

VITABLOCS®

The Concept



VITA shade determination

VITA shade communication

VITA shade reproduction

VITA shade control

Date of issue: 03.15



VITA shade, VITA made.

VITA

VITABLOCS® ceramics: history



1985 – First patient treatments using VITABLOCS (University of Zurich)



1991 – Introduction of VITABLOCS Mark II in VITA classical shades



1998 – Introduction of VITABLOCS Mark II in VITA SYSTEM 3D-MASTER shades



2003 – Introduction of VITABLOCS TriLuxe



2007 – Introduction of VITABLOCS TriLuxe forte










2010 – Introduction of VITABLOCS RealLife and VITABLOCS for VITA Rapid Layer Technology



VITABLOCS® ceramics: supported indications/system compatibility:

Overview of indications:

Indication		Type of material	VITABLOCS Mark II	VITABLOCS TriLuxe/TriLuxe forte	VITABLOCS RealLife
	Inlay		●	○	○
	Onlay		●	○	○
	Veneer		○	●	●
	Endodontic crown ²⁾		○	○	○
	Anterior crown		○	●	●
	Posterior crowns		○	○	○
	Veneer structure for the VITA Rapid Layer Technology ¹⁾		●	●	—

● recommended ○ possible

¹⁾ When using CEREC/inLab, milling only possible with MC XL unit

²⁾ molars only

System compatibility:

VITABLOCS – SYSTEM SOLUTIONS

VITA offers VITABLOCS with specific holder systems for the CAD/CAM systems:

- CEREC/inLab (Sirona Dental GmbH)*
- Ceramill Motion II (Amann Girrbach AG)*
- KaVo ARCTICA/Everest (KaVo Dental GmbH)*

VITABLOCS – UNIVERSAL SOLUTIONS

VITA offers VITABLOCS with universal holder system for the CAD/CAM systems:

- CORiTEC line (imes-icore GmbH)*
- CS 3000 (Carestream Inc.)*
- K-/S devices (vhf camfacture AG)*

*) The CAD/CAM system partner has been validated by VITA Zahnfabrik for processing specific VITA CAD/CAM materials.

Please note:

The range of geometries/shades of VITA CAD/CAM materials available may vary for the individual CAD/CAM system partners or systems. The specific hardware and software requirements are available from the respective CAD/CAM system partners or can be downloaded under "System compatibility VITA CAD/CAM materials" at www.vita-zahnfabrik.com.



Initial situation: fractured metal ceramic crown
Source: Dr. R. Masek, San Diego, USA

Proven a million times over

- With a total of more than 20 million single tooth restorations, the VITABLOCS ceramics have proven their excellent reliability over more than 25 years.
- VITABLOCS restorations show exceptional survival rates. Success rates of over 90% correspond to what is considered the gold standard.
- In tests, VITABLOCS ceramics demonstrate abrasion comparable to that of natural enamel.



Full crown made from VITABLOCS Mark II
Source: Dr. R. Masek, San Diego, USA

Simple and efficient processing

- VITABLOCS do not require a firing procedure but can be inserted immediately after milling and polishing.
- Restorations made from VITABLOCS ceramics can be ground with maximum precision to ensure excellent fit.
- Thanks to their uniquely fine structure, VITABLOCS offer outstanding reworking and polishing results.



Initial situation
Source: Dr. A. Kurbad, Viersen, Germany

Superior esthetics

- VITABLOCS exhibit natural translucency and support superb integration into the residual tooth substance in terms of shade.



