

VITA ENAMIC® HYBRID CERAMIC

Information for dentists



VITA shade determination

VITA shade communication

VITA shade reproduction

VITA shade control

Date of issue 2023-01



VITA – perfect match.

VITA

CONCEPT AND BENEFITS

VITA ENAMIC® hybrid ceramic combines enormous load capacity with high elasticity. The material has natural, toothlike properties and enables a natural play of colors. Read on to learn more.



*The VITA ENAMIC formula for success:
elasticity + strength = reliability²*

VITA ENAMIC® – A NEW DEFINITION OF LOAD CAPACITY*



What?

- VITA ENAMIC is the world's first and only hybrid dental ceramic featuring a dual-network structure.
- The innovative material combines high load capacity with excellent elasticity, allowing fabrication of precise restorations that preserve natural tooth structure.

What for?

VITA ENAMIC is particularly suited for:

- minimally invasive, delicate reconstructions

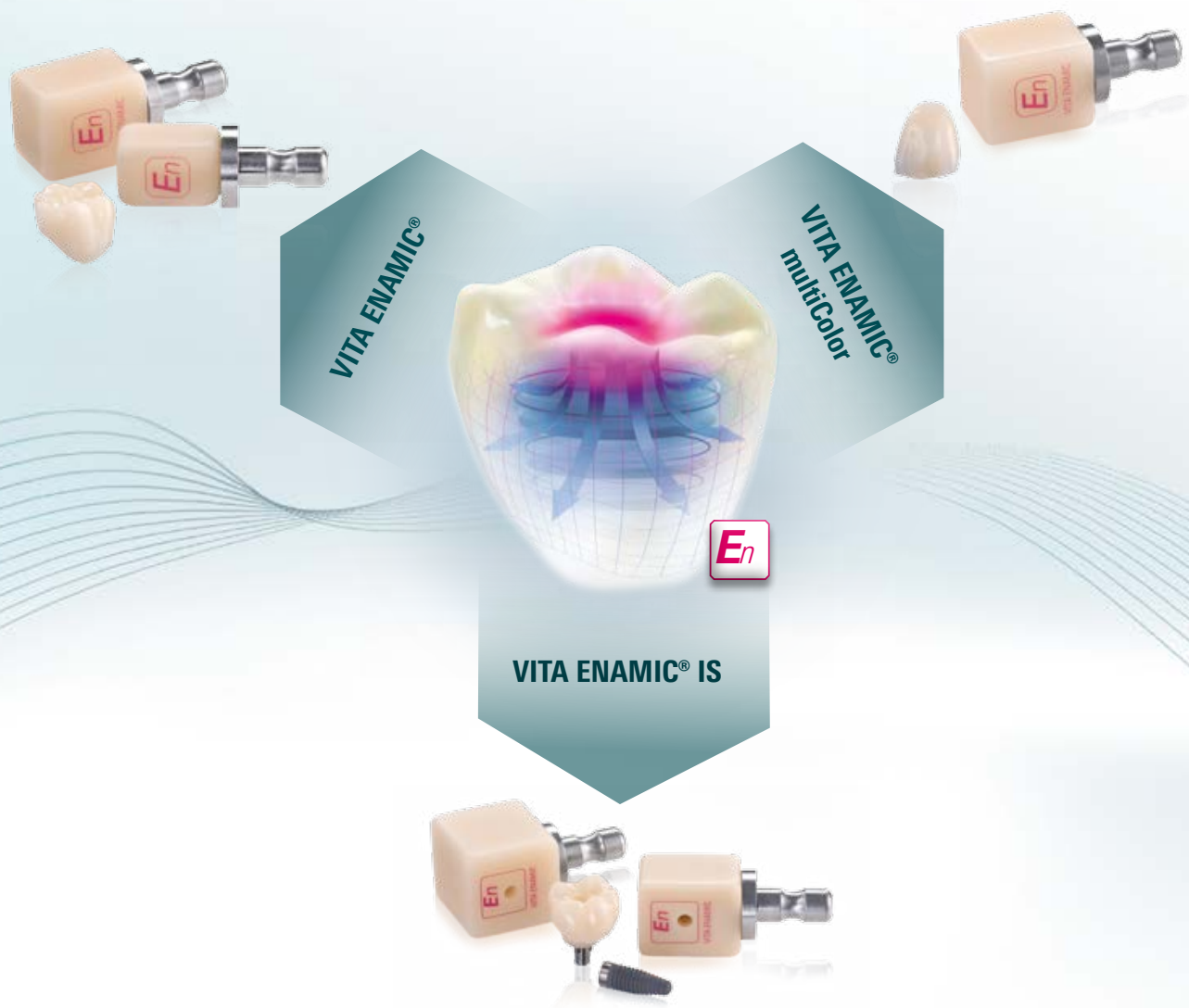
With what?

VITA ENAMIC is available in different variations and translucency levels:

- VITA ENAMIC, VITA ENAMIC multiColor, VITA ENAMIC IS
- T (Translucent), HT (High Translucent), ST (Super Translucent)

*) In addition to a high degree of elasticity, this hybrid ceramic enables high load capacity after adhesive bonding.

A MATERIAL FOR A VARIETY OF SOLUTIONS



VITA ENAMIC®

- Monochromatic CAD/CAM blanks in three translucency levels for restorations that preserve natural tooth structure.

