



Grandio® blocs · Grandio® disc

PROCESSING INSTRUCTIONS

Content

1. Introduction	3
2. Step-by-step instruction for the individualisation of Grandio blocs	4
2.1. Overview accessories	4
2.2. Incisor crown: Processing and luting	6
2.3. Incisor crown: Cut-back technique	12
2.4. Molar crown: Individual characterisation	15
3. Questions and answers	18
4. Indications	20
5. Shade selection	21
6. Approved devices for processing of Grandio blocs / Grandio disc	22
7. Clinical cases	23
8. Scientific data	24
9. Technical data / dimensions	30
10. Presentation Grandio blocs / Grandio disc	31

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 long-lasting and high aesthetic restorations with impressive properties.

Nano-ceramic hybrid materials specially designed for CAD / CAM use are equivalent products for many standard restorations as inlays, onlays, 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 individualisation, 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, individualisation and the adhesive luting of restorations made of Grandio blocs / disc.

There are no limits for your own creativity e.g. for the individualisation of an incisor crown and the results are visible instantly – without a burning step. Less production steps and a manageable number of (redating) instruments save time and lead to brilliant restorations which are economically for your business and please you and your patients

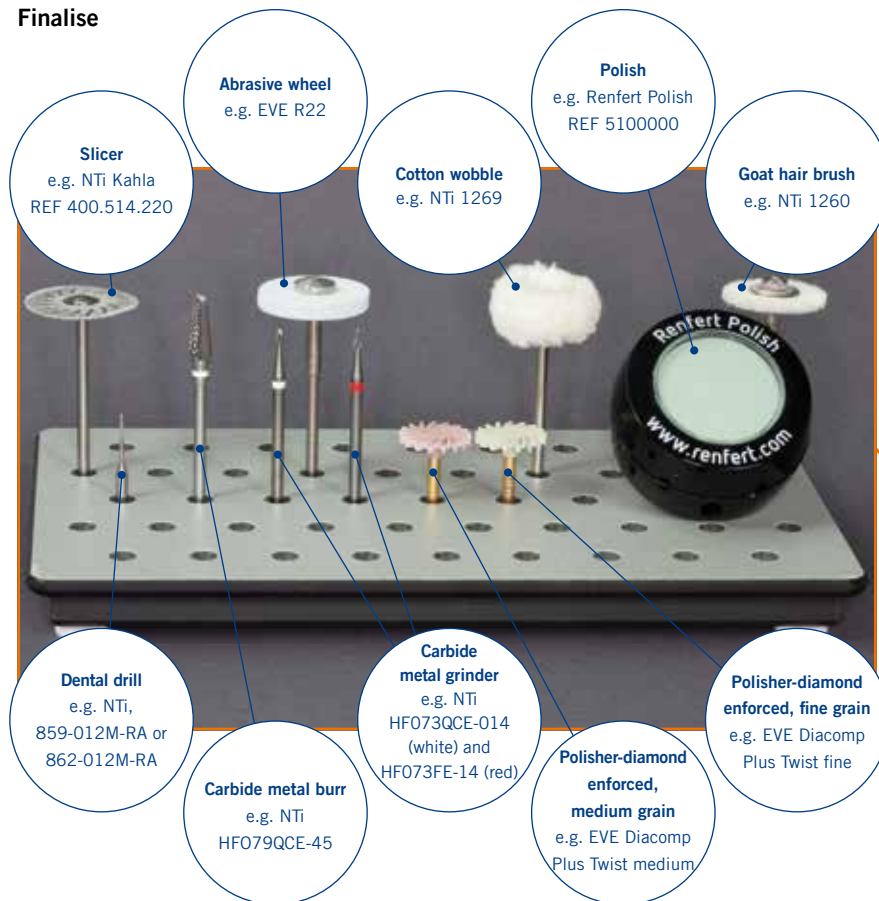
Good Luck!



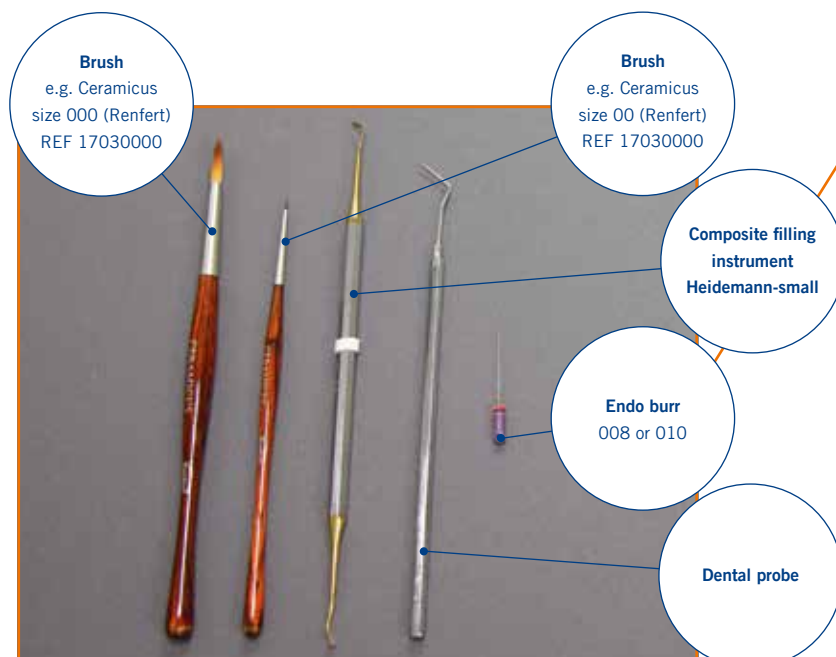
2. Step-by-step instruction for the individualisation of Grandio blocs