Anterior crown made from VITABLOCS RealLife
Source: Dr. A. Kurbad, Viersen, Germany



VITA SYSTEM 3D-MASTER® shades:

VITABLOCS Mark II: 0M1C*, 1M1C, 1M2C, 2M1C, 2M2C, 2M3C, 3M1C, 3M2C, 3M3C, 4M2C

VITABLOCS TriLuxe/TriLuxe forte: 1M2C, 2M2C, 3M2C

VITABLOCS RealLife: 0M1C, 1M1C, 1M2C, 2M1C, 2M2C, 3M2C

VITA classical A1 – D4® shades:

VITABLOCS Mark II: A1C, A2C, A3C, A3.5C, A4C, B2C, B3C, C2C, C3C, D3C

VITABLOCS TriLuxe/TriLuxe forte: A1C, A2C, A3C, A3.5C**

*) available in the geometries I12 and I14

**) Only VITABLOCS TriLuxe forte



Monochromatic feldspar ceramic - proven a million times over

VITABLOCS Mark II is an esthetic, tooth-colored feldspar ceramic which is particularly suitable for inlays, onlays and partial crowns. The shades of VITABLOCS Mark II restorations match those of residual teeth.



Benefits

Clinical reliability:

With millions of restorations in more than 25 years, VITABLOCS Mark II ceramics have proven their excellent reliability. Success rates of over 90 % for inlays, onlays and crowns were achieved in clinical studies.

Cost-effectiveness:

VITABLOCS Mark II guarantee cost-effective fabrication of fully anatomical, tooth-colored restorations. The restorative material can be inserted immediately after grinding and polishing. A firing procedure is not required but can be carried out.

Optimum esthetics:

In combination with the wide range of shades (VITA 3D-MASTER/VITA classical), the excellent translucency of VITABLOCS Mark II enables a natural play of colors.

Recommended indications*

VITABLOCS Mark II is especially recommended for inlays, onlays and partial crowns.

Shades

- 10 VITA SYSTEM 3D-MASTER shades: 0M1C (bleached shade for I12, I14), 1M1C, 1M2C, 2M1C, 2M2C, 2M3C, 3M1C, 3M2C, 3M3C and 4M2C
- 10 VITA classical A1–D4 shades: A1C, A2C, A3C, A3.5C, A4C, B2C, B3C, C2C, C3C and D3C

* Of course, the entire range of single-tooth restorations can normally be fabricated. For detailed information, please refer to the Working Instructions No. 1455.



Multichromatic feldspar ceramic with integrated tooth color gradient

VITABLOCS TriLuxe/TriLuxe forte is the second generation of VITABLOCS. Since the tooth color gradient is already integrated in the blanks, these types of VITABLOCS enable computerized reproduction of the natural play of colors. VITABLOCS TriLuxe includes three and TriLuxe forte four layers of different shade intensity.



Benefits

Optimum esthetics:

The shade transition from the neck to the incisal edge has been matched with the natural tooth shade gradient. Particularly fine nuances can be found in the transition of enamel to the neck layer in the VITABLOCS TriLuxe forte blocks.

Cost-effectiveness:

Efficient and esthetic restorations thanks to the integrated color gradient. Characterization or individualization are frequently not required but can be carried out.

Recommended indications*

Especially suitable for veneers, partial and full crowns in the anterior area.

Shades

- 3 VITA SYSTEM 3D-MASTER shades: 1M2C, 2M2C and 3M2C
- 4 VITA classical A1–D4 shades: A1C, A2C, A3C and A3.5**

* Of course, the entire range of single-tooth restorations can normally be fabricated.
For detailed information, please refer to the Working Instructions No. 1455.

** Only VITABLOCS TriLuxe forte



Multichromatic feldspar ceramic in three dimensions

Based on the 3D block, VITABLOCS ReaLife replicates the curved color gradient found in natural dentition between the dentin and the edge areas. As a result, computerized and highly esthetic anterior restorations can be fabricated from a proven feldspar ceramic.



Benefits

Natural play of colors in 3D:

The 3D structure of VITABLOCS ReaLife enables simple and individual reproduction of the natural play of colors in the anterior area with just a few mouse clicks.

Simple and cost-effective:

With VITABLOCS ReaLife, a blank is available for practices and laboratories which enables them to achieve highly esthetic results quickly and in a cost-effective manner without the need for characterization or individualization.

Highly individual thanks to CAM software:

Practices and laboratories are enabled to change the position of the restoration in the virtual block in all three spatial dimensions and hence reproduce very fine shade nuances.

