zolid

AMANNGIRRBACH

DE

DENTISTRY UNIFIED

Highly esthetic and precisely fitting restorations made of Zolid zirconia

Zolid Processing Techniques

INTRODUCTION

Overview Zolid Product Portfolio

Zolid zirconia – a promise of flexible solutions

100 % manufactured in-house

10 Mio units clinically proven

open for all systems

100 % Made in Austria

10 YEARS WARRANTY zolid ZIRCONIA

Zirconia impresses with its technical and optical properties and is versatile in its applications. The zirconia blanks of the Zolid brand from Amann Girrbach are developed and produced in Austria and offer the right material for every indication, enabling cost-effective restorations with high stability and natural esthetics.

Portfolio	ZOLID BION	ZOLID FX MULTILAYER	ZOLID LUNARIS	ZOLID GEN-X	ZOLID HT+ PRESHADES	ZOLID HT+ WHITE	CERAMILL ZI	ZOLID DRS
Material-Type	Multilayer 4Y-TZP & 5Y-TZP	Multilayer 5Y-TZP	Multilayer 3Y-TZP & 4Y-TZP	Multilayer 4Y-TZP	Preshade 4Y-TZP	White 4Y-TZP	White 3Y-TZP	Multilayer 4Y-TZP
Translucency	Super High 45 - 49 %	Super High 49 %	High 46 %	High 45 %	High 45 %	High 45 %	Low 35 %	High 45 %
Strength*	1.100 MPa	700 MPa	1.000 MPa	1.000 MPa	1.000 MPa	1.100 MPa	1.200 MPa	1.100 MPa
Colors	16 VITA-Colors, BL0 - BL4	16 VITA-Colors, Bleach	16 VITA-Colors, BL0 - BL4	16 VITA-Colors, BL1 & BL3	16 VITA-Colors, Bleach	White	White	16 VITA-Colors, BL1 & BL3
Heights	12, 14, 16, 18, 20, 25, 30 mm	14, 16, 20 mm	12, 14, 16, 18, 20, 25, 30 mm	12, 14, 16, 18, 20, 25 mm	14, 16, 20 mm	10, 12, 14, 16, 18, 20, 25 mm	10, 12, 14, 16, 18, 20, 25 mm	Blocs: C20, B40

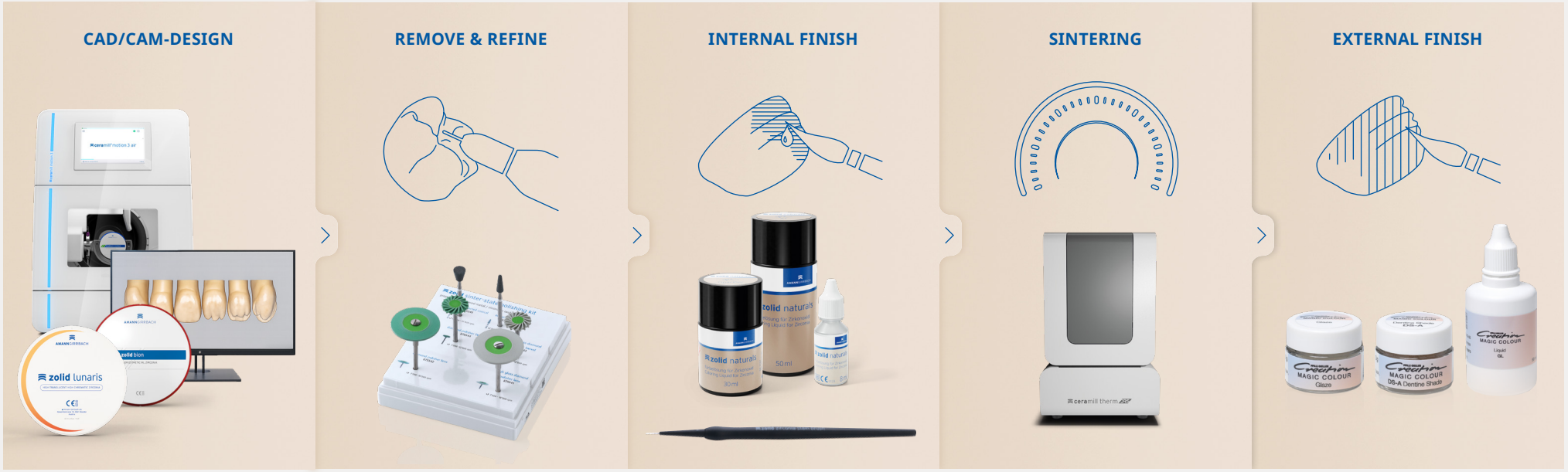
* Average of three-point bending test as defined in DIN EN ISO 6872, R&D Amann Girrbach

Optimized workflows for maximum patient satisfaction

As esthetics are not happenstance

Amann Girrbach's Esthetic Management encompasses products and solutions required for every step of the zirconia workflow. The focus is on efficient, simple, and reproducible processes for the user – delivering highly esthetic results and high patient satisfaction.

Step by step, the clearly illustrated processing technique and numerous video tutorials guide users through the workflow. In addition, a wide range of courses and online webinars is available. New products and tools further support users by significantly simplifying daily work with zirconia.



Adjustment of existing parameters

Processing techniques and indications

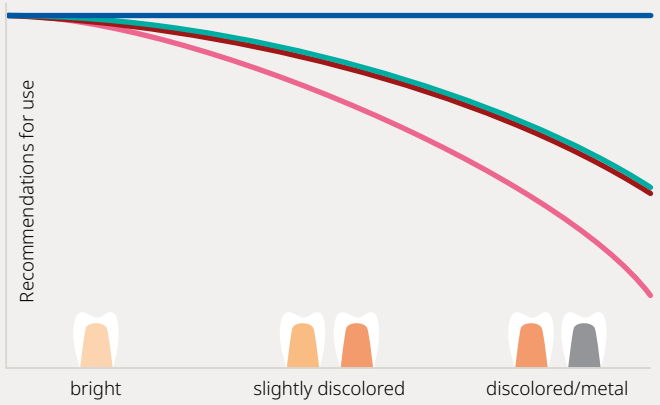
The optimal zirconia for a given indication is determined by a variety of factors. Esthetic requirements, the size of the restoration, or the stump shade all significantly influence the choice of material. The more precisely stump shade, material, and indication are coordinated with one another, the more predictable and esthetically accurate the final result can be achieved

		ZOLID BION	ZOLID FX MULTI-LAYER	ZOLID LUNARIS	ZOLID GEN-X	ZOLID HT+ PRESHADES	ZOLID HT+ WHITE	CERAMILL ZI	ZOLID DRS
Design recommendation	Monolithic	○	○	○	○				○
	Cut-Back/ Partial Layering	○	○	○	○	○	○		○
	Reduced frameworks	○	○	○	○	○	○	○	
Indication recommendation	Veneer	○	○	○					
	Inlay/Onlay	○	○	○	○				○
	Single Crowns	○	○	○	○	○	○	○	○
	3-unit bridges	○	○	○	○	○	○	○	○
	multi-unit bridges	○		○	○	○	○	○	
	Abutments	○	○	○	○	○	○	○	○

Tips & important notes

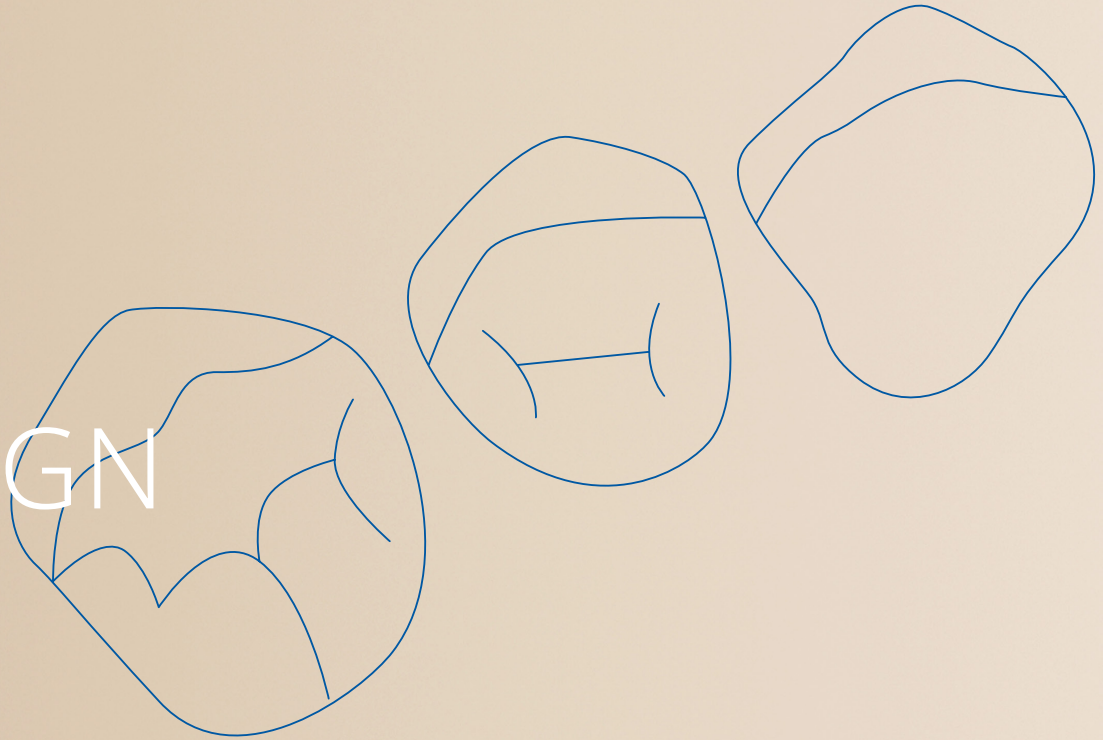
✓ In combination with the Zolid Naturals Opacifier, highly translucent materials such as, for example, Zolid FX Multilayer can also be used for discolored/ metallic stumps.

