corrections such as subsequent application of contact points and closure of trepanated crowns or crowns featuring a screw channel, etc., light-curing methacrylate-based composites, particularly low-viscosity filling composites, are a suitable choice as they can be easily applied and adapted to the restoration. In addition, indirect veneering composites such as VITA VM LC may also be used for extraoral applications. The surface of the VITA ENAMIC restoration to be individualized must first be roughened and conditioned using a suitable bonding agent.

Please read the corresponding product information, which can be downloaded at www.vita-enamic.com.

Adhesive bonding

- Adhesive bonding using light- or dual-curing fine-hybrid composites is required for restorations made from VITA ENAMIC.
- The self-adhesive composite RelyX Unicem (3M ESPE) is exclusively suitable also for cementing crowns (dentine adhesion).
  When using this composite, the restoration is etched with VITA CERAMICS ETCH for 60 sec and silanized subsequently.
- Adhesive bonding of crowns should preferably be performed using a more flowable, dual-curing composite (depending on the thickness of the layering).
- The ultrasonic insertion method or preheated composite can be used for stronger composite materials.
- Dual-curing composites should not be used for thin veneers since these composites may cause a slight change in color (yellow shade) after curing. Therefore a light-curing composite should be preferred. A microbrush that is adhesively bonded to the veneer using light-curing bonding or a glue stick can be used as a holder. Fixing the veneer with a finger allows more uniform distribution of pressure during the adhesive cementation.

		VITA ENAMIC		
Adhesive technique	**Adhesive composite**	**crown** 	**Inlay/Onlay/Partial crown** 	**Veneer** 
Conventional with Adhesive system	Fine-hybrid composite with adhesive system: for example VITA DUO CEMENT with VITA A.R.T. BOND or PANAVIA F 2.0 with ED Primer II	●	●	●
Self-adhesive	Self-adhesive composite: RelyX Unicem	● [1)]	–	–

[1)] luted to dentine

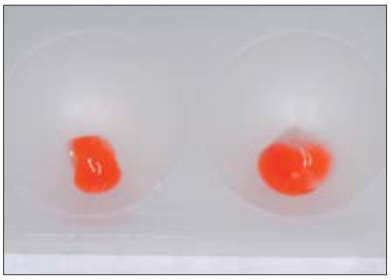
Procedure for conventional adhesive technique with adhesive system

Conditioning the tooth substance

- If present, etch enamel with VITA ETCHANT GEL (phosphoric acid gel, 35%) for 30 sec Spray clean for 30 sec and dry for 20 sec Control: etched surface must be white opaque.

- Agitate dentin primer (for example VITA A.R.T. BOND Primer A+B) with a disposable brush or Microbrush for 30 sec, dry with air for 15 sec.
  Agitate primer coat of adhesive (for example VITA A.R.T. BOND, Bonder) for 20 sec, clean carefully for 5 sec (using air). Any excess should be soaked up with endo paper points. Light curing: 60 sec.

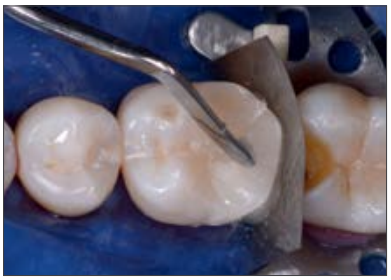
Conditioning the restoration



- Use alcohol to degrease the restoration before it is seated.
  Apply VITA CERAMICS ETCH (hydrofluoric acid gel, 5%) to the inner surfaces. Etching time: 60 sec Cover any polished outer surface in order to avoid accidental etching.

- Completely remove any remaining acid by using water spray (60 sec) or clean in the ultrasonic bath. Then dry for 20 sec. Do not clean with a brush to avoid the risk of contamination! After drying, the etched surfaces have a whitish opaque appearance. Apply silane (for example VITASIL) to the etched surfaces. Allow to evaporate completely.

- Apply primer coat of adhesive (for example VITA A.R.T. BOND Bonder), blow off. Do not light cure!
  The restoration must be protected against light before it is inserted.



- Insertion of the restorations.

- Light curing of the composite.

Finishing and polishing (intraoral)

Pay attention to margins and contact points when finishing and polishing the restoration. Generation of heat must be avoided!

