Grandio blocs · Grandio disc

PROCESSING INSTRUCTIONS

VOCO
DIE DENTALISTEN

Content

1. Content

Machine-made and computer aided construction and manufacturing of metal-free dental restorations are established for decades in dentistry. Enormous improvements of the design-software as well as the milling units and most important of the products for manufacturing the restorations lead to longlasting and high esthetic restorations with impressive properties.

Nano-ceramic hybrid materials specially designed for CAD-CAM use are equivalent products for many standard restorations as inlays, onlay, veneers, crowns and in future also 3-unit bridges which were reserved for ceramic material so far. Although restorations made of these new materials are less complicated while manufacturing and indiviualization, need no final gloss burn and do not require any acid for conditioning before luting.

Modifications can be done easily either before final luting or afterwards. All you need for any modification exists already in your clinic or your dental lab.

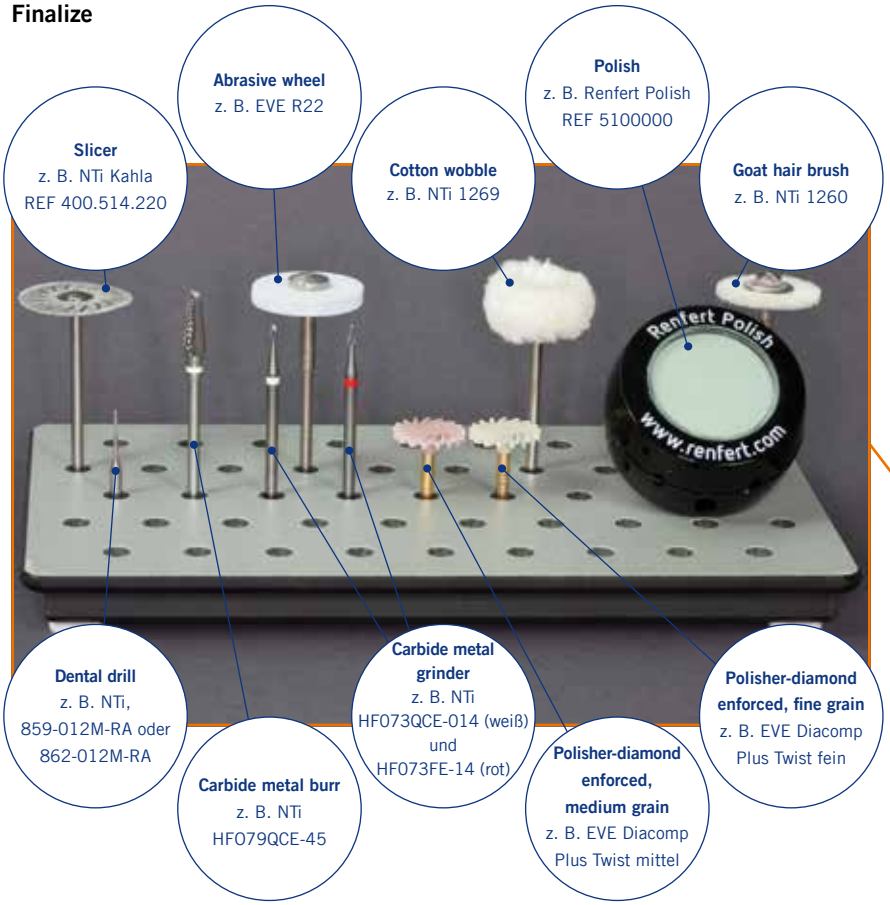
This present compendium contains beside basic information about our Grandio blocs / disc a step-by-step instruction for polishing, individualization and the adhesive luting of restorations made of Grandio blocs / disc.
There are no limits for your own creativity e.g. for the individualization of an incisor crown and the results are visible instantly – without a burning step. Less production steps and a manageable number of (rotating) instruments save time and lead to brilliant restorations which are economically for your business and please you and your patients

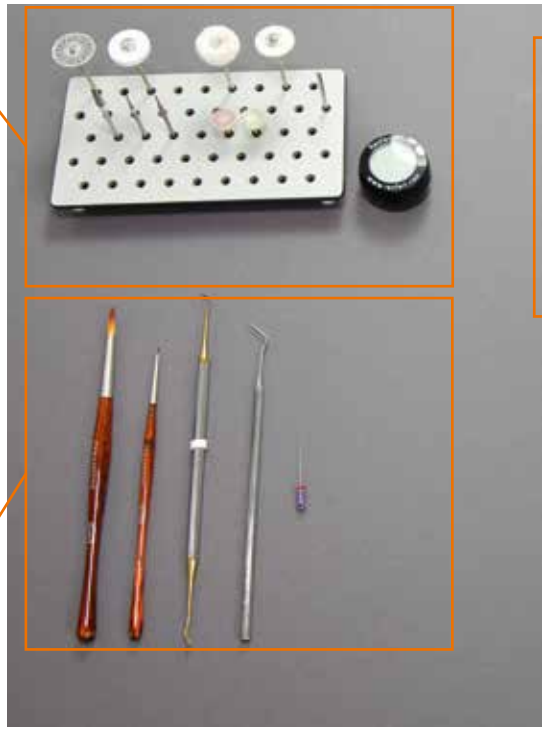
Good Luck!