RECOMMENDATIONS FOR USE OF AMANN GIRRBACH ZIRCONIUM OXIDE IN TERMS OF STUMP SHADE AND DEGREE OF TRANSLUCENCY



- **LT** / Ceramill ZI
- **HT+** / Zolid Lunaris, Zolid Gen-X, Zolid HT+ White, Zolid HT+ PS, Zolid DRS
- **SHT/HT+** / Zolid Bion
- **SHT** / Zolid FX ML

CAD/CAM-DESIGN



The foundation for good success

CAD/CAM Design

During the CAD/CAM design of crowns and bridges certain parameters already have to be considered.

STUMP PREPARATIONS

Some important points apply when using a model (plaster, CAD/CAM fabricated model).

Tips & important notes

- ✓ Use scannable plaster or CAD/CAM model material
- ✓ Never mark the preparation margin with a pencil before scanning, this will lead to a deterioration of the scanning results
- ✓ Sharp edges should be blocked out in the CAD software. The cement gap can be increased specifically with the help of the brush instrument

MINIMUM WALL THICKNESSES AND CONNECTOR CROSS-SECTION

It is essential to observe the following minimum wall thicknesses and connector cross-sections when designing Zolid restorations. Minimum wall thickness and connector cross-section depend on the material and indication.

MATERIAL PARAMETERS FOR ZOLID SHT / HT+ / LT – UP TO MAX. 3-PONTIC BRIDGE

INDICATION	ANTERIOR REGION				POSTERIOR REGION			
	Wall thickness (mm)		Connector cross-section SHT	Connector cross-section HT+/LT	Wall thickness (mm)		Connector cross-section SHT	Connector cross-section HT+/LT
	incisal/occlusal	circular			incisal/occlusal	circular		
Single tooth-	0,5	0,5	-	-	0,5	0,5	-	-
3-pontic bridges and 1 pontic	0,5	0,5	>12	>7	0,7	0,5	>12	>9

MATERIAL PARAMETERS FOR ZOLID HT+ / LT – UP TO 14-PONTIC BRIDGE*

INDICATION	ANTERIOR REGION			POSTERIOR REGION		
	Wall thickness (mm)		Connector cross-section HT+/LT	Wall thickness (mm)		Connector cross-section HT+/LT
	incisal/occlusal	circular		incisal/occlusal	circular	
As of a 4-pontic bridge and a maximum of 2 pontics	0,7	0,5	>9	1,0	0,7	>12
As of a 4-pontic bridge and a maximum of 3 pontics	0,7	0,5	>9			
Cantilever bridge and one cantilever pontic				1,0	0,7	>12

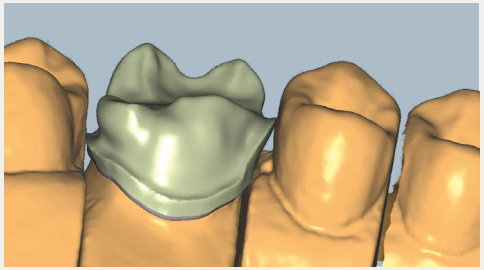
* Excluded Zolid DRS

SHT = Zolid FX, Zolid FX Multilayer | HT+ = Zolid HT+, Zolid HT+ Preshade, Zolid Gen-X, Zolid DRS, Zolid Bion, Zolid Lunaris | LT = Ceramill ZI

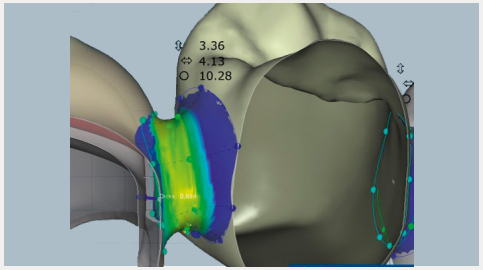
Clean data sets lead to success

Design of the restorations

In addition to minimum wall thickness and connector cross section, which must be strictly complied with during the fabrication of Zolid restorations, it is essential to also observe other points:



Supportive design in the area of the cusps and the proximal contact for the subsequent veneering ceramic.



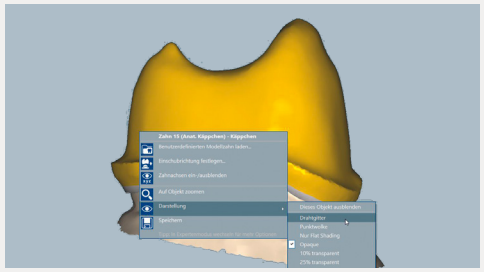
Display of an optimal connector cross-section

Tipps & wichtige Hinweise

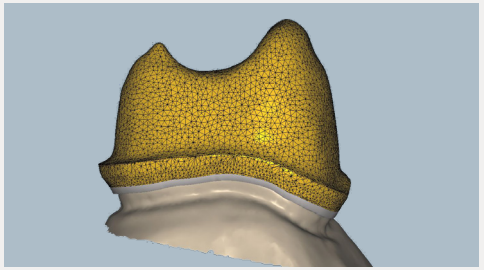
- ✓ Avoid sharp edges and corners during restoration design
- ✓ Smooth sharp edges again after the function “Shrinking the anatomy”
- ✓ Cusp-supporting design for later use of veneering ceramics
- ✓ Support of the veneering ceramic is also recommended for proximal contacts
- ✓ The transition from the connector to the abutment crown should be kept as wide as possible

TIPS FOR A “CLEAN” DATA SET

To give precise milling results, “clean” STL data sets should be generated and transferred to the CAM software. Once the final design has been defined, the following steps should be followed.



Change display to “wireframe”



- Select the “Smooth” function in the free-form area
- Reduce the amount of smoothing
- Then smooth the surface of the restoration such that the grid surface is as small and even as possible.

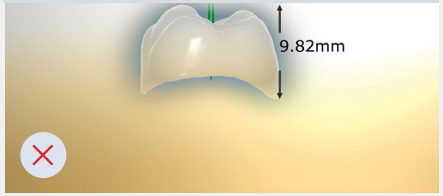
Proportions in focus

Nesting of multilayer blanks

GENERAL INFORMATION

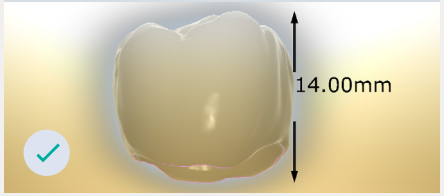
The following applies in general to the nesting of Zolid Bion, Zolid Lunaris, and Zolid Gen-X: Under no circumstances should low restorations be nested in blanks that are too high, and vice versa, as otherwise the correct coloration with the desired color gradient will not be achieved.

A low restoration nested in an oversized blank, e.g. 20 mm



The shade gradient is not displayed correctly. The tooth shade appears either too light or too dark — depending on the nesting position.

Optimal ratio of crown height to blank height, with approximately 1 mm clearance to the upper and lower blank surfaces.



The shade gradient is displayed correctly. The tooth shade appears accurate.

NESTING OF 25/30 MM BLANKS OF THE TYPE ZOLID GEN-X / ZOLID BION / ZOLID LUNARIS

Upper part of the blank:
The shade gradient (layer concept) corresponds to that of a 16 mm blank for Zolid Gen-X or a 20 mm blank for Zolid Bion and Zolid Lunaris.

Lower part of the blank: No shade gradient; instead, it is homogeneously colored/filled (preshaded). Restorations with a gingiva portion should therefore be nested in such a way that only the gingiva portion lies within the lower, fully shaded half of the blank.

25mm Zolid Gen-X

Corresponds to the 16 mm distribution (multilayer), then filled up (preshade).

25mm Zolid Lunaris

Corresponds to the 20 mm distribution (multilayer), then filled up (preshade).

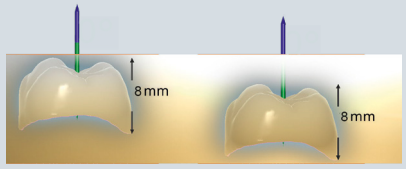
25mm Zolid Bion

Corresponds to the 20 mm distribution (multilayer), then filled up (preshade).

NESTING OF ZOLID FX MULTILAYER BLANKS

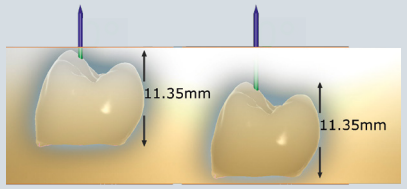
With Zolid FX Multilayer blanks, it is possible—depending on the nesting position—to cover two different tooth shades per blank. To achieve an optimal shade gradient, a few points need to be considered. The choice of the correct blank height in proportion to the restoration height is crucial for achieving the desired result.

14 mm



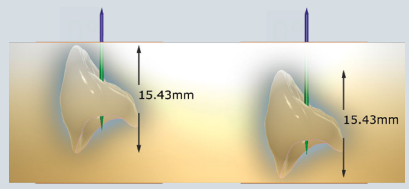
Optimal for restorations with the following heights: approx. 6–8 mm

16 mm



Optimal for restorations with the following heights: approx. 9-12 mm

20 mm



Optimal for restorations with the following heights: approx. 13-16 mm

Zolid zirconia ready to meet different requirements

Magnification factor

To compensate for volume shrinkage during the sintering process, restorations made of Zolid zirconia and Ceramill Sintron are always fabricated with a certain allowance. This is defined by entering the so-called magnification factor in the CAM software.

There are various CAM software systems on the market, all of which require different values to be entered. To meet the various requirements, the Zolid zirconia blanks are marked with the following three specifications for the magnification factor:

F-WERT	V–WERT	S–WERT
Special Amann Girrbach magnification factor, only relevant for Amann Girrbach customer/fabrication systems	General magnification factor, given as factor for entry in CAM software	Special magnification factor, very rare – relevant e.g. for Zirkonzahn system
Zolid Bion	Zolid Bion	Zolid Bion
A2 98x16 | **F 10,27** | V1,233 | S 18,94	A2 98x16 | F 10,27 | **V1,233** | S 18,94	A2 98x16 | F 10,27 | V1,233 | **S 18,94**

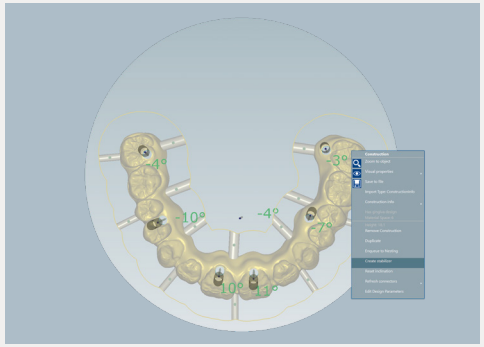
Note: the magnification factors shown are only exemplary values which are not generally valid.