2.1. Overview accessories

Finalise



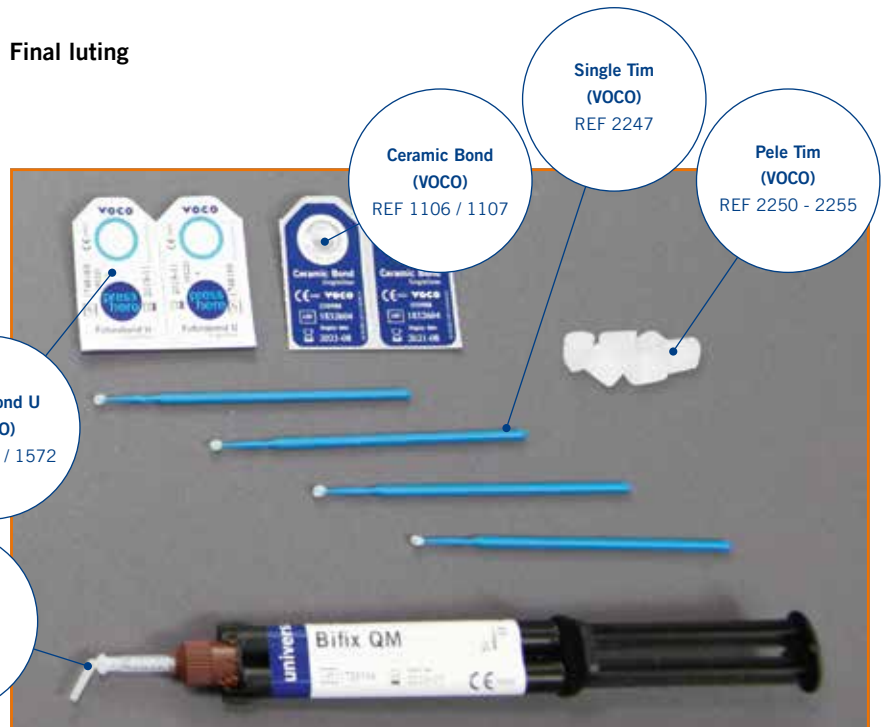
Individualisation – Instruments



Individualisation – Composite



Final luting



2.2. Incisor crown: Processing and luting



CAM restoration.

Notes on the use of multicolour restorations can be found on page 11



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



Grinding / smoothing with a fine tooting carbide metal grinder. Watch for possible contact points.



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



Smoothing 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.





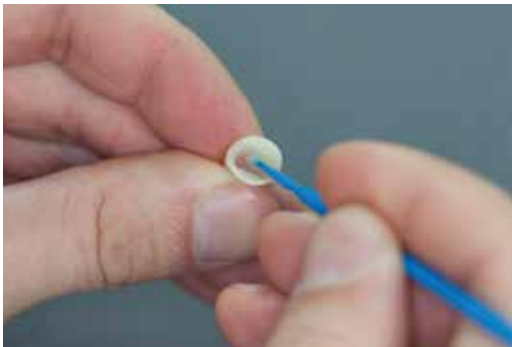
Finalisation with a cotton wobble.



Note
Disinfection of the restoration before try-in and final luting is mandatory



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



Apply Ceramic Bond all over 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 onto 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 setting time of Bifix QM is 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 of the dual-curing luting cement is possible.

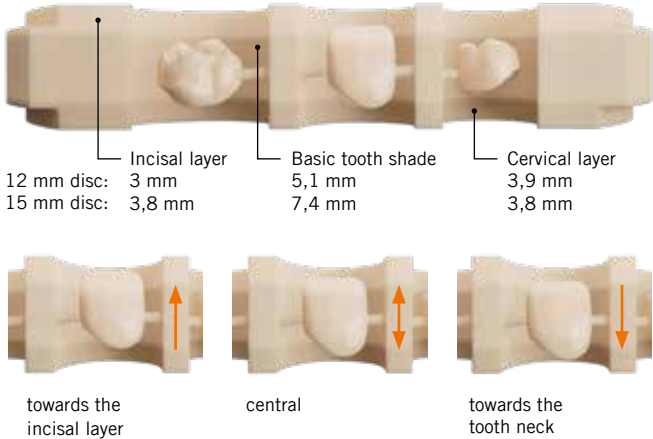


High-aesthetic result after luting.

Notes for the use of Grandio disc multicolor

Depending on the degree of customisation, the restoration can be moved within the three layers in the nesting software.


Note
The bars should be positioned centrally in the disc.