Recommended indications*

VITABLOCS ReaLife are perfectly suitable for highly esthetic anterior crowns and veneers.

Shades

6 VITA SYSTEM 3D-MASTER shades: 0M1C, 1M1C, 1M2C, 2M1C, 2M2C and 3M2C.

* Of course, the entire range of single-tooth restorations can normally be fabricated.
For detailed information, please refer to the Working Instructions No. 1724.



Highly efficient CAD/CAM veneering of bridge substructures

VITABLOCS Mark II and the multi-layer block VITABLOCS TriLuxe forte are also available in a large size as I-/TF-40/19 geometry. This geometry was especially developed for CAD/CAM veneering (= VITA Rapid Layer Technology) of multi-unit bridge substructures.

With VITA Rapid Layer Technology, both the substructure (= oxide ceramic) and veneer structure (= feldspar ceramic) can be fabricated as part of a digital manufacturing process. The substructure and the veneer are bonded to one another using a luting composite.



Benefits

Considerably faster:

Compared with the conventional layering technique, this innovative approach saves a significant amount of time, as the framework and veneer structures are fabricated using a fully computerized process.

Simple bonding:

The primary and secondary structures can be bonded to each other easily and reliably using a luting composite. A complex and time-consuming sintering process for ceramic soldering is no longer required.

High reliability:

The digital veneering technique guarantees high process reliability and clinical safety since the substructure and the veneer are perfectly matched. This technique also minimizes the risk of chipping.

Recommended indications

VITABLOCS Mark II /TriLuxe forte I-/TF-40/19 are primarily suitable for the fabrication of CAD/CAM veneers of posterior bridge substructures with up to four units. Using VITA Rapid Layer Technology, crown substructures can also be veneered using CAD/CAM technology.

Shades

4 VITA SYSTEM 3D-MASTER shades: 1M1C (for Mark II only), 1M2C, 2M2C and 3M2C.



VITABLOCS inlays

Fig. 1) Initial situation following preparation

Fig. 2) Inlays made from VITABLOCS Mark II in situ



Source: Dr. A. Devigus, Bülach, Switzerland



VITABLOCS posterior crowns

Fig. 3) Initial situation following preparation

Fig. 4) Follow-up examination after 14.5 years in situ, intact VITABLOCS posterior crowns on teeth 24-27



Source: Dr. A. Bindl, Zurich, Switzerland



VITABLOCS anterior crown and veneer

Fig. 5) Initial situation following preparation

Fig. 6) Anterior crown and veneer made from VITABLOCS Triluxe, characterized and glazed with VITA AKZENT Plus stains



Source: Dr. A. Mirzayan, Los Angeles, USA



VITABLOCS veneer

Fig. 7) Initial situation

Fig. 8) Veneer made from VITABLOCS Mark II using VITA VM 9 materials for individualization.



Source: Dr. A. Bindl, Zurich, Switzerland
G. Lombardi (Dental Technician), Dübendorf, Switzerland

High clinical reliability

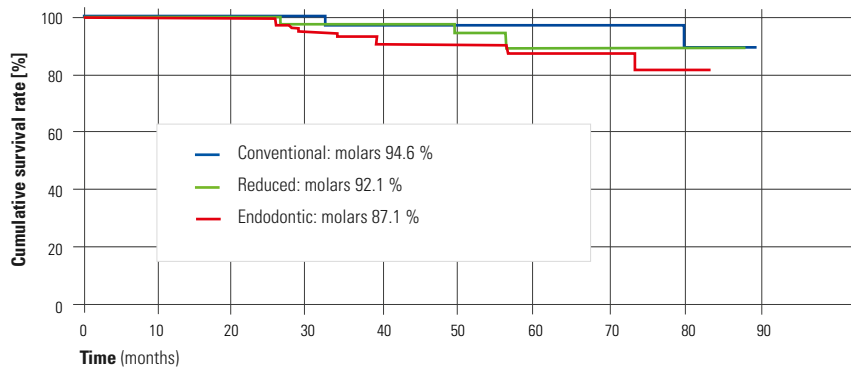
VITABLOCS Mark II	
Inlays/onlays	95% success rate, after 5-10 years ¹
Molar crowns	94.6% success rate, after 4-6 years ²
Crowns/inlays	94% success rate, after 7 years ³