For the perfect fit

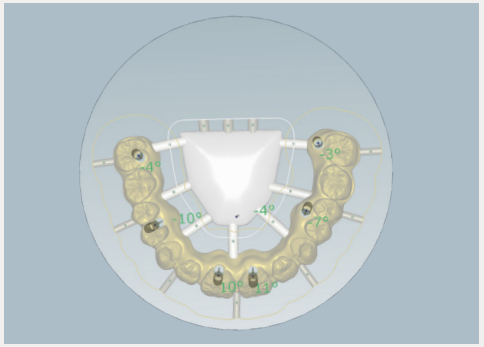
Sintering support structures

To avoid problems of distortion and fit, large span bridges should always be sintered with a supporting structure. The following bridge constructions require a sintering support structure under all circumstances:

- Bridge constructions with more than 9 pontics
- Bridge constructions with a pronounced curvature, such as anterior tooth bridges (also for < 9 units)



Selection of a suitable sintering block



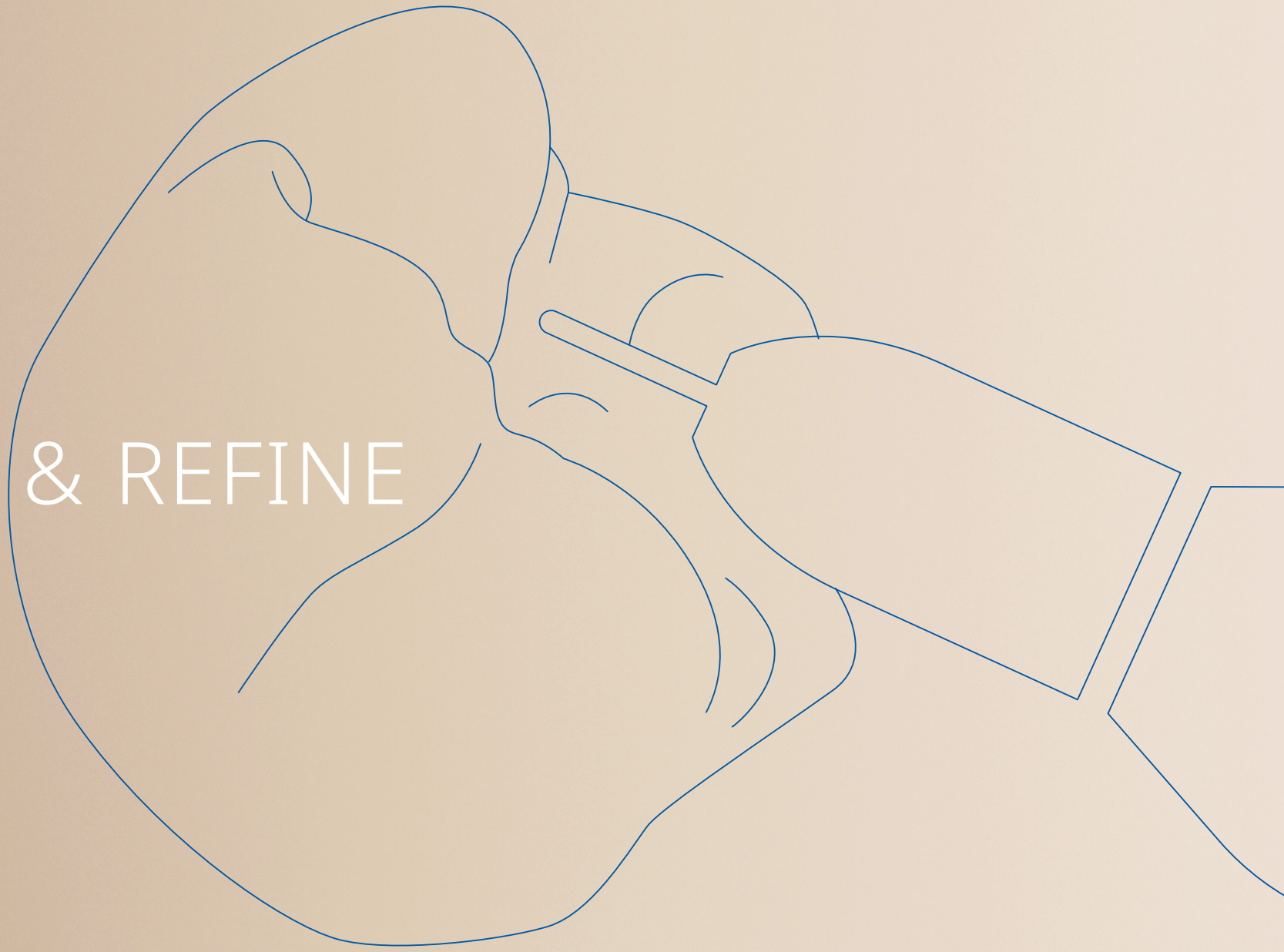
The connectors should be arranged as symmetrically as possible

Tipps & wichtige Hinweise

- ✓ For the support structure, the “dynamic stabilizer” is selected in the CAM software
- ✓ The terminal bridge pontics must be connected to the sintering block via connectors
- ✓ The number of connectors between the sintering block and the bridge should be at least four
- ✓ The connectors should be arranged as symmetrically as possible
- ✓ The connectors should preferably be positioned between the pontics and the sintering block
- ✓ The distal connectors to the sintering block should be at least 3 mm thick
- ✓ In the staining technique with liquids, the attachment point of the connector in particular must be stained to a greater extent to ensure that no unstained areas remain after subsequent separation. The sintering support structure must not be stained, as heating could then lead to cracks.

The number of connectors between the sintering block and the bridge should be at least four.

REMOVE & REFINE

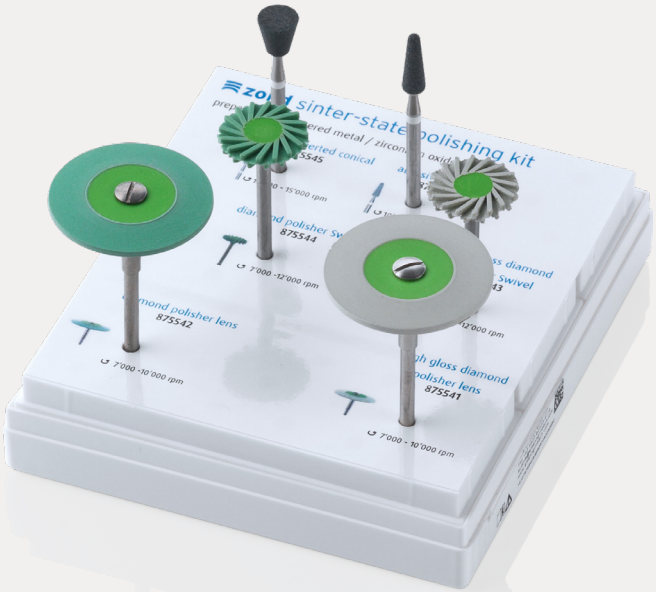


Product recommendations for the perfect finish

Re-Working

To prevent damage to the material, correct finishing is essential after the milling process.
Here a distinction is made between finishing before sintering and finishing after sintering.
The choice of suitable instruments is crucial for success.

Green-State Finishing Kit for finishing zirconia restorations before sintering. (Art.No. 875520).



Sinter-State Polishing Kit for finishing zirconia restorations after sintering. (Art.No. 875540).

Zolid Polishing Dent Kit Update to polish zirconia restorations after cementation (Art.No. 875557).

Step-by-Step

Re-Working after sintering

The final material properties have not yet been attained in the white blank state, therefore the milling objects should be handled very carefully.
The following basic rules should be observed:

Using the “milling cutter” special tool, the restoration can be separated gently in circular movements.

Coarse grinding of the connectors with the Grenade

Fine grinding of the connectors

Tip: marking the preparation margin with a wax crayon facilitates thinning of the crown margin before sintering

Thinning the margins with the fine universal polisher

The fissure milling cutter enables extremely fine fissures to create a natural morphology.

Tips & important notes

- ✓ Never fall below minimum wall thicknesses and connector cross-sections
- ✓ If possible, all steps for preparation should be carried out before sintering to prevent damage in the material
- ✓ Separate objects from the blank with care and caution. Gently sever the connectors with circular movements. Avoid the formation of wedges
- ✓ Use a turbine or a well-maintained handpiece for separation, avoid any unbalance
- ✓ After finishing, the milled objects should be thoroughly cleaned of any adhering milling dust. Metal-free brushes and oil-free compressed air are suitable for this purpose
- ✓ If the surface of the whites is polished too much, this can lead to poorer absorption of the staining liquid.

Step-by-Step

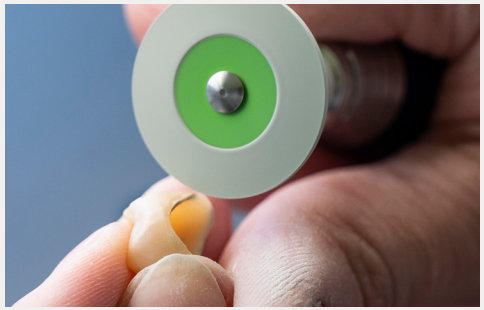
Re-Working after sintering

To prevent damage to the material, correct finishing is essential after sintering.
Here, the choice of suitable instruments is also crucial for success.

Gentle grinding of the occlusal contacts

Polishing “Lens” or “Swivel”

Tip: The “Swivel” is ideal for difficult to access areas such as fissures, cusps or interdental areas.



