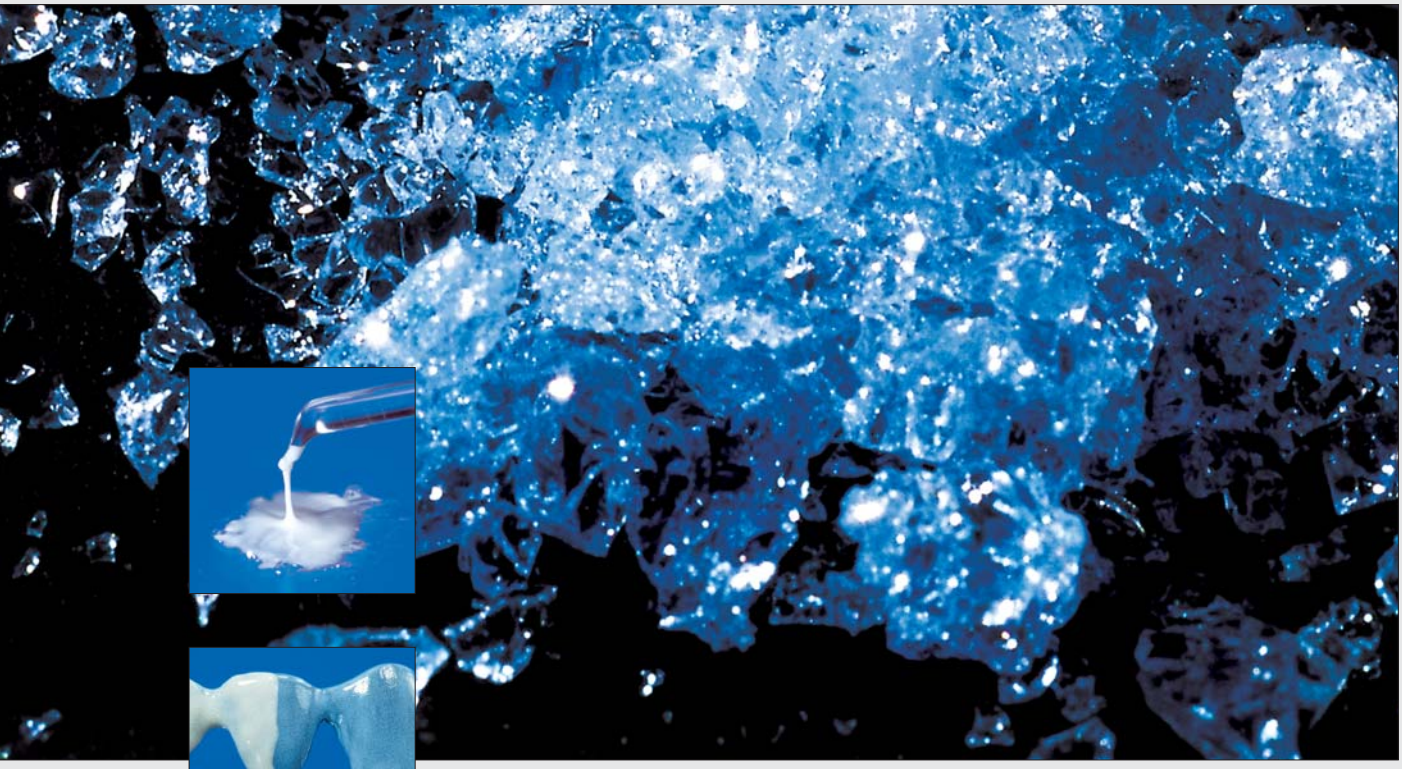


Triceram®

CE 0483

The ceramics for titanium and zirconium oxide

Product Information and Instructions for Use

DENTAURUM

Titanium / Advantages at a glance

For contented patients

Titanium has a high resistance to corrosion

Titanium does not corrode. Following the establishment of a protective oxide layer, it is very slow to react. This is also referred to as „chemically inert".

Titanium is bio-compatible

Titanium does not release ions and does not trigger pathological reactions in the body.

Titanium is the most bio-compatible metal available

It has proven to be very effective in human medicine and dentistry.

Titanium has low thermal conductivity

The patient can enjoy hot or cold food without experiencing dental pain. Gold has a thermal conductivity of 15 times higher than titanium, causing the patient to feel greater sensitivity to hot or cold.

Titanium has a neutral taste

Titanium's passivated surface prevents a reaction between metal, saliva and food. The patient does not experience a metallic taste as with many other dental alloys.

Titanium has a multitude of indications

It is possible to use titanium for a variety of different indications, with the advantage of requiring just one metal for all restorations.

Titanium is light

This proves more comfortable for the patient. Gold is four times heavier, which is noticeable in large bridge framework.

Titanium has a high strength, without being too hard or too soft

Titanium can withstand the tremendous forces generated during mastication. Titanium is easy to process in the dental laboratory.

Illustrations:
Photos: by Dentaurum
Page 20: Dentallabor Bischoff, Northeim

Contents

Guarantee

All data on products and processing are given to the best of our knowledge and technical experience, they are however without obligation. Our general terms for supply and payment apply exclusively. Our products undergo continual development. We therefore reserve the right to make changes at our own discretion.

1. Technical Data

CTE and Firing Temperatures

Pure titanium requires a ceramics with special characteristics for bonding.

On the one hand the ceramics must have a CTE (coefficient of thermal expansion) which is compatible with titanium (9.6 x 10^{-6} + K^{-1} 25 - 500°C) and on the other hand the ceramic firing must not heat the titanium over 800° C. This is due to intensive chemical reactions which occur on titanium when this temperature is exceeded.

Triceram® is a monophase, bonding ceramics with a unique capability of meeting these specific demands. The firing temperatures do not exceed 795° C and the CTE is compatible (see table: CTE values of individual Triceram® materials and harmonises ideally with titanium throughout firing). See Thermal expansion of titanium and Triceram®.

Flexural Strength and Resistance to Chemical Corrosion

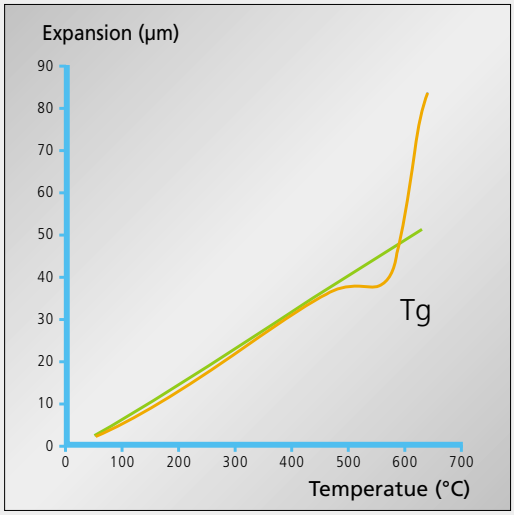
Even More: Triceram® successfully fulfils and surpasses all minimum requirements according to the international standards (EN ISO 6872, EN ISO 9693) and has far lower chemical solubility levels than the maximum values permitted (see table: Solubility of individual Triceram® materials).

Bonding Strength

The bonding strength between ceramic and underlying framework played an important role in development. Triceram® exceeds all international standard demands EN ISO 9693 (25 MPa) by far, with results of 42 MPa (see graph: Bonding strength characterization). Aesthetical freedom in marginal design and at the same time maximal bonding strength is achieved through the application of the white coloured Triceram® bonder. New aesthetical limits and even greater bond strength can be achieved through the application of AESTHETIC UNIVERSAL bonder.

Reliability

Throughout the whole technological development of Triceram® bonding ceramics, the choice of raw materials with their various characteristics and ability to create high quality aesthetics, was of great importance. The production of CARMEN®, the bonding ceramics from Espident for conventional alloys, has shown that the avoidance of natural raw materials and use of well proven production methods such as the thermo-coloration technique, all aid in achieving reliability.