- Check if excess material has been applied, finish with Sof-Lex discs or files in an oscillating dental handpiece.

Fine morphological adjustments

The occlusion must be completely free of interferences. Remove unwanted occlusal contacts with diamond abrasives (40 µm).

- In order to achieve a natural surface shine, two steps are required.

– Prepolishing with the pink polishers of the VITA ENAMIC Polishing set (7,000 – 10,000 rpm) while cooling with water.

– High gloss polishing with the grey diamond-coated polishers of the VITA ENAMIC Polishing Set (5,000 – 8,000 rpm).
Exert slight pressure only!

Tip: High-gloss polishing at lowest speed and without water cooling. If Sof-Lex polishing discs are used for finishing and prepolishing, use only the medium grain (M) and very fine grain (SF) types.

Situation prior to treatment.

Situation after treatment. The restorations were fabricated using VITA ENAMIC blocks of shade 1M2 HT.

Assortments: VITA ENAMIC for CEREC/inLab

VITA ENAMIC translucent (T)				
Shade	**Designation of block**	**Size in mm**	**Content of pack**	**Prod. No.**
0M1-T	EM-14	12 x 14 x 18	5 pieces	EC40M1TEM14
1M1-T	EM-14	12 x 14 x 18	5 pieces	EC41M1TEM14
1M2-T	EM-14	12 x 14 x 18	5 pieces	EC41M2TEM14
2M2-T	EM-14	12 x 14 x 18	5 pieces	EC42M2TEM14
3M2-T	EM-14	12 x 14 x 18	5 pieces	EC43M2TEM14

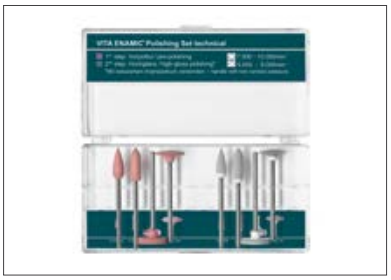
VITA ENAMIC high translucent (HT)				
Shade	**Designation of block**	**Size in mm**	**Content of pack**	**Prod. No.**
0M1-HT	EM-14	12 x 14 x 18	5 pieces	EC40M1HTEM14
1M1-HT	EM-14	12 x 14 x 18	5 pieces	EC41M1HTEM14
1M2-HT	EM-14	12 x 14 x 18	5 pieces	EC41M2HTEM14
2M2-HT	EM-14	12 x 14 x 18	5 pieces	EC42M2HTEM14
3M2-HT	EM-14	12 x 14 x 18	5 pieces	EC43M2HTEM14
0M1-HT	EM-10	8 x 10 x 15	5 pieces	EC40M1HTEM10
1M1-HT	EM-10	8 x 10 x 15	5 pieces	EC41M1HTEM10
1M2-HT	EM-10	8 x 10 x 15	5 pieces	EC41M2HTEM10
2M2-HT	EM-10	8 x 10 x 15	5 pieces	EC42M2HTEM10
3M2-HT	EM-10	8 x 10 x 15	5 pieces	EC43M2HTEM10

Accessories

VITA ENAMIC Polishing Sets

Specially developed set for time-saving and efficient polishing of VITA ENAMIC restorations. Includes all instruments for two-stage, well-coordinated polishing.

2 polishing sets with 8 polishers each are available:



- VITA ENAMIC Polishing Set **technical** with instruments for the handpiece.
- **Prod. No. EENPSETT**

- VITA ENAMIC Polishing Set **clinical** with instruments for the contra-angle
- **Prod. No. EENPSETC**

Note: Each polishing instrument of the two VITA ENAMIC Polishing Sets is available in refill packs containing 6 instruments each.
See Product Sheet, VITA ENAMIC Polishing Set, Prod. No. 1924.

VITA ENAMIC STAINS KIT
Specially developed assortment for characterizing (staining technique) the shade of restorations made of VITA ENAMIC.
Contains 6 light curing stains, sealing varnish and accessories.