2. Step-by-step instruction for the individualization of Grandio blocs

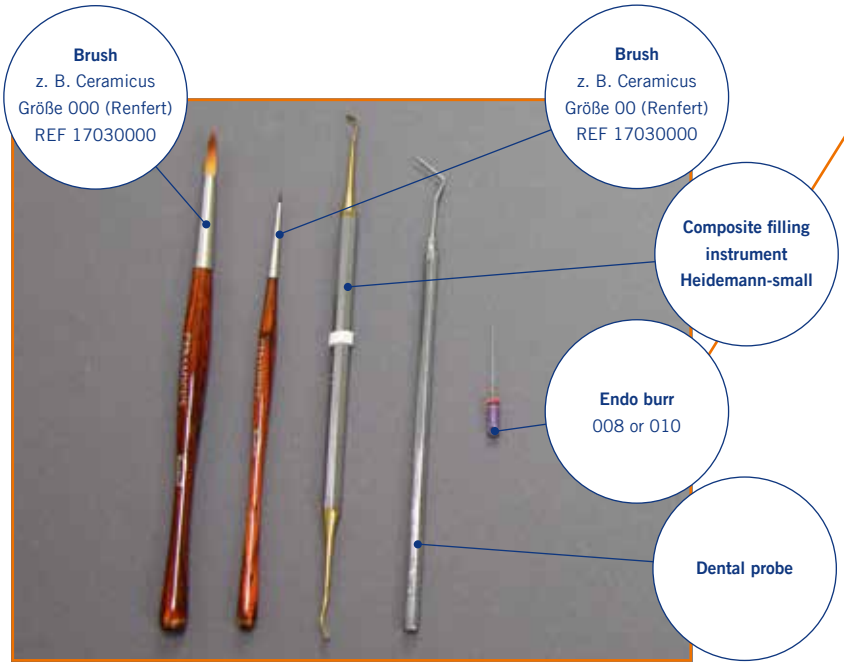
2.1. Overview Accessories

Finalize



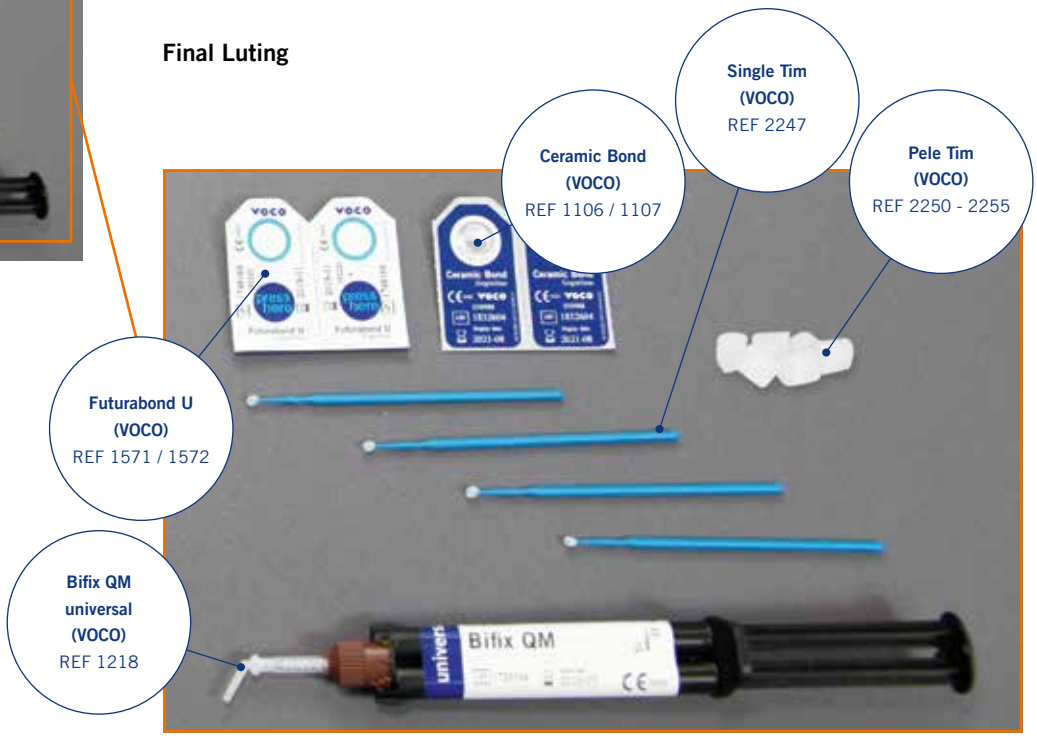


Individualization – Instruments



Individualization – Composite

Final Luting



2.2. Incisor crown: Processing and luting

CAM restoration.

Separating the restoration with a slicer or another suited instrument from the pin.

Grinding / smoothening with a fine toothing carbide metal grinder. Watch for possible contact points.

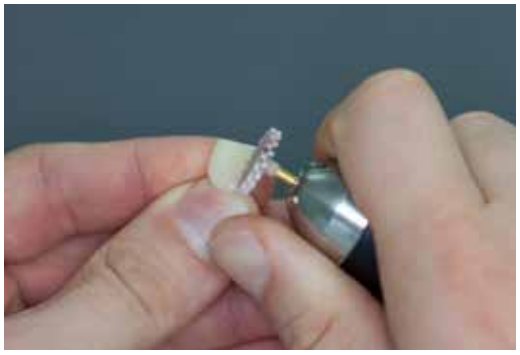
Tip
Also possible with fine diamond burrs

It is the right time now to try in the restoration at the patient when the restoration is manufactured chairside in the dental clinic. Clean and disinfect the restoration with alcohol before try-in.

Conditioning of the luting face with airblasting (Al_2O_3, 50 µm, air pressure 1,5 - 2 bar).

Carefully removing of Al_2O_3 residue in ultrasonic cleaner with Ethanol (70 %) or steam cleaner.
Dry the restoration with airstream.

Chairside



Smoothening and pre-polishing with mid to fine grained diamond polishing system.

High-gloss polishing with extra-fine diamond polishing system.

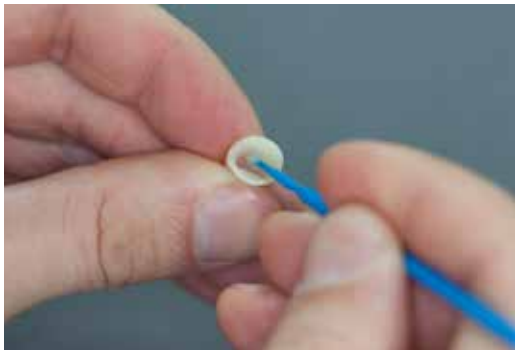
Labside

A goat hair brush together with a diamond polish may be used alternatively.

Finalization with a cotton wobble.

Note
Disinfection of the restoration bevor try-in and final luting is mandantory

Pierce the foil of a Cermic Bond *SingleDose* with a Single Tim and wet it.



Apply Ceramic Bond allover the luting face and let it react for 60 sec.

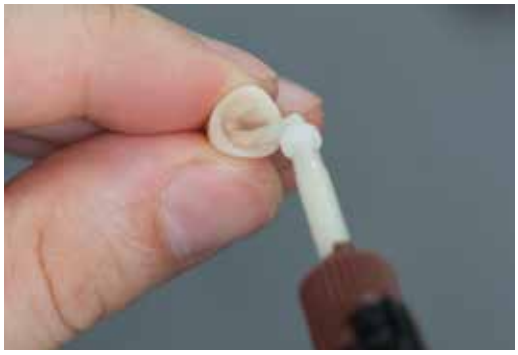
Then dry it carefully with air.

Activate Futurabond U by pressing on the marked area, pierce the blister with a Single Tim and stir carefully.

Apply the adhesive homogeneously on to the prepared tooth surfaces and rub it in for 20 sec..

Dry off the adhesive layer with air in order to remove any solvents.

Light cure the adhesive layer for 10 sec..



Adhesive luting with Bifix QM

The material is automatically mixed in the mixing tip and can be applied directly onto the prepared contact areas.

Note

Restorations made of Grandio blocs / disc must be luted adhesively!

Place the restoration and fix it with gentle pressure. The chemical curing of Bifix QM lasts 3 min. after placing the restoration.

Remove excess amounts of Bifix QM with a foam pellet or a disposable brush.

Dental floss is recommended for removing excess material from interdental spaces.

Additional light curing oft he dual-curing luting cement is possible.

High-esthetic result after luting.

2.3. Incisor crown: cut-back technique

Grandio blocs / disc may be individualized quick and easy for high esthetic demands.
GrandioSO Flow / Heavy Flow in combination with Final Touch allow a quick and simple light curing individualization of any restoration.

Perform the Cut-back-technique manually with carbide metal grinders or diamond coated burrs.

