

L2 Instructions for use

Precious Metal Alloys for the Ceramic-fused-to-metal Technique

(Products with catalogue numbers in the appendix)

Preventive measures

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 when pickling.

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

With the publication of these instructions for use all previous editions are no longer valid.

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

Intended use

Fixed and removable dentures.

Product description

Alloys with a high precious metal content (Type 4 according to ISO 22674) have a fine-grained, homogeneous cast structure and good corrosion resistance and biocompatibility when processed as specified. They are suitable for bridge work with short and large spans as well as for milling and combined works, can be soldered before and after firing and are also suitable for casting onto prefabricated construction elements. Intended use: Fixed and removable dentures.

Expected clinical benefit

Restoration of chewing function and improved aesthetics.

Qualification

Professional dentist and dental technician know-how is required. The instructions for use must be available and understood before the first application. The manufacturing work must be carried out by qualified specialists. For information and additional details, please contact your Cendres+Métaux representative.

Side effects

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.

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.

Disinfection

All the parts must be disinfected before use with a high-level disinfectant. Follow the instructions of the manufacturer regarding dosage and exposure time.

When choosing the disinfectant, ensure that:

- it is suitable for the cleaning and disinfection of dental prosthetic components,
- it is compatible with the materials of the products to be cleaned and disinfected, and
- it has proven efficacy in disinfection.

We recommend using an ortho-phthaldehyde (OPA) solution like the Cidex® OPA Solution. Strictly follow the manufacturer's instructions.

General instructions

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.

Spruing

Wax sprues of no less than Ø 3.5 mm are required. Direct (Ø 3.5 mm) and cross bar (Ø 5 mm) spruing produce excellent results. Feeder sprues to heavy pontics should be of at least Ø 4 mm. Air vents (Ø 1 mm) may be used to advantage.

Wax patterns should be set outside the thermal centre, i.e. near the casting ring wall and about 5 mm from the end. For individual copings and small bridges (up to three units), use of the circular sprue provides ideal positioning of the wax patterns and ensure controlled solidification of the frameworks.

Investing

When using steel casting rings always use refractory liner in order to allow free expansion of the investment.

The following investment materials from Cendres+Métaux are suitable for this alloy type:

uniVest Plus: universal phosphate-bonded, graphite- and gypsum-free investment material

CM-20: graphite-free investment material based on quartz and cristobalite

uniVest Rapid: graphite-free, phosphate-bonded investment material

Plaster-based investments must not be used for these types of alloys!

Rapid preheating technique: the use of burn-out plastic parts can lead to spalling in the investment material.

Preheating

Observe manufacturer's recommendations with regard to setting times, temperature levels etc. On reaching the end temperature a soaking period of 20 to 45 min. is advisable depending on the size of the cylinder.

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.

Melting

It is important, when using a torch for melting that the recommended propane (approx. 0.5 bar or 7.25 psi) / oxygen (approx. 1.0 bar or 14.5 psi) mixture and pressure are observed. Before melting add a pinch of flux to the alloy.

Flux: boric acid

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.

Finishing

Trim the framework first preferably using carbide burs and then fine grinding points at low speed.

Soldering

We recommend using a propane/oxygen torch for soldering and a flux like CM soldering paste. During soldering wear dark goggles for protection. The design of the soldering block is a compromise between minimising its thermal mass whilst retaining sufficient strength to avoid its fracturing during soldering. Leave a parallel gap of 0.1–0.2 mm between surfaces to be soldered and sufficient area to ensure adequate strength of the joint.

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.

Thermal treatments (not compulsory)

After casting, some of the high gold metal alloys have not yet obtained their maximal mechanical properties. For long-span bridgework and for works with attachments in combustible plastic 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).

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.

Labeling on packaging/symbols	
	Date of manufacture
	Manufacturer
	Catalogue number
	Batch code
	Quantity
	Consult instructions for use URL: cmsa.ch/docs
Rx only	Attention: According to US federal law, this product may only be sold by or on behalf of a physician.
	Cendres+Métaux products with CE labelling meet the requirements of the relevant European requirements.

Instructions for use

Alloys	Cat. No.	Indication						Composition %															
		a	b	c	d	e	f	Au + Pt group metals	Au	Pt	Pd	Ag	Cu	Sn	Zn	In	Ga	Ir	Ru	Rh	Fe	Others	
V-Deltaloy	01050001	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	85.28	54.20		31.04	4.83				8.99	0.90	0.01	0.03				
V-Delta Special	01050028	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	78.10	52.50		25.54	17.00	0.20	3.50	0.20	1.00		0.02	0.04				
V-Delta SF	01050017	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	90.00	51.50		38.40					8.50	1.50		0.10				
Esteticor® Economic	010617	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	75.50	50.00	0.45	25.00	19.00		1.00	1.00	3.50		0.05					
Esteticor® Plus	010620	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	84.10	45.00		38.90	5.00	0.40	0.50		8.60	1.40		0.20				
Esteticor® Accurate 40	01000112	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	77.00	40.00		36.80	13.30				9.50	0.20		0.20				
Esteticor® Implant 58	01000030	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	87.50	58.50		28.85	8.00		4.50				0.05	0.10				