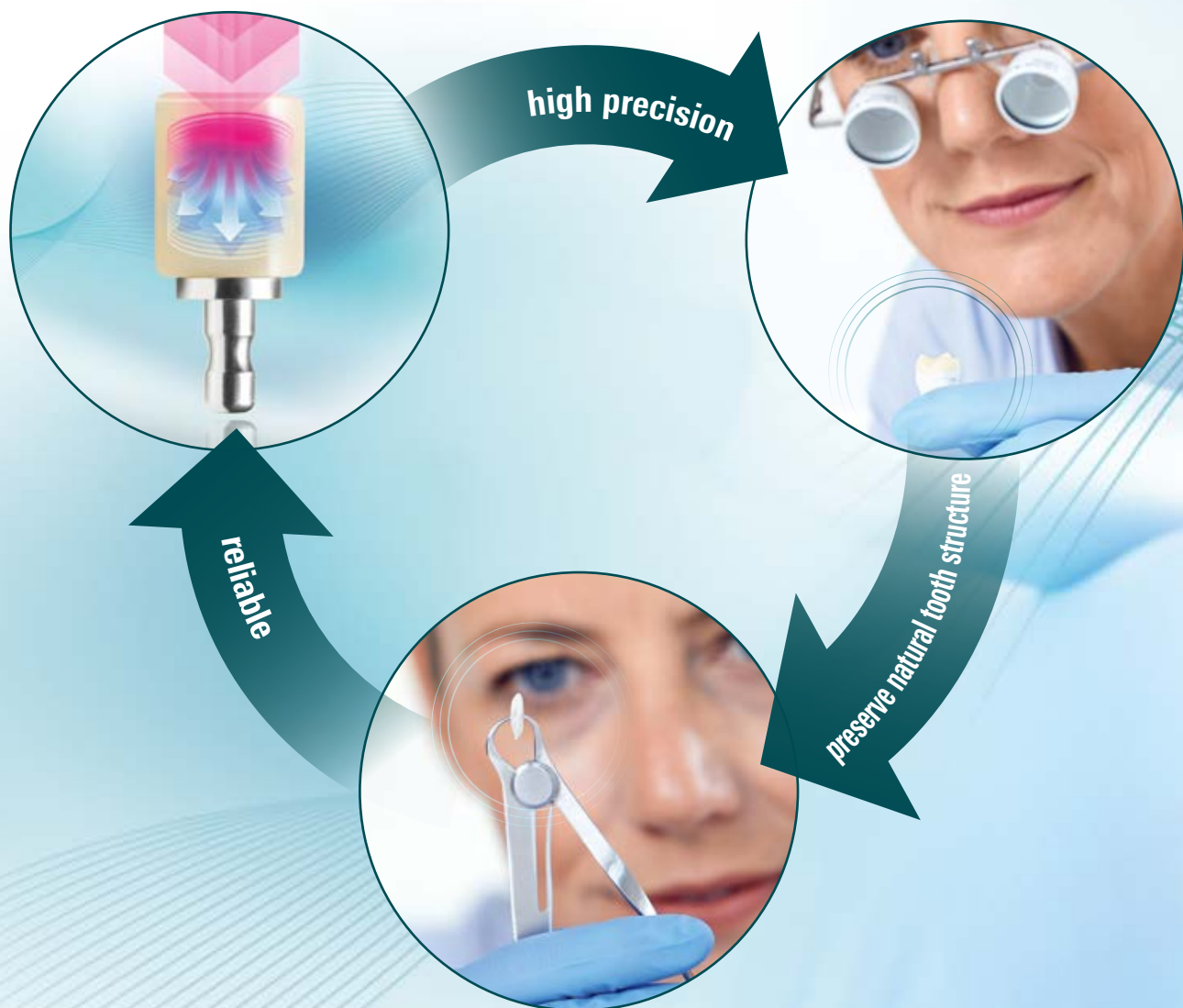
VITA ENAMIC® multiColor

- Multichromatic CAD/CAM blanks with integrated tooth color gradient for esthetic reconstructions at the push of a button.

VITA ENAMIC® IS

- CAD/CAM blanks with an integrated interface to an adhesive/titanium base for efficient fabrication of implant-supported superstructures.

THE ADVANTAGES



Reliable

- Fabricating durable restorations using a hybrid ceramic offering load capacity and absorption of masticatory forces.

Preserves natural tooth structure

- Non-/minimally invasive restorations possible, since the elastic hybrid ceramic enables reduced wall thicknesses.

High precision

- Fabricating accurate, precise and reliable restorations, thanks to high edge stability.

Cost effective

- Cost-effective reconstruction, thanks to time-saving CAM fabrication and simple finishing by polishing without any firing process.



VITA ENAMIC:
*Just polish and
seat immediately!*

EXTENDED TREATMENT RANGE – DENTISTRY 4.0





Why?

VITA ENAMIC provides new possibilities and extends the dental CAD/CAM treatment range - for digital dentistry 4.0.

What for?

VITA ENAMIC: Recommended indications

- reconstructions with reduced wall thicknesses that preserve natural tooth structure
- posterior crowns that offer high load capacity in cases with limited space availability
- precise repair of small defects (e.g., indirect cervical fillings)
- non-/minimally-invasive reconstruction of occlusal surfaces (table tops)

VITA ENAMIC multiColor: Recommended indications

- esthetic crown restorations with vivid play of color/light
- delicate (non-prep) veneers for cosmetic reconstructions

VITA ENAMIC IS: Recommended indications

- Implant-supported abutment crowns and mesostructures

PROVEN MATERIAL CONCEPT



Proven material concept

- With VITA ENAMIC, the proven concept of reinforced hybrid materials already employed in the construction industry and in aircraft construction, is now also available for dental use.

Reinforced ceramic structure

- In VITA ENAMIC, the dominant ceramic network is reinforced by a polymer network to ensure improved mechanical properties.

Used a million times over

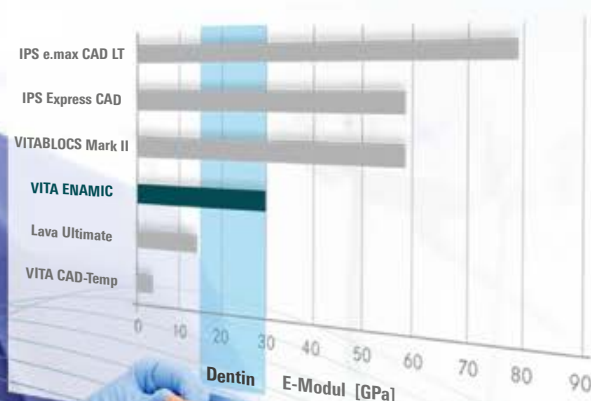
- Since 2013, VITA ENAMIC hybrid ceramic has been used to fabricate approximately 3.5 million units in practices and laboratories all over the world.

NATURAL RESTORATIONS – ENTHUSIASTIC PATIENTS

"My VITA ENAMIC restoration feels like my natural tooth substance, which makes me really happy!"

H. Kimmich, Lörrach, Germany

Modulus of elasticity*



Source: Internal study VITA R&D; Berechnung der Elastizitätsmodule o. g. Materialien aus Spannungs-Dehnungs-Diagrammen von Biegefestigkeitsmessungen, report 03/12 ([1], see back of brochure)

Toothlike properties

- VITA ENAMIC is a biomimetic material that has convincing natural properties, such as elasticity that is similar to dentin.*

High patient satisfaction

- Patients with VITA ENAMIC restorations appreciate the chewing comfort that is comparable to natural teeth.

Numerous possibilities

- Thanks to its elasticity, the material allows a broad spectrum of therapeutic options (e.g., for functional therapy), which are still being reviewed.

*) Note: With an elasticity of 30 GPa, VITA ENAMIC is in the same range as human dentin. Information provided in literature about human dentin varies considerably. Source: Kinney JH, Marshall SJ, Marshall GW. The mechanical properties of human dentin: a critical review and reevaluation of the dental literature. Critical Reviews in Oral Biology & Medicine 2003; 14:13-29.



CLINICAL EXAMPLES

In addition to classic single tooth restorations, **VITA ENAMIC®** hybrid ceramic is particularly suited for minimally invasive, delicate and implant-supported reconstructions. Learn more now.



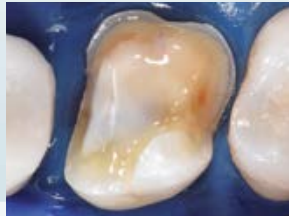
VITA ENAMIC:
*The hybrid ceramic has been used to fabricate
approximately 3.5 million units since 2013.*

VITA ENAMIC® IN CLINICAL USE

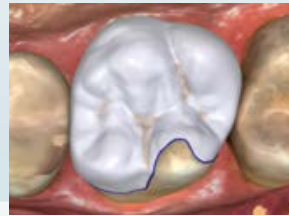
CASE STUDY 1: PARTIAL CROWN RESTORATION



1. Insufficient amalgam filling in tooth 16.



2. Condition after excavation, preparation and adhesive core build up.



3. The virtual partial crown created with CEREC software.



4. Final polishing of the partial crown with a VITA ENAMIC high-gloss polisher.

Photos provided by: Dr. Sebastian Horvath, dentist, Jestetten, Germany

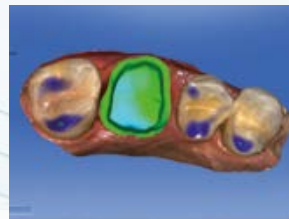
CASE STUDY 2: FULL CROWN RESTORATION



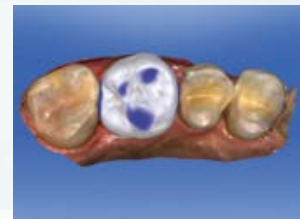
1. Insufficient composite and amalgam filling of tooth 16.