2.3. Incisor crown: Cut-back technique

Grandio blocs / disc may be individualised quick and easy for high aesthetic demands. GrandioSO Flow / Heavy Flow in combination with Final Touch allow a quick and simple individualisation of any restoration using pure light curing.



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

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 individualisation is desired must be sandblasted (Al_2O_3 , 50 μm , air pressure 1,5 - 2 bar) prior to the individualisation steps.

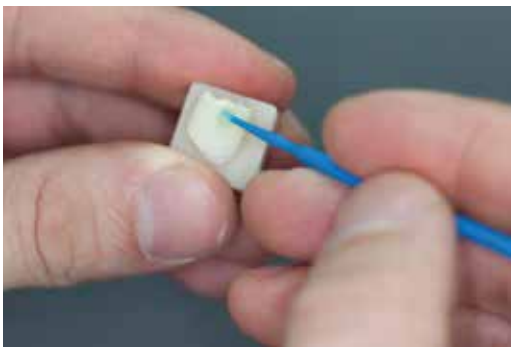


Note

Mandatory 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 entire surface of the restoration



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 individualisation.

Find more composites in 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.



Fixation of different flowable composites respectively of different flow layers by light curing in between.



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

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



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

2.4. Molar crown: Individual characterisation



Finalise the fissures with a carbide metal burr or diamond burr. Clean the restoration afterwards.



Note

Wet the entire surface of the restoration



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 can be used „pure“ or as a colour mixture, especially with the colour “white” for the individualisation of fissures, incisal edges and tooth necks. Always use the colours very economically!



Note
Ambient light



Apply Final Touch with a fine ceramic brush. Alternatively, fine Endo instruments can be used.



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



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

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



Grade of individualisation



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.

For non-listed devices, please contact your CAD / CAM system provider.

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

Grandio blocs / disc have to be milled 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 are restorations made from Grandio blocs / disc finally luted?

The restorations must be luted exclusively 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 exclusively 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 chosen by the dentist?

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

- roanding inner edges and borders
- shoulder preparation with roanded inner edges and borders respectively a chamfer preparation

Do the restorations need to be 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 silane covering onto 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 be prepared before the 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 of the restoration.

Why do individualised fissures have to be covered with a composite?

Most of the available composite individualisation colours only show a low resistance 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 individualisation with light-curing composites. This technique is an easy and cost-effective technique for high aesthetic 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?

Medical 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 as intraorally. For best results a two-step polishing system for highly-filled composites is recommended.