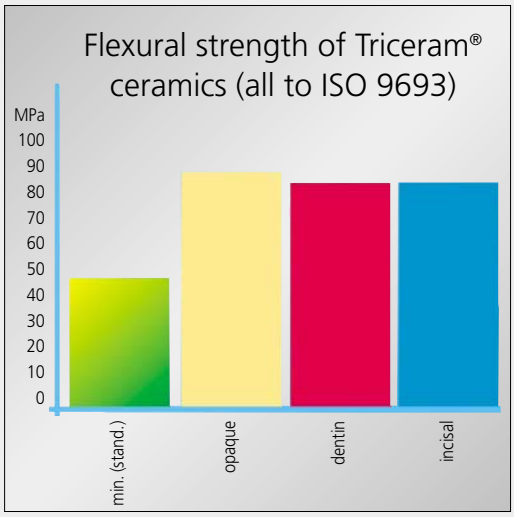


Thermal expansion of titanium and Triceram®

Coefficient of thermal expansion (CTE 25-400 °C):

Triceram® bonder:	9,2 x 10^{-6} K^{-1}
Triceram® opaque:	8,8 x 10^{-6} K^{-1}
Triceram® dentin:	8,6 x 10^{-6} K^{-1}
Triceram® incisal:	8,5 x 10^{-6} K^{-1}

CTE values of individual Triceram® materials



Flexural strength

Solubility:

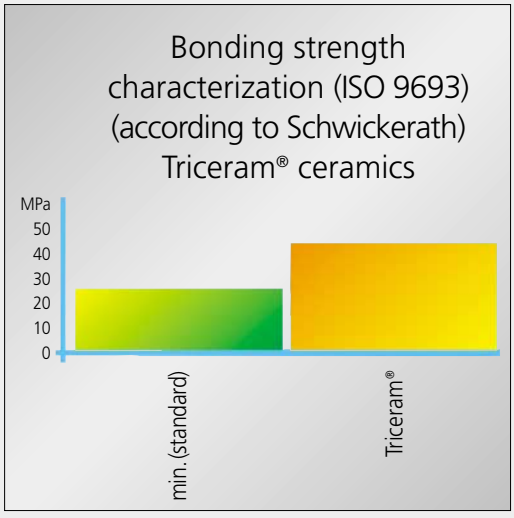
The maximum permitted solubility in the hydrolysis test all to ISO 9693 is 100 µg/cm²

Figures obtained for Triceram® titanium ceramics:

Opaque:	55 µg/cm²
Dentin:	31 µg/cm²
Incisal:	31 µg/cm²

The solubility is therefore well below the specified limit.

Solubility of individual Triceram® materials



Bonding strength characterization

2. Dental Technical Instructions for Use on Titanium Framework

2.1. Framework design and conditioning

2.1.1. Basic factors

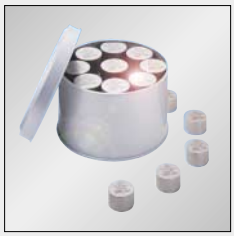
Designing and conditioning the framework correctly to suit titanium is an indispensable factor in the production of durable, aesthetical, ceramic veneered restorations. A sound knowledge and understanding of titanium's characteristics is essential to achieve successful results.

This information can be acquired from manufacturers and suppliers of titanium casting machines, for example the Rematitan®-System from Dentaurum.

Please follow the manufacturer's instructions for use regarding the wax-up, sprue construction, investment and casting.

There may be processing differences according to which manufacturer the material is supplied from. The following instructions for designing and conditioning the titanium framework are based upon the Rematitan®-system by Dentaurum. Many aspects however can be applied to titanium framework produced through other systems.

Titanium frameworks can be made by casting, milling or eroding, as well as by using pre-fabricated elements (e.g. implant prosthetic components). However, the surface of the titanium framework must be entirely free of the α-case layer.

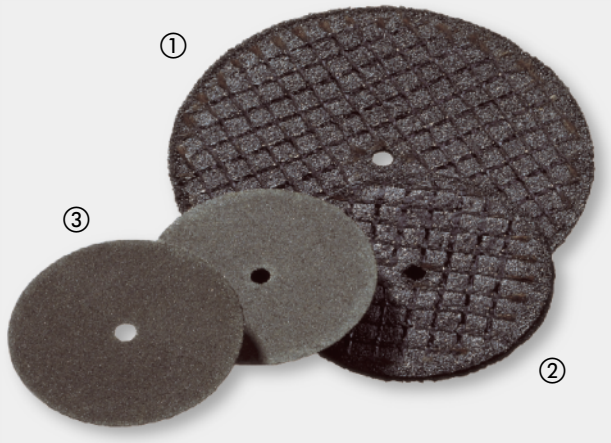


2.1.2. Trimming and grinding titanium framework

Important! Do not overheat the cast framework during grinding. Avoid red heat and cool well with water. Do not tilt the separating disk.

Recommended separating discs:

①	ST-separating disc for thick sprues	(Order No. 130-100-00)
②	ST-mini separating disc (rapid grinder or handpiece)	(Order No. 130-110-00)
③	TX-separating disc for thin sprues	(Order No. 130-512-00)



Grinding in preparation for ceramic veneering:

Notes in general: Surface processing must be recognised as the most important factor in the manufacturing process of titanium. Depending on the casting system, the investment material and the wall thickness, the α-case layer formed by cast titanium may vary in thickness. This is enriched with oxygen and other substances and has a negative effect on the ceramic coat. More or less intensive grinding of the surface is therefore necessary, depending on the casting system, the investment material and the wall thickness.

Recommended rule of thumb:

- Light grinding of crowns with thin to normal wall thickness.
- Intense grinding of crowns with thicker walls or solid pontics .

Use carbide cutters **only** and work in one direction. Especially suitable are the cross-cut carbide cutters specially designed for titanium. The α-case layer typical of titanium must be removed completely.

Recommended cutters of the Esprident/Dentaurum product range:

④	carbide cutter, mini	(Order No. 123-610-00)
⑤	carbide cutter, midi	(Order No. 123-611-00)
⑥	carbide cutter, maxi	(Order No. 123-612-00)
⑦	carbide cutter, maxi plus	(Order No. 123-613-00)

Maximum speed: 10 000 r.p.m., low pressure.

Due to titanium's low thermal conductivity, excessive pressure during grinding may result in overheating. This in turn prevents the production of metal filings, subsequently causing overlapping.

Never use tools for processing titanium with any other type of metal or material. Do not use grinding points or diamond burs for areas to be covered with dental ceramics (risk of gas bubbles in the ceramics!) Ensure that the cutter does not become clogged with metal chips. If necessary, clean it with a wire brush. Carefully sandblast the surface of the framework with a microblaster using aluminium oxide (125-250 µm) and 2-3 bars air pressure. Recommended jet angle 45°.

At lower pressure, the conditioning of the surface is inadequate. At higher pressure there is a risk of surface contamination.

After having sandblasted and cleaned the metal framework (using a steam cleaner), do not touch it with your fingers.

Never immerse titanium frameworks into hydrofluoric acid as this severely corrodes titanium.

2.2. Ceramic build-up

2.2.1. Colour-combination table

Colour	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Opaque	O A1	O A2	O A3	O A3,5	O A4	O B1	O B2	O B3	O B4	O C1	O C2	O C3	O C4	O D2	O D3	O D4
Opaque dentin	OD A1	OD A2	OD A3	OD A3,5	OD A4	OD B1	OD B2	OD B3	OD B4	OD C1	OD C2	OD C3	OD C4	OD D2	OD D3	OD D4
Dentin	D A1	D A2	D A3	D A3,5	D A4	D B1	D B2	D B3	D B4	D C1	D C2	D C3	D C4	D D2	D D3	D D4
Incisal	IT 57	IT 57	IT 59	IT 59	IT 60	IT 57	IT 59	IT 59	IT 59	IT 59	IT 59	IT 59	IT 60	IT 59	IT 59	IT 59
Shoulder*	1/2 A	2/3 A	3/4 A	1/1 A	1/1 A	1/2 B	2/3 B	1/1 B	1/1 B	2/3 C	3/4 C	3/4 C	1/1 C	1/3 A 1/3 D	1/2 A 1/4 D	1/1 D

*Portion of corresponding shoulder material, remainder SM-modifier white.

2.2.2. Firing chart

	Base temperature*	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Powder bonder bake	500 °C 932 °F	4 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	795 °C 1463 °F	795 °C 1463 °F	1 min. under vacuum	0 min.
Paste bonder bake	500 °C 932 °F	6 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	795 °C 1463 °F	795 °C 1463 °F	1 min. under vacuum	0 min.
Opaque bake 1+2	500 °C 932 °F	4 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	795 °C 1463 °F	795 °C 1463 °F	1 min. under vacuum	0 min.
Shoulder bake	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	785 °C 1445 °F	785 °C 1445 °F	1 min. under vacuum	0 min.
Dentin bake (with liquid LV univ.)**	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.
Correction bake (with liquid LV univ.)**	500 °C 932 °F	4 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.
Glaze bake	500 °C 932 °F	2 min.	55 °C/min. 131 °F/min.	--	--	755 °C*** 1391 °F	1 min.****	0 min.
Correction material	500 °C 932 °F	4 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	715 °C 1319 °F	715 °C 1319 °F	1 min. under vacuum	0 min.
Gingival material	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.