2. Build up of prepared tooth and preparation of tooth 16.



3. The virtual model of the preparation.



4. Computer aided design of the full crown.

Photos provided by: Dr. Julián Conejo, dentist, Philadelphia, USA

CASE STUDY 3: IMPLANT-SUPPORTED CROWN RESTORATION



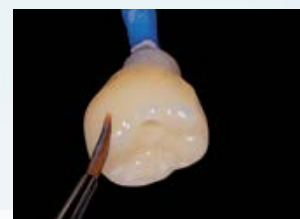
1. Implant placement, tooth 46
Intraoral situation with perfectly shaped soft tissue.



2. Post-operative fastened scan body for scanning the implant position.



3. Digitally designed abutment crown.



4. Characterization of the ground restoration with VITA ENAMIC STAINS.

Photos provided by: Dr. Andreas Kurbad, dentist, Viersen-Dülken, Germany



5. Finished restoration before adhesive bonding.



6. Final adhesively bonded VITA ENAMIC partial crown in situ.



5. The virtual restoration placed in the block.



6. The permanently bonded VITA ENAMIC crown in situ.



5. Closure of the screw channel with composite.



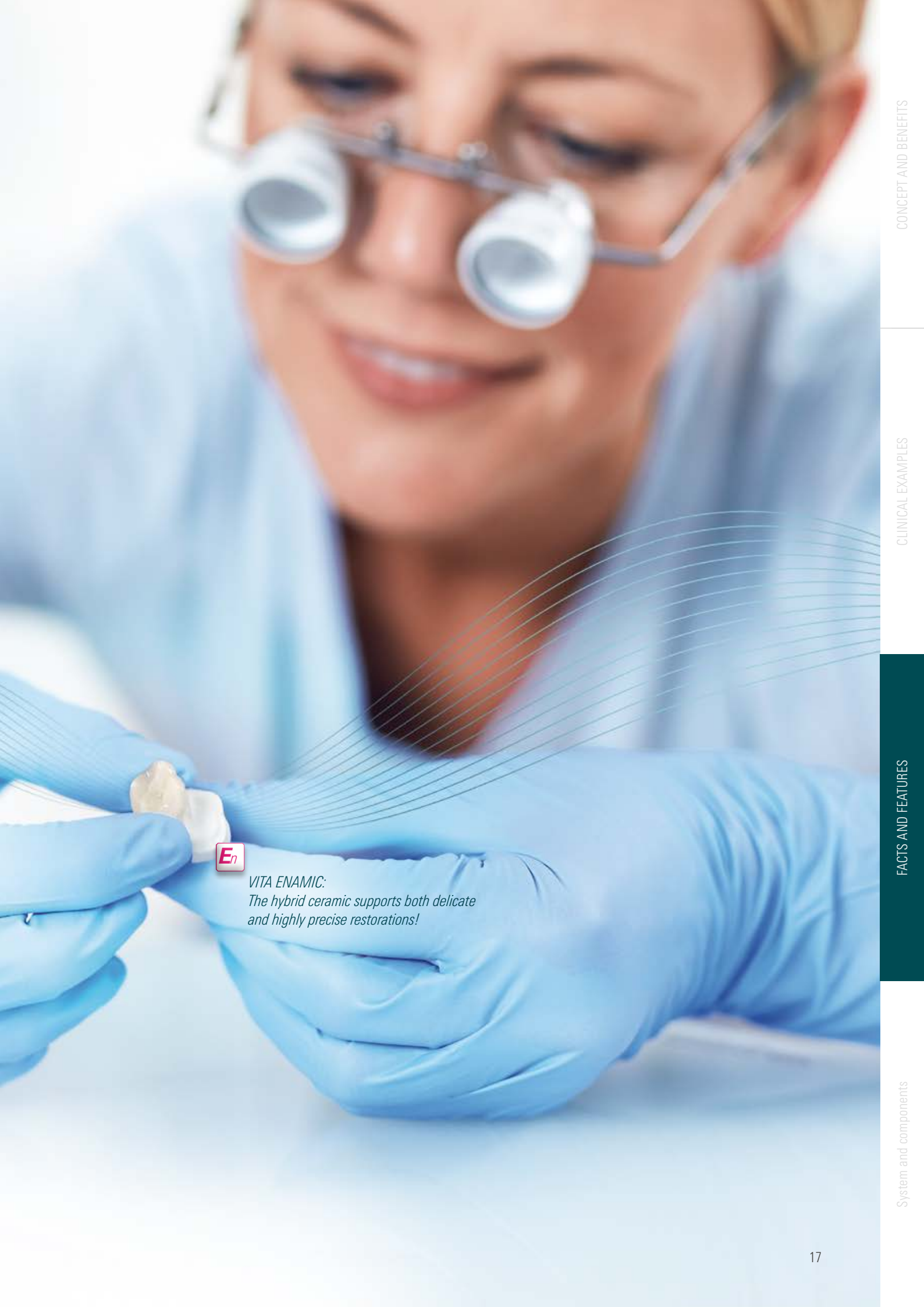
6. Red and white harmony following the integration of 46.





FACTS AND FEATURES

VITA ENAMIC® offers high reliability, enables the fabrication of precision restorations that preserve natural tooth structure and can be processed efficiently. Key facts and evidence can be found on the following pages.



VITA ENAMIC:
*The hybrid ceramic supports both delicate
and highly precise restorations!*

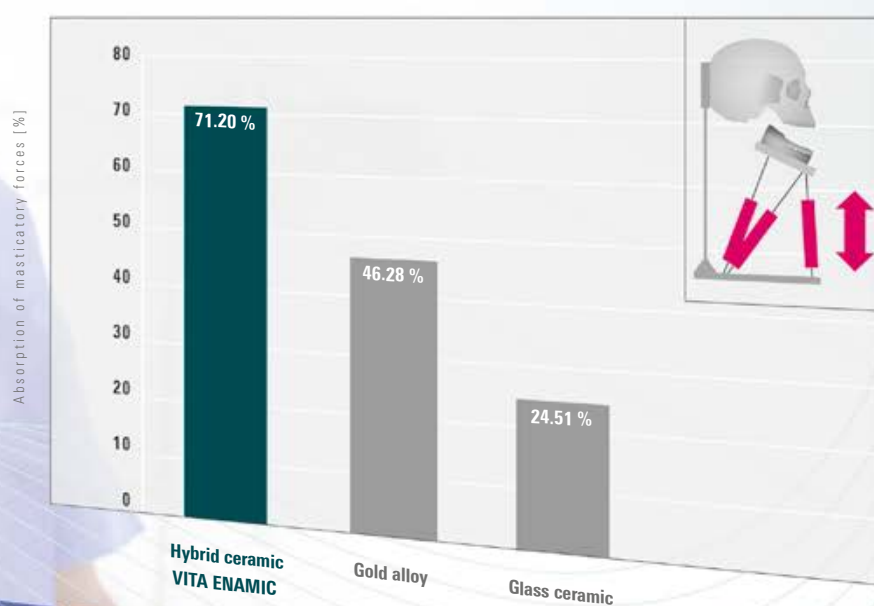
FIVE REASONS FOR HIGH RELIABILITY

1. Excellent resilience – hybrid ceramic is able to absorb masticatory forces!



Thanks to its polymer network, VITA ENAMIC offers an integrated "buffer function."