High-gloss polishing “Lens” or “Swivel”

Tips & important notes

- ✓ Processing should be kept to a minimum after sintering
- ✓ Only apply slight pressure
- ✓ Restrict heat generation to a minimum
- ✓ Only use suitable tools
- ✓ If possible finish under water cooling
- ✓ Never re-separate the bridge units with a cutting disc, this applies in particular to the basal areas (tensile stress)
- ✓ All contact points (occlusal & proximal) should always be polished to a high gloss with a multi-stage polishing system to prevent abrasion of the antagonist.

Step-by-Step

Re-Working after cementation

Especially with monolithic zirconia restorations, it is important to polish the contact surfaces after processing in order to prevent possible abrasion on the opposing tooth.

1. GRINDING WITH DIAMOND OR GRINDING TOOLS

Diamond for grinding zirconium oxide at speeds of 160.000 rp

Grinding tool for grinding zirconium oxide at speeds of 25.000 rpm

2. POLISHING WITH SWIVEL OR FLAME DIAMOND POLISHER

Diamond polishers for smoothing and polishing at a speed of 10.000 – 12.000 rpm

Diamond polishers for smoothing and polishing at a speed of 7,7.000 – 12.000 rpm

3. HIGH GLOSS POLISHING SWIVEL OR FLAME DIAMOND POLISHERS

Diamond polishers for high gloss polishing with a speed of 10.000 – 12.000 rpm

Diamond polishers for high gloss polishing with a speed of 7.000 – 12.000 rpm

Tips & important notes

- ✓ Processing zirconium oxide with a water-cooled turbine at the recommended speeds to prevent overheating
- ✓ Especially with monolithic dental prostheses, the surface must be polished to a high gloss to prevent abrasion on the antagonist.
- ✓ Studies show that polished contact points on monolithic zirconia dental prostheses have hardly any abrasive effect on the antagonist, in contrast to contact surfaces that are merely glazed or veneered*.
- ✓ Monolithic dental prostheses must be checked once a year in the patient's mouth, taking into account the remaining teeth, antagonists, and soft tissue.

* Stawarczyk B, Özcan M, Schmutz F, Trottmann A, Roos M, Hämmerle CHF. Two-body wear of monolithic, veneered and glazed zirconia and their corresponding enamel antagonists. Acta Odontol Scand 2013;71:102-12

Zolid Bion / Amann Girrbach

INTERNAL FINISH

Zolid Naturals

Easy Esthetics, Every Time.

Give monolithic or anatomically reduced restorations made with Zolid Naturals a more natural appearance with just a few brush strokes – for effortless, customized esthetics.

The processing workflow is easier than ever, thanks to short dipping times or an efficient brush technique. The compact starter kit includes various effect liquids, including Intense Shades, allowing targeted accentuations, for example in the cervical area. VITA shades are available separately.

Additionally, the kit includes modifiers, which contain a dimmer as well as the Zolid Naturals Opacifier. The opacifier allows optimal masking of discolored or metallic abutments without compromising the material's translucency.

Portfolio Overview

A-D FARBEN	EFFEKTFARBEN	SPEZIELLE LIQUIDS
Zolid Naturals A intense*	**Zolid Naturals GR = Grey***	**Zolid Naturals Liquid Eye red***
Zolid Naturals B intense*	**Zolid Naturals VIO = Violet***	**Zolid Naturals Liquid Eye blue***
Zolid Naturals C intense*	**Zolid Naturals BL = Blue***	**Zolid Naturals Liquid Eye yellow***
Zolid Naturals D intense*	For example, for accentuating incisal areas and cusp tips.	**Zolid Naturals Liquid Eye green***
Intensive A–D shades (Intense Shades), for example for targeted accentuation of cervical tooth areas.		Fully burnable color pigments for visualizing the colorless Zolid Naturals coloring solutions.
Zolid Naturals A1- D4 (Dentin Shades)	**Zolid Naturals BR = Brown***	**Zolid Naturals Opacifier***
16 Vita shades for the immersion technique and, for example, for targeted accentuation in the dentine area.	**Zolid Naturals OR = Orange***	To increase opacity and, therefore, to targeted coverage of discolored or metallic stumps.
	For example, for targeted accentuation of cervical areas and fissures.	
	Zolid Naturals GIN = Gingiva*	**Zolid Naturals Dimmer***
	For targeted pink pre-coloring of areas with gingiva structures.	For diluting Zolid Naturals to achieve a lower color intensity and for the dipping technique of Zolid.

*Part of the Zolid Natural Starter Kit

Tips and Tricks

Processing of liquids

The following information about immersion times and brush applications are recommendations for use and depend on numerous factors. These need to be adjusted individually depending on the workflow and preferences. When using staining liquids for coloring before sintering, some tips can prove to be very useful.

Tips & Important Notes

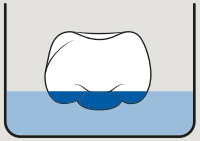
- ✓ Remove the remaining zirconium dust from the frames with a brush and compressed air.
- ✓ Only work with metal-free brushes with synthetic hair.
- ✓ The following mixing ratio is recommended for coloring the coloring liquids: drop Liquid Eye per 2 ml coloring liquid.
- ✓ The Opacifier can be diluted with the Dimmer as required, however it can not be mixed with any other liquid of the portfolio.
- ✓ Zolid Natural Liquids must not be mixed with a coloring system from other manufacturers.
- ✓ Zolid Naturals dye liquids should always be stored tightly closed in their original containers. This ensures color fidelity and functionality.

Zirconia Brush Kit (Art.No. 761939) – available in three different sizes for targeted application of the coloring liquids. The brushes are metal-free and the synthetic brush hair is easy to clean.

Immersion technique

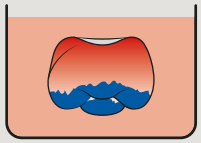
The immersion technique allows aesthetic restorations with color gradients to be produced in a matter of seconds. It is particularly suitable for white zirconia from Amann Girrbach, such as Ceramill ZI and Zolid HT+ White. Please observe the mixing ratios and immersion times on the following page for monolithic work using Zolid HT+ White.

PREPARATION
Using Dimmer



Immersion in Dimmer Liquid for approx. 2-4 s

Apply Dimmer Liquid with brush



Immerse in Liquid A-D for approx. 5s

Pretreatment of the bridge unit through immersion technique

Prior to immersion, it is recommended to apply a little Dimmer Liquid to the solid pontic to obtain a shade of the pontic after immersion which is not too intensive.

Tips & important notes

- ✓ The recommended immersion time of approx. 5 sec (max. 15 sec) should be observed to achieve the desired shade result and to avoid a possible negative influence on the mechanical properties of the zirconia, e. g. due to insufficient drying and crack formation.
- ✓ To avoid strong infiltration of the liquids with the immersion technique, the areas can be blocked out with Dimmer.

Zolid Naturals und Zolid HT+White

Color assignment table for Immersion technique

The Zolid Naturals staining liquids were originally developed for the individualization of pre-shaded zirconia. However, they are also perfectly suited for coloring white zirconia — easy to use and delivering aesthetically convincing results.

Tips & Important Notes

- ✓ If you would like to color Zolid HT+ White frameworks using the Zolid Naturals Liquids with the immersion technique according to the VITA Shade Guide, the mixing instructions provided below offer reliable guidance.
- ✓ The desired A–D shades can be precisely prepared by mixing with Zolid Naturals Dimmer (Art. No. 761455) according to the specified mixing ratios. Please also observe the recommended dipping times.
- ✓ This technique was developed specifically for monolithic restorations; in the case of frameworks, the color may appear lighter due to the thin wall thickness.

ZOLID NATURALS „A-D“ [%]	A1 80	A2 80	A3 85	A3,5 85	A4 90	B1 75	B2 75	B3 90	B4 90	C1 80	C2 90	C3 90	C4 90	D2 85	D3 80	D4 90
ZOLID NATURALS „Dimmer“ [%]	20	20	15	15	10	25	25	10	10	20	10	10	10	15	20	10
Dipping Time [sec]	5	5	5	5	5	5	5	5	10	5	5	5	5	5	5	5

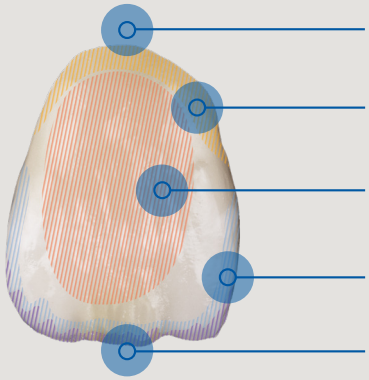
Zolid Lunaris / Amann Girrbach

Brush technique

Partial infiltration with the Effect and Intense Liquids can be used to create specific highlights to give restorations even more depth and prior to sintering. This technique is particularly suitable for pre-shaded material such as Zolid HT+ Preshade, Zolid FX Multilayer, Zolid Gen-X and Zolid Bion. A combination of the brush technique and the immersion technique enables additional individualization of white zirconia. In addition, Opacifier can be used to cover discolored stumps and abutments.

Tips & Important Notes

- ✓ 1–3 brush strokes, depending on the desired intensity and wall thickness.
- ✓ Due to the strong pigmentation, it is advisable to start cautiously and practice on sample material first.
- ✓ The Zolid Naturals products can be diluted using the Zolid Naturals Dimmer.
- ✓ Please observe an appropriate pre-drying time when applying liquids to zirconia restorations (see page 28).