* Positioning of objects only at correct standby temperatures.

** When using modelling liquid MV universal, observe different bake sequence (see page 16).

*** By reducing (adjusting) the firing temperature, variation in glaze can be achieved.

**** The glaze bake can be carried out under or without vacuum.The grade of glaze can be increased by prolonging the holding time.

The data shown are valid for fine-silver calibrated furnaces. These may vary from one furnace to another or from one type of furnace to another. Correction of the firing temperature is urgently recommended, as the furnaces are generally calibrated for higher temperatures. It is recommended to use a furnace specially for titanium ceramics.

When different alloys are fired in the same furnace, it is necessary to make frequent purge firings to the furnace according to the manufacturer's instructions. This prevents the metal framework from becoming contaminated with other alloy constituents and other negative effects of impurity.

2.2.3. Firing temperature control

In order to adjust the firing temperature of your furnace, we recommend a firing test, as this is the only way to judge the correct bake sequence.

For that purpose, use NT-material (neutral transparent) mixed with modelling liquid LV universal and fire at the following temperatures:

- Base temperature 500 °C/932 °F
- Drying time 6 minutes
- Heating rate 55 °C/min. / 131 °F/min.
- Vacuum start 500 °C/932 °F
- Vacuum end at final temperature 755 °C/1391 °F
- Holding time 1 minute under vacuum

Put the bake specimen on platinum foil, not on firing cotton, as this may cause dulling.

Fig. 1: Bake specimen, correct.

Fig. 1a: Bake specimen, temperature too low.

The temperature of the furnace is correct when the specimen is clear and translucent with sharp edges (fig. 1). If the final temperature is too high, the specimen has a glossy appearance and the edges are not sharply defined. If the final temperature is too low, the specimen appears milky white (fig. 1a). According to your result, please raise or lower the final temperature in steps of 10 °C/50 °F and fire a new specimen.

Furnace cleaning

The ceramic furnace must be cleaned regularly in order to remove contamination from the inner surfaces of the muffle.
We recommend:

- Frequent cleansing firing with carbon fibre chips (Order No. 260-317-00)
- Cleansing of firing tray with pins
- Base temperature: 600 °C/1112 °F
- Drying time: 1 min
- Heating rate: 100 – 120 °C/212 – 248 °F per min
- Final temperature: 1050 °C/1922 °F
- Holding time: 10 min.
  Firing program without vacuum. Please follow furnace manufacturer's instructions!

Always keep the furnace closed. Close the furnace after use or switch to night modus to prevent uptake of humidity.

2.2.4. Application of bonder

After sandblasting, a resting time of 10 minutes in air is necessary to allow the surface oxide to form. Do not wait for longer than 30 minutes before applying the bonder.

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Powder bonder bake	500 °C 932 °F	4 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	795 °C 1463 °F	795 °C 1463 °F	1 min. under vacuum	0 min.
Paste bonder bake	500 °C 932 °F	6 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	795 °C 1463 °F	795 °C 1463 °F	1 min. under vacuum	0 min.

When using the paste bonder, please be sure to mix thoroughly in the pot before application. If necessary add universal paste liquide, Order No. 299-170-40, to create a creamy consistency. Caution: Please observe the longer drying times in the firing chart.

Using a glass spatula the bonder powder is mixed with unviversal liquid B.O.L., Order No. 299-180-40, to a creamy consistency (fig. 2).

Apply bonder thinly on the framework by glass spatula or brush, as if wetting the surface. Avoid the formation of puddles or drops on framework surface. The actual masking of the framework is achieved after having applied the opaque.

The bonder is not the opaque!

After baking, the bonder has an even shiny surface.

Fig. 2:
Mixing of the bonder to a creamy consistency with the glass spatula.

Fig. 3a:
3-part bridge on model. Metal framework fully conditioned. 1 crown shortened for application of shoulder material.

Fig. 3b:
3-part bridge with bonder applied (before bonder bake).

Fig. 3c:
3-part bridge (after bonder bake).

2.2.5. AESTHETIC UNIVERSAL Bonder

Application

Note: When using AESTHETIC UNIVERSAL bonder on a titanium framework, Triceram® titanium bonder should no longer be applied!

1. Prepare the metal framework according to chapter 2.1. Sandblast the metal surface and clean thoroughly. Warm the titanium framework gently using the heat from an open ceramic furnace.

   Storage information:
   During long periods of storage the gold content inside the syringe can separate from the paste. For this reason we recommend turning the syringe from time to time. Should a dispersion of the mixture be visible, please proceed as follows:
   - **Remove the lid.**
   - **Withdraw the plunger as far as possible and stand the syringe upright with the plunger at the base.**
   - **The paste will sink toward the base.**
   - **Push the plunger back to its original position until the paste can be seen in the syringe head again. Repeat this procedure two or three times.**
   - **If the AESTHETIC UNIVERSAL bonder becomes difficult to spread it is possible to add a small amount of AESTHETIC UNIVERSAL bonder liquid, Order No. 299-200-10. Place the paste as required in a small bowl and mix with a small amount of liquid.**

   .

   Important: Use the liquid sparingly! Once in use, the object must be dried for a longer period of time, otherwise danger of bubbling.

Availibility:

Set
(syringe 4g, brush, liquid and small bowl)
Order No. **292-200-15**

Syringe
(4g)
Order No. **292-200-10**

Brush No. 4
Order No. **260-905-00**

Liquid
Order No. **299-200-10**

2. Apply the AESTHETIC UNIVERSAL bonder in a thin layer to the titanium framework using a clean brush (Espident brush no. 4, Order No. 260-905-00). Use gentle pressure and light rotation of the brush on the surface to cover the titanium framework uniformly.

3. Apply a thin covering layer of AESTHETIC UNIVERSAL bonder. Apply AESTHETIC UNIVERSAL bonder uniformly to ensure that no air becomes trapped.

4. After application, dry the covered surface for at least 5 min. in front of an opened ceramic furnace at the standby temperature of 400°C / 752°F. The shiny paste will turn matt. The object must not exceed 150°C / 302°F. If necessary, a second layer of AESTHETIC UNIVERSAL bonder may be applied on top of the dried bonder. Again dry thoroughly.

   Important: It is essential to dry the AESTHETIC UNIVERSAL bonder thoroughly before firing. Otherwise the remaining bonder liquid within the superficially dried paste will break free later during ceramic firing. These inclusions can cause bubbles to occur. During drying, the objects should reach a temperature of between 100 – 120°C /212 – 248°F irrespective of the furnace program, but never exceed 150°C / 302°F. If the open furnace does not generate enough heat, raise the standby temperature. The pre-heating furnace can also be used as an alternative (increase heat slowly to 130°C / 266°F and hold for 5 minutes) or with a hot air blower (set at 120°C / 248°F for 5 minutes).

5. After firing, an even distribution of ceramic particles should be visible on the titanium surface (rough surface). If necessary, apply a second layer

6. Then apply the opaque according to chapter 2.2.6. Only one firing is generally required.

Firing chart

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
AESTHETIC UNIVERSAL bonder	400 °C 752 °F	min. 5 min	55 °C/min. 131 °F/min.	400 °C 752 °F	800 °C 1472 °F	800 °C 1472 °F	1 min. under vacuum	0 min

2.2.6. Applying the opaque

Using a glass spatula, mix the opaque with the universal liquid B.O.L. to a creamy consistency.

	Base temperature*	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Opaque bake 1+2	500 °C 932 °F	4 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	795 °C 1463 °F	795 °C 1463 °F	1 min. under vacuum	0 min.

Fig. 4a:
3-part bridge before first opaque bake.

For the first bake, apply the opaque thinly but evenly to the bonder covered framework (fig. 4a). Use the rounded tip of the glass spatula. After baking, the opaque appears silky and shiny (fig. 4b).

For the second opaque bake, the opaque is also applied in a thin even layer, taking care to cover the entire surface. The result should appear dense and shiny (fig. 4c).

Fig. 4b:
3-part bridge after first opaque bake.

Fig. 4c:
3-part bridge after second opaque bake.

2.2.7. Use of shoulder material

The Triceram® system comprises four different shoulder materials which are divided into the colour categories A-B-C-D.

All colour variations from A1 to D4 can be achieved by mixing the SM-modifier "white" in accordance with the table shown opposite.

The transparency of the shoulder and the effect of depth can be increased by adding the SM-modifier "transparent". For mixing use the shoulder material liquid universal.