Sources:

- 1.) Posselt, A., Kerschbaum, T. (2003). Longevity of 2328 chairside Cerec inlays and onlays. *Int J Comput Dent*, 6(3), 231-248.
 Martin, N., Jedynakiewicz, N. M. (1999). Clinical performance of CEREC ceramic inlays: a systematic review. *Dental Materials* 15 (1), 54-61.
 Fasbinder, D. J. (2006). Clinical performance of chairside CAD/CAM restorations. *J Am Dent Assoc*, 137, 22p.
- 2.) Bindl, A., Richter, B., Mörmann, W. H. (2004). Survival of ceramic computer-aided design/manufacturing crowns bonded to preparations with reduced macroretention geometry. *Int J Prosthodont*, 18(3), 219-224.
- 3.) Christensen, G. (2006). Cerec 20th Anniversary- is it time to buy in-office CAD-CAM. *CRA Foundation Newsletter*, 30(4), 3.

Survival rates of framework-free crowns

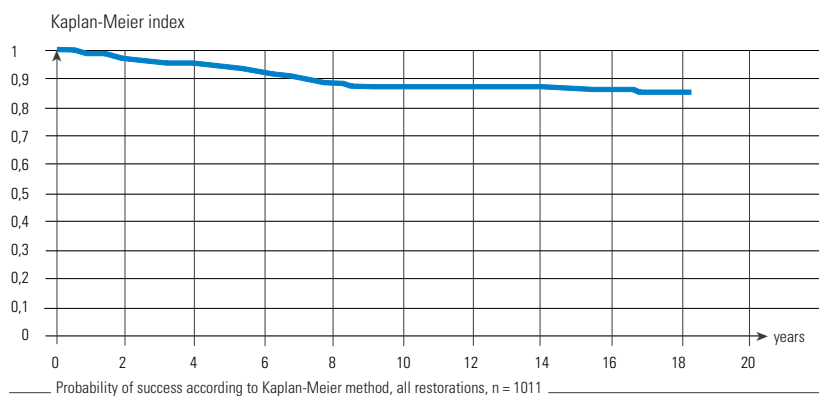
208 VITABLOCS Mark II crowns (CEREC 2)



Source:

- Bindl, A., Richter, B., Mörmann, W. H. (2004). Survival of ceramic computer-aided design/manufacturing crowns bonded to preparations with reduced macroretention geometry. *Int J Prosthodont*, 18(3), 219-224.

18-year results, CEREC inlays

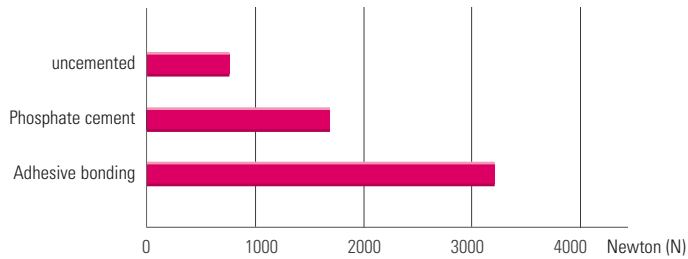


Source:

- Reiss, B. (2006). Clinical Results of Cerec Inlays in a Dental Practice over a Period of 18 Years. *Int J Comput Dent*, 9, 11-22.