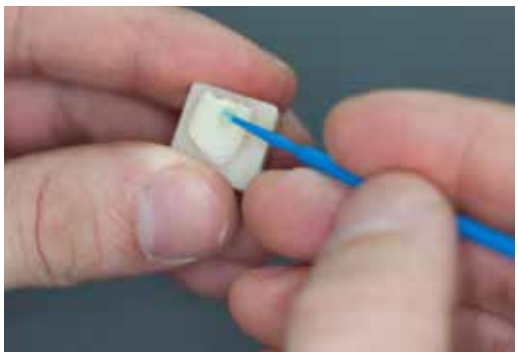
Alternatively the Cut-Back-Technique may be done already during the CAD step.

Note
Watch the given minimal wall thickness (page 20)

The area of the restoration where individualization is desired must be sandblasted (Al_2O_3, 50 µm, air pressure 1,5 - 2 bar) prior to the individualization steps.

Note
Mandantory cleaning (see page 6)

Activate Futurabond U by pressing on the marked area, pierce the blister with a Single Tim and stir carefully.

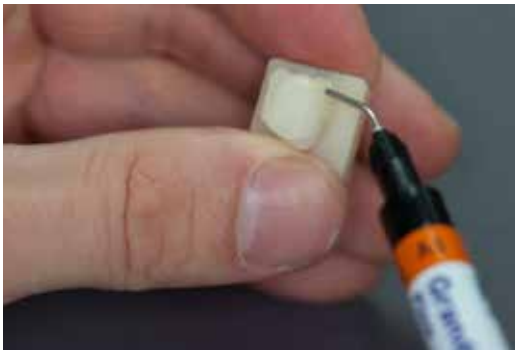


Apply the adhesive homogeneously on to the prepared tooth surfaces and rub it in for 20 sec..

Note
Wet the whole surface of the restoration not only single areas

Dry off the adhesive layer with air for at least 5 sec. in order to remove any solvents.

Light cure the adhesive layer for 10 sec..

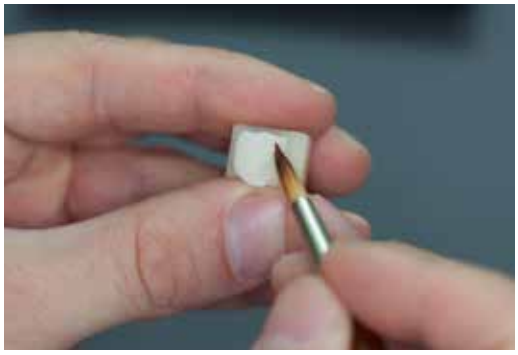


Use GrandioSO Flow for incisal individualization.

Find more composites at the overview on page 5.

For incisal edges use transparent composites e.g. GrandioSO Incisal or Amaris HT.

Tip
Application also possible with other suitable instruments



To achieve mamelon-like structures very fine brushes may be helpful.

White spots can be simulated with Final Touch. Final touch must always be covered with a (transparent) final composite layer.

Note
Clean brushes used for Final Touch with ethanol directly after use

Fixation of different Flow-Composites respectively of different Flow layers by light curing in between.

→ More steps see case 1 „incisor crown“, step 2 - 21

Incisor crown individualized with GrandioSO and polished to high gloss finish.

2.4. Molar crown: individual characterization

Finalize the fissures with a Carbide metal burr or diamond burr. Clean the restoration afterwards.

Note
Wet the whole surface of the restoration not only single areas

Apply the adhesive over the entire surface after cleaning and rub it in for 20 sec..

Dry off the adhesive layer with air for at least 5 sec. in order to remove any solvents.

Light cure the adhesive layer for 10 sec..

Effect composite colours as FinalTouch may be used as they are just out of the syringe or mixed with other colours especially „white“ for the individualization of fissures, incisal edges and tooth necks. Colours should always be used very economical!

Note
Ambient light

Apply Final Touch with a fine ceramic brush. Alternatively one may use fine endodontic instruments.

Light-polymerization of the applied colour (20 sec.).

Overlaying subsequently with a transparent flow composite e.g. Amaris HT.

Final polymerization (page 14) and polishing (pages page 7 and 8).

Grade of individualization

3. Questions and answers

Which CAD / CAM systems can process Grandio blocs / disc?

Please find the list of suitable systems on page 22 and www.voco.dental.

Please ask for not listed devices your CAD / CAM system provider.

Which tools have to be used for milling Grandio blocs / disc?

Grandio blocs / disc have to be machining with diamond coated tools.

Is it possible to mill Grandio blocs / disc without water?

Grandio blocs / disc can be milled dry or wet depending on the milling machine.

How must restorations made from Grandio blocs / disc finally luted?

The restorations must be luted exlusively adhesiv.
The proven procedure requires few steps only for reliable luting of the restoration.

Is Bifix SE indicated for luting Grandio blocs / disc restorations?

No, self-adhesive luting cements are not cleared for final luting. Grandio blocs / disc must be luted exlusively adhesively. The proven procedure requires few steps only for reliable luting of the restoration with the prepared tooth.

Which kind of tooth preparation should be choosen by the dentist?

In general the tooth preparation should follow the rules for full-ceramic restorations, means:

- rounding inner edges and borders
- shoulder preparation with rounded inner edges and borders respectively a chamfer preparation

Must the restorations specially pretreated before luting?

The restorations must be clean and greaseless. The luting face must be sandblasted (Al_2O_3, 50 µm, air pressure 1,5 - 2 bar). Afterwards Al_2O_3 residue must be removed carefully and the restoration has to be washed with ethanol / isopropanol again. Dry the restoration carefully. Shortly before luting apply Silan covering on to the luting face and let it react for 60 sec. Afterwards blow the solvent for 5 s and lute in the restoration adhesively.

How must the tooth hard substance conditioned before luting?

Luting follows the rules of adhesive dentistry: A dental adhesive is applied on to the clean surface of the particular tooth, the solvent must be blown with a gentle air stream followed by the light-curing. If the adhesive is used correctly light-curing will not influence the fitting oft he restoration.

Why must individualizations of restorations made with composite tints covered with a composite layer?

Most of the available composite tints only show a low restistance against abrasion and would disappear shortly when not covered with a suitable composite.

What means „Cut-back“ and when will this technique be used?

„Cut-back“ means a reduction of the restoration at the vestibular area before the individualization with light-curing composites. This technique is an easy and cost-effective technique for high esthetic restorations.

What do I have to consider when trying in a restoration?

The restoration must be clean, free of all grinding or blasting residue and disinfected with medical alcohol.

How to disinfect Grandio blocs / disc prior to the luting?

Mediacl alcohol is the appropriate disinfection agent. Wash the restoration with medical alcohol completely and dry it carefully with air before applying the silane.

How to polish restorations made from Grandio blocs / disc?

The polishing can be done extraorally as well a intraorally.
For best results a two-step polishing system for highly-filled composites is recommended.