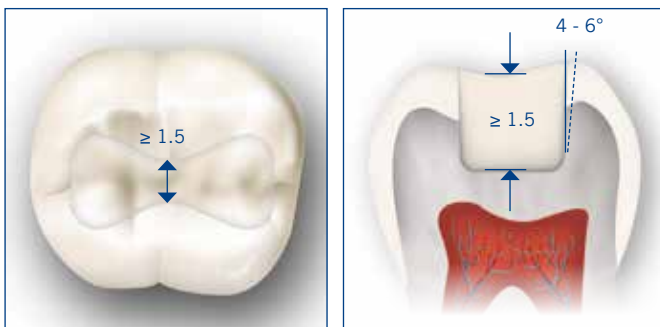
4. Indications

Crowns, inlays, onlays, veneers

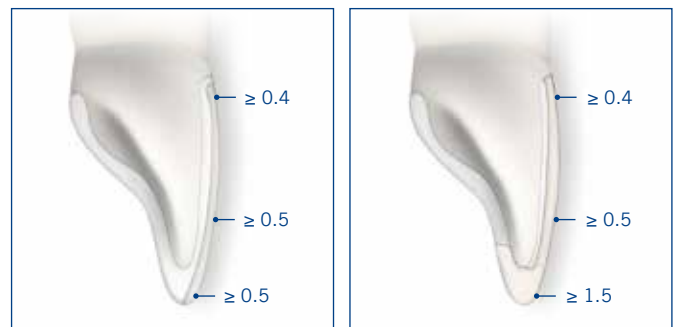
Implant-supported crowns

Minimum wall thickness for restorations

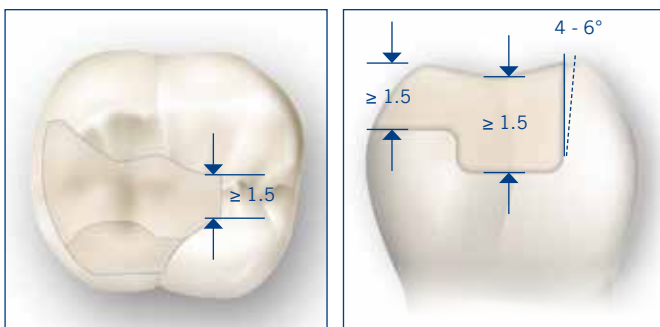
Inlay



Veneer

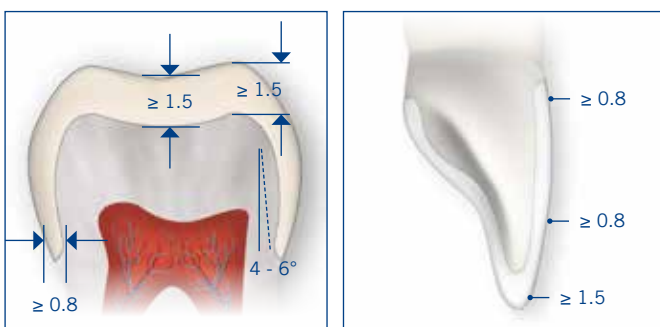


Onlay

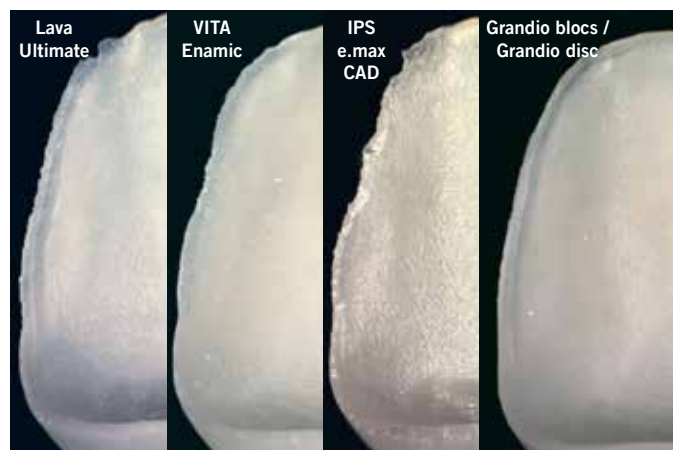


Cement space: $70 \mu\text{m} (\pm 10 \mu\text{m})$

Crown



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.



Source: Internal pictures, veneer 0.6 mm

5. Shade selection

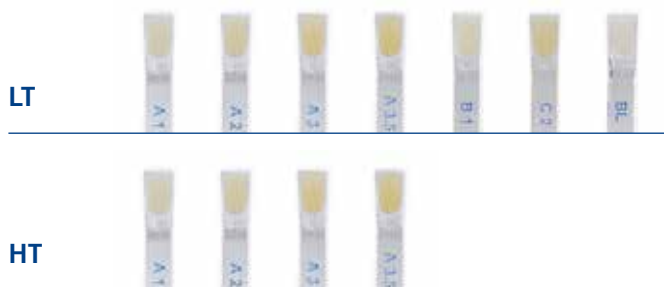
Use the VITA® shade system (e.g., GrandioSO shade guide) to determine the shade against the cleaned but unprepared tooth prior to anaesthesia and preferably in daylight conditions.

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:

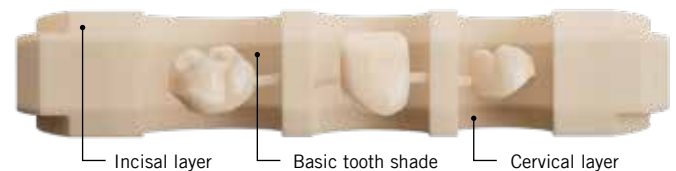
- Colour of the core
- Layer thickness of the restoration
- Colour and translucency of the restorative
- Colour of the luting material

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.

Grandio disc multicolor

A1, A2, A3, A3.5, B1, C2 (basic tooth shade)





The different positioning of the restoration determines individualisation with optional accentuation of the incisal or cervical area:





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






	vhf camufacture www.vhf.de	
	Grandio blocs	Grandio disc
Machine type	S1, S2, S5, K4, K4 edition, K5, K5+, R5, Z4, N4, N4+, E4, Z4	S1, S2, S5, K4, K4 edition, K5, K5+, R5, E5
Modus	Grandio blocs (wet)	Grandio disc / Grandio disc multicolor (wet + dry)
Type of processing	Grinding	Grinding + Milling
Software	DentalCAM 7	DentalCAM 7


	Zirkonzahn www.zirkonzahn.com	
	Grandio blocs	Grandio disc
Machine type	Milling Unit M (M1–M5)	M2, M2 Dual, M4, M6 (98 holder)
Modus	Composite glass (wet)	Glass95 (wet)
Type of processing	Grinding	Machinable with grinder
Software	Zirkonzahn Nesting	Zirkonzahn Nesting

	imes-icore www.imes-icore.de	
	Grandio blocs	Grandio disc
Machine type	CORITEC 150i–650i series, One/+ series	CORITEC 150i–650i series, One+
Modus	Grandio blocs (wet)	Composite (wet, dry on request imes-icore support)
Type of processing	Grinding	Milling
Software	icam V4.7 / V5 smart	icam V4.7 / V5 smart


	Amann Girrbach www.amanngirrbach.com	
	Grandio blocs	Grandio disc
Machine type	Ceramill Motion 2, Ceramill Motion 2 DNA, Ceramill Motion 3, Ceramill Matik, Ceramill Matron, Ceramill Mikro 5x & 4x DNA, Ceramill Motion DRS, Ceramill Mikro IC (Cerec adapter with block holder)	Ceramill Motion 2 DNA, Ceramill Motion 3, Ceramill Matik, Ceramill Matron (Ceramill Material 98)
Modus	Hybrid (wet)	Grandio disc (wet + dry)
Type of processing	Grinding	Grinding + Milling
Software	Cermill Mind	Cermill Mind