VITABLOCS ceramics impress with high strength and stability

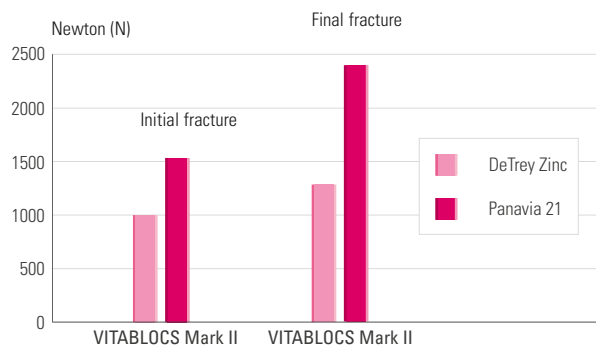
Fracture load study: silicate ceramic crowns



Source:

Mörmann, W.H.; Rathke, A.; Luthy, H. (1998) Der Einfluss von Präparation und Befestigungsmethode auf die Bruchlast vollkeramischer Computerkronen. (The impact of the preparation and cementation method on the fracture load of all-ceramic computerized crowns). Acta Med Dent Helv, 3, 29-35.

Fracture load study: VITABLOCS crowns

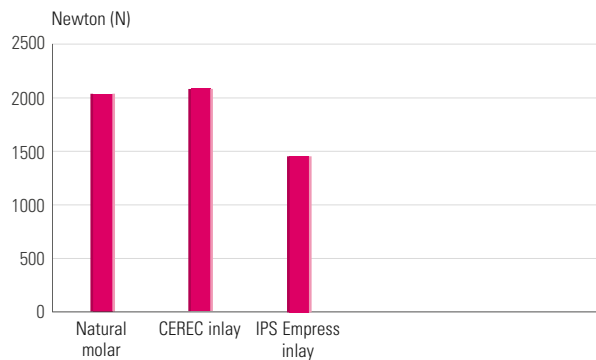


Source:

Bindl, A., Lütthy, H., Mörmann, W. H. (2006). Strength and fracture pattern of monolithic CAD/CAM-generated posterior crowns. Dental Materials, 22(1), 29-36.

Note: The use of conventional bonding for VITABLOCS restorations has not been approved by VITA!

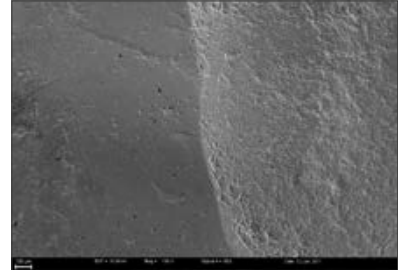
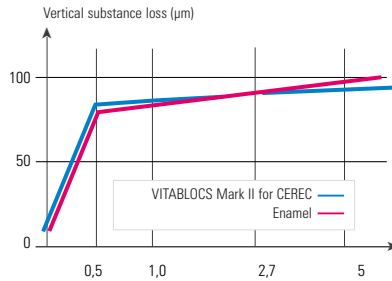
Fracture load study: VITABLOCS crowns



Source:

Bremer, B. D., Geurtsen, W. (2001). Molar fracture resistance after adhesive restoration with ceramic inlays or resin-based composites. American J Dent, 14(4), 216-220.

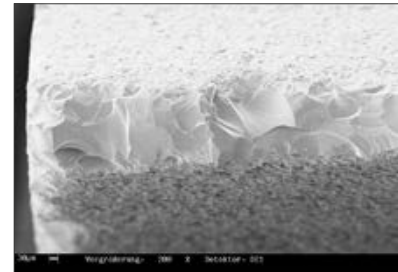
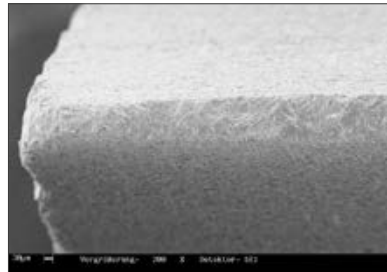
Natural abrasion behavior and precise milling results



Source: Krejci, I. (1991). Wear of CEREC and other restorative materials. In Proceedings of the International Symposium on Computer Restorations: State of the Art of the Cerec Method. Berlin: Quintessence Verlag, 245-251.