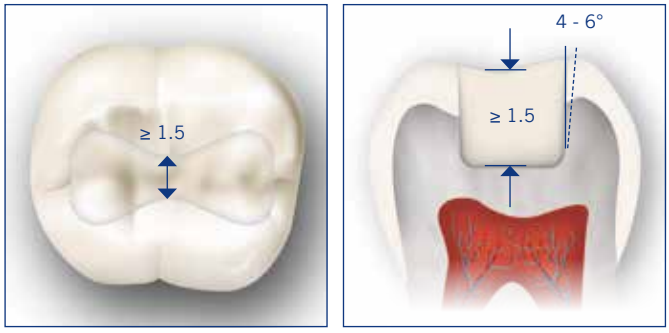
4. Indications

Crowns, inlays, onlays, veneers

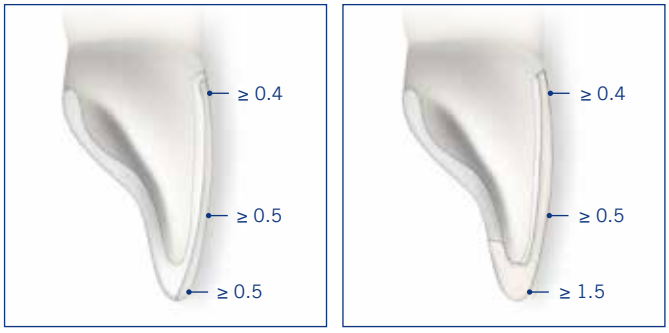
Implant-supported crowns

Minimum wall thickness for restorations

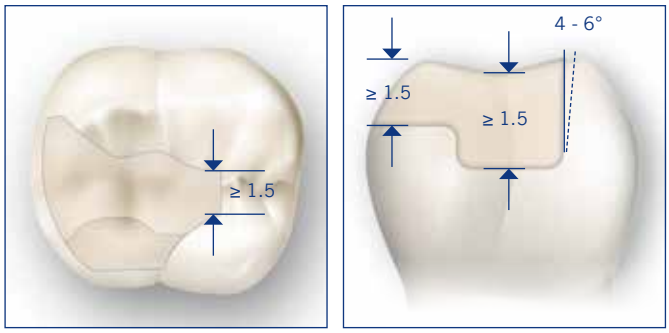
Inlay



Veneer



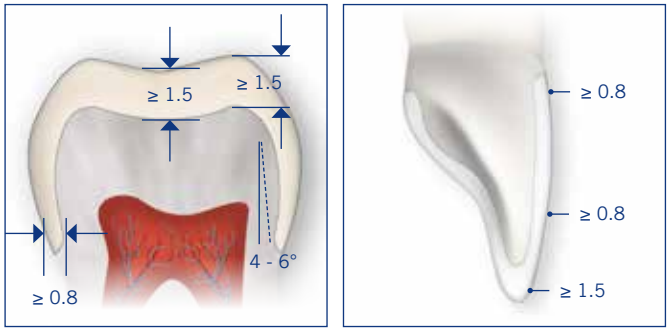
Onlay

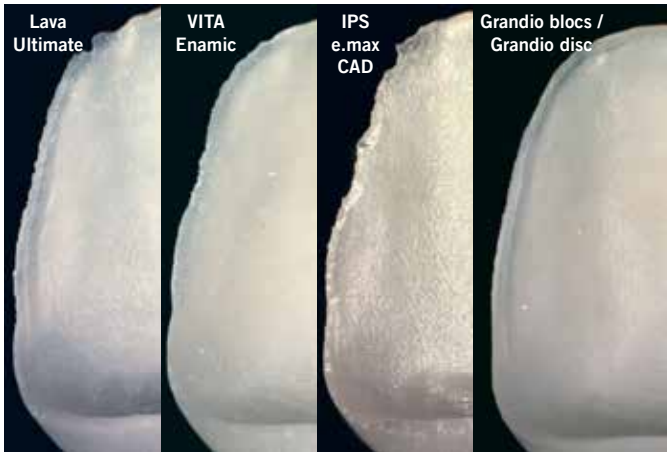


Cement space: 70 µm (± 10 µm)

The use of Grandio materials makes it possible to mill even thinly tapering edges precisely and without the risk of chipping or breakages. This means precision-fit restorations that are also easy to polish inside the mouth or outside.

Crown





Source: Internal pictures, veneer 0.6 mm

5. Shade selection

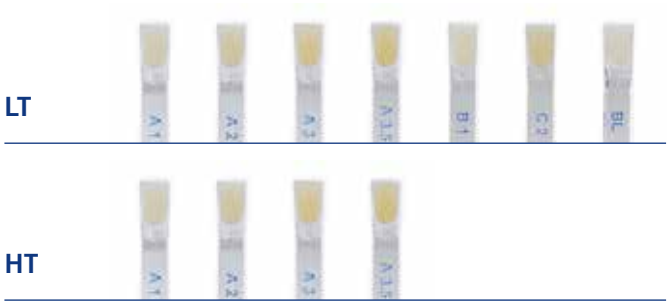
Use the VITA® shade system (e.g., GrandioSO shade guide) to determine the shade against the cleaned but unprepared tooth prior to anaesthesia and preferably in daylight conditions.

Two grades of translucency for optimal aesthetics

LT – ideal for the anterior region in the shades
A1, A2, A3, A3.5, B1, C2, BL

HT – ideal for the posterior region in the shades
A1, A2, A3, A3.5

11 shades ensure that your patient always receives the restoration which suits him or her best.



As a general rule of thumb, the choice of colour tone for the final result, i.e., the luted restorations, depends on a number of factors:

- Colour of the core
- Layer thickness of the restoration
- Colour and translucency of the restorative
- Colour of the luting material

Special shades or effects for composite blocks are easy to create using a flowable material. After milling, parts of the restoration are abraded with a grinding tool, then rebuilt by applying, for example, GrandioSO Flow in the adhesive technique.

Grandio blocs, with its range of available shades and resulting possibilities for individual solutions, is ideal for chairside use, offering the user maximum simplicity regarding shade selection

6. Approved devices for processing of Grandio blocs / Grandio disc

vhf	**vhf camfacture**	www.vhf.de
Device model	Impression S1/S2, R5, K5 and Z4	
Modus	Wet (if wet is not a device option, choose dry)	
Type of processing	Grinding and milling	
Universal holder Grandio blocs	Yes	
Universal holder Grandio disc	Yes	
Software	DentalCAM 7	
Software update	June 2018	

Zirkonzahn Human Zirconium Technology	**Zirkonzahn**	www.zirkonzahn.com
Device model	Milling Unit M (M1 - M5)	
Modus	Wet	
Type of processing	Grinding	
Universal holder Grandio blocs	Yes	
Universal holder Grandio disc	No	
Software	Zirkonzahn Nesting	
Software update	Summer 2018	

imes-icore® Competence in CNC & DENTAL-Solutions	**imes-icore**	www.imes-icore.de
Device model	CORiTEC-Serie	
Modus	Wet (blocks) and dry (disc)	
Type of processing	Grinding and milling	
Universal holder Grandio blocs	Yes (CORiTEC 245 - 650i + One)	
Universal holder Grandio disc	Yes (CORiTEC 245 - 650i)	
Software	icam V4.7 / V5 smart	
Software update	May / June 2018	