Absorption of masticatory forces compared to zirconia (ZrO₂)



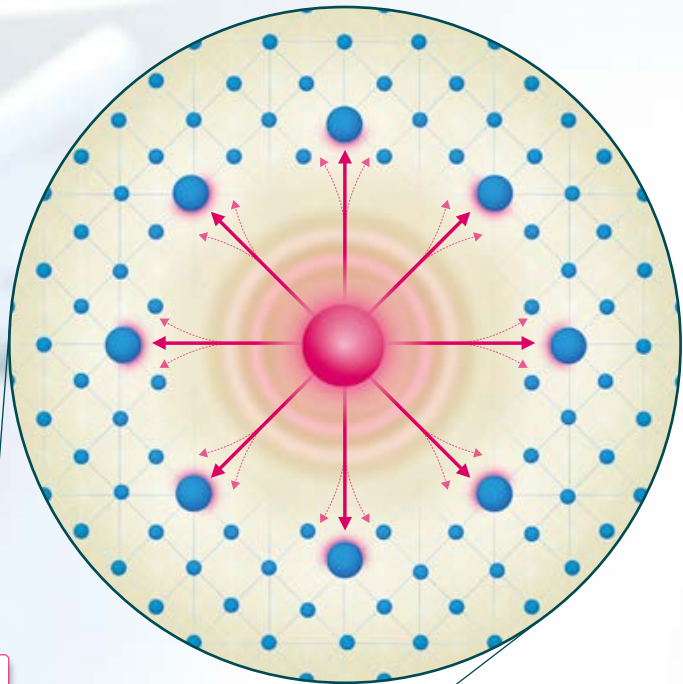
Source: University of Genoa, Dr. Maria Menini et al., Genoa, Italy; Messungen zur Kraftübertragung auf den simulierten periimplantären Knochen mittels monolithischen Kronen aus o. g. Materialien auf einem stilisierten Implantatabutment, report 01/15, ([2], see back or brochure).

VITA ENAMIC

- enables restorations with excellent resilience, since the material features an integrated "buffer function"
- is able to absorb 70 percent of the forces in the test, compared to very rigid zirconia

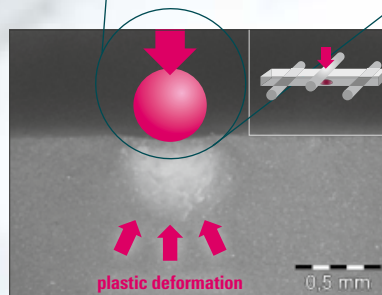
FIVE REASONS FOR HIGH RELIABILITY

2. Reliability, thanks to durable material structure!

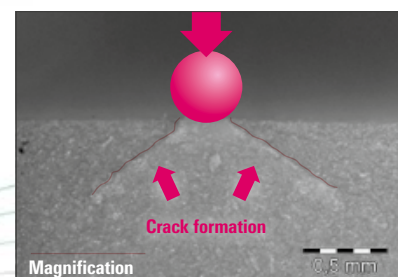


E_n

VITA ENAMIC: material with integrated "crack-stop function"



VITA ENAMIC hybrid ceramic



Traditional silicate ceramic

Source: Internal study VITA R&D; Analyse des Querschnitts der Bruchflächen o. g. Materialproben nach Vorschädigung mit einer Wolframcarbid-Kugel, report 11/13 ([1], see back of brochure).

VITA ENAMIC

- **exhibits outstanding reliability and durability**
the polymer network is able to stop crack propagation
- **reveals plastic deformation after prior damage in the test;**
whereas, traditional ceramics reveal noticeable cracks

3. Clinical stability, thanks to high load capacity!



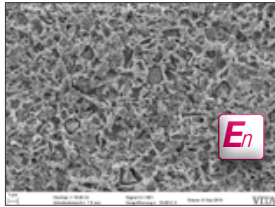
Source: Boston University, Prof. Dr. Russell Giordano, Boston, USA; Statische Bruchlastuntersuchung zu monolithischen, CAD/CAM-gefertigten und adhäsiv befestigten Kronen aus o. g. Materialien, report 07/13 ([3], see back of brochure).

VITA ENAMIC

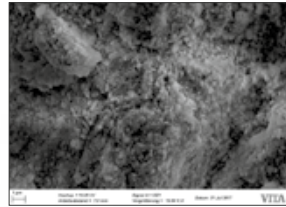
- **indicates very good clinical stability,**
since the material offers enormous load capacity after adhesive bonding
- **reaches the highest average fracture load value of 2,766 N**
of all CAD/CAM materials examined in the test

FIVE REASONS FOR HIGH RELIABILITY

4. Reliable bonding, thanks to proven protocol!



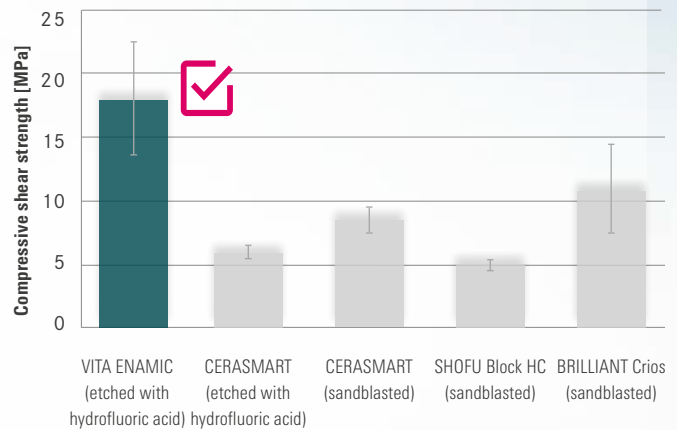
VITA ENAMIC
Etched hybrid ceramic



CERASMART
Sandblasted composite

Photos provided by: VITA R&D, SEM picture (left) of etched hybrid ceramic surface (5% hydrofluoric acid, 60 sec.) plus SEM picture (right) of sandblasted composite surface (Al_2O_3 50 μm , 1.5 bar), magnification x 10,000.

Adhesive bond of Variolink Esthetic to hybrid ceramics and composites

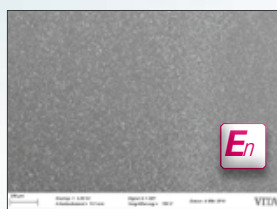


Source: Internal study, VITA R&D, Dr. Berit Müller, Report of 10/17, Test: For each CAD/CAM material, five test specimens of two sample parts were produced, glued, and then the compressive shear strength was determined by means of a universal testing machine (Type Z010 from Zwick) see back of brochure.