Occlusal surface of a VITABLOCS crown after 12 years
Source: Dr. A. Bindl, Zurich, Switzerland

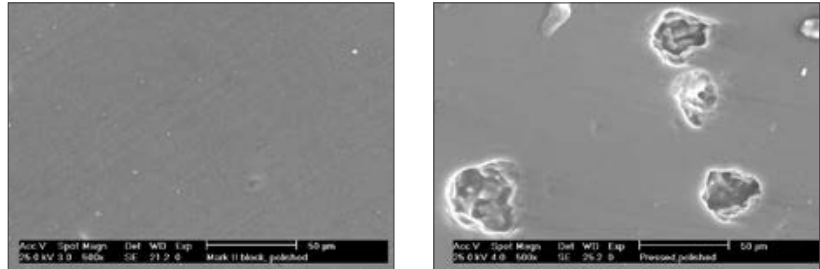
The fine structure of VITABLOCS Mark II ceramics demonstrates abrasion properties comparable to those of natural enamel. This behavior is achieved thanks to the fine crystalline structure of VITABLOCS. As a result, VITABLOCS restorations are considered particularly antagonist-friendly.



Comparison of edge stability: view of triangular-shaped body, VITABLOCS Mark II (left image), magnification 200 x, vs competitor ceramic (right image), magnification 200 x.
Source: Internal studies, VITA R&D, Bad Säckingen

Thanks to their uniquely fine structure, VITABLOCS feldspar ceramics can also be precisely milled even in thin edge areas. This edge stability ensures that the end product offers excellent fit.

Material homogeneity and surface quality



SEM image of the surface (magnification 500 x) of VITABLOCS (left) compared with conventional laboratory-ready press ceramics (right).

Quelle: Prof. Dr. R. Giordano, Boston, USA

The SEM images show the outstanding homogeneity of the VITABLOCS structure (image left) compared with conventional laboratory-ready press ceramics (image right).

VITABLOCS ceramics are densely sintered using an industrially standardized process. This eliminates the risk of defects that sometimes arise during pressing. This means that the homogenous structure of VITABLOCS also guarantees excellent surface quality.

Bonding

Dual-curing (light/chemically curing) luting composites, such as VITA DUO CEMENT, Clearfil Esthetic Cement (Kuraray) and Multilink Automix (Ivoclar Vivadent), are primarily recommended for bonding VITABLOCS ceramics. For thin restorations such as veneers, pure light-curing luting composites can also be used. VITABLOCS crown restorations can also be bonded using self-adhesive techniques (VITA recommendation: RelyX Unicem, 3M ESPE).



System components



Characterization with VITA AKZENT Plus

Individualization with VITA VM 9



- Use **VITA Easyshade V** for digital shade taking and **VITABLOCS-Guide 3D MASTER**, **VITA Linearguide 3D-MASTER** or the **VITA classical A1–D4 shade guide**, for example, for conventional shade taking.



- For CAD/CAM-fabrication, VITA offers you **VITABLOCS Mark II**, **TriLuxe**, **TriLuxe forte** and **RealLife** – simply select the material solution that fulfills your individual requirements.



- Use the **VITA AKZENT Plus** stains and **VITA VM 9** veneering ceramics for feldspar ceramics.



- Glaze, stains and/or individualization firing can be carried out with the **VITA VACUMAT 6000 M** premium furnace.



- In the case of VITA feldspar ceramics, use polishing systems suitable for silicate ceramics (e. g. **VITA Karat diamond polishing set**).



- **VITA DUO CEMENT** or a different bonding system recommended by VITA can be used for bonding VITA feldspar ceramics.



*) Note "Optional process steps"





The feldspar ceramic material can be inserted immediately after milling and polishing. Therefore the following process steps mentioned above are optional for feldspar ceramics.