	Roland DG www.dgshape.com	
	Grandio blocs	Grandio disc
Machine type	DWX-4, -42W, -51D, -52D, -52DC, -52DCi, -53D, -53DC	DWX-51D, -52D, -52DC, -52DCi, -52Di, -53D, -53DC
Modus	Hybrid Ceramic (wet)	Composite (wet, optional dry)
Type of processing	Grinding	Grinding + Milling
Software	Millbox	Millbox

 by 	Dental Machine by TECNO-GAZ		www.dentalmachine.it
	Grandio blocs		Grandio disc
Machine type	A5, C5 PLUS, G5, VECTOR, VECTOR LOADER, VORTEX, AXYMAT, AXYLAB		A5, C5 PLUS, G5, VECTOR, VECTOR LOADER, VORTEX, AXYMAT, AXYLAB
Modus	Grandio blocs (wet + dry)		Grandio disc (wet + dry)
Type of processing	Grinding		Milling
Software	Millbox		Millbox

	Planmeca		www.planmeca.com
	Grandio blocs for PlanMill		Grandio disc
Machine type	PlanMill 30 S / 35 S / 40 S / 60 S		PlanMill 60 S
Modus	Grandio blocs		Composite
Type of processing	Grinding		Milling
Software			

	exocad GmbH		www.exocad.com
	Grandio blocs		Grandio disc
Software	DentalCAD / Chairside CAD*		DentalCAD*

	3Shape		www.3shape.com
	Grandio blocs		Grandio disc
Software	Dental System**		Dental System**

10/2024, updated continuously, www.voco.dental/devicesgrandio *VOCO material data for exocad are available at exocad DentalShare or can be obtained from VOCO Digital Support (digitalsupport@voco.com) **VOCO material data (.dme's) are available at VOCO Digital Support (digitalsupport@voco.com)

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 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

Adhesive luting

Luting of Grandio blocs / disc is always carried out using an adhesive luting system. Bifix QM, in combination with Futurabond U and Ceramic Bond, is the system of choice for ensuring that the highest standards are also met in this respect. Bifix QM is a universal dual-curing luting material, which, when used together with the state-of-the-art universal adhesive Futurabond U and the silane coupling agent Ceramic Bond, achieves a long-term bond which your patients can rely on completely.



Source: Prof. Dr. Jürgen Manhart, Munich / Germany

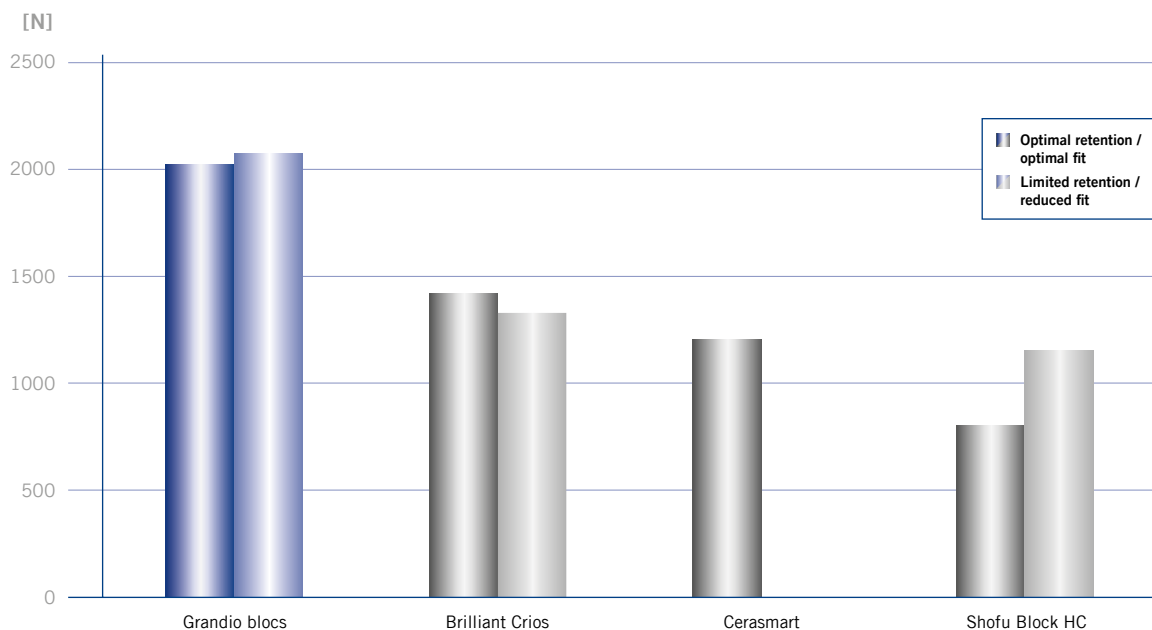
8. Scientific data

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, $1,2 \times 10^6$ cycles)