VITA ENAMIC

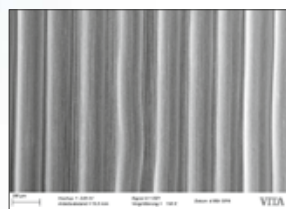
- can be safely bonded based on a proven protocol, since conditioning is identical to that of feldspar ceramics
- allows for excellent micro-mechanical retention by means of hydrofluoric acid etching of the ceramic structure (86 wt %)

5. Resistant to abrasion, thanks to stable ceramic network!



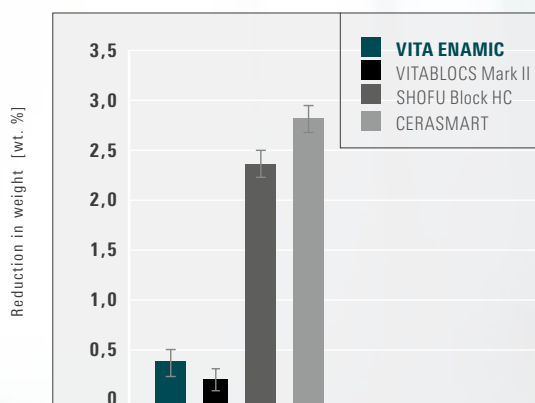
VITA ENAMIC
Hybrid ceramic material sample
after the test

Photos provided by: VITA R&D, SEM pictures of material samples after toothbrush abrasion, samples were mechanically brushed with abrasive toothpaste under a definite load, magnification x 150.



CERASMART
Composite material sample
after the test

Toothbrush abrasion test



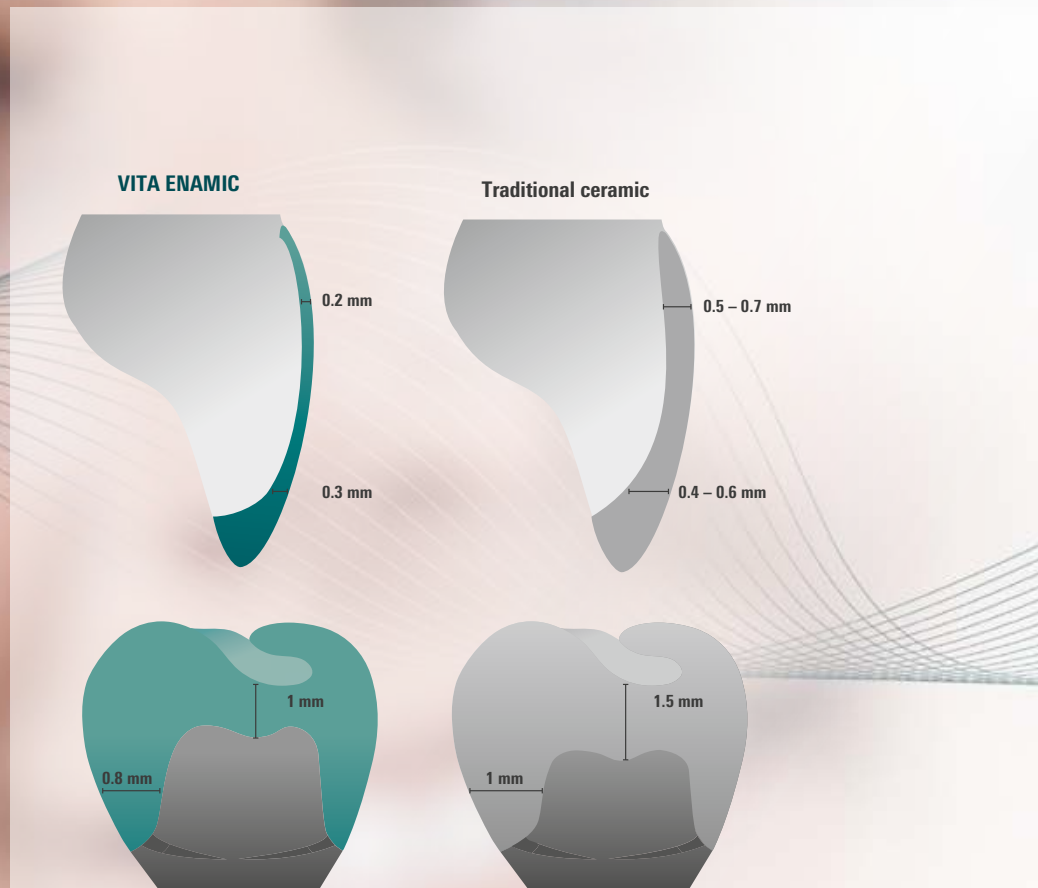
Source: Internal study VITA R&D; Mittelwerte zu Gewichtsverlust nach Zahnbürstenabrieb (32 Std. mit abrasiver Zahncreme) auf Basis von fünf Materialproben je o. g. Werkstoff, report 03/16 ([1], see back of brochure).

VITA ENAMIC

- **reveals outstanding abrasion stability**
for reliable function, thanks to a stable ceramic network
- **produces very good results in the wear test,**
which can be compared to those of proven dental ceramics

TWO REASONS FOR RESTORATIONS THAT PRESERVE NATURAL TOOTH STRUCTURE

1. Minimally invasive restorations, thanks to reduced wall thickness!



VITA ENAMIC

- thanks to high resilience, VITA ENAMIC enables fabrication of restorations that preserve natural tooth structure, since reduced wall thickness is possible
- is especially advantageous in cases of limited space, where natural tooth structure must be preserved

2. Delicate reconstructions, thanks to integrated elasticity!



Source: Internal study VITA R&D; Visuelle Begutachtung von „Non-Prep“-Veneers aus o. g. Materialien mit Wandstärken von ca. 0,2 mm nach CAM-Fertigung mit Sirona MC XL-Einheit, Important: The manufacturer has not approved the use of IPS Empress CAD and IPS e.max CAD for a wall thickness of approx. 0.2 mm; report 10/2011 ([1], see back of brochure).

VITA ENAMIC

- **enables CAM fabrication of particularly delicate reconstructions,** thanks to the low brittleness of the material
- **exhibits excellent CAM machinability in the test;** the veneer geometry (approx. 0.2 mm) could only be achieved with hybrid ceramic-polymer materials*

* Important! The manufacturer has not approved the use of IPS Empress CAD and IPS e.max CAD for a wall thickness of approx. 0.2 mm.

TWO REASONS FOR HIGH-PRECISION RESULTS

1. Detailed morphology, thanks to ideal CAM machinability!

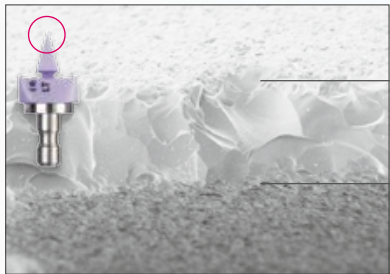


*VITA ENAMIC: The CAD/CAM material
to achieve accurate and detailed results!*

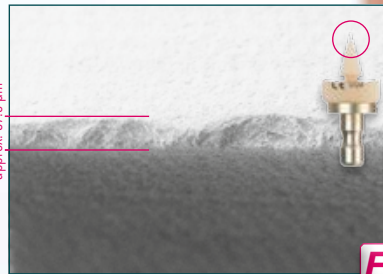
VITA ENAMIC

- enables **CAM reconstructions with a high level of accuracy**
for an exact reproduction of the function

2. Precise results for exact marginal fit, thanks to edge stability!



IPS e.max CAD



VITA ENAMIC

Source: Internal study VITA R&D, Untersuchung von standardisierten Dreiecksformkörpern (30° Keil, Aufsicht) aus o. g. Materialproben mittels REM nach CAM-Fertigung mit Sirona MC XL-Schleifeinheit, 200-fache Vergrößerung, report 05/10 ([1], see back of brochure).