DGSHAPE	**Roland DG**	www.rolandeasyshape.com
Device model	DWX-series	
Modus	Wet (Optional dry)	
Type of processing	Grinding	
Universal holder Grandio blocs	Yes (DWX 4, -4W, -51D, -52D, -52DC, -52 DCi)	
Universal holder Grandio disc	Yes (DWX 51D, -52D, -52DC, -52 DCi)	
Software	Millbox	
Software update		

Subject to change withour notice. Status: June 2018. Further information is available at www.voco.dental

7. Clinical cases

Clinical case 1


Initial clinical situation


Core preparation


Restoration directly after milling


Finally prepared restorations


Inserted restorations


Final result

Source: Dr. Felipe Moura, Brazil

Clinical case 2


Initial situation tooth 26


Individualized crown on model


Fixed crown


Final result

Source: Alvaro Ferrando, Visiting professor master aesthetic dentistry and minimally invasive rehabilitation, University Valencia, Spain

Clinical case 3


Initial situation tooth 16


Occlusal view of the individualized overlay


Buccal view


Overlay on model


Final result

Source: Alvaro Ferrando, Visiting professor master aesthetic dentistry and minimally invasive rehabilitation, Manuel Minguez, dental technician, University Valencia, Spain

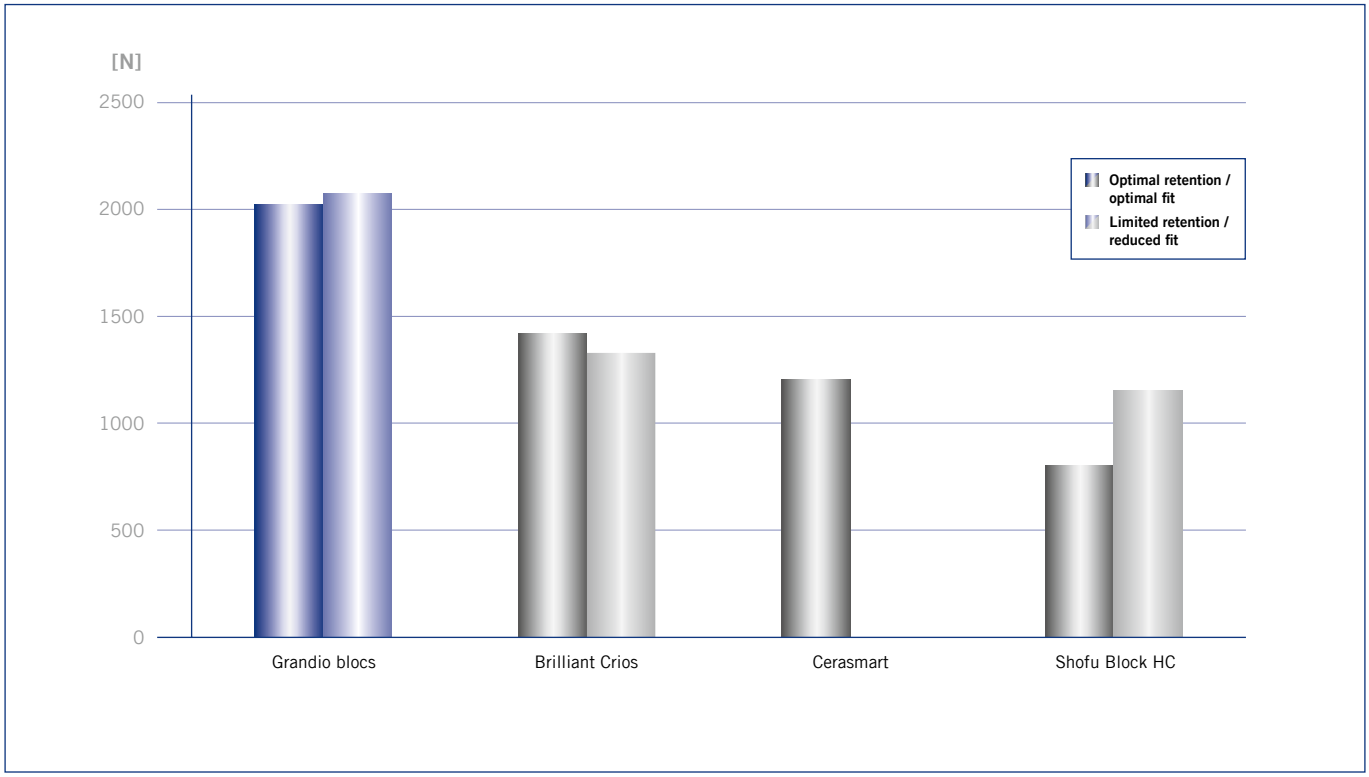
8. Scientific data

Strongest in their class

The amount of the study results shown here demonstrates that the nano ceramic hybrid CAD / CAM material Grandio blocs / Grandio disc is stronger than the composite blocs currently available on the market.

An investigation of the fracture force of the materials shows that Grandio blocs / Grandio disc has a high value even with limited retention and reduced fit of the crown until it breaks.

Fracture force (after TCML, 5 - 55 °C, 1,2 × 10^6 cycles)



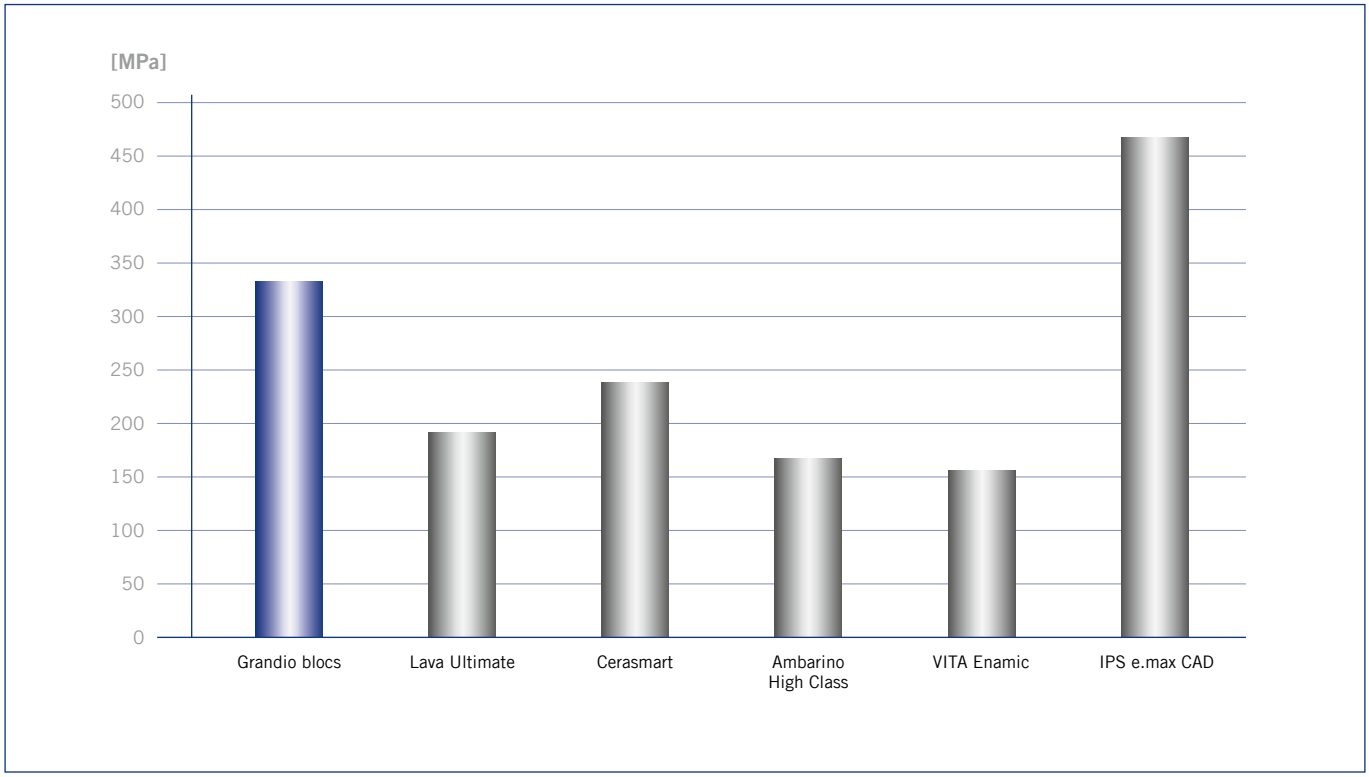
Source: V. Preis, M. Behr, S. Schneider-Feyrer, M. Rosentritt, J Dent Res Spec Iss 97 B: 3329, 2018