VITABLOCS® Available products

Fine-structure feldspar ceramic												
Designation	Dimensions (mm)	Package size (pieces)	Shades									
VITABLOCS® Mark II / VITA SYSTEM 3D-MASTER®												
I8	8 x 8 x 15	5	–	1M1C	1M2C	2M1C	2M2C	2M3C	3M1C	3M2C	3M3C	4M2C
I10	8 x 10 x 15	5	–	1M1C	1M2C	2M1C	2M2C	2M3C	3M1C	3M2C	3M3C	4M2C
I12	10 x 12 x 15	5	0M1C	1M1C	1M2C	2M1C	2M2C	2M3C	3M1C	3M2C	3M3C	4M2C
I14	12 x 14 x 18	5	0M1C	1M1C	1M2C	2M1C	2M2C	2M3C	3M1C	3M2C	3M3C	4M2C
I-40/19*	15.5 x 19 x 39	2	–	1M1C	1M2C	–	2M2C	–	–	3M2C	–	–
VITABLOCS® TriLuxe / VITA SYSTEM 3D-MASTER®												
TRI-12	10 x 12 x 15	10	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
TRI-14	12 x 14 x 18	5	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
TRI-14/14	14 x 14 x 18	5	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
VITABLOCS® TriLuxe forte / VITA SYSTEM 3D-MASTER®												
TF-12	10 x 12 x 15	5	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
TF-14	12 x 14 x 18	5	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
TF-14/14	14 x 14 x 18	5	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
TF-40/19*	15.5 x 19 x 39	2	–	–	1M2C	–	2M2C	–	–	3M2C	–	–
VITABLOCS RealLife® / VITA SYSTEM 3D-MASTER®												
RL-14/14	14 x 14 x 18	5	0M1C	1M1C	1M2C	2M1C	2M2C	–	–	3M2C	–	–
VITABLOCS® Mark II / VITA classical A1 – D4®												
I8	8 x 8 x 15	5	A1C	A2C	A3C	–	–	–	–	–	–	–
I10	8 x 10 x 15	5	A1C	A2C	A3C	A3,5	A4C	B2C	B3C	C2C	C3C	D3C
I12	10 x 12 x 15	5	A1C	A2C	A3C	A3,5	A4C	B2C	B3C	C2C	C3C	D3C
I14	12 x 14 x 18	5	A1C	A2C	A3C	A3,5	A4C	B2C	B3C	C2C	C3C	D3C
VITABLOCS® TriLuxe / VITA classical A1 – D4®												
TRI-12	10 x 12 x 15	10	A1C	A2C	A3C	–	–	–	–	–	–	–
TRI-14	12 x 14 x 18	5	A1C	A2C	A3C	–	–	–	–	–	–	–
VITABLOCS® TriLuxe forte / VITA classical A1 – D4®												
TF-12	10 x 12 x 15	5	A1C	A2C	A3C	A3,5	–	–	–	–	–	–
TF-14	12 x 14 x 18	5	A1C	A2C	A3C	A3,5	–	–	–	–	–	–
TF-14/14	14 x 14 x 18	5	A1C	A2C	A3C	A3,5	–	–	–	–	–	–

* for VITA Rapid Layer Technology

 A white rectangular box containing several small, light-colored rectangular pieces, likely artificial teeth or dies, arranged in a row.	<p>VITA SIMULATE Preparation Material Set</p> <p>Assortment with light curing composites and accessories for the fabrication of artificial dies in 6 shades: 0M1S to simulate bleached dies and the shades 1M1S, 2M3S, 3M2S, 4M3S and 5M3S. They can be used to simulate the shade of the prepared tooth even if it exhibits major discoloration. The shade result of the restoration made of VITABLOCS can be verified already during the fabrication process and adjusted if required.</p>
 A hand holding a blue and white spray bottle, spraying a fine mist of blue pigment suspension.	<p>VITA Powder Scan Spray</p> <p>Bottle containing 75 ml of blue spray-on pigment suspension with mint flavor for direct application (tooth surface) and for indirect use (plaster die/plaster model) for the opto-electronic impression of CAD/CAM restorations.</p>
 A collection of dental materials and tools, including tubes of adhesive, etching gel, and luting composite, arranged in a tray.	<p>VITA LUTING SET</p> <p>The VITA LUTING SET includes all materials required for adhesive bonding of feldspar, glass ceramic and composite restorations to tooth substance: enamel etching gel, dentine/enamel adhesive, ceramic etching gel, silane bonding agent, luting composite, glycerine gel and accessories.</p>