VITA ENAMIC

- **enables delicate and precise marginal areas**
for exact marginal fit, thanks to high edge stability
- **produces high marginal precision in the test**
for objects with thinning marginal areas

TWO REASONS FOR HIGH COST-EFFECTIVENESS

1. Fast fabrication in a few minutes!



1. CAM fabrication:
approx. five minutes



2. Reworking:
approx. two minutes



3. Polishing:
approx. three minutes



4. Bonding:
approx. five to ten minutes

VITA ENAMIC

- enables the fabrication of restorations within a few minutes, since seating can be done immediately after the CAM process and polishing
- reveals extremely fast CAM machinability in the test, thanks to high elasticity and perfectly matched milling strategies

2. Cost-effective CAD/CAM fabrication, thanks to long tool life!



Source: Internal study VITA R&D, Schleiferstandzeitversuche zur CAM-Fertigung von Molarenkronen aus o. g. Materialien mit jeweils einem neuen Schleiferpaar mittels Sirona MC XL-Schleifeinheit, Software 3.8 x, report 03/10 ([1] see back of brochure).

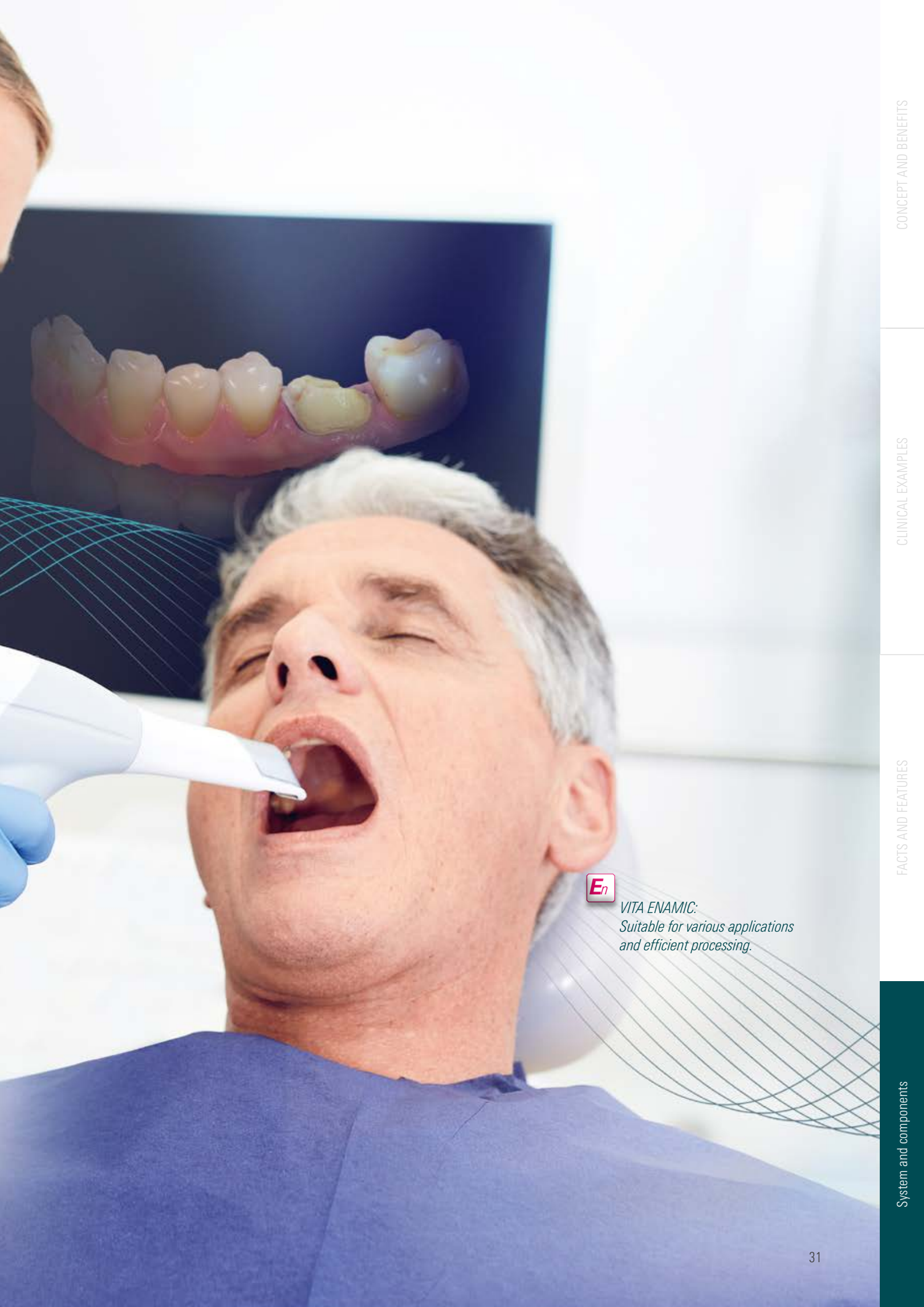
VITA ENAMIC

- **enables cost-effective processing with numerous systems,** since the hybrid ceramic allows for long tool life
- **milling tools last up to seven times longer when tested,** compared to glass ceramics, when fabricating crowns with Sirona MC XL