Extraordinary strength

In a Tübingen University study, Grandio blocs achieved a biaxial flexural strength result of 333 MPa, while its compressive strength was measured (in-house) at 530 MPa. These results were far superior to other tested products.

With this extraordinary strength and the highest filler content, at 86 % by weight, Grandio blocs is a guarantee for durable restorations.

Biaxial flexural strength

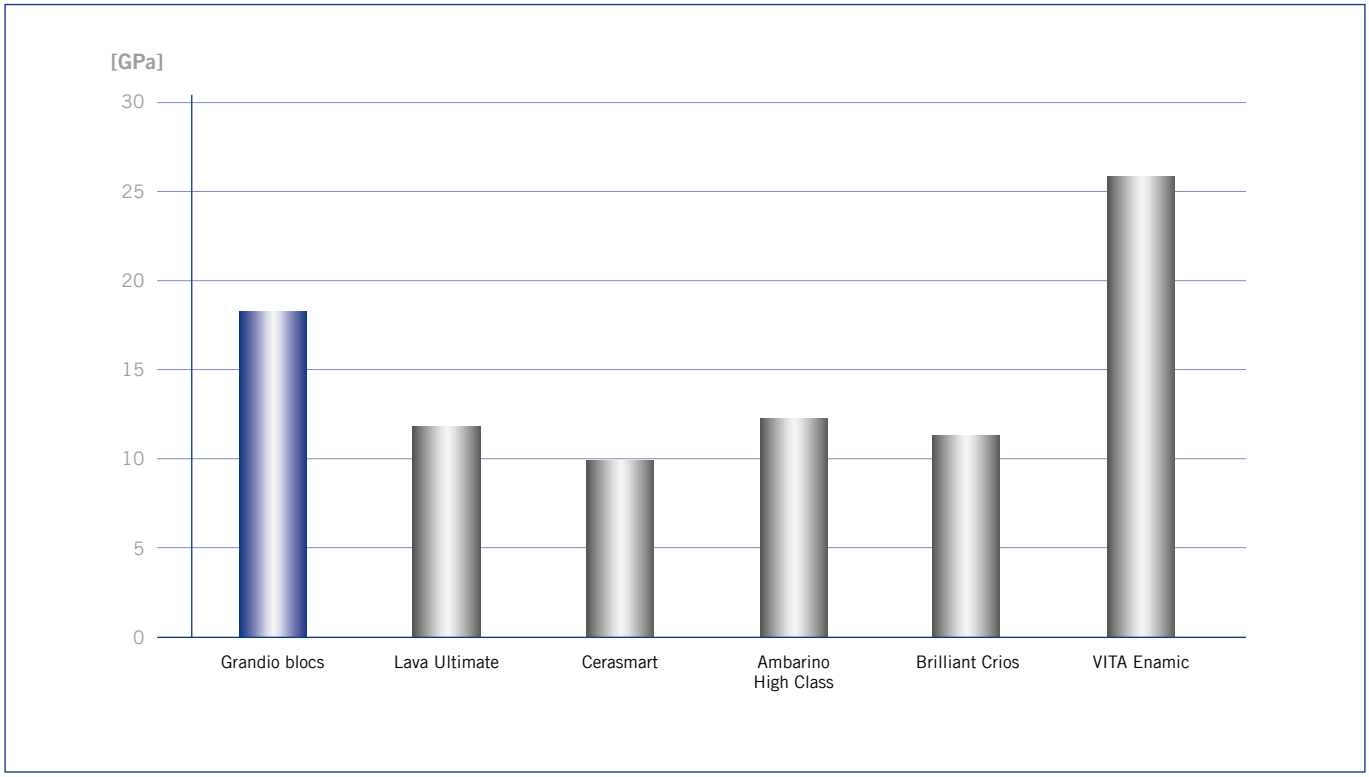


Source: Two-body Wear Behavior of Nano-hybrid Technology Produced CAD / CAM Composite-resin Blocks C. Lyu, J. Geis-Gerstorfer et al, J Dent Res Vol 96 (Spec Iss A): 1002, 2017 (www.iadr.org)

Similar to natural tooth substance

The modulus of elasticity is a measure of the resistance that a material exerts against its deformation. In the best case scenario, it should be the same as that of natural tooth substance. Grandio blocs also achieves this with ease, and thus offers not only extremely high strength, but also the similarity to natural tooth substance desired by practitioners.