To achieve the best results when lifting off the applied shoulder material and avoid any discoloration in the shoulder zone, it is recommended to work with the isolation SM-Isoprotector.

	A	B	C	D	White
A1	1/2	-	-	-	1/2
A2	2/3	-	-	-	1/3
A3	3/4	-	-	-	1/4
A3,5	1/1	-	-	-	-
A4	1/1	-	-	-	-
B1	-	1/2	-	-	1/2
B2	-	2/3	-	-	1/3
B3	-	1/1	-	-	-
B4	-	1/1	-	-	-
C1	-	-	2/3	-	1/3
C2	-	-	3/4	-	1/4
C3	-	-	3/4	-	1/4
C4	-	-	1/1	-	-
D2	1/3	-	-	1/3	1/3
D3	1/2	-	-	1/4	1/4
D4	-	-	-	1/1	-

SM-Isoprotector

Ord.-No. 260-324-00

25 ml

Isolates plaster from ceramics and ceramics from ceramics. Smoothes out and seals at the same time.

The separating effect is fantastic. Optimal results are achieved on dies and basal areas which have not been previously treated with hardener, sealant or die spacer. The surface must be dry. The isolation should be applied twice.

Application of shoulder material

Isolate the die with SM-Isoprotector in the area where the shoulder material is to be applied. The shoulder material, which has been selected to match the tooth shade, can be applied immediately.

Mix the shoulder material with corresponding shoulder material liquid universal. Apply the shoulder material from the framework towards the preparation line. Dry the material (hair-dryer or tissue). Then remove crown from the die and fire according to indicated program.

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Shoulder bake	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	785 °C 1445 °F	785 °C 1445 °F	1 min. under vacuum	0 min.

To compensate for shrinkage of the shoulder material which is to be expected due to the reduction of the crown (according to the preparation), a second bake is required. Re-separate the areas for correction with SM-Isoprotector and add the missing material. Bake as for first shoulder bake.

After the second bake, remount the crown onto the die and adjust the marginal edge with adequate finishing burs. (Observe the speed of the handpiece max. 15 000 r.p.m.). Continue the process in the usual way.

Fig. 5a:
Crown shortened after opaque bake. Shoulder material applied before shoulder bake.

Fig. 5b:
Crown after first shoulder bake.

Fig. 5c:
Crown before second shoulder bake. Shoulder material applied.

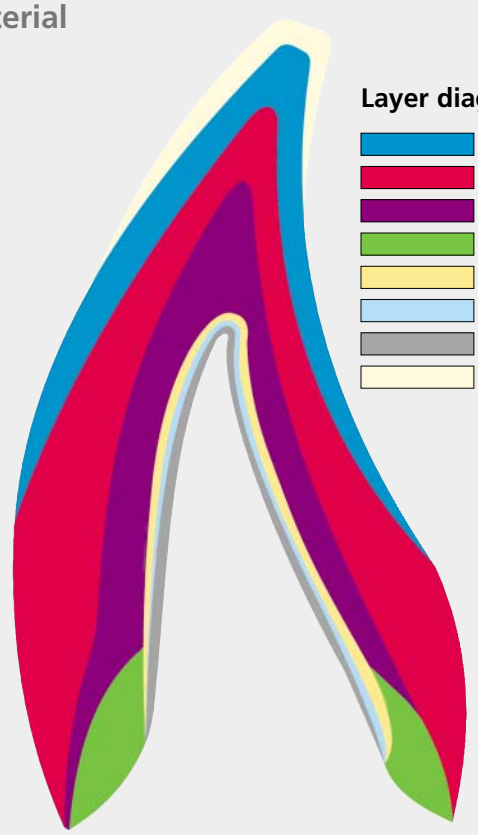
Fig. 5d:
Crown after fitting.

2.2.8. Build-up with dentin and incisal material

2.2.8.1. Layer diagram

Selection of the ceramic materials according to tooth shade. For build-up of the shade refer to the layer diagram opposite.

Note on layer build-up: To avoid visible colour demarcations, use opaque dentin (OD). It also prevents the visibility of the opaqued titanium framework. OD materials can also be used to control brightness (by mixing dentin and opaque dentin). At layer thicknesses from 0.9 mm on, opaque dentin is not required.



2.2.8.2. Note on materials and liquids

All the materials – opaque dentin, dentin, incisal, neutral transparent, transpa-effect, gingival and correction materials – are mixed using the modelling liquid LV universal. The ceramic materials should be kept as evenly moist as possible. Any additional moistening is done using modelling liquid LV universal.

Opaque dentin OD

- diffusing effect
- three-dimensional effect of depth (when completed)
- complementing of actual tooth shade (even in an unfavourable space situation)
- intensifies depth reflections

Dentin D

- 16 dentin colours
- easy handling
- stability of shape and edges
- bake stability
- low shrinkage
- colour stability
- prismatic effect
- natural fluorescence

Incisal transparent IT

Classification of the incisal materials

A1	IT 57	B4	IT 59
A2	IT 57	C1	IT 59
A3	IT 59	C2	IT 59
A3,5	IT 59	C3	IT 59
A4	IT 60	C4	IT 60
B1	IT 57	D2	IT 59
B2	IT 59	D3	IT 59
B3	IT 59	D4	IT 59

With IT 58 it is possible to achieve additional grey effects in the area of the posteriors.

Incisal opalescent IO

- for incisal alternative layer
- opalescent bluish effect in reflected light, slightly orange effect in permeated light
- intensifies natural refraction of light
- application in incisal area

Transpa-effect materials TE

In order to increase the lively effect in the incisal area, or to obtain individual or characteristic effects, TE-materials can also be used with Triceram®.

- incisal alternative layer
- application in incisal area
- natural refraction of light

Stains Universal ST

To obtain modifications in shade. They can be laid in and mixed with the materials. Stains can be mixed up to 10 mass% with the ceramic materials (SM, OD, D, IT, IO, TE, NT + G). If they are mixed with Stains Universal liquid, these materials are also suitable for painting the surface of the ceramic material.

This material has highly individual characteristics and special depth of colour.

- ST 0 neutral
- ST 1 white
- ST 2 vanilla
- ST 3 yellow
- ST 45 orange plus
- ST 6 pink
- ST 7 dark pink
- ST 8 purple
- ST 9 blue
- ST 10 grey
- ST 11 olive-green
- ST 12 olive-yellow
- ST 13 medium brown
- ST 14 red brown
- ST 15 black

Note:

Stains Universal ST can also be used in combination with the CARMEN® system (for mixing and painting).

The liquids:

Stains Universal liquid

- for mixing with Stains Universal ST
- for the glaze bake

Shoulder material liquid universal

- for mixing shoulder materials
- increases the stability of shape and edges

Universal liquid B.O.L.

- for mixing powder bonder, opaque and liner

Universal paste liquid

- for mixing paste bonder

Modelling liquid MV universal

- for increasing plasticity
- especially in dry warm climates
- for prolonging the carving ability

Modelling liquid LV universal

- universal standard liquid for mixing and re-moistening of previously mixed materials

Important:

When using modelling liquid MV universal, note the differences in bake sequence from modelling liquid LV universal (see firing chart). Do not mix the universal liquids LV and MV as this may cause bubbles!

Note:

Universal liquids can also be used in combination with the CARMEN® system.