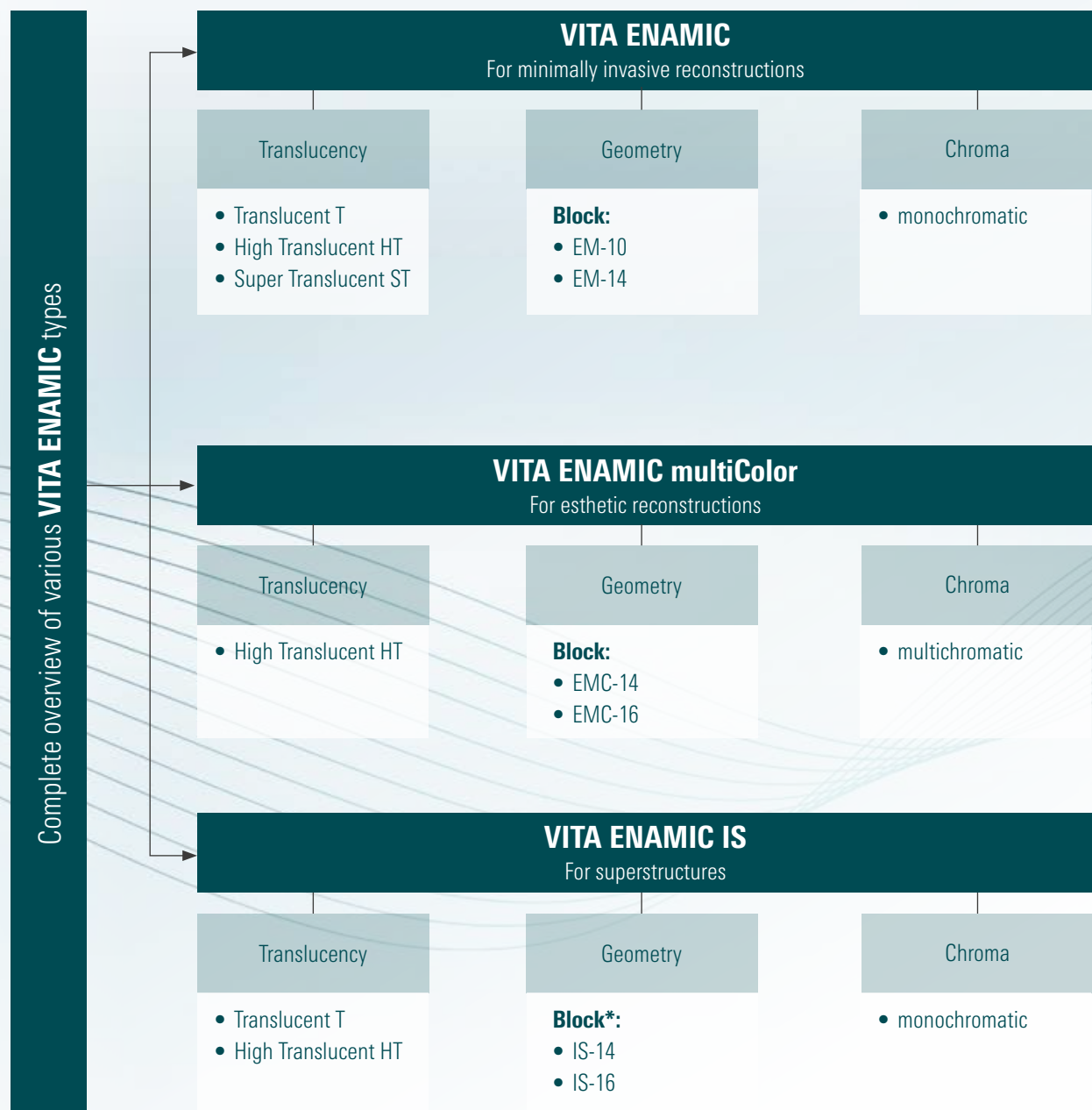
SYSTEM AND COMPONENTS

VITA ENAMIC® is available in a variety of geometries, translucency levels and shades. Perfectly matched system components enable efficient processing. Read on to learn more.



VITA ENAMIC:
*Suitable for various applications
and efficient processing.*

TYPES, GEOMETRIES, TRANSLUCENCY LEVELS



*) The IS-14 geometry is available in T, and the IS-16 geometry is available in HT.

AVAILABLE SHADES

Translucency levels	VITA SYSTEM 3D-MASTER range of shades									
	0M1	1M1	1M2	2M1	2M2	2M3	3M1	3M2	3M3	4M2
Super Translucent										
High Translucent										
High Translucent multiColor										
Translucent										


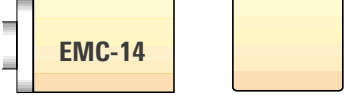
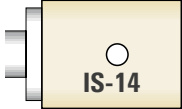

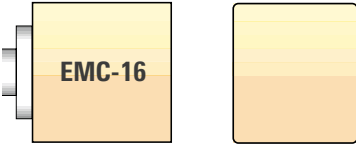
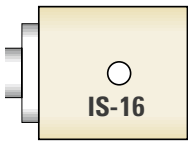
RECOMMENDED INDICATIONS (for each type/level of translucency)

Degree of translucency	VITA ENAMIC			VITA ENAMIC multiColor	VITA ENAMIC IS	
	T Translucent	HT High Translucent	ST Super Translucent	HT High Translucent	T Translucent	HT High Translucent
Indication						
	—	○	●	○	—	—
	—	○	●	○	—	—
	—	●	○	—	—	—
	—	●	○	○	—	—
	—	●	●	●	—	—
	—	●	○	●	—	—
	● *	●	—	●	—	—
	● *	○	—	—	○	●

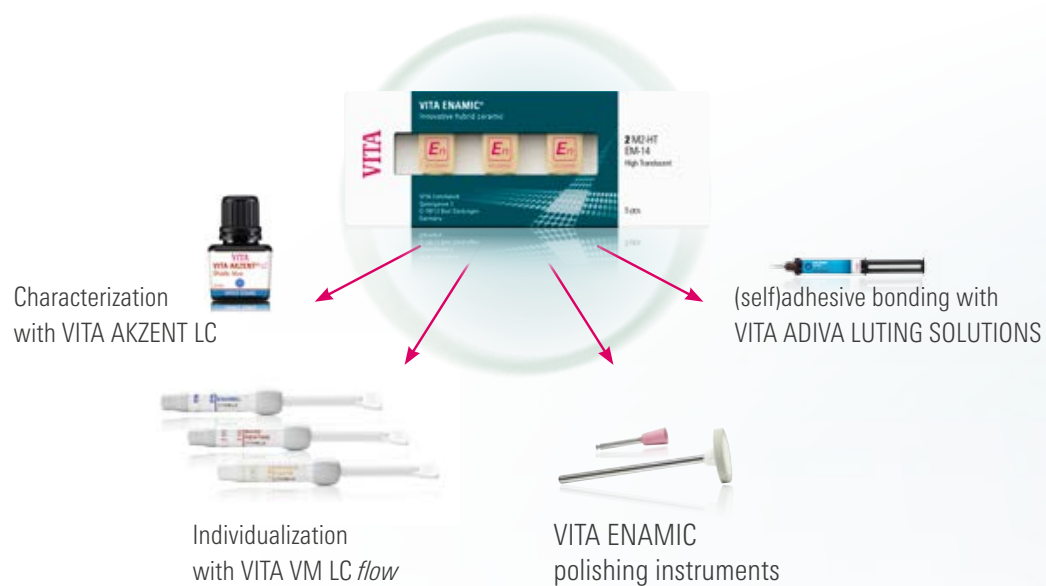
● recommended ○ possible

*) Due to the comparatively high opacity, Translucent is recommended when metal structures or discolored natural tooth substance need to be masked.

AVAILABLE GEOMETRIES

VITA ENAMIC	VITA ENAMIC multiColor	VITA ENAMIC IS
 <p>EM-14: 12 x 14 x 18 mm</p>	 <p>EMC-14: 12 x 14 x 18 mm</p>	 <p>IS-14: 18 x 14 x 12 mm (for mesostructures)</p>
 <p>EM-10: 8 x 10 x 15 mm</p>	 <p>EMC-16: 18 x 16 x 18 mm</p>	 <p>IS-16: (18 x 16 x 18 mm) (for abutment crowns) Note: with an integrated S- or L-interface for each geometry size</p>

AVAILABLE SYSTEM COMPONENTS



DESCRIPTION OF COMPONENTS



VITA ENAMIC blanks

Pack of five VITA ENAMIC hybrid ceramic blanks.



