

Universal precious metal alloy for veneering with high-fusing ceramic or with dental resin

Mixing of different alloys or alloys of similar types is not allowed!
Wear darkened eye protection and protective gloves when melting.

Protect eyes, hands and breathing during pickling.

Protect eyes and breathing during processing with rotating instruments with an aspirator device.

With the publication of these instructions of use all previous editions are no longer valid.

The manufacturer refuses any liability for damages due to disregard of the instructions for use below.

Directions for ceramic-fused-to-metal alloys for universal use

The high gold alloy BioEthic® corresponds, based on its ceramic-fused-to-metal properties, to the standard ISO 9693 (Dental ceramic- fused-to-metal restorative materials).

Due to its balanced mechanical and physical properties this alloy can be applied in all fields of indication. The alloy can be veneered with usual medium fusing and high fusing ceramic compounds as well as with composites.

General instructions for use

Modelling

Usual modelling technique for ceramic-fused-to-metal works. Minimal wall thickness 0.4 mm. With bridgework the connections must have a minimum section of 6–9 mm². Modelling of garlands or inlay shaped reinforcements in the palatal region will give added stability. The application of air and cooling vents improves casting results.

Investing

The following investments are recommended for this type of alloy: Cendres+Métaux-**Ceramicor**® (phosphate-based, containing graphite).

CM-20 (based on quartz and cristobalite without graphite for the rapid preheating technique).

The plaster-based investment **CM-10** is specially indicated for precision-castings of inlays and crowns.

Re-use of alloy

Only use perfectly cleaned (by sand-blasting with aluminium oxide) buttons and sprues and add **at least 1/3 of new alloy**.

Traceability of lot numbers

If different lots of an alloy are being used for the realisation of a restoration, all lot numbers concerned must be noted in order to assure traceability.

Surface quality of cast objects

In order to prevent corrosion the cast object must have a surface free of shrink holes and porosities after trimming and polishing.

Cooling of castings

Do not quench the casting cylinder after casting, but bench cool to room temperature.

Thermal treatments

After casting, BioEthic® has not yet obtained its maximal mechanical properties. For long-span bridgework and for works with attachments in combustible plastic or ceramic spacer technique which will not be veneered with ceramic, a simulation firing of the work in the as cast condition (cleaned frameworks, sprues not yet removed) in the ceramic furnace can be done.

This procedure has the following advantages:

The hardness increase allows easier and faster trimming of the frameworks. Grinding overlaps are prevented. Possible tensions due to the casting process are reduced. (Firing data see table overleaf).

Pickling

After firing or soldering pickle in a warm, freshly prepared (clean) solution of 10 vol. % sulphuric acid (H₂SO₄)

Note: When using other pickling agents follow the instructions for use of the respective manufacturer.

Gilding of frameworks

Gilding is carried out at the user's own risk.

Polishing

After the last firing free metal surfaces must be polished to a high shine in order to completely remove the oxide layer.

Disinfection

Each prosthetic restoration must be cleaned and disinfected before try-in or definite insertion in the mouth of the patient.

Further information

On processing precious metal alloys, soldering and casting-on are included in the Dental documentation of Cendres+Métaux.


Allergies

With patients having an existing allergy to one or several elements contained in any one alloy, this particular alloy must not be used. With patients suspected of having an allergy to one or several elements contained in any one alloy, this alloy can only be used after preliminary allergological testing and proof of a non-existing allergy.

Physical and mechanical properties

Alloys	Indications						Colour	Composition in weight %											Solder ① Before firing	Solders ① After firing					
	a	b	c	d	e	f		Au- + Pt- Met.	Au	Pt	Pd	Ag	Cu	Sn	Zn	In	Ga	Ir		Ru	Re	Fe	Ta	1.	2.
BioEthic®	✓	✓	✓	✓	✓	✓	Yellow	97.87	86.70	10.75		0.03		0.10	1.50	0.20		0.02			Rh0.40	0.30	S.G 1030	S.G 810	S.G 750

ISO 22674 / ISO 9693

Indications	a 	b 	c 	d 	e 	f 
	Inlays, onlays	Single crowns	Short-span bridgework	Long-span bridgework	Milled work	Clasps, lingual bars, palatal plates

① The use of solders not mentioned in the table is subject to the user's risk. In case of uncertainties, consult the instructions of the manufacturer involved.

Alloys	Density g/cm³	Melting range °C	Casting temp. °C	Crucible	Hardness				Young's Modulus GPa*	0.2 % proof stress, Rp 0.2 %				Elongation A5				Linear coefficient of thermal expansion CTE	
					as cast HV5*	annealed HV5*	after firing HV5*	hardened HV5*		as cast MPa*	annealed MPa*	after firing MPa*	hardened MPa*	as cast %*	annealed %*	after firing %*	hardened %*	(25–500°C) 10 ⁻⁶ K ⁻¹	(25–600°C) 10 ⁻⁶ K ⁻¹
BioEthic®	18.9	1030–1150	1250–1300	① ② ③	190	95	220	220	90	435	180	525	525	6	30	7	6	14.5	14.8

① Graphite crucible ② Universal ceramic crucible ③ Vitrified carbon crucible

* The values indicated result from measurements obtained under exactly defined conditions. Individual deviations of ± 10% are possible and to be considered as normal.

Particular instructions for use

Alloys	Preheating temperatures Investments		Recommended casting systems (not compulsory)					Thermal treatment of the framework before surface treatment (not compulsory)	Annealing	Hardening	Trimming of the framework surface with ceramically bonded grinding stones
	Plaster-based	Phosphate-based	Propane-oxygen flame	Vacuum-pressure casting with electric resistance furnace	Centrifugal casting with electric resistance furnace	High frequency induction in atmosphere	High frequency induction in protective gas atmosphere				
BioEthic®	700 °C	850 °C	✓	✓	✓	✓	✓	900 °C / 15 min	900 °C / 30 min / air	450 °C / 15 min / air	✓

Alloys	Sandblasting with non-recycled aluminium oxide (Al ₂ O ₃) 50µm	Cleaning with steam jet	Oxide firing with vacuum	without vacuum	Pickling after oxide firing in a warm and proper solution of 10 vol. % sulphuric acid (H ₂ SO ₄)
BioEthic®	✓	✓	900 °C / 10 min		✓

Alloys	Special indications for veneering with ceramic compounds				Heating rate max.	Tested compatible ceramic compound	Other ceramic compounds
	Slow cooling	Normal cooling	Rapid cooling				
BioEthic®	✓				60 °C / min	VITA VMK 95	The alloy is compatible with the usual high fusing ceramic compounds. In case of doubt, consult the instructions of the ceramic manufacturer concerned.