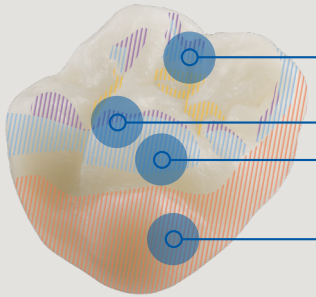
Opacifier is used to cover or conceal metallic abutments or discolored stumps

Intense Shades to intensify the cervical area

Dentin to increase the chroma of the A-D Dentincolors

Blue to highlight the lateral ridges

Grey / **Violet** for translucency in the incisal area

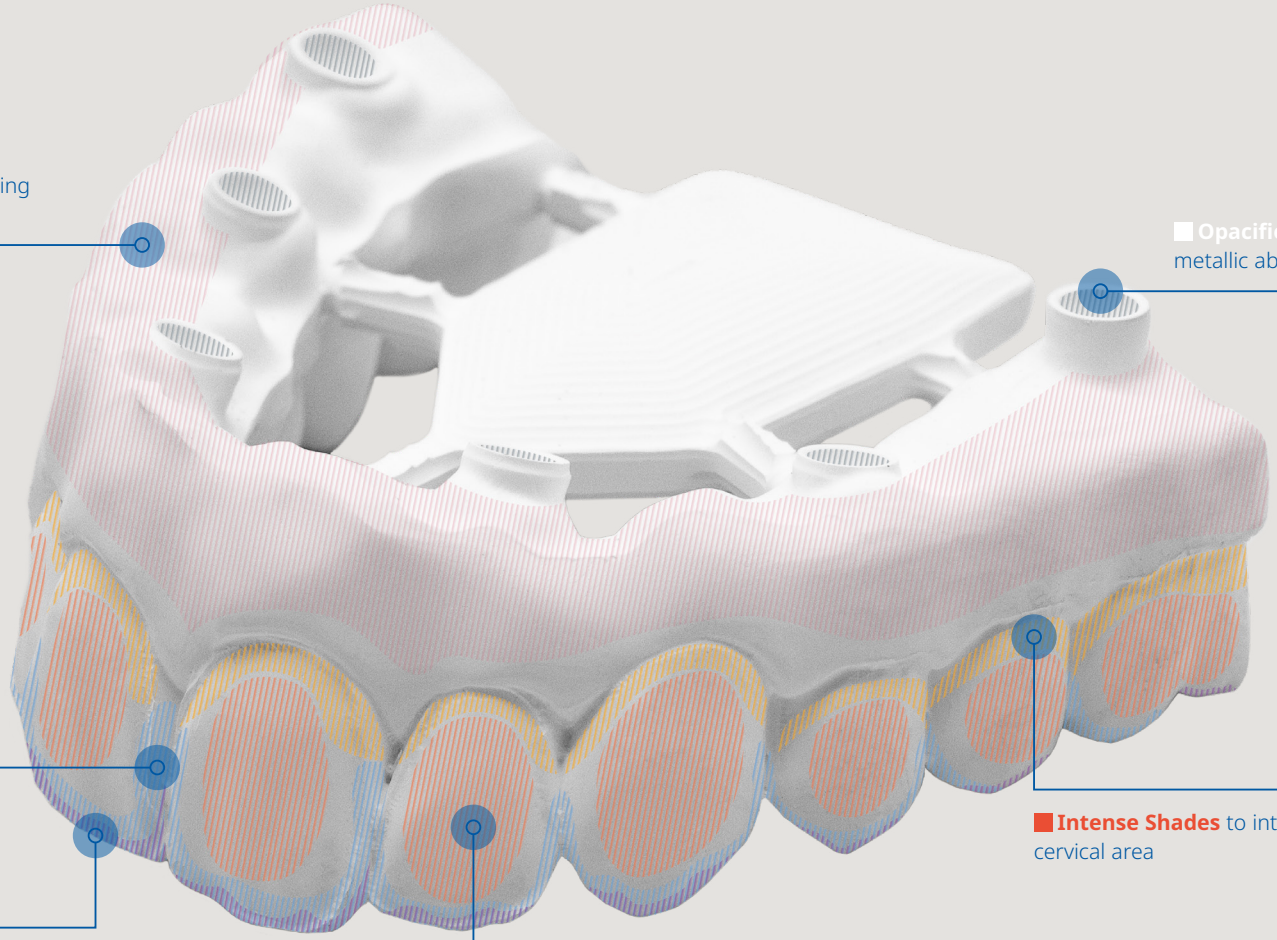


Brown / **Dentin-Colors** for a depth effect in the fissures or cervical area

Grey / **Violet** for translucent occlusal area

Grey / **Violet** or **Blue** to highlight the lateral ridges

Dentin / **Intense Shades** to increase the chroma or to intensify the cervical area



Gingiva is suitable for achieving a pre-shade for gingival areas

Opacifier is used to cover or conceal metallic abutments or discolored stumps

Blue to highlight the lateral ridges

Intense Shades to intensify the cervical area

Grau, **Violett** for translucency in the incisal area

Dentin to increase the chroma of the A-D dentin shades

Pre-drying for perfect results

PRE-DRYING

Zolid zirconia restorations should be pre-dried immediately after staining with Zolid Naturals. This acts to fixate the shade and avoid stains (homogenization). The risk of cracks and fissures is also reduced for large objects.

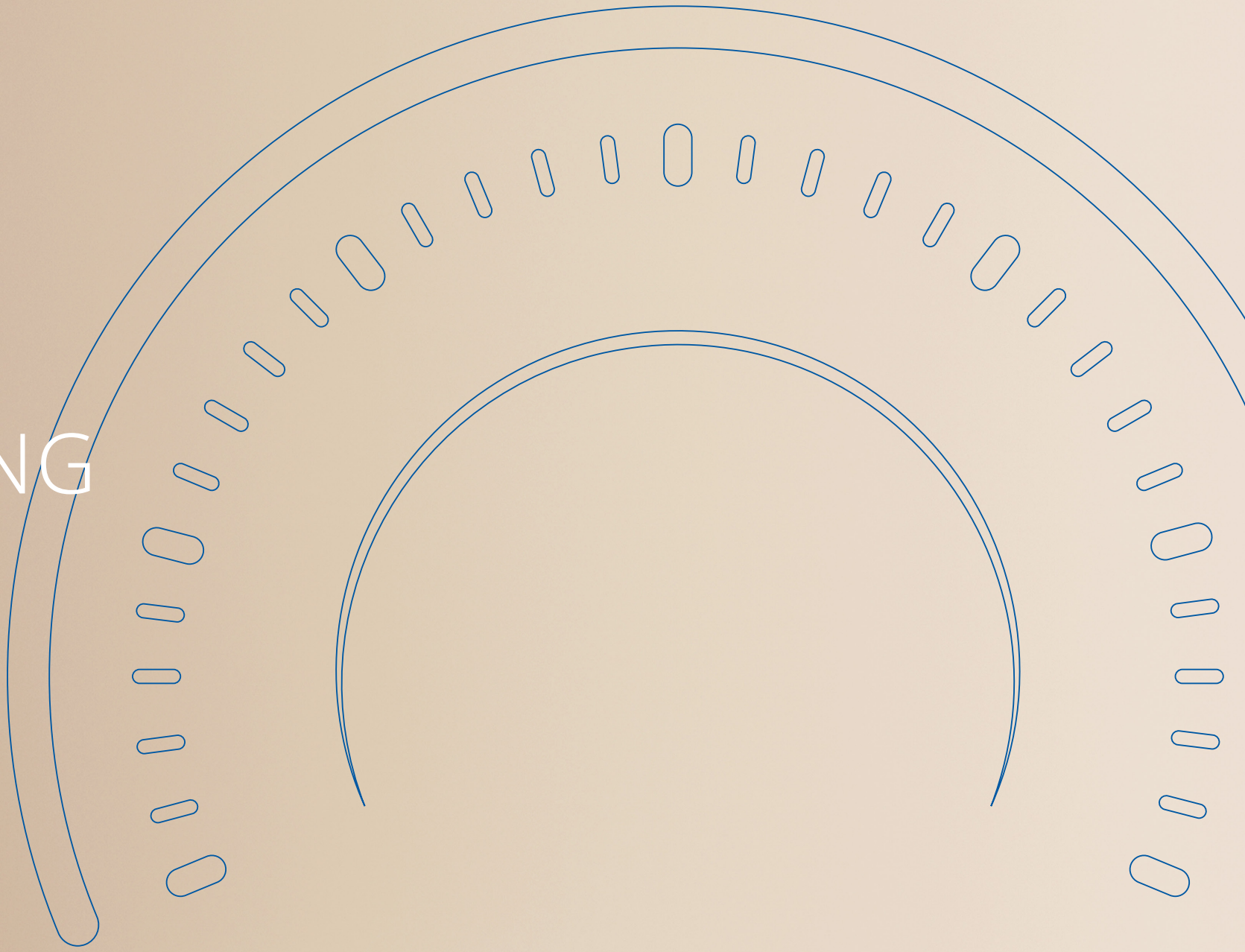
MATERIAL	PRE-DRYING TEMPERATURE	PRE-DRYING DURATION
Zolid zirconia restorations (without sintering block)	80 °C	60 min

Tips & Important Notes

- ✓ Dry restorations sufficiently long before sintering or select sintering programs with a pre-drying function. After staining the Zolid zirconia, a ceramic furnace can be used to dry the restoration. The ceramic furnace and the other ceramic firings are not affected by the drying process. Alternatively, a suitable zirconia dryer with heated circulating air or radiant heat can be used.
- ✓ If sintering is not performed immediately after staining, the restoration should be dried immediately to ensure a homogeneous color result. This fixes the color and allows the restoration to be stored until sintering.

Zolid Bion / CDT Luis Saraiva, Clarity Lab, Porto PT

SINTERING



Perfectly Coordinated

Sintering of Zolid Restorations

The sintering of zirconia is one of the most important process steps in the manufacturing of dental restorations. Under the influence of high temperatures, the porous white body becomes densified, allowing the blank to attain its final mechanical properties (e.g. strength) as well as its optical properties (translucency, color). Choosing the right sintering program is therefore essential for producing aesthetic and long-lasting zirconia restorations.

Optimal results are achieved with the high-temperature furnaces **Ceramill Therm** and **Therm DRS** from Amann Girrbach. These are fully coordinated with the Zolid portfolio,enabling the best possible development of the material properties.

Since different materials sometimes require different sintering programs to develop their optimal characteristics, the necessary sintering parameters are listed on the following pages.

