

L6 Instructions for use

Ag-Pd-Au Alloys for Inlays, Crown and Bridgework

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With the publication of these instructions for use all previous editions are no longer valid.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

These casting Ag-Pd-Au alloys have a narrower processing tolerance than high gold content and reduced gold content alloys. The group includes alloys with different mechanical and physical properties. It is therefore possible to select an alloy on the basis of its composition which is best suited to the type of work to be performed. The alloys can be soldered without difficulties and are also suitable for the cast-on technique.

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.

When using plaster based investment compounds care has to be taken not to exceed a preheating temperature of 700°C in order to prevent an embrittlement of the alloy by the uptake of sulphur. Pd-based alloys absorb carbon in the melted condition. Therefore graphite based investment compounds should not be used. Also, these alloys should only be melted in ceramic or vitrified carbon crucibles to prevent embrittlement of the alloy during frequent remelting.

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

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 casting 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 Type (ISO 22674)	a	b	c	d	e	f	Composition %													
									Au + Pt group metals	Au	Pt	Pd	Ag	Cu	Sn	Zn	In	Ga	Ir	Ru	Rh	Fe
Strator 3	010675	3		●	●	●	●	●	40.00	20.00		19.95	40.00			4.00	16.00			0.05		
Pagalinor 2	01050024	4	■	■	■				31.41	12.50		18.90	53.65	14.29		0.65				0.01		
Pallorag 33	010651	4		■	■	■	■		30.00	10.00		20.00	59.50	9.50		1.00						
Pagalin 2	01050012	4	■	■	■				26.05	3.00		23.00	65.00	6.45		0.50	2.00		0.05			

 **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											
	Density g/cm³	Melting range °C	Young's Modulus GPa	Hardness HV5			Proof stress Rp 0.2% MPa			Tensile strength (Rm) MPa			Elongation A5 %		
				As cast	Soft	Hardened	As cast	Soft	Hardened	As cast	Soft	Hardened	As cast	Soft	Hardened
Strator 3	11.4	855–900	75	175	125	165*	315	230	305*	535	465	530*	5	7	5*
Pagalinor 2	11.1	900–980	110	185	135	240*	430	300	340*	550			22	25	12*
Pallorag 33	10.9	935–1020	95	170	135	230	430	280	615	575	505	810	15	24	9
Pagalin 2	10.8	975–1070	95	175	135	230*	390	250	400*	580			22	20	7*

* 100% selfhardening after cooling in the cylinder or soldering block, otherwise particular instructions for use.

Alloys	Solders		Laser welding wire	Instructions for use		
	Pre-Solder	Post Solder		Preheating °C	Crucible	Casting temperature °C
Strator 3	S.G 810	S.G 750	not weldable	700	② ③	1010–1060
Pagalinor 2	S.G 810	S.G 750	LW N° 6	650–680	②	1180
Pallorag 33	S.G 810	S.G 750	LW N° 7	700	② ③	1120–1170
Pagalin 2	S.G 880	S.G 750	LW N° 7	630–680	②	1270

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

Alloys	Recommended casting systems (not compulsory)					Particular instructions for use		
	Propane-oxygen flame Post-melting time 5–10 s	Vacuum-pressure casting with electric resistance furnace Post-melting time 20–40 s	Centrifugal casting with electric resistance furnace Post-melting time 20–40 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	Annealing	Hardening	Sandblasting with glass beads 50 µm
Strator 3	✓	✓	✓			700 °C / 10 min / H ₂ O	400 °C / 15 / air*	✓
Pagalinor 2	✓	✓	✓			700 °C / 10 min / H ₂ O	375 °C / 15 / air*	✓
Pallorag 33	✓	✓	✓			700 °C / 10 min / H ₂ O	400 °C / 15 / air*	✓
Pagalin 2	✓	✓	✓			700 °C / 10 min / H ₂ O	450 °C / 15 / air*	✓

* Annealing before hardening

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