Modulus of elasticity

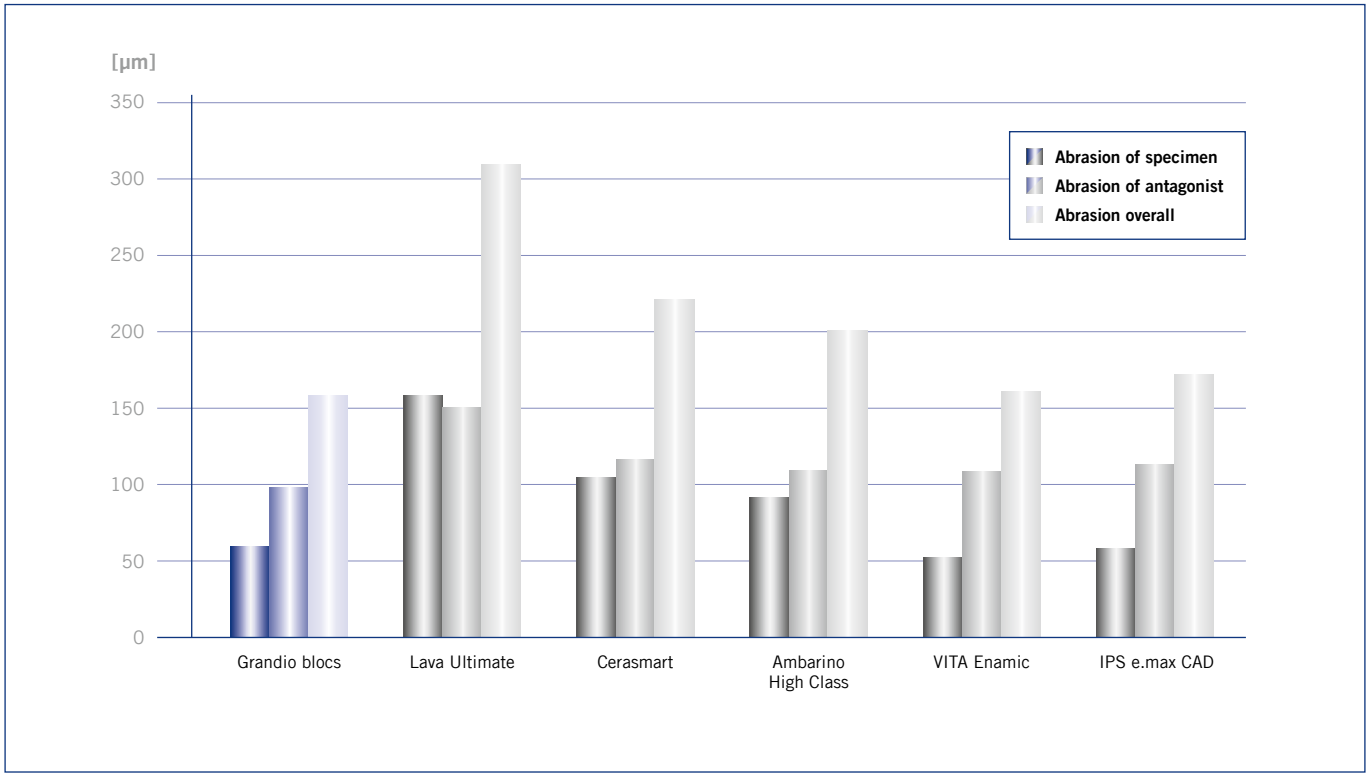


Source: Spintzyk, S.; Geis-Gerstorfer, J. et al, 4th EuroBioMat, Weimar, 2017

Antagonist-friendly

The two-body wear test shows that Grandio blocs demonstrates similarly low abrasion to lithium disilicate and, in addition, is antagonistfriendly.

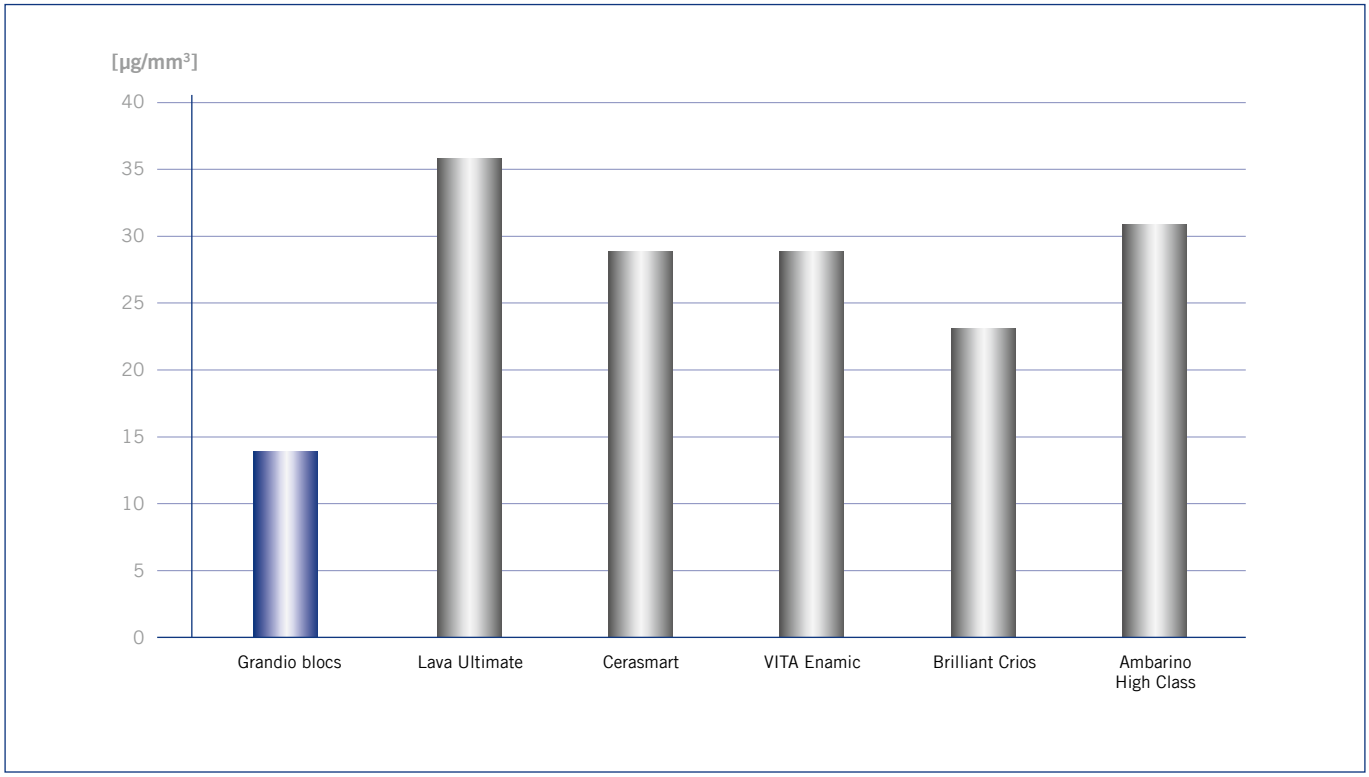
Two-body wear



Source: Two-body Wear Behavior of Nano-hybrid Technology Produced CAD / CAM Composite-resin Blocks C. Lyu, J. Geis-Gerstorfer et al, J Dent Res Vol 96 (Spec Iss A): 1002, 2017 (www.iadr.org)

Compared to other CAD / CAM materials Grandio blocs has an extremely low water absorption, which stands for a higher quality of the restoration and as well for an increased longevity.