VITA ENAMIC Polishing Set clinical/technical

Two-stage polishing system with a total of six pre- and high-gloss polishers for the contra-angle or the handpiece.



VITA AKZENT LC

Light-curing stains/glaze for reproducing individual shade effects and applying shade corrections to VITA ENAMIC restorations.



VITA VM LC flow

Light-curing, low-viscous composite materials for individualizing restorations, including VITA ENAMIC.



VITA ADIVA LUTING SOLUTIONS

Luting system for full-adhesive, self-adhesive and temporary bonding of restorations.



SYSTEM COMPATIBILITY

CAD/CAM systems

VITA ENAMIC – SYSTEM SOLUTIONS*

VITA offers VITA ENAMIC with specific holder systems for these CAD/CAM systems:

- from Dentsply Sirona
- Ceramill mikro IC/Ceramill Motion 2 (Amann Girrbach AG)
- Planmill 40/PlanMill 40S (Planmeca)

VITA ENAMIC – UNIVERSAL SOLUTIONS*

VITA offers VITA ENAMIC with a universal holder system for these CAD/CAM systems:

- CORiTEC line (imes-icore GmbH)
- DGSHAPE DWX line (DGSHAPE Corporation)
- CS 3000 (Carestream Inc.)
- N4/R5/S1/S2/Z4/R5 (vhf manufacture AG)
- DMG ULTRASONIC line (DMG Mori AG)
- Röders RXD line (Röders GmbH)
- Zfx Inhouse5x (Zfx GmbH)
- MILLING UNIT M line (Zirkonzahn S.r.l.)
- Organical Desktop line (R+K CAD/CAM Technologie GmbH & Co. KG)

BONDING SYSTEMS**

VITA ENAMIC restorations can be fully and self-adhesively bonded. Bonding is carried out based on the proven protocol for feldspar ceramics. The hybrid ceramic is etched (60 sec) with hydrofluoric acid (VITA ADIVA CERA-ETCH), cleaned and then silanized (VITA ADIVA C-PRIME).



Recommended system

- **VITA ADIVA LUTING SOLUTIONS** (full-/self-adhesive)

Other systems

- Variolink Esthetic (Ivoclar Vivadent), Vitique (DMG)
- NX3 (KerrHawe), Calibra Ceram (Dentsply Sirona), RelyX Ultimate (3M), Bifix QM (VOCO)
- PANAVIA V5 (Kuraray), DuoCem (Coltène)

IMPLANT SYSTEMS***



VITA IMPLANT SOLUTIONS (VITA ENAMIC IS, VITA CAD-Temp IS) are compatible with implant systems from the manufacturers listed below via the integrated interface for the adhesive/titanium base (TiBase, Sirona Dental GmbH):

- Nobel Biocare
- Straumann
- Dentsply Sirona
- Zimmer
- Medentika
- CAMLOG
- BIOMET 3i
- BioHorizons
- Osstem
- Henry Schein

*) The range of geometries/shades of VITA CAD/CAM materials available may vary for the individual CAD/CAM system partners or systems.

**) Self-adhesive systems may only be used for crown restorations.

***) A comprehensive, up-to-date overview of the implant systems compatible with TiBase is available at www.vita-zahnfabrik.com/VITA_ENAMIC_IS#titan_compatibility

IDEAL SOLUTIONS IN THE PROCESS



* Note optional process steps: The hybrid ceramic can be seated directly after milling and polishing.
Characterization with VITA AKZENT LC stains and individualization with veneering composite are optional process steps.

NOTES

WE ARE HAPPY TO HELP

› More information about the products and processing is also available at www.vita-zahnfabrik.com



Hotline Sales Support

Mr. Udo Wolfner and his team
(Internal Sales Department)
will be glad to assist you with orders
or questions about the delivery,
product data and marketing materials.

► Phone +49 (0) 7761 / 56 28 84
Fax +49 (0) 7761 / 56 22 99
8 a.m. to 5 p.m. CET
E-mail: info@vita-zahnfabrik.com



Technical Hotline

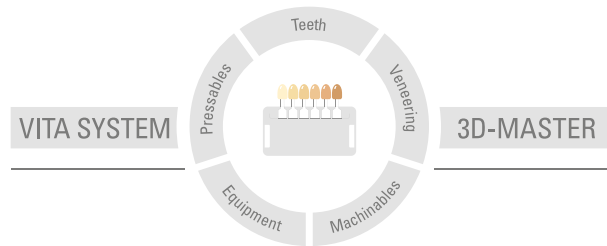
If you have technical questions concerning
VITA product solutions, you can
contact Dr. Michael Tholey
and his Technical Service team.

► Phone +49 (0) 7761 / 56 22 22
Fax +49 (0) 7761 / 56 24 46
8 a.m. to 5 p.m. CET
E-mail: info@vita-zahnfabrik.com

› Additional international contact information can be found at www.vita-zahnfabrik.com/contacts



More information about VITA ENAMIC
is available at www.vita-enamic.com



Bibliography:

1. Internal studies, VITA R&D:

VITA Zahnfabrik H. Rauter GmbH & Co. KG
Research and Development Division
Spitalgasse 3, 79713 Bad Säckingen, Germany
Dr. Enno Bojemüller, head of Solid State Analysis VITA R&D, VITA Zahnfabrik,
Bad Säckingen
Dr.-Ing. Andrea Coldea, Material Development, R&D Inorganic Chemistry,
Bad Säckingen
Dr. Berit Müller, project manager for VITA R&D, VITA Zahnfabrik, Bad Säckingen
Prof. Dr. Dr. Jens Fischer, R&D division director, Bad Säckingen

2. Menini M.

Research Report: In-vitro-Test zur Fähigkeit der Hybridkeramik,
Kräfte zu absorbieren, January 2015.
Investigator: Dr. Maria Menini, Department for fixed and implant-prosthetic
restorations, University of Genoa, Italy

3. Giordano R.

Development of Novel All-Ceramic Restorations and Wear, Strength, and Fatigue of
Restorative Materials
Research Report, Juli 2013
Principal Investigator: Russell Giordano, D.M.D., D.M.Sc., Director of Biomaterials
Boston University, Goldman School of Graduate Dentistry, Department of
Biomaterials, Boston MA, USA

For detailed test data, see Technical and scientific documentation VITA ENAMIC®
Download at www.vita-enamic.com

Please note: Our products must be used in accordance with the instructions for use.
We accept no liability for any damage resulting from incorrect handling or usage. The
user is 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 that are
not compatible or not authorized for use with our product and this results in damage.
The VITA Modulbox is not necessarily a component of the product. Date of issue of this
information: 2023-01

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

VITA Zahnfabrik is certified, and the following products bear the mark

CE 0124

VITA ENAMIC®, VITA ADIVA®, VITA AKZENT® LC

The products/systems of other manufacturers mentioned in this document are
registered trademarks of the respective manufacturers.

Acknowledgements

We would like to thank MDT Maurice T. Anderson (Bad Säckingen, Germany) for the
fabrication of numerous VITA ENAMIC reconstructions.
and Dr. med. dent. Sebastian Horvath (Jestetten, Germany) for the provision of his
practice rooms for photographs.

MD Rx only

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