



Instructions for use

## Pd-based dental casting alloy for metal-ceramic work according to ISO 22674 and ISO 9693, Type 4.

### Indications

- The alloy is suitable for accurately fitting work of up to 7 units on natural abutment teeth.
- Excellent melting and casting properties.
- High corrosion resistance.
- Compatible with ceramic compounds having a medium CTE.

- b  Single crowns
- c  Short-span bridgework
- d  Long-span bridge-work

### Physical properties

Composition in weight %

Au + Pt group metals	58.49
Pd	57.29
Ag	29.00
In	11.00
Au	1.00
Sn	1.00
Ga	0.50
Ru	0.20
B	0.01
Colour	white
Density g/cm <sup>3</sup>	11.3
Melting range °C	1205–1310
CTE (25–500 °C) 10 <sup>-6</sup> K <sup>-1</sup>	14.3
(25–600 °C) 10 <sup>-6</sup> K <sup>-1</sup>	14.6
Young's Modulus GPa *	140

### Mechanical properties

Hardness HV5 *	1	300
	2	260
0.2 % Proof stress, Rp 0.2 % MPa *	1	720
	2	605
Yield strength (Rm) MPa *	1	955
	2	845
Elongation A5 % *	1	6
	2	13

### State

1	as cast
2	after firing

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

### Traceability of lot numbers

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

Rx only

The products carry the CE sign.  
See packaging for details.

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.

*Upon publication, these instructions for use supersede all previous editions.*

*The manufacturer is not liable for any damages due to the user disregarding the instructions for use below.*

#### Note on Pd-based ceramic alloys

Owing to their low density and high Pd or Pd-Au content, these alloys are very reasonably priced but have a narrower processing tolerance than alloys with a high Au content or high precious metal content. They are suitable for bridgework with short and long span widths as well as combined work and the casting-on technique. Pd-Ag alloys can easily be soldered before and/or after firing.

### 1. Modelling

Usual modelling technique for the construction of frameworks. Minimum wax thickness with abutment crowns 0.4 mm and with single crowns 0.3 mm. With bridgework care has to be taken, that the connections have a surface of at least 6–9 mm<sup>2</sup>. By modelling garlands and inlay-like reinforcements in the palatal region the stability can be further increased. By attaching vents and cooling sprues casting quality will be improved.

### 2. Sprueing system

#### 2.1 Single crowns

These must be directly connected at the thickest part with a wax sprue of  $\varnothing$  3.0–3.5 mm.

#### 2.2 Frameworks

The modelled frameworks must be sprued with a sufficiently dimensioned and stable sprueing system. When connecting the sprues, make sure that the wax parts have as few contractions as possible. Connect the sprues with a  $\varnothing$  of 3.0–3.5 mm to the thickest parts of the cast object. The cross bar must have a  $\varnothing$  of 5.0–6.0 mm depending on the size of the bridgework. The distances of the cast object to the cross-bar and from the cross-bar to the button must be specifically adapted in order to maintain the correct positioning of the cast object outside of the heat-centre in the cylinder. The connectors between cross-bar and button must have a minimum  $\varnothing$  of at least 4.0 mm.

### 3. Investing

#### 3.1 Investments

The following investments are recommended for this type of alloy: **CM Ceramicor® (containing graphite) recommended for the conventional preheating technique and particularly for implant work. CM-20** (without graphite and for the rapid preheating technique). Not recommended for implant bridges with plastic parts capable of being burnt out or for cast-on high-fusing alloys in combination with the rapid preheating technique.

#### 3.2 Mixing ratio for the investment

Further information can be obtained in the instructions for use of the investment.

### 4. Preheating of the casting cylinders

**Final temperature: 850°C**

Further information on the preheating technique can be obtained in the instructions for use of the CM Ceramicor® or CM-20 investment.

#### 4.1 Holding times at final temperature (investment CM Ceramicor®)

30–50 min. at 850°C

60 min. at 850°C for large cylinders

#### 4.2 Holding times at final temperature with rapid preheating technique

size 3 cylinder 30–45 min. at 850°C

size 6 cylinder 40–60 min. at 850°C

size 9 cylinder not recommended

For other brands of investment, follow the preheating instructions of the relevant manufacturer.

### 5. Re-use alloy

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

### 6. Melting and casting

Recommended casting temperatures and systems (not binding)

– Propane-oxygen flame

– High frequency induction in atmosphere or in protective gas atmosphere

– Vacuum-pressure casting with electric resistance furnace (ca. 150°C above TL)

### 7. Melting

If the alloy is molten in atmosphere in a ceramic crucible, the addition of a minimal amount of melting powder (borax) may suppress the oxidation of the alloy surface and thus allow for a better determination of the correct starting of the casting procedure. When using a propane-oxygen flame, the addition of melting powder is not necessary, if the ceramic crucible has been coated with a borax layer prior to its first use.

**8. Continued heating time in seconds**

As soon as the alloy reaches at the liquid state, the following continued heating times apply prior to start the casting procedure:

– Propane-oxygen flame	5–10 s
– High frequency induction in atmosphere or in protective gaz atmosphere	5–10 s
– Vacuum-pressure casting with electric resistance furnace	40–60 s

**9. Cooling and devesting of cast objects**

Do not quench the casting cylinder after casting, but bench cool to room temperature. Never use a hammer, but remove the investment by carefully using plaster-tweezers or a pneumatic hand-chisel. An ultrasonic bath, water jet or sandblasting with glass beads should be used to remove investment from the functional insides of the cast-on gold caps or the cast plastic parts.

**10. Conditioning of the framework for veneering with ceramic**

Trim the frameworks with tungsten cutters, then fine trim the surfaces to be veneered using ceramically bonded grinding stones. Always maintain the same grinding direction in order to avoid overlapps on the surface. Don't use diamond coated grinders!

**11. Sandblasting**

Sandblast the trimmed framework with non-recycled aluminium oxide (Al<sub>2</sub>O<sub>3</sub>). Then clean thoroughly with a steam jet.

Grain size	50 µm
Pressure	2–4 bar

**12. Cleaning**

Steam-jet.

**13. Oxide firing**

960°C / 5 min. / without vacuum

**14. Oxide removal**

The oxide resulting from the oxide firing can be blasted off with aluminium oxide, then clean thoroughly with a steam jet.

Grain size	50 µm
Pressure	2–4 bar

The removal of residues of flux after firing can be done by pickling in a warm and clean bath of 10 Vol.-% sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) or in a pickling agent.

**Note:** When using other pickling agents follow the instructions for use of the respective manufacturer. The flux can also be sand-blasted off with a fine-grain abrasive.

**15. Veneering with ceramic**

Compatible, tested ceramics (