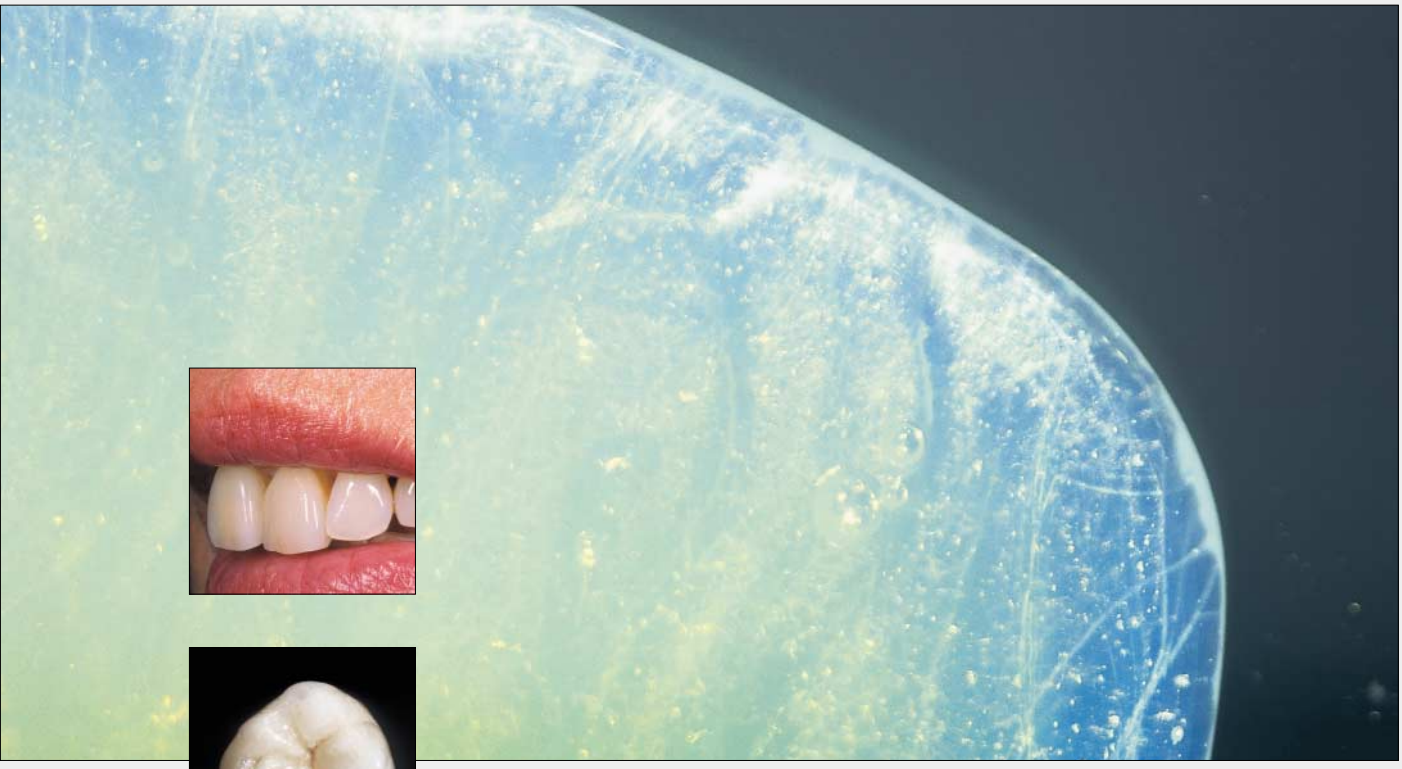
Bake sequence for dentin and correction bakes, see firing chart:

For standard modelling liquid LV universal

	Base-temperature	Drying time	Holding time at base temp.	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Dentin bake (with liquid LV univ.)	500 °C 932 °F	6 min.	0 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.
Correction bake (with liquid LV univ..)	500 °C 932 °F	4 min.	0 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.

For modelling liquid MV universal

Dentin bake (with liquid MV univ.)	500 °C 932 °F	4 min.	4 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.
Correction bake (with liquid MV univ.)	500 °C 932 °F	3 min.	3 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.



Triceram®

Incisal opalescent material

For reinforcing natural opalescence

2.2.8.3. Layer build-up (standard) step-by-step

1. Opaque dentin (OD) is applied to the entire labial surface. The OD projects well beyond the incisal edge of the titanium framework (increase in light dispersion).

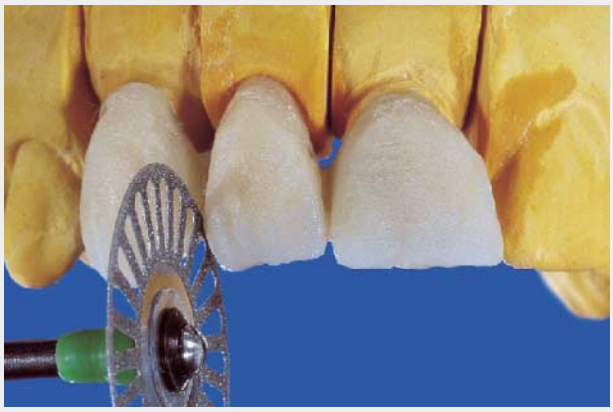
2. Build-up of the complete anatomical tooth form with dentin.

3. Cutting back the dentin in incisal area to make room for completion with incisal transparent material (IT).

4. Layering of incisal area with IT material.

5. When building up a bridge, separate the ceramics between the teeth, down to the opaque layer, using a scalpel (labially as well as palatinally).

6. Correction of shape after dentin bake (before correction bake).



7. After the correction bake, make the necessary corrections to shape (for suitable separating discs see 4, page 23).

8. Grind the bridge lightly using a diamond bur (suitable diamonds see 4 page 23).

9. The glaze bake is carried out without glaze material. Special colour effects can be achieved by applying stains to the ceramic surface. Mix the Stains with the stains universal liquid.

10. Finished work after glaze bake.

Bake sequence for dentin and correction bakes, see firing chart:

For standard modelling liquid LV universal

	Base temperature	Drying time	Holding time at base temp.	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Dentin bake (with liquid LV univ..)	500 °C 932 °F	6 min.	0 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.
Correction bake (with liquid LV univ.)	500 °C 932 °F	4 min.	0 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.

For modelling liquid MV universal

Dentin bake (with liquid MV univ.)	500 °C 932 °F	4 min.	4 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.
Correction bake (with liquid MV univ.)	500 °C 932 °F	3 min.	3 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.

Bake sequence for glaze bake, see firing chart

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Glaze bake	500 °C 932 °F	2 min.	55 °C/min. 131 °F/min.	--	--	755 °C* 1391 °F	1 min.**	0 min.

* By reducing (adjusting) the firing temperature, variation in glaze can be achieved.

** The glaze bake can be carried out under or without vacuum. The grade of glaze can be increased by prolonging the holding time.

2.2.8.4. Individual layer build-up step-by-step

1. Colour modifications with stains on baked opaque.

2. Application of opaque dentin. More individual effects can be achieved by carefully mixing OD and stains together.

3. An individual build-up using dentin, dentin and stains mixed together and finished off with incisal and transpa effect materials..

4. Shape corrections and application of effect or transpa materials as required.

5. After the correction bake and final shaping, stains can be used to achieve special effects on the surface.

6. Finished bridge after glaze bake.

2.2.9. Use of gingival material

Gingival materials G (light) and GD (dark)

- build-up and reconstruction of gingival and papilla situation
- compensation of mucous-membrane deficiencies
- for masking parts of titanium framework with gingival coloured opaque wherever necessary

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Gingival material	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	755 °C 1391 °F	755 °C 1391 °F	1 min. under vacuum	0 min.

2.2.10. Use of correction material

Use for correcting minor defects (contact points, occlusion area).

In order to obtain perfect results from an aesthetic point of view, it is recommended to mix the correction material with dentin D or incisal material IT (proportion as required - 50:50).

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Correction material	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	715 °C 1319 °F	715 °C 1319 °F	1 min. under vacuum	0 min.

2.2.11. Preparation of Triceram® ceramics

To achieve good surface density and homogeneity, it is recommended to grind over the surface with super-fine sintered diamonds or sintered diamond discs. Finishing, structuring and polishing (before glaze bake) are carried out with diadurite-impregnated special fibre polishers and micro-fine diamond-impregnated felt polishers (for interdental and occlusal polishing). With Triceram® glaze materials are not required.

3. Dental Technical Instructions for Use on Zirconium Oxide Framework

Zirconium oxide has different thermal characteristics to titanium. For this reason, in order to achieve optimal firing results of Triceram® on zirconium oxide, the firing temperature must be raised and the holding time lengthened. The same basic prerequisites for metal alloy framework, also apply for zirconium oxide. It is essential that the size of the framework is a smaller version of the final anatomical shape desired. A successful restoration relies on an even thikkness of bonding ceramics. Please note the firing recommendations in the table below.

1. Preparing the framework

a) Sandblast with aluminium oxide, grain size 125µm, at a pressure of 2-3 bar / 30-45 psi
b) Carefully clean using a steam cleaner

2. Applying the Triceram® liner

Apply the liner according to the selected tooth shade (see colour-combination table) and mixed with universal liquid B.O.L., Order No. 299-180-40, to a creamy consistency. For the first bake, apply the liner thinly to the framework. For the second liner bake, the liner is also applied in a thin even layer, taking care to cover the entire surface. After the second bake, the liner surface appears silk shiny

3. Ceramic build-up

(see page 18)

Please note that all firing temperatures must be increased by 5°C - 10°C compared to the firing recommendations for titanium, (see firing table below).

The holding time for the dentin bakes must be prolonged by 1.5 – 2 minutes.

Different furnaces may require individual variations in temperature.
Tips for furnace control see page 9 Triceram® Instructions for Use.