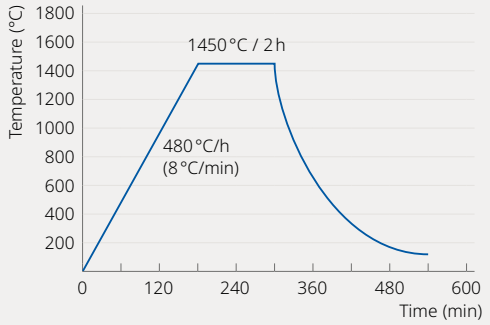
Therm DRS

Therm 3

Standard-Sintering programs

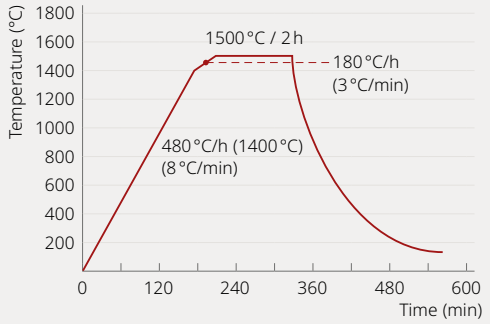
Ceramill ZI, Zolid FX Multilayer, Zolid Gen-X, Zolid HT+ White, Zolid HT+ Preshade

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1450 °C (2642°F)	8 °C/min (46°F/min)	–
Holding phase	1450 °C (2642°F)	1450 °C (2642°F)	–	120 min
Turn off				



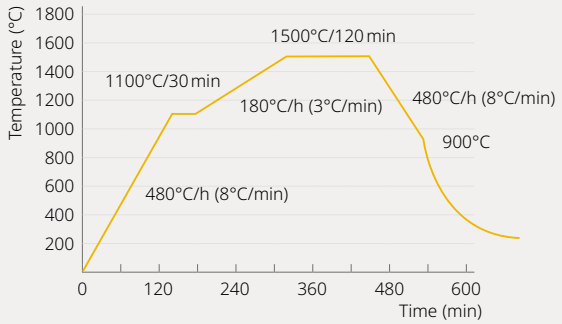
Zolid Bion

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1400 °C (2552°F)	8 °C/min (46 °F/min)	–
Heating phase	1400 °C (2552°F)	1500 °C (2732°F)	3 °C/min (37°F/min)	–
Holding phase	1500 °C (2732°F)	1500 °C (2732°F)	–	120 min
Turn off				



Zolid Lunaris

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1100 °C (2012°F)	8 °C/min (46°F/min)	–
Holding phase	1100 °C (2012°F)	1100 °C (2012°F)	–	30 min
Heating phase	1100 °C (2012°F)	1500 °C (2732°F)	3°C/min (37°F/min)	–
Holding phase	1500 °C (2732°F)	1500 °C (2732°F)	–	120 min
Cooling phase	1500 °C (2732°F)	900 °C (1652°F)	8 °C/min (46°F/min)	–
Turn off				



Tips & Important Notes

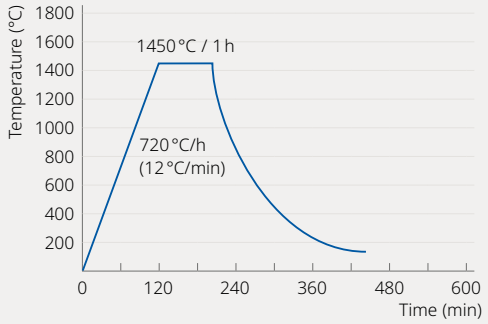
- ✓ For **Zolid Bion**, the chroma can be specifically adjusted within the standard sintering program by modifying the final holding temperature and the duration of the holding time. The holding temperature can be reduced by up to 50°C (122°F), which results in more chromatic color outcomes as the temperature decreases. To maintain the material's translucency at the same time, it is necessary to extend the holding time from the original 2 hours to 3 hours. (Example: 1450°C / 3 h)
- ✓ For **Zolid Lunaris**, the brightness/value can be adjusted within the standard sintering program by modifying the final holding temperature. Increasing the final temperature by up to 30°C (86°F) results in a visibly brighter color outcome, without requiring changes to any other program parameters.

Short Duration-Sintering program

Approved for single-unit restorations only, use no more than one sintering tray/bowl

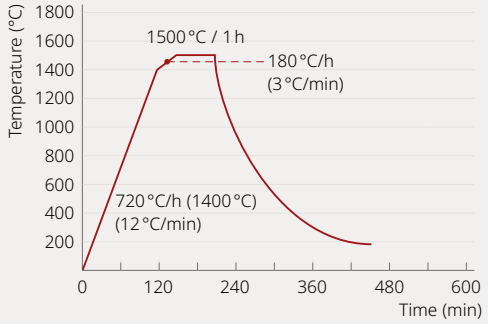
Ceramill ZI, Zolid FX Multilayer, Zolid Gen-X, Zolid HT+ White, Zolid HT+ Preshade

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1450 °C (2642°F)	12 °C/min (53°F/min)	–
Holding phase	1450 °C (2642°F)	1450 °C (2642°F)	–	60 min
Turn off				



Zolid Bion

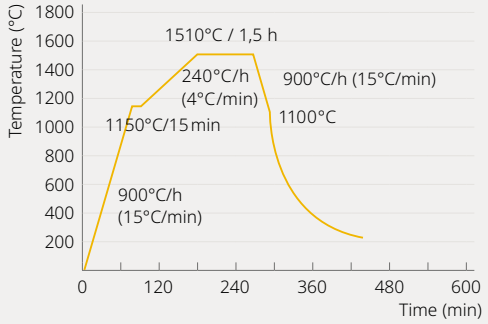
PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1400 °C (2552°F)	12 °C/min (53°F/min)	–
Heating phase	1400 °C (2552°F)	1500 °C (2732 °F)	3 °C/min (37°F/min)	–
Holding phase	1500 °C (2732 °F)	1500 °C (2732 °F)	–	60 min
Turn off				



Only permitted for restorations with a maximum of 5 units, use no more than one sintering tray/bowl

Zolid Lunaris

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1150°C (2102°F)	15 °C/min (59°F/min)	–
Holding phase	1150 °C (2102°F)	1150 °C (2102°F)	–	15 min
Aufheizphase	1150 °C (2102°F)	1510 °C (2750°F)	4°C/min (39°F/min)	–
Holding phase	1510 °C (2750°F)	1510 °C (2750°F)	–	90 min
Cooling phase	1510 °C (2750°F)	1100 °C (2012°F)	15 °C/min (59°F/min)	–
Turn off				

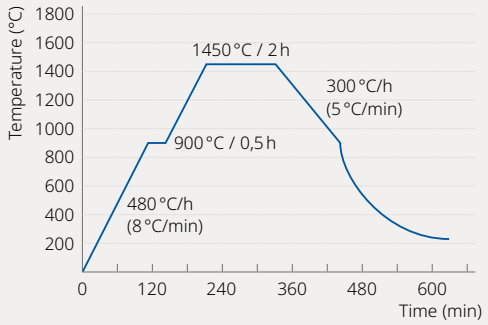


Sintering Program with Long-Term Cooling

Recommended for large/solid restorations (with sintering block)

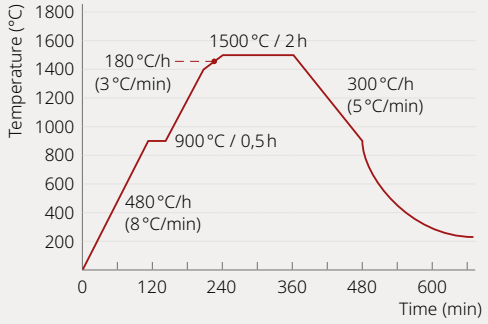
Ceramill ZI, Zolid FX Multilayer, Zolid Gen-X, Zolid HT+ White, Zolid HT+ Preshade

PHASE	TEMPERATURE 1	TEMPERATUR 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	900 °C (1652°F)	8 °C/min (46°F/min)	–
Holding phase	900 °C (1652°F)	900 °C (1652°F)	–	30 min
Heating phase	900 °C (1652°F)	1450 °C (2642°F)	8 °C/min (46°F/min)	–
Holding phase	1450 °C (2642°F)	1450 °C (2642°F)	–	120 min
Cooling phase	1450 °C (2642°F)	900 °C (1652°F)	5 °C/min (41°F/min)	–
Turn off				



Zolid Bion

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	900 °C (1652°F)	8 °C/min (46°F/min)	–
Holding phase	900 °C (1652°F)	900 °C (1652°F)	–	30 min
Heating phase	900 °C (1652°F)	1400 °C (2552°F)	8 °C/min (46°F/min)	–
Heating phase	1400 °C (2552°F)	1500 °C (2732°F)	3 °C/min (37°F/min)	–
Holding phase	1500 °C (2732°F)	1500 °C (2732°F)	–	120 min
Cooling phase	1500 °C (2732°F)	900 °C (1652°F)	5 °C/min (41°F/min)	–
Turn off				

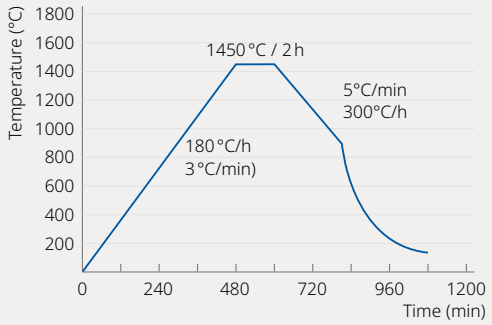


Sintering program with Pre-Drying

Recommended for large/solid restorations (with sintering block), for example, infiltrated with staining liquids.