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

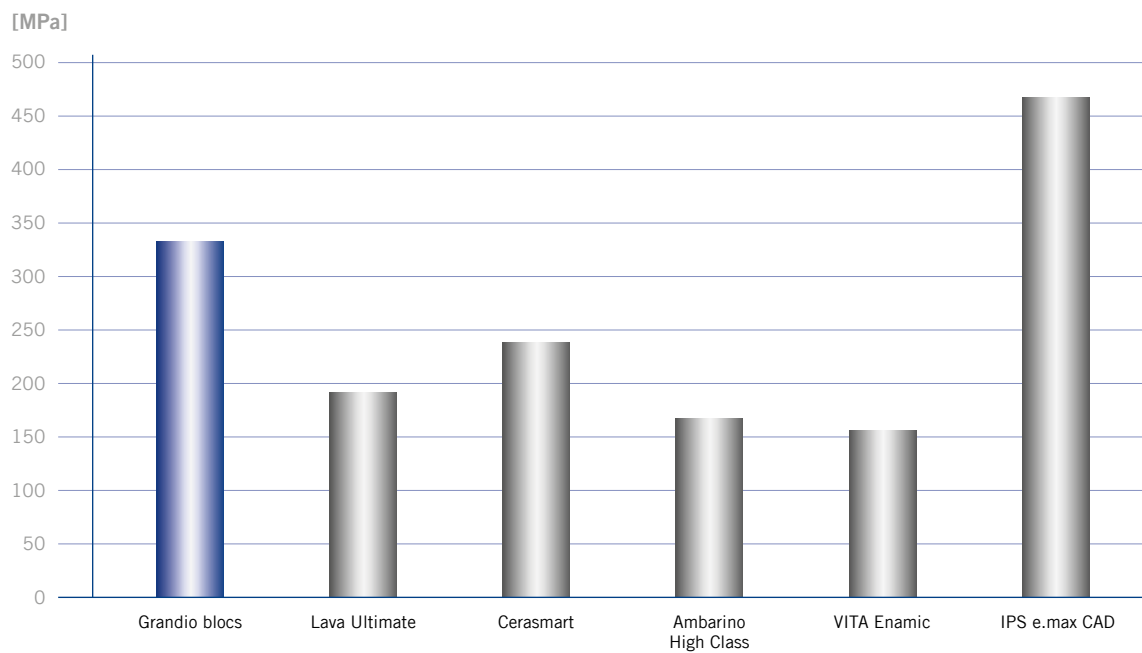
Brilliant Crios, Cerasmart and Shofu Block HC are not registered trademarks of VOCO GmbH.

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)

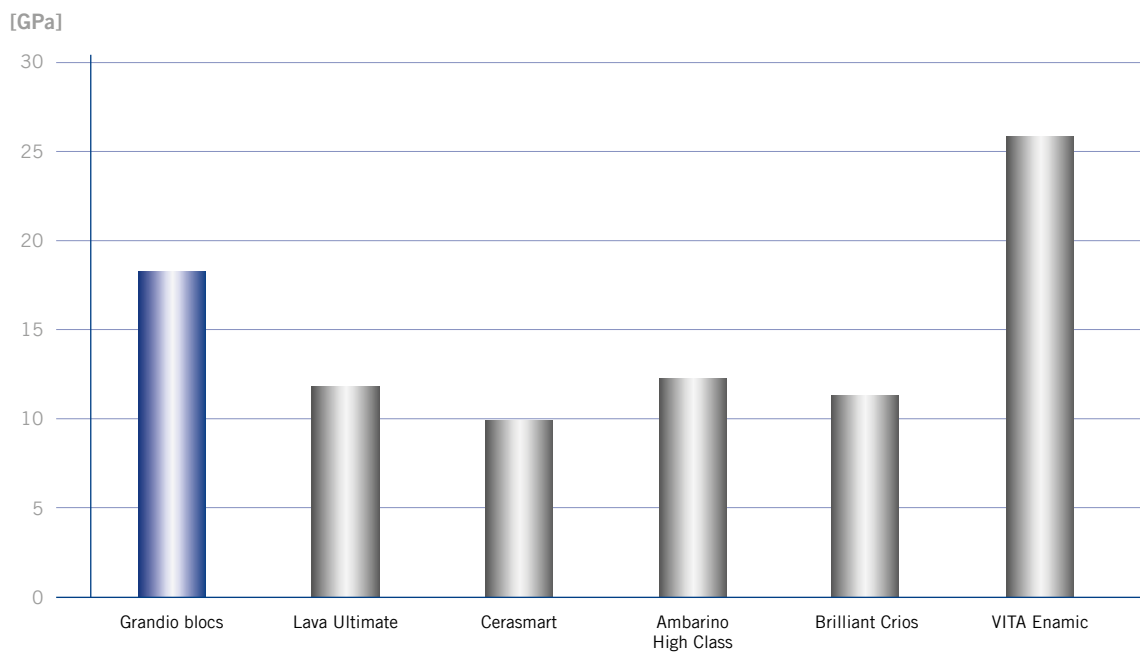
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Similar to natural tooth substance