Water absorption

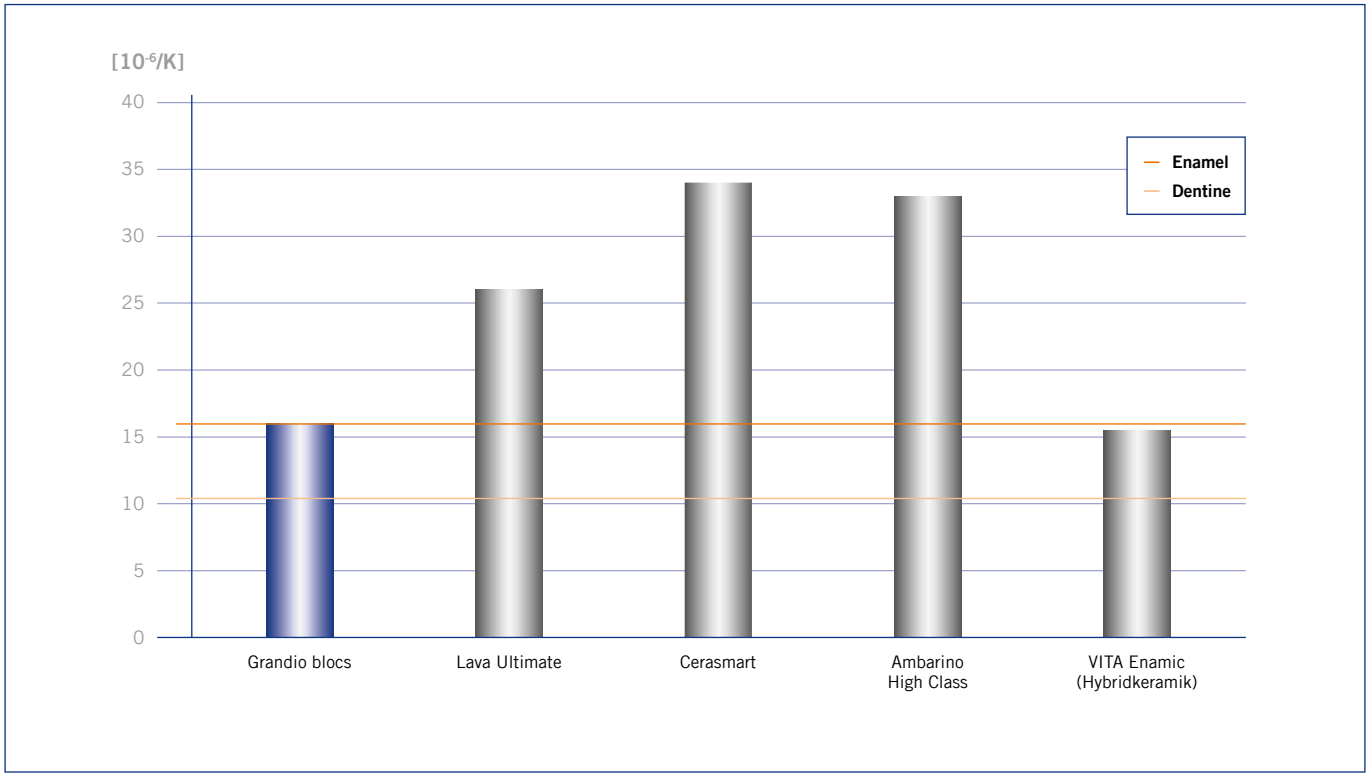


Source: as per ISO 4049, VOCO, 2017

Like most materials, composites expand when heated and contract when they cool again. This behaviour is also true of human teeth. Teeth and restoratives expand when we consume hot food and drinks.

If the expansion of the restoration (crown) is greater than that of the tooth itself, a tensile force develops at the adhesive bond. The study conducted by Wolter et al. revealed that Grandio blocs comes close to the values recorded for natural tooth substance (cf. Xu et al., 1989).

Coefficient of thermal expansion



Source: H. Wolter et al., Fraunhofer ISC Würzburg, report to VOCO, 2016

9. Technical data / dimensions

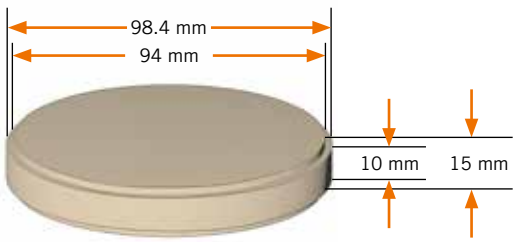
Grandio blocs / disc		
Biaxial flexural strength	333 MPa	University of Tübingen
Vickers hardness [HV]	154.6	University of Tübingen
Two-body wear (specimen)	59.9 µm	University of Tübingen
Two-body wear (antagonist)	98.1 µm	University of Tübingen
Filler content	86 % w/w	DIN 51081
Coefficient of thermal expansion	$16.0 \cdot 10^{-6} K^{-1}$	ISC Würzburg
Compressive strength	530 MPa	As per ISO 9917
Modulus of elasticity	18.28 GPa	
Water absorption	13.6 µg/mm³	As per ISO 4049
Water solubility	< 0.1 µg/mm³	As per ISO 4049
Radiopacity	308 %Al	As per ISO 4049

Grandio® blocs is available in two sizes

12 – for small restorations such as inlays

14L – for larger restorations such as crowns

Grandio® disc



10. Presentation Grandio® blocs / Grandio® disc

Presentation Grandio® blocs

REF 6000 Set blocks
2 × No. 12 (A2 LT, A3 HT), 3 × No. 14L (A3 LT, A3 HT, A3.5 LT), Bifix QM QuickMix syringe 10 g universal, Futurabond U *SingleDose* 5 pcs., Ceramic Bond bottle 5 ml, Dimanto set, accessories

Low translucent (LT)	**5 × No. 12**	**5 × No. 14L**
A1 LT	REF 6003	REF 6018
A2 LT	REF 6004	REF 6019
A3 LT	REF 6005	REF 6020
A3.5 LT	REF 6006	REF 6021
B1 LT	REF 6007	REF 6022
C2 LT	REF 6008	REF 6023
BL LT	REF 6009	REF 6024
High translucent (HT)	**5 × No. 12**	**5 × No. 14L**
A1 HT	REF 6012	REF 6027
A2 HT	REF 6013	REF 6028
A3 HT	REF 6014	REF 6029
A3.5 HT	REF 6015	REF 6030
Shade	**5 × No. 12**	**5 × No. 14L**
Mixed*	REF 6033	REF 6034

*(A1 LT, B1 LT, C2 LT, BL LT, A1 HT)

Presentation Grandio® disc

Low translucent (LT)	**1 × 15 mm, ø 98.4 mm**
A1 LT	REF 6050
A2 LT	REF 6051
A3 LT	REF 6052
A3.5 LT	REF 6053
B1 LT	REF 6054
C2 LT	REF 6055
BL LT	REF 6056
High translucent (HT)	**1 × 15 mm, ø 98.4 mm**
A1 HT	REF 6057
A2 HT	REF 6058
A3 HT	REF 6059
A3.5 HT	REF 6060

Should you have any further questions on the CAD / CAM materials, please do not hesitate to contact your local VOCO dental consultant or our customer service department on Freecall: 00 800 44 444 555

VOCO GmbH
Anton-Flettner-Straße 1-3
27472 Cuxhaven
Germany

Freecall: 00 800 44 444 555
Fax: +49 (0) 4721-719-140

info@voco.com
www.voco.dental

DIE DENTALISTEN