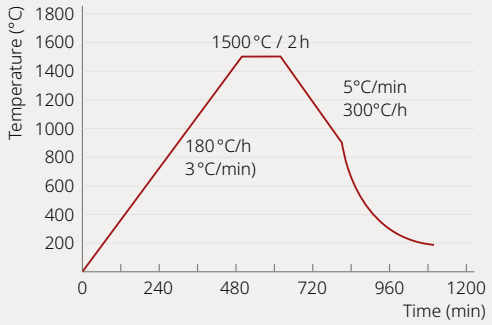
Ceramill ZI, Zolid FX Multilayer, Zolid Gen-X, Zolid HT+ White, Zolid HT+ Preshade

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1450 °C (2642°F)	3 °C/min (37°F/min)	–
Holding phase	1450 °C (2642°F)	1450 °C (2642°F)	–	120 min
Cooling phase	1450 °C (2642°F)	900 °C (1652°F)	5 °C/min (41°F/min)	–
		Turn off		



Zolid Bion

PHASE	TEMPERATURE 1	TEMPERATURE 2	HEATING RATE	HOLDING TIME
Heating phase	20 °C (68°F)	1500 °C (2732°F)	3 °C/min (37°F/min)	–
Holding phase	1500 °C (2732°F)	1500 °C (2732°F)	–	120 min
Cooling phase	1500 °C (2732°F)	900 °C (1652°F)	5 °C/min (41°F/min)	–
		Turn off		



Sintering programs Therm 3

PROGRAM	MATERIAL	DESCRIPTION	INDICATION	TIME
Program 1 (P1)	Ceramill Zi, Zolid HT+ white, Zolid HT+ Preshade, Zolid Gen-X, Zolid FX Multilayer	Standard program	Crowns & bridges	8 h
Program 2 (P2)	Ceramill Zi, Zolid HT+ white, Zolid HT+ Preshade, Zolid Gen-X, Zolid FX Multilayer	Shortened program	Single restoration	6 h
Program 3 (P3)	Ceramill Zi, Zolid HT+ white, Zolid HT+ Preshade, Zolid Gen-X, Zolid FX Multilayer	Slow program	Large/massive restoration (with sintering support block) and/or when multiple sintering trays/bowls are placed in the furnace.	10 h
Program 4 (P4)	Ceramill Zi, Zolid HT+ white, Zolid HT+ Preshade, Zolid Gen-X, Zolid FX Multilayer	Liquid - Program with pre-drying	Large/massive restoration (with sintering support block), infiltrated with coloring liquids (Zolid Naturals)	14 h
Program 5 (P5)	Zolid Bion	Standard program	Crowns & bridges	8 h
Program 6 (P6)	Zolid Bion	Fast - Shortened program	Single restoration	6 h
Program 7 (P7)	Zolid Bion	Slow - Slow program	Large/massive restoration (with sintering support block) and/or when multiple sintering trays/bowls are placed in the furnace.	10 h
Program 8 (P8)	Zolid Bion	Liquid - Program with pre-drying	Large/massive restoration (with sintering support block), infiltrated with coloring liquids (Zolid Naturals)	14 h
Program 9 (P9)	Zolid Lunaris	Standard program	Crowns & bridges	11 h
Program 10 (P10)	Zolid Lunaris	Fast - Shortened program	Maximum 5-unit bridges	7,5 h

Pre-installed from January 2026 delivery or download at ag.live/software.

Sintering programs Therm DRS

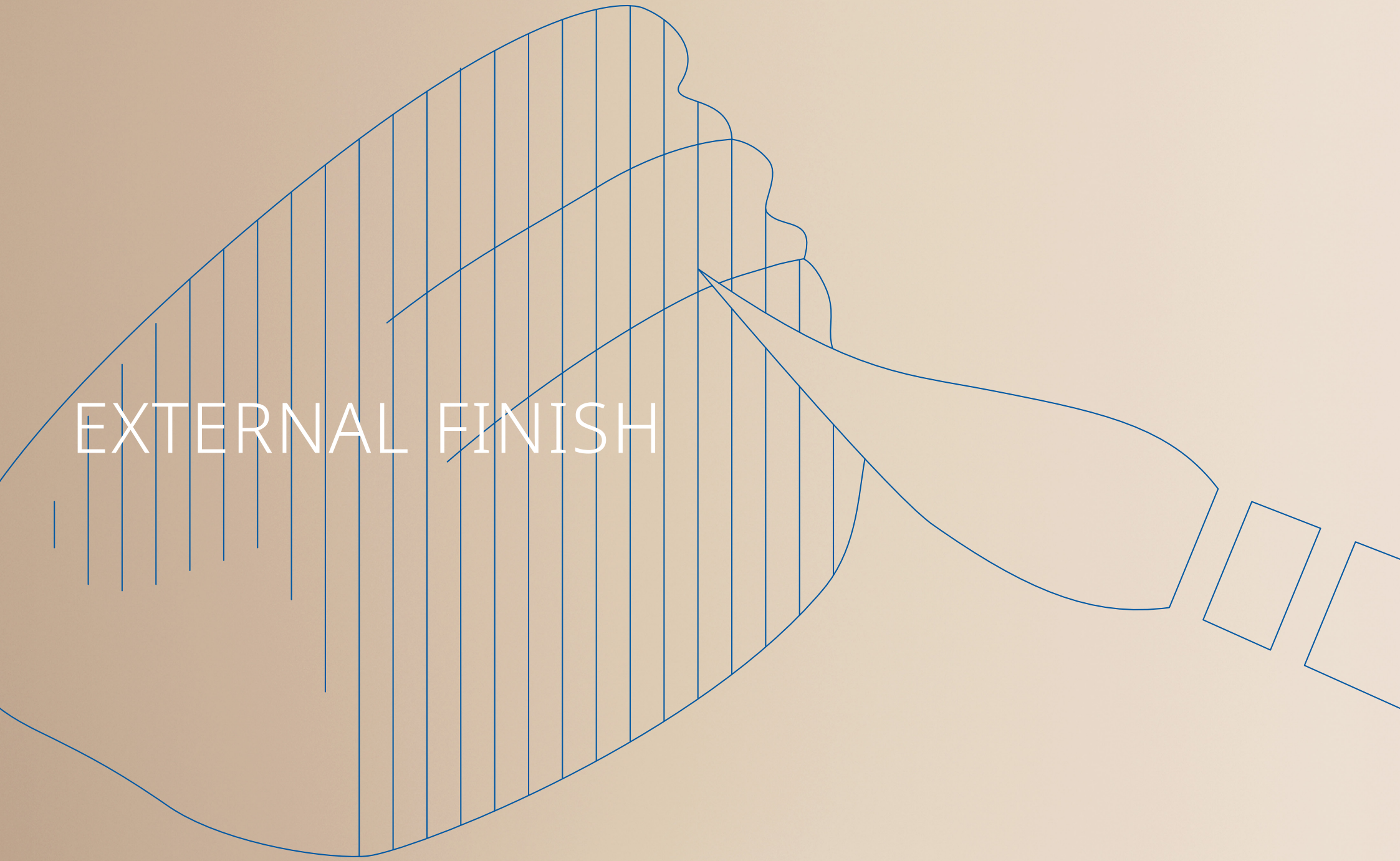
PROGRAM	MATERIAL	DESCRIPTION	INDICATION	ZEIT***
P1 Zolid DRS -C&B- Dry milled	Zolid DRS, Zolid-Gen X*	Dry milled restorations	Max. four single restorations and up to one 3-unit bridge. Maximum recommended restoration thickness for optimum translucency: crowns ideally up to 2 mm wall thickness, bridges with premolar/anterior tooth pontics, two-piece hybrid abutments.	28 min.
P2 Zolid DRS -C&B- Wet (Autodry)	Zolid DRS, Zolid-Gen X*	Restorations milled wet, steamed off or partially infiltrated		31 min.
P3 Zolid DRS -Single C- Dry milled	Zolid DRS, Zolid-Gen X*	Dry milled restorations	Max. one single restoration Maximum recommended restoration thickness for optimum translucency: crowns ideally < 2 mm wall thickness, veneers, inlays	21 min.
P4 Zolid DRS -Single C- Wet (Autodry)	Zolid DRS, Zolid-Gen X*	Restorations milled wet, steamed off or partially infiltrated		25 min.
P5 Zolid Bion -Single C- Dry milled	Zolid Bion	Dry milled restorations	Max. one single restoration Anterior and posterior crowns up to ideally 2 mm wall thickness, veneers, inlays, two-part hybrid abutments.	45 min.
P6 Zolid Bion -Single C- Wet (Autodry)	Zolid Bion	Restorations steamed off, or partially infiltrated		49 min.
P7 Zolid Gen-x/DRS/Bion 1h - C&B- Dry milled	Zolid DRS, Zolid-Gen X*, Zolid Bion	Dry milled restorations	Max. four single restorations and up to one 3-unit bridge. Maximum recommended restoration thickness for optimum translucency: crowns > 2 mm wall thickness, molar pontics, single-part monolithic abutment crowns.	1 h
P8 Zolid Gen-x/DRS/Bion 1h - C&B- Wet (Autodry)	Zolid DRS, Zolid-Gen X*, Zolid Bion	Restorations steamed off, or partially infiltrated		1 h
P9 Ceramill Zirconia Speed 2h	Ceramill ZI / Zolid HT+/HT+PS/Gen-X Ceramill Zolid FX White/Multilayer	Restorations milled wet, steamed off or infiltrated with staining liquid	Single restorations and up to 3-unit bridges	2 h
P10 Ceramill Stain & Glaze	Alle Zolid Zirkonoxide	Stains and glazes for Stain & Glaze**	Single restorations and up to 3-unit bridges	19 min.
P11 Pre-dry before liquid coloring	Alle Zolid Zirkonoxide	Drying firing for wet restorations before staining with staining solutions (wet milled/ evaporated)	Single restorations and up to 3-unit bridges	10 min.
P12 Zolid Lunaris -C&B- 15min	Zolid Lunaris	Dry milled restorations	Max. 3x single restorations and up to 1x 3-unit bridges in the anterior region. Maximum recommended restoration thickness for optimal translucency: Crowns up to an ideal wall thickness of 2 mm, anterior pontics/premolars, two-piece hybrid abutments.	15 min.
P13 Zolid Lunaris -C&B- 19min (Autodry)	Zolid Lunaris	Restorations steamed off, or partially infiltrated		19 min.
P14 Zolid Lunaris-C&B- 22min	Zolid Lunaris	Dry milled restorations	Max. 4x single restorations and up to 1x 3-unit bridges in the posterior region. Maximum recommended restoration thickness for optimal translucency: Crowns > 2mm wall thickness, molars one-piece monolithic crown abutments.	22 min.
P15 Zolid Lunaris -C&B- 26min (Autodry)	Zolid Lunaris	Restorations steamed off, or partially infiltrated		26 min.