Prod. No. EENSTKIT

The following products require hazard identification:		
VITA CERAMICS ETCH (hydrofluoric acid ceramic etching gel)	**Caustic / Toxic** For indirect use only! Contains hydrofluoric acid. Toxic if swallowed. Fatal in contact with skin. Causes severe skin burns and damage to eyes. Harmful by inhalation. Wear protective gloves/protective clothing/safety goggles. Keep locked up. If swallowed, call Toxicological Information Center immediately and provide safety data sheet. In case of contact with clothing/skin, remove contaminated clothing immediately and rinse with copious amount of water. Specific measures, see safety data sheet. In case of contact with eyes, rinse with water for a few minutes and consult a doctor/Toxicological Information Center. This material and its container must be disposed of as hazardous waste.	 
VITA ETCHANT GEL (Phosphoric acid etching gel)	**Caustic** Causes severe skin burns and damage to eyes. Contains phosphoric acid. When working with the product, 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. When working with the product, wear suitable safety goggles / face protection, protective gloves, and protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste.	
VITASIL (Silane bonding agent)	**Highly flammable** Highly flammable liquid and vapor. Store container well sealed at an adequately ventilated place. Keep away from ignition sources. - No smoking. Do not empty into drains. This material and its container must be disposed of as hazardous waste.	

Personal protective equipment	When working with the product, wear suitable safety goggles / face protection, gloves and safety clothing.	

The respective safety data sheets can be downloaded at www.vita-zahnfabrik.com or requested by fax at (+49) 7761-562-233.

Literature

Al-Harbi, A; Ardu, S; Bortolotto, T.; Krejci, I.: Stain intensity of CAD/CAM Materials versus Direct composites. IADR 2012 Poster Abstract, Iguaçu Falls, Brazil

Coldea, A; Swain, MV; Thiel, N.: In-vitro strength degradation of dental ceramics and novel PICN material by sharp indentation. J Mech Behav Biomed Mater 2013 Oct;26(10):34-42.

Coldea, A; Swain, MV; Thiel, N.: Mechanical properties of polymer-infiltrated-ceramic-network materials. Dental Materials 2013; 29:419-426

Coldea, A; Swain, MV; Thiel, N.: Hertzian contact response and damage tolerance of dental ceramics. J Mech Behav Biomed Mater 2014; 34:124-133.

Dirxen, C; Blunck, U; Preissner, S.: Clinical performance of a new biomimetic double network material. Open Dent J. 2013 Sep 6;7:118-22. doi: 10.2174/1874210620130904003

He, Li-Hong; Swain, M.: A novel polymer infiltrated ceramic dental material. Dent Mater 14, 1 64-71 (1998) 2011 Jun;27(6):527-34.

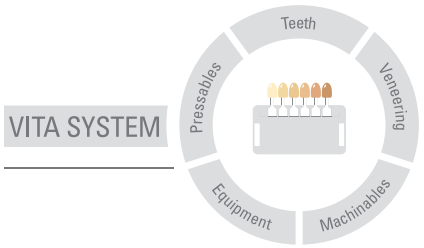
He, Li-Hong; Purton, D.; Swain, M.: A novel polymer infiltrated ceramic for dental simulation. J Mater Sci Med 2011; Jul;22(7): 1639-43

Mörmann, W; Stawarczyk, B; Ender, A; Sener, B; Attin, T; Mehl, A.: Wear characteristics of current aesthetic dental restorative CAD/CAM materials: Two-body wear, gloss retention, roughness and Martens hardness. Journal of the Mechanical Behavior of Biomedical Materials 2013; 20:113-125

VITA printed materials

VITA ENAMIC Working Instructions, Prod. No. 1767E
VITA ENAMIC Technical and Scientific Documentation, Prod. No. 10025E
VITA ENAMIC Concept Brochure, Prod. No. 10024E
VITA ENAMIC Product Sheet, Prod. No. 1912E
VITA ENAMIC Product Brochure, Prod. No. 1780E
VITA ENAMIC Magazine, Prod. No. 1911E
VITA ENAMIC Testimonials, Prod. No. 1938E
VITA ENAMIC STAINS KIT, Working Instructions, Prod. No. 1931E
VITA ENAMIC STAINS KIT, Product Sheet, Prod. No. 1923E
VITA ENAMIC Polishing Set, Product Sheet, Prod. No. 1924E

With the unique VITA SYSTEM 3D-MASTER, all natural tooth shades can be systematically determined and perfectly reproduced.



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

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VITA

VITA Zahnfabrik H. Rauter GmbH & Co.KG
Spitalgasse 3 · D-79713 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
facebook.com/vita.zahnfabrik

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