	<p>VITA CERAMICS ETCH Hydrofluoric acid gel (5%) for etching ceramic restorations VITA CERAMICS ETCH is a hydrofluoric acid gel for etching restorations made from feldspar and glass ceramics. Microretention between ceramic and luting composite is achieved by the retentive etching pattern. Intended for indirect use only!</p> <p>Two different application forms are available: Dropper bottle cont. 6 ml and syringe cont. 3 ml</p>
	<p>VITA ETCHANT GEL Phosphoric acid gel, 35% for etching tooth substance VITA ETCHANT GEL is a phosphoric acid gel (35%) for etching tooth enamel for adhesive bonding of restorations made of ceramic and composite to tooth substance. Also suitable for the Total Etch technique.</p>
	<p>VITASIL® Single-component silane bonding agent for the adhesive technique VITASIL is a single-component silane bonding agent and creates a chemical bond between ceramic restorations and bonding composite in the adhesive technique.</p>
	<p>VITA OXY-PREVENT Glycerine gel for preventing oxygen inhibition VITA OXY-PREVENT is a neutral-colored glycerine gel for preventing the formation of the oxygen inhibition layer when bonding ceramic and composite restorations using composites. Also suitable as a try-in paste.</p>

Clinical studies - an overview

Material	Type of restoration	Quantity	Observation period	Survival rate	Author
VITABLOCS	Inlays	51	5 years	94.2 %	Berg
VITABLOCS Mark II	Inlays	18	4 years	94.4 %	Bindl, Mörmann
VITABLOCS Mark II	crowns	208	5 years	94–97 %	Bindl et. al.
VITABLOCS Mark II	Endodontic crowns	19	2 years	95 %	Bindl, Mörmann
VITABLOCS	Inlays	109	7 years	100 %	Cerutti et. al.
VITABLOCS Mark II	Partial crowns	96	3 years	100 %	Fasbinder et. al.
VITABLOCS	Inlays, onlays	187	10 years	95 %	Otto, de Nisco
VITABLOCS Mark II	Inlays	32	8 years	90.7 %	Pallesen, Van Dijken
VITABLOCS Mark II	Inlays, onlays	2328	9 years	95.5 %	Posselt, Kerschbaum
VITABLOCS Mark II	Restorations on pivot teeth	58	3 years	100 %	Reich et. al.
VITABLOCS	Inlays	1011	18 years	84.4 %	Reiss
VITABLOCS Mark II	Inlays	1011	10 years	90 %	Reiss, Walther
VITABLOCS	Inlays	2374	5 years	92 %	Schauermann
VITABLOCS	Veneers	617	9 years	94 %	Wiedhahn et. al.

References

Bindl, A., Mörmann, W.H. (1997). Chairside-Computer-Kronen – Verfahrenszeit und klinische Qualität. *Acta Med Dent Helv*, 2, 293 – 300.

Bindl, A., Mörmann, W.H. (1999). Clinical Evaluation of Adhesively Placed CEREC Endo-Crowns after 2 Years-Preliminary Results. *J Adhes Dent*, 1(3), 225-265.

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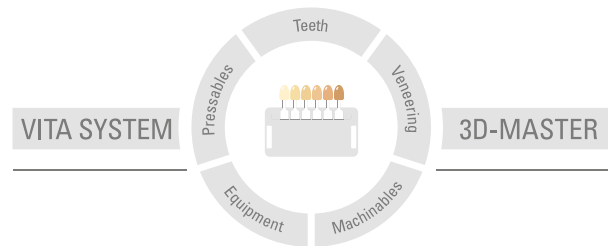
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