** The shade of Zolid Gen-X may appear slightly brighter after high-speed sintering compared to conventional sintering. It is recommended to select the next darker shade in the portfolio or, if necessary, adjust using stains/glaze materials.*

*** Depending on the desired gloss level, the preset firing temperature may be increased/adjusted by up to 30 °C.*

**** Average cycle times until furnace opening.*

EXTERNAL FINISH



Mastering tooth shade

Tips & tricks for final shade evaluation

LIGHT

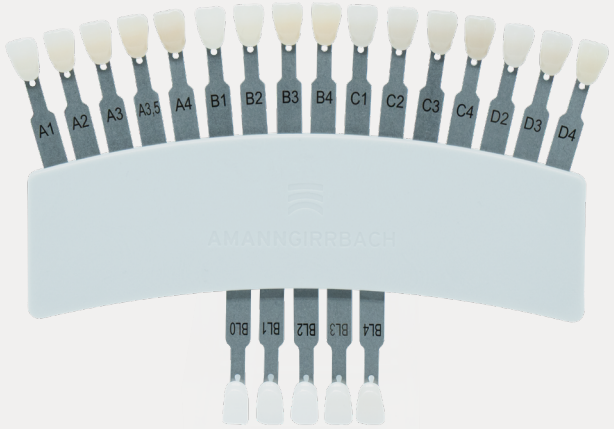
- Always evaluate tooth shades under daylight conditions (6,500 K) to ensure reliable results.
- Assess tooth shades only in the glazed or polished state.
- Be aware of deviations between different shade guides – ideally use the Zolid Shade Guide as the reference to compare zirconia with zirconia.

NESTING

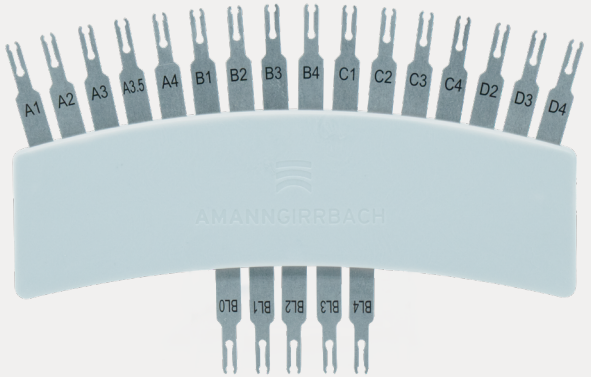
- Ensure the correct vertical positioning of the restoration within the blank to allow sufficient space for vertical adjustments.
- Position more towards the incisal area to enhance translucency/enamel effects and achieve a brighter shade – ideal for single anterior restorations.
- Position more towards the lower area of the blank to increase chroma – ideal for posterior restorations.

SINTERING

- Always use the manufacturer-recommended programs to achieve optimal results.
- When using third-party furnaces, ensure that programs can be freely configured and that the temperature is correctly calibrated.
- Use only high-quality sintering tools approved for dental applications, such as sintering trays or sintering beads.



Zolid Bion Shade Guide (Art.No. 761943)



Zolid DIY Shade Guide (Art.No. 761942)

That individual touch for every restoration

System solution Creation Magic Colour

Magic Colour from Creation is used for accentuating and surface painting of monolithic and partially reduced restorations. Be it from white blanks or work made from Zolid HT+ Preshades, Zolid Gen-X Multilayer or Zolid FX Multilayer or Zolid Bion. Pre-shaded, monochrome restorations in the basic shades made of Zolid HT+ Preshades are finalized after sintering with the staining system to achieve the final tooth shade.

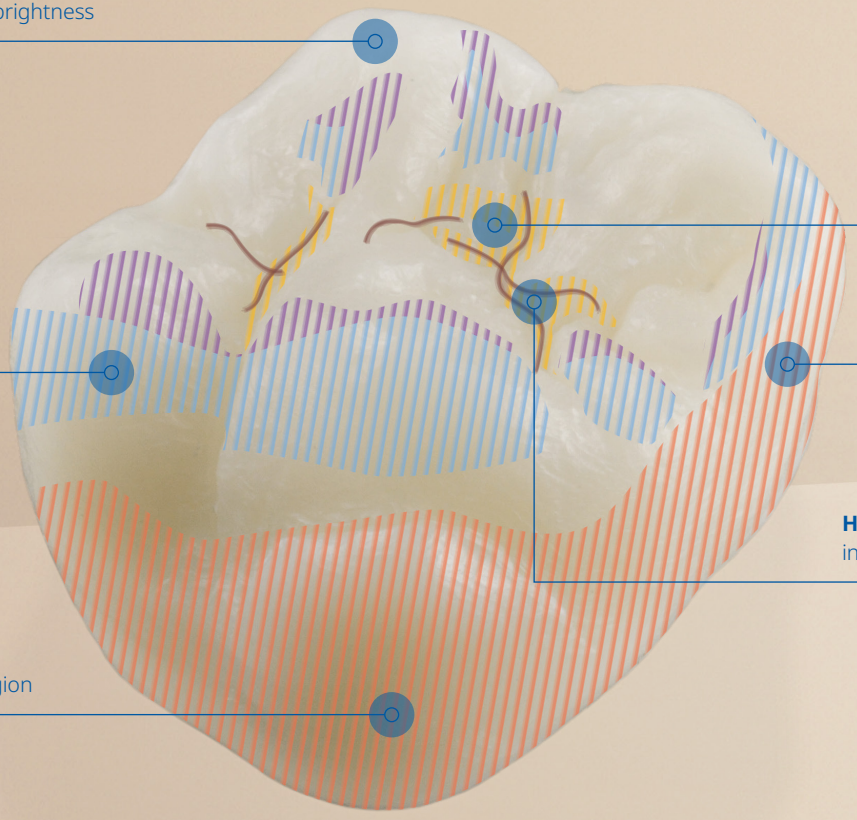
The system consists of the following components:
- Staining powder for the individual coloring of dental and gingival restorations
- Glazing powder with and without fluorescence for sealing surfaces
- A mixing liquid for staining powder
- A special liquid for micro-layering

Tips & Important notes

- ✓ Thoroughly clean the restorations before applying stains and glazes, e.g. by blasting with aluminum oxide (recommended grain size: 50-110 µm at max. 1.5 bar).
- ✓ Highlights such as blue, violet or gray can for example be used to individualize areas such as incisal edges and cusp tips.
- ✓ Highlights such as orange or brown can for example be used to individualize areas such as fissures or proximal contacts.

HL-2 eggshell for cusp tips and margin ridges to increase brightness

HL-11 dove blue for translucency in the cusp and marginal ridge areas



HL-4 mandarine for occlusal surfaces for a warm depth effect/discolorations

HL-7 light brown/HL-14 fissure in fissure areas for discoloration

Dentine Shades A-D for the body region

Special shades, “Gingiva Shades” (GS-1, GS-2, GS-3), for the gingival area also allow restorations to be fabricated with a gingival section.

Important notes on the firing procedure

Creation Magic Colour

The duration of the pre-drying time, the temperature rise, the closing time, the final temperature and the long-term cooling depend on the size of the restoration. Large-volume restorations require longer pre-drying, slower preheating, firing at a higher temperature and slow cooling.

Tips & Important notes

- ✓ Magic Colour stains are mixed on a glass or ceramic mixing plate.
- ✓ To achieve better esthetics, the characterizing restoration can be veneered with a thin layer of veneering ceramic (micro-layering).
- ✓ If the desired shade has not been achieved, it can be corrected by firing again.

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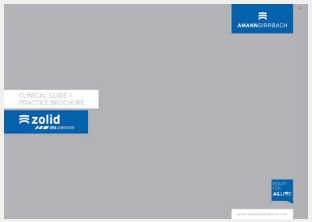
TRAINING

More information and training courses

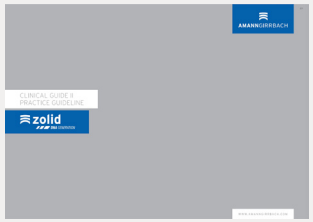
The route to esthetic success

A product is only complete if one knows how to use it correctly. For this reason, Amann Girrbach offers comprehensive information and training within the context of Esthetic Management for the use of the Zolid zirconia product range, to ensure that esthetics are not happenstance. In combination with the individual staining concepts, the didactically prepared print and online media as well as courses ensure the desired outcomes right from the start.



CLINICAL GUIDE I

Practice brochure
All important information about Zolid zirconia.



CLINICAL GUIDE II

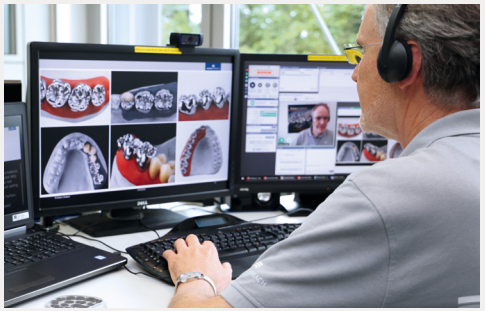
Practice guideline
Preparation, luting, surface polishing

CLINICAL GUIDE III

Scientific compendium
Compendium of Zolid zirconia studies

HANDS-ON COURSES

Scientific compendium
Compendium of Zolid zirconia studies



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About Amann Girrbach

As a pioneer in dental CAD/CAM technology, Amann Girrbach is among the leading innovators and preferred full-service providers in digital dental prosthetics. With high development expertise and consistent customer orientation, the company offers sophisticated products and open system solutions. In addition to innovative scanning and production solutions designed for interoperability and flexibility, the portfolio is complemented by high-quality materials, strong technical service with a globally positioned helpdesk, as well as educational offerings and training programs.Its customers in around 90 countries include dental practices, practice aboratories, and dental laboratories. A high quality standard and sustainability are critical value creation criteria for Amann Girrbach, which is why the entire development and production are located at the headquarters in Mäder, Austria. Additionally, Amann Girrbach has sales subsidiaries in Pforzheim (DE), Verona (IT), Jossigny (FR), Charlotte (USA), Singapore (SGP), Curitiba (BRA), Beijing (CHN), as well as cooperations in Kyoto (JPN) and Beirut (LBN).

We would be pleased to also inform you personally. Simply contact us!
On our website you will find further information about our locations and contact details so that you can reach us quickly.
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