 **a** Inlays, onlays, crowns ¾
 **b** Single crowns
 **c** Short-span bridgework
 **d** Long-span bridgework
 **e** Milled work
 **f** Clasps, lingual bars, palatal plates

Alloys	Physical properties					Mechanical properties							
	CTE 10 ⁻⁶ K ⁻¹		Density g/cm ³	Melting range °C	Young's Modulus GPa	Hardness HV5		Proof stress Rp 0.2% MPa		Tensile strength (Rm) MPa		Elongation A5 %	
	(25–500 °C)	(25–600 °C)				As cast	After firing	As cast	After firing	As cast	After firing	As cast	After firing
V-Deltaloy	14.1	14.3	14.7	1115–1295	125	250	255		635		865		9
V-Delta Special	14.7	14.9	14.4	1155–1265	115	205	250		510		705		7
V-Delta SF	13.6	13.9	14.5	1210–1310	115	225	245		525		790		25
Esteticor® Economic	14.8	15.1	14.0	1145–1255	120	205	235		535		750		15
Esteticor® Plus	13.9	14.2	13.8	1115–1285	135	235	260		580		865		23
Esteticor® Accurate 40	14.1	14.4	13.6	1210–1295	125	235	245		490		715		15
Esteticor® Implant 58	13.9	14.0	15.1	1215–1305	120	240	260		610		820		13

Alloys	Solders				Laser welding wire	Instructions for use		
	Pre-Solder		Post Solder			Preheating °C	Crucible	Casting temperature °C
V-Deltaloy	S.W 1100	S.G 1080	S.G 750		LW N° 3	850	②	1450
V-Delta Special	S.W 1100		S.G 750		LW N° 3	850	②	1450
V-Delta SF	S.W 1125	S.G 1120	S.G 750		LW N° 3	850	②	1450
Esteticor® Economic	S.W 1100		S.G 810	S.G 750	LW N° 2	850	② ③	1390–1420
Esteticor® Plus	S.W 1100		S.G 810	S.G 750	LW N° 2	850	② ③	1430–1460
Esteticor® Accurate 40	S.W 1125		S.G 750		LW N° 2	850	② ③	1400–1450
Esteticor® Implant 58	S.G 1055	S.G 1030	S.G 750		LW N° 3	850	② ③	1405–1455

① = Graphite crucible = Universal ceramic crucible = Vitrified carbon crucible

Alloys	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
	Propane-oxygen flame Post-melting time 5–10 s	Vacuum-pressure casting with electric resistance furnace Post-melting time 40–60 s	Centrifugal casting with electric resistance furnace Post-melting time 40–60 s	High frequency induction in atmosphere Post-melting time 5–10 s	High frequency induction in protective gas atmosphere Post-melting time 5–10 s					
V-Deltaloy	✓	✓	✓	✓	✓		900°C / 15 min / H ₂ O	600°C / 15 min / air*	✓	
V-Delta Special	✓	✓	✓	✓	✓		900°C / 15 min / H ₂ O	600°C / 15 min / air*	✓	
V-Delta SF	✓	✓	✓	✓	✓		900°C / 15 min / H ₂ O	600°C / 15 min / air*	✓	
Esteticor® Economic	✓	✓	✓	✓	✓	950°C / 10 min			✓	
Esteticor® Plus	✓	✓	✓	✓	✓	950°C / 10 min			✓	
Esteticor® Accurate 40	✓	✓	✓	✓	✓				✓	
Esteticor® Implant 58	✓	✓	✓	✓	✓	600°C / 15 min			✓	

* Annealing before hardening

Alloys	Sandblasting with non-recycled aluminium oxide (Al ₂ O ₃) 50µm	Cleaning with steam jet	Oxide firing		Pickling after oxide firing in a warm and clean solution of 10 vol. % sulphuric acid (H ₂ SO ₄)	Sandblasting after oxide firing with non recycled aluminium oxide (Al ₂ O ₃) 50µm
			with vacuum	without vacuum		
V-Deltaloy	✓	✓		950°C / 10 min		
V-Delta Special	✓	✓		950°C / 10 min		
V-Delta SF	✓	✓		950°C / 10 min		
Esteticor® Economic	✓	✓		960°C / 5 min		✓
Esteticor® Plus	✓	✓		960°C / 5 min		✓
Esteticor® Accurate 40	✓	✓		960°C / 5 min		✓
Esteticor® Implant 58	✓	✓		900°C / 10 min		✓

Alloys	Ceramic veneer: cooling cycle after firing						
	Heating rate max.	Ceramics < 900°C			Ceramics > 900°C		
		Long-term	Normal	Rapid	Long-term	Normal	Rapid
V-Deltaloy			■		■	■	
V-Delta Special			■	■	■	■	
V-Delta SF			■	■		■	■
Esteticor® Economic		■	■		■	■	
Esteticor® Plus			■			■	
Esteticor® Accurate 40			■			■	
Esteticor® Implant 58			■			■	

Not binding, please also observe the instructions of the ceramic manufacturer!

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