Colour-combination table

tooth shade	L1	L2	L3	L4	L5	L6
A1	1/3				2/3	
A2	2/3				1/3	
A3	1					
A3,5	3/4					1/4
A4	1/2					1/2
B1		1/3			2/3	
B2		2/3			1/3	
B3		3/4			1/4	
B4		1				
C1			1/3		2/3	
C2			2/3		1/3	
C3			3/4		1/4	
C4			1			
D2				2/3	1/3	
D3				3/4	1/4	
D4		1/3		2/3		

Recommended Firing Temperatures for Zirconium Oxide Framework

	Base temperature	Drying time	Heat rate	Vacuum start	Vacuum end	Final temperature	Holding time	Cooling time
Liner 1+2 bake	500 °C 932 °F	4 min.	65 °C/min. 149 °F/min.	500 °C 932 °F	800 °C 1472 °F	800 °C 1472 °F	1 min. under vacuum	0 min.
Shoulder bake	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	790 °C 1454 °F	790 °C 1454 °F	1 min. under vacuum	0 min.
1. Dentin bake	500 °C 932 °F	6 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	760 °C 1400 °F	760 °C 1400 °F	1,5 - 2 min. under vacuum	0 min.
2. Dentin bake	500 °C 932 °F	4 min.	55 °C/min. 131 °F/min.	500 °C 932 °F	760 °C 1400 °F	760 °C 1400 °F	1,5 - 2 min. under vacuum	0 min.
Glaze bake	500 °C 932 °F	2 min.	55 °C/min. 131 °F/min.	–	–	760 °C 1400 °F	1 min.*	0 min.

* The glaze bake can be carried out under or without vacuum. The grade of glaze can be increased by prolonging the holding time.

Instead of using the Triceram® liner you can also use Triceram® bonder and Triceram® opaque.

4. Accessories for Preparation of Ceramics

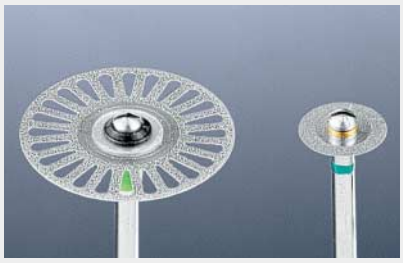
A B C D

Order No. 260-803-01 A **Sidio I**
Unit: 1 piece
Speed:
10 000-20 000 r.p.m.
Shaft Ø 2.35 mm
Superfine sintered diamond for forming the ceramic margins. Also suitable for the extensive areas of the oral or vestibular molar regions and fascial areas.

Order No. 260-803-02 B **Sidio II**
Unit: 1 piece
Speed:
10 000-20 000 r.p.m.
Shaft Ø 2.35 mm
Superfine sintered diamond for the occlusal ceramic forming, as well as for the preparation of fissures.

Order No. 260-803-03 C **Sidio III**
Unit: 1 piece
Speed:
10 000-20 000 r.p.m.
Shaft Ø 2.35 mm
Superfine sintered diamond for the formation of lingual anterior areas, as well as for forming the labial structure areas.

Order No. 260-803-04 D **Sidio IV**
Unit: 1 piece
Speed:
10 000-20 000 r.p.m.
Shaft Ø 2.35 mm
Superfine sintered diamond for trimming the fissures and forming the interproximal transitions.



A B

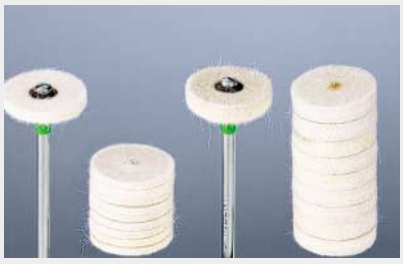
Order No. 260-804-02 A **Highflex**
Unit: 1 piece
Speed:
3 000-5 000 r.p.m.
Shaft Ø 2.35 mm
Hyperflexible diamond disc for separating and contouring ceramic material (thickness 0.15 mm) as well as for general formation of interproximal areas (moderate pressure!).

Order No. 260-804-01 B **Dia-Miniflex**
Unit: 1 piece
Speed:
5 000-10 000 r.p.m.
Shaft Ø 2.35 mm
Superfine flexible diamond disc for extremely fine interproximal and incisal corrections.

A B

Order No. 260-805-01 A **Kerofix I**
Unit: 2 pieces
Speed:
2 000-3 000 r.p.m.
Shaft Ø 2.35 mm
Special pre-polisher for ceramics with diadurite-impregnated fibres. Important! An intermittent working style with firm pressure and with gently circular motions is recommended.

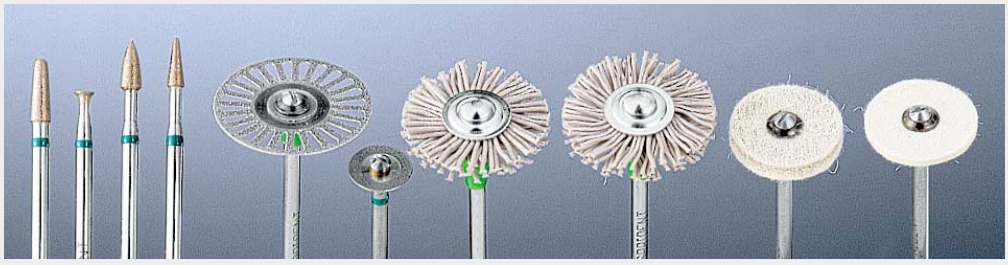
Order No. 260-805-02 B **Kerofix II**
Unit: 2 pieces
Speed:
2 000-3 000 r.p.m.
Shaft Ø 2.35 mm
Special finishing polisher for ceramics with diadurite-impregnated fibres. Important! An intermittent working style with firm pressure and with gently circular motions is recommended.



A B

Order No. 260-806-01 A **Diafix I**
Unit: 10 pieces
(1 mounted + 9 unmounted)
Speed:
2 000-3 000 r.p.m.
Shaft Ø 2.35 mm
The non-drying microfine diamond-impregnated felt polisher for the high-shine polish of interproximal and occlusal areas.

Order No. 260-806-02 B **Diafix II**
Unit: 10 pieces
(1 mounted + 9 unmounted)
Speed:
2 000-3 000 r.p.m.
Shaft Ø 2.35 mm
The non-drying microfine diamond-impregnated felt polisher for natural high-shine polish of vestibular and oral ceramic surfaces.



Kera set 10 pieces
Order No. 260-800-12
Consisting of:
Sidio I, Sidio II, Sidio III, Sidio IV, Highflex, Dia-Miniflex, Kerofix I, Kerofix II, Diafix I, Diafix II

5. Triceram®
Product Components and Assortments

5.1. Product components

2 Bonder				
6 Liner:	L1, L5,	L2, L6	L3,	L4,
17 Opaque materials:	O A1, O A4, O B4, O C4, G	O A2, O B1, O C1, O D2,	O A3, O B2, O C2, O D3,	O A3.5, O B3, O C3, O D4,
16 Opaque dentin materials:	OD A1, OD A4, OD B4, OD C4,	OD A2, OD B1, OD C1, OD D2,	OD A3, OD B2, OD C2, OD D3,	OD A3.5, OD B3, OD C3, OD D4
16 Dentin materials:	D A1, D A4, D B4, D C4,	D A2, D B1, D C1, D D2,	D A3, D B2, D C2, D D3,	D A3.5, D B3, D C3, D D4
9 Incisal materials:	IT 57, IO 1, IO 5	IT 58, IO 2,	IT 59, IO 3,	IT 60 IO 4,
1 Neutral transparent material:	NT			
1 Correction material:	CM			
6 Transpa-effect materials:	TE 1, TE 5 ,	TE 2, TE 6	TE 3 ,	TE 4 ,
4 Shoulder materials:	SM A,	SM B,	SM C,	SM D
2 SM-modifiers:	SM W,	SM T		
2 Gingival materials:	G,	GD		
15 Stains:	ST 0, ST 45, ST 9, ST 13,	ST 1, ST 6, ST 10, ST 14,	ST 2, ST 7, ST 11, ST 15	ST 3, ST 8, ST 12,
7 Liquids universal:	modelling (LV, MV), Stains, shoulder material, SM-Isoprotector,paste, B.O.L			

5.2. Test set

Triceram® test set
Ord.-No. 290-113-01

1 Powder bonder, 3 g
1 Paste bonder, 3 g
1 Opaque material O A3, 15 g
1 Opaque dentin material OD A3, 15 g
1 Dentin material D A3, 15 g
1 Incisal transparent material IT 59, 15 g
1 Neutral transparent material NT, 15 g
1 Universal liquid B.O.L., 20 ml
1 Modelling liquid LV universal, 20 ml
1 Glass spatula for applying bonder and opaque
1 Opaque brush

5.3. Assortments

Triceram® Master set (1) (Not available via air freight)
Ord.-No. 290-112-01

1 Powder bonder, 15 g
17 Opaque materials O A1-D4 + G, 15 g each
16 Opaque dentin materials OD A1-D4, 15 g each
16 Dentin materials D A1-D4, 15 g each
4 Incisal transparent materials IT 57-60, 15 g each
5 Incisal opalescent IO 1-5, 15 g each
1 Neutral transparent material NT, 15 g
1 Correction material CM, 3 g
6 Transpa-effect materials TE 1-6, 15 g each
4 Shoulder materials SM A-D, 15 g each
2 Shoulder material modifiers SM W-SM T, 15 g each
2 Gingival materials G, GD, 15 g each
15 Stains Universal ST 0-15, 3 g each
1 Stains Universal liquid, 20 ml
1 Shoulder material liquid universal, 20 ml
1 Universal liquid B.O.L., 100 ml
1 Modelling liquid MV universal, 20 ml
1 Modelling liquid LV universal, 100 ml
1 SM-Isoprotector, 25 ml
1 Glass spatula for applying bonder and opaque
1 Opaque brush
1 Shade guide for effect materials
1 Shade guide for Stains Universal

Triceram® Master set (2)
Ord.-No. 290-112-11

Contents identical to 290-112-01,
with paste bonder instead of powder bonder

Triceram® Master set -air freight- (3)
Ord.-No. 290-112-51

Contents identical to 290-112-01,
but: without SM-Isoprotector

Triceram® Master set -air freight- (5)
Ord.-No. 290-112-61

Contents identical to 290-112-01,
with paste bonder instead of powder bonder
and without SM-Isoprotector

Stains Universal set
Ord.-No. 296-000-01

15 Stains Universal ST 0-15, 3 g each
1 Stains Universal liquid, 20 ml
1 Shade guide for Stains Universal

5.4. Individual products

Article description	Order-No.	Unit (g)
Bonder		
Powder bonder	292-100-10	3
Powder bonder	292-100-30	15
Powder bonder	292-100-60	40
Paste bonder	292-110-05	3
Paste bonder	292-110-10	8
LINER		
Liner 1	292-513-30	20
Liner 2	292-523-30	20
Liner 3	292-533-30	20
Liner 4	292-543-30	20
Liner 5	292-550-30	20
Liner 5	292-567-30	20
AESTHETIC UNIV. BONDER		
AESTHETIC B. set	292-200-15	4
AESTHETIC Bonder	292-200-10	4
Opaque O		
Opaque A1	292-211-30	15
Opaque A1	292-211-60	40
Opaque A2	292-212-30	15
Opaque A2	292-212-60	40
Opaque A3	292-213-30	15
Opaque A3	292-213-60	40
Opaque A3.5	292-214-30	15
Opaque A3.5	292-214-60	40
Opaque A4	292-215-30	15
Opaque A4	292-215-60	40
Opaque B1	292-221-30	15
Opaque B1	292-221-60	40
Opaque B2	292-222-30	15
Opaque B2	292-222-60	40
Opaque B3	292-223-30	15
Opaque B3	292-223-60	40
Opaque B4	292-224-30	15
Opaque B4	292-224-60	40
Opaque C1	292-231-30	15
Opaque C1	292-231-60	40
Opaque C2	292-232-30	15
Opaque C2	292-232-60	40
Opaque C3	292-233-30	15
Opaque C3	292-233-60	40
Opaque C4	292-234-30	15
Opaque C4	292-234-60	40
Opaque D2	292-242-30	15
Opaque D2	292-242-60	40
Opaque D3	292-243-30	15
Opaque D3	292-243-60	40
Opaque D4	292-244-30	15
Opaque D4	292-244-60	40
Opaque gingival	292-250-30	15
Shoulder SM		
Shoulder material A	293-110-30	15
Shoulder material B	293-120-30	15
Shoulder material C	293-130-30	15
Shoulder material D	293-140-30	15
SM-modifier		
SM-modifier white	293-150-30	15
SM-modifier transparent	293-199-30	15
Opaque dentin OD		
Opaque dentin A1	294-111-30	15
Opaque dentin A1	294-111-60	40
Opaque dentin A2	294-112-30	15
Opaque dentin A2	294-112-60	40
Opaque dentin A3	294-113-30	15
Opaque dentin A3	294-113-60	40

Article description	Order-No.	Unit (g)
Opaque dentin OD		
Opaque dentin A3.5	294-114-30	15
Opaque dentin A3.5	294-114-60	40
Opaque dentin A4	294-115-30	15
Opaque dentin A4	294-115-60	40
Opaque dentin B1	294-121-30	15
Opaque dentin B1	294-121-60	40
Opaque dentin B2	294-122-30	15
Opaque dentin B2	294-122-60	40
Opaque dentin B3	294-123-30	15
Opaque dentin B3	294-123-60	40
Opaque dentin B4	294-124-30	15
Opaque dentin B4	294-124-60	40
Opaque dentin C1	294-131-30	15
Opaque dentin C1	294-131-60	40
Opaque dentin C2	294-132-30	15
Opaque dentin C2	294-132-60	40
Opaque dentin C3	294-133-30	15
Opaque dentin C3	294-133-60	40
Opaque dentin C4	294-134-30	15
Opaque dentin C4	294-134-60	40
Opaque dentin D2	294-142-30	15
Opaque dentin D2	294-142-60	40
Opaque dentin D3	294-143-30	15
Opaque dentin D3	294-143-60	40
Opaque dentin D4	294-144-30	15
Opaque dentin D4	294-144-60	40
Dentin D		
Dentin A1	294-211-30	15
Dentin A1	294-211-60	40
Dentin A2	294-212-30	15
Dentin A2	294-212-60	40
Dentin A3	294-213-30	15
Dentin A3	294-213-60	40
Dentin A3.5	294-214-30	15
Dentin A3.5	294-214-60	40
Dentin A4	294-215-30	15
Dentin A4	294-215-60	40
Dentin B1	294-221-30	15
Dentin B1	294-221-60	40
Dentin B2	294-222-30	15
Dentin B2	294-222-60	40
Dentin B3	294-223-30	15
Dentin B3	294-223-60	40
Dentin B4	294-224-30	15
Dentin B4	294-224-60	40
Dentin C1	294-231-30	15
Dentin C1	294-231-60	40
Dentin C2	294-232-30	15
Dentin C2	294-232-60	40
Dentin C3	294-233-30	15
Dentin C3	294-233-60	40
Dentin C4	294-234-30	15
Dentin C4	294-234-60	40
Dentin D2	294-242-30	15
Dentin D2	294-242-60	40
Dentin D3	294-243-30	15
Dentin D3	294-243-60	40
Dentin D4	294-244-30	15
Dentin D4	294-244-60	40
Incisal transparent IT		
Incisal transp. 57	295-150-30	15
Incisal transp. 57	295-150-60	40
Incisal transp. 58	295-154-30	15
Incisal transp. 58	295-154-60	40
Incisal transp. 59	295-160-30	15
Incisal transp. 59	295-160-60	40
Incisal transp. 60	295-170-30	15
Incisal transp. 60	295-170-60	40

Article description	Order-No.	Unit (g)	
Incisal opalescent IO			
Incisal opal. 1	295-210-30	15	ice white
Incisal opal. 2	295-215-30	15	polar white
Incisal opal. 3	295-250-30	15	snow white
Incisal opal. 4	295-270-30	15	sky blue
Incisal opal. 5	295-280-30	15	amber
Neutral transparent NT			
Neutral transparent	295-299-30	15	
Neutral transparent	295-299-60	40	
Transpa-effect TE			
Transpa-effect 1	295-350-30	15	white
Transpa-effect 2	295-360-30	15	yellow
Transpa-effect 3	295-385-30	15	pink
Transpa-effect 4	295-370-30	15	honey
Transpa-effect 5	295-380-30	15	blue
Transpa-effect 6	295-367-30	15	brown
Stains Universal ST			
Stains 0	296-199-10	3	neutral
Stains 1	296-150-10	3	white
Stains 2	296-162-10	3	vanilla
Stains 3	296-160-10	3	yellow
Stains 45	296-171-10	3	orange plus
Stains 6	296-185-10	3	pink
Stains 7	296-187-10	3	dark pink
Stains 8	296-189-10	3	purple
Stains 9	296-180-10	3	blue
Stains 10	296-155-10	3	grey
Stains 11	296-193-10	3	olive green
Stains 12	296-192-10	3	olive yellow
Stains 13	296-167-10	3	medium brown
Stains 14	296-168-10	3	red brown
Stains 15	296-198-10	3	black
Correction CM			
Correction material	297-199-10	3	
Gingival G			
Gingival G	298-110-30	15	
Gingival GD	298-120-30	15	

Liquids		ml
Stains Universal	299-110-40	20
Shoulder material univ.	299-120-40	20
Modelling MV univ.	299-150-40	20
Modelling MV univ.	299-150-80	100
Modelling LV univ.	299-160-40	20
Modelling LV univ.	299-160-80	100
Modellier LV univ.	299-160-99	500
Universal paste	299-170-40	20
Universal paste	299-170-80	100
Universal B.O.L.	299-180-40	20
Universal B.O.L.	299-180-80	100
SM-Isoprotector	260-324-00	25
AESTHETIC B. Liquid	299-200-10	5

Accessoires		piece
Glass spatula bonder	291-000-00	1
Opaque brush	260-907-00	1
Shade guide basic m.	291-000-04	1
Shade guide effect m.	291-000-05	1
Shade guide Stains Univ.	291-000-03	1

6. Firing charts – for Titanium Framework

Austromat 3001	
Powder bonder bake	C500 T60 T180 · L9 V9 TO65 · C795 T60 V0 CO LO T2 C500
Paste bonder bake	C500 T60 T300 · L9 V9 TO65 · C795 T60 V0 CO LO T2 C500
Opaque bake 1 + 2	C500 T60 T180 · L9 V9 TO65 · C795 T60 V0 CO LO T2 C500
Shoulder bake	C500 T60 T360 · L9 V9 TO55 · C785 T60 V0 CO LO T2 C500
Dentin bake (with liquid LV universal) **	C500 T60 T360 · L9 V9 TO55 · C755 T60 V0 CO LO T2 C500
Correction bake (with liquid LV universal) **	C500 T60 T240 · L9 V9 TO55 · C755 T60 V0 CO LO T2 C500
Glaze bake	C500 T60 T120 · L9 TO55 · C755 T60 CO LO T2 C500
Correction material	C500 T60 T240 · L9 V9 TO55 · C715 T60 V0 CO LO T2 C500
Gingival material	C500 T60 T360 · L9 V9 TO55 · C755 T60 V0 CO LO T2 C500

Vacumat 100/200/50	Final temperature	Predrying time (min.)	Heat rate (min.)	Holding time	Vacuum (min.)	Cooling
Powder bonder bake	795°C ***1463°F***	4	5	1 min. under vacuum	6	—
Paste bonder bake	795°C ***1463°F***	6	5	1 min. under vacuum	6	—
Opaque bake 1 + 2	795°C ***1463°F***	4	5	1 min. under vacuum	6	—
Shoulder bake	785°C ***1445°F***	6	5	1 min. under vacuum	6	—
Dentin bake (with liquid LV universal) **	755°C ***1391°F***	6	5	1 min. under vacuum	6	—
Correction bake (with liquid LV universal) **	755°C ***1391°F***	4	5	1 min. under vacuum	6	—
Glaze bake	755°C ***1391°F***	2	5	1 min. ****	****	—
Correction material	715°C ***1319°F***	6	5	1 min. under vacuum	6	—
Gingival material	755°C ***1391°F***	6	5	1 min. under vacuum	6	—

Multimat MCII (Mach1/Mach2)	Preheating temperature	Drying (min.)	Preheating (min.)	Vacuum (min.)	Firing time (min.)	Firing temperature	Heat rate/min.	Vacuum
Powder bonder bake	500°C ***932°F***	3	1	1,0	2,0	815°C ***1499°F***	65°C ***149°F***	50 ***122***
Paste bonder bake	500°C ***932°F***	5	1	1,0	2,0	815°C ***1499°F***	65°C ***149°F***	50 ***122***
Opaque bake 1 + 2	500°C ***932°F***	3	1	1,0	2,0	815°C ***1499°F***	65°C ***149°F***	50 ***122***
Shoulder bake	500°C ***932°F***	4	2	1,0	2,0	805°C ***1481°F***	55°C ***131°F***	50 ***122***
Dentin bake (with liquid LV universal) **	500°C ***932°F***	4	2	1,0	2,0	775°C ***1427°F***	55°C ***131°F***	50 ***122***
Correction bake (with liquid LV universal) **	500°C ***932°F***	4	2	1,0	2,0	775°C ***1427°F***	55°C ***131°F***	50 ***122***
Glaze bake	500°C ***932°F***	2	2	****	1,5	775°C ***1427°F***	55°C ***131°F***	****
Correction material	500°C ***932°F***	4	2	1,0	2,0	735°C ***1355°F***	55°C ***131°F***	50 ***122***
Gingival material	500°C ***932°F***	4	2	1,0	2,0	775°C ***1427°F***	55°C ***131°F***	50 ***122***

** When using modelling liquid MV universal, observe different bake sequence.

**** The glaze bake can be carried out under or without vacuum. The grade of glaze can be increased by prolonging the holding time.

7. Firing charts – for Zirconium Oxide Framework

Austromat 3001

Liner bake	C500 T60 T180 · L9 V9 TO65 · C800 T60 V0 CO LO T2 C500
Shoulder bake	C500 T60 T360 · L9 V9 TO55 · C790 T60 V0 CO LO T2 C500
Dentin bake (with liquid LV universal) **	C500 T60 T360 · L9 V9 TO55 · C760 T90-120 V0 CO LO T2 C500
Correction bake (with liquid LV universal) **	C500 T60 T240 · L9 V9 TO55 · C760 T90-120 V0 CO LO T2 C500
Glaze bake	C500 T60 T120 · L9 TO55 · C760 T60 CO LO T2 C500
Correction material	C500 T60 T240 · L9 V9 TO55 · C720 T60 V0 CO LO T2 C500
Gingival material	C500 T60 T360 · L9 V9 TO55 · C760 T60 V0 CO LO T2 C500
	The holding time for the dentin bakes should be between 90 and 120 seconds.

Vacumat 100/200/50

	Final temperature	Predrying time (min.)	Heat rate (min.)	Holding time	Vacuum (min.)	Cooling
Liner bake	800°C ***1472°F***	4	5	1 min. under vacuum	6	—
Shoulder bake	790°C ***1454°F***	6	5	1 min. under vacuum	6	—
Dentin bake (with liquid LV universal) **	760°C ***1400°F***	6	5	1,5 - 2 min. under vacuum	6,5-7,0	—
Correction bake (with liquid LV universal) **	760°C ***1400°F***	4	5	1,5 - 2 min. under vacuum	6,5-7,0	—
Glaze bake	760°C ***1400°F***	2	5	1 min. ****	****	—
Correction material	720°C ***1328°F***	6	5	1 min. under vacuum	6	—
Gingival material	760°C ***1400°F***	6	5	1 min. under vacuum	6	—

Multimat MCII (Mach1/Mach2)

	Preheating temperature	Drying (min.)	Preheating (min.)	Vacuum (min.)	Firing time (min.)	Firing temperature	Heat rate/min.	Vacuum
Liner bake	500°C ***932°F***	3	2	1,0	2,0	820°C ***1508°F***	65°C ***149°F***	50 ***122***
Shoulder bake	500°C ***932°F***	4	2	1,0	2,0	810°C ***1490°F***	55°C ***131°F***	50 ***122***
Dentin bake (with liquid LV universal) **	500°C ***932°F***	4	2	1,0	2,5 - 3,0	780°C ***1436°F***	55°C ***131°F***	50 ***122***
Correction bake (with liquid LV universal) **	500°C ***932°F***	4	2	1,0	2,5 - 3,0	780°C ***1436°F***	55°C ***131°F***	50 ***122***
Glaze bake	500°C ***932°F***	2	2	****	1,5	780°C ***1436°F***	55°C ***131°F***	****
Correction material	500°C ***932°F***	4	2	1,0	2,0	740°C ***1364°F***	55°C ***131°F***	50 ***122***
Gingival material	500°C ***932°F***	4	2	1,0	2,0	780°C ***1436°F***	55°C ***131°F***	50 ***122***

Please note:

The values given are only guidelines and should be adjusted individually depending on the respective situation, age and manufacturer of the furnace.

The firing charts are based on newly fine-silver calibrated furnaces.

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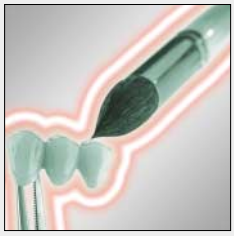

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