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



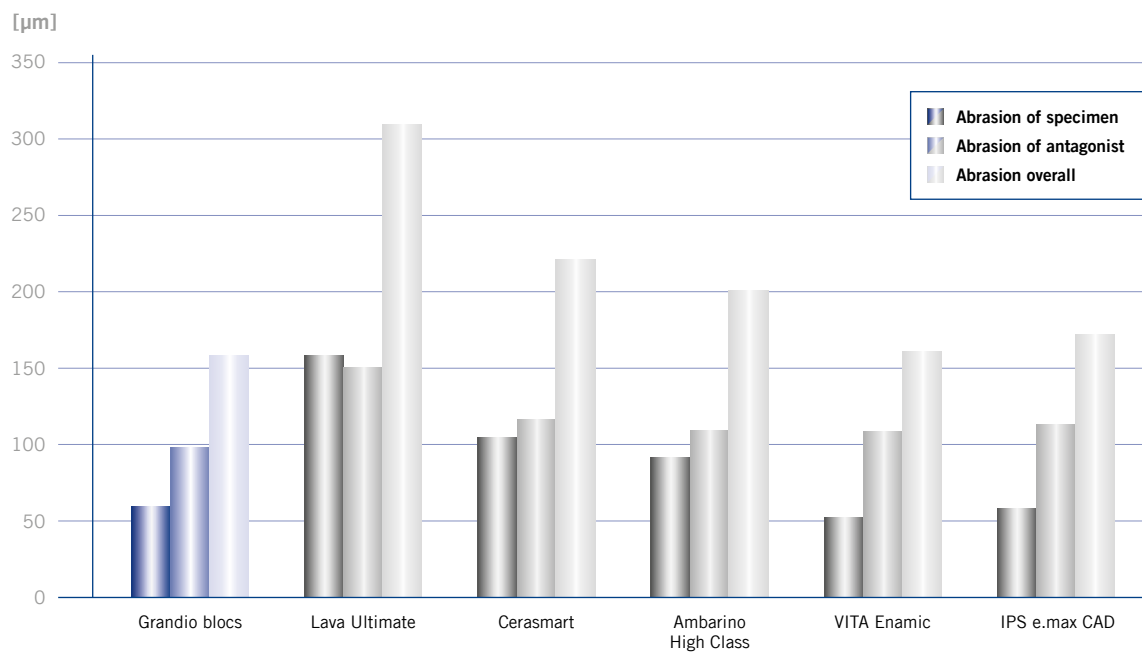
Source: Spintzyk, S.; Geis-Gerstorfer, J. et al, 4th EuroBioMat, Weimar, 2017

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Antagonist-friendly

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

Two-body wear

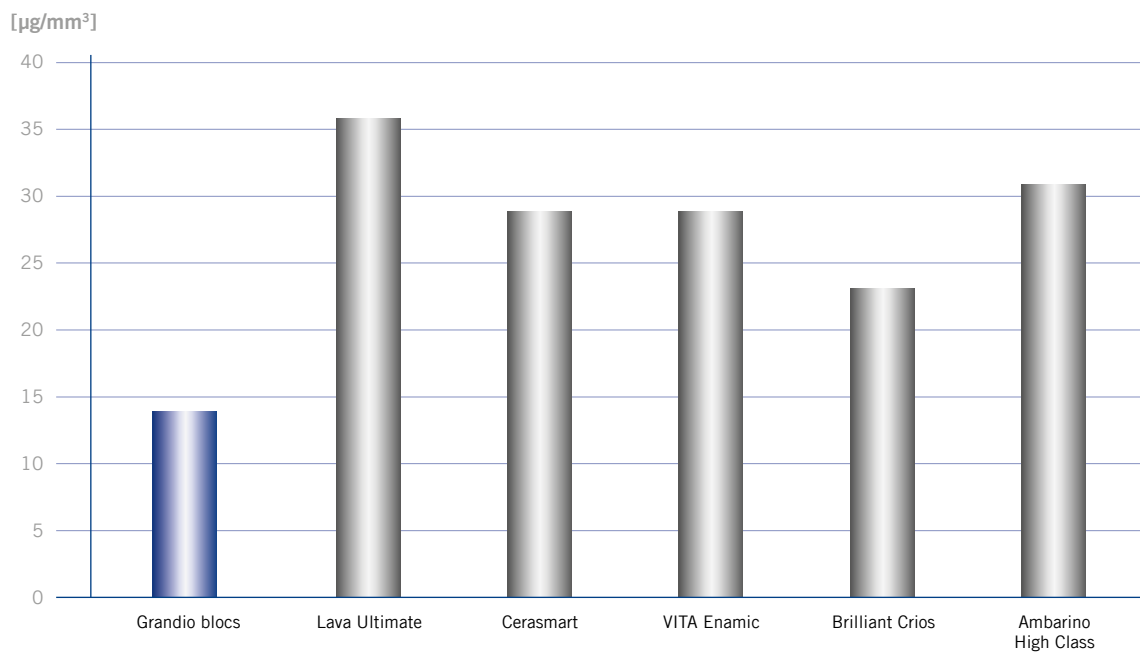


Source: Two-body Wear Behavior of Nano-hybrid Technology Produced CAD / CAM Composite-resin Blocks C. Lyu, J. Geis-Gerstorfer et al, J Dent Res Vol 96 (Spec Iss A): 1002, 2017 (www.iadr.org)

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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

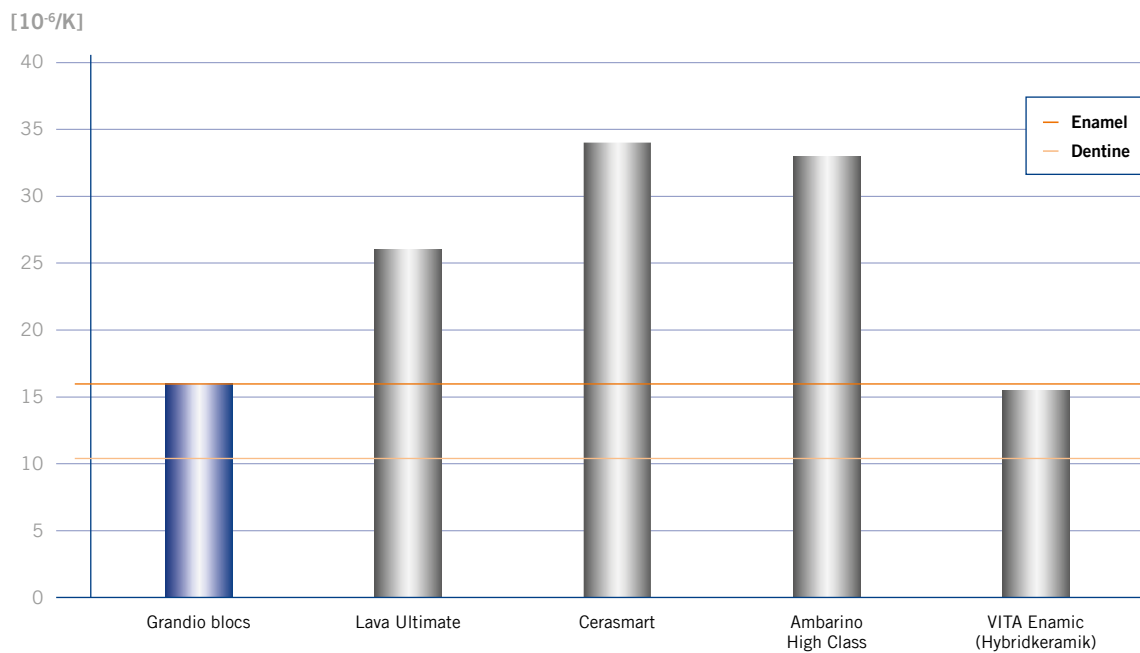


Source: as per ISO 4049, VOCO, 2017

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

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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	$16.0 \cdot 10^{-6} \text{K}^{-1}$	ISC Würzburg
Compressive strength	530 MPa	As per ISO 9917
Modulus of elasticity	18.28 GPa	
Water absorption	$13.6 \mu\text{g}/\text{mm}^3$	As per ISO 4049
Water solubility	$< 0.1 \mu\text{g}/\text{mm}^3$	As per ISO 4049
Radiopacity	308 %Al	As per ISO 4049

Grandio® blocs is available in two sizes

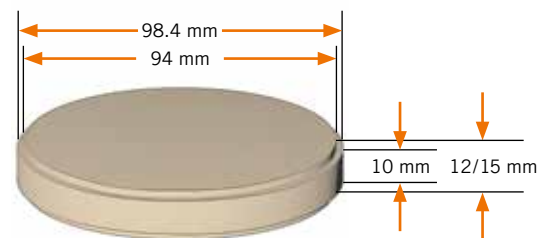
12 – for small restorations such as inlays



14L – for larger restorations such as crowns



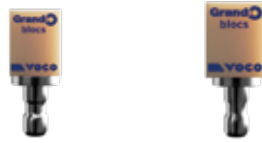
Grandio® disc



10. Presentation Grandio® blocs / Grandio® disc

Grandio® blocs

Universal



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

PlanMill®



Low translucent (LT)	5 × No. 12	5 × No. 14L
A1 LT	REF 6153	REF 6168
A2 LT	REF 6154	REF 6169
A3 LT	REF 6155	REF 6170
A3.5 LT	REF 6156	REF 6171
B1 LT	REF 6157	REF 6172
C2 LT	REF 6158	REF 6173
BL LT	REF 6159	REF 6174
High translucent (HT)	5 × No. 12	5 × No. 14L
A1 HT	REF 6162	REF 6177
A2 HT	REF 6163	REF 6178
A3 HT	REF 6164	REF 6179
A3.5 HT	REF 6165	REF 6180

Grandio® disc

Low translucent (LT)	5 × No. 12
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)	5 × No. 12
A1 HT	REF 6057
A2 HT	REF 6058
A3 HT	REF 6059
A3.5 HT	REF 6060



Grandio® disc multicolor

12 mm disc:
Available from
01.04.25

Basic tooth shade	1 × 12 mm, ø 98 mm	1 × 15 mm, ø 98 mm
A1	REF 6248	REF 6216
A2	REF 6249	REF 6217
A3	REF 6250	REF 6218
A3.5	REF 6251	REF 6219
B1	REF 6252	REF 6220
C2	REF 6253	REF 6221



Should you have any further questions on the CAD / CAM materials, please do not hesitate to contact your local VOCO dental consultant or our CAD / CAM customer service digitalsupport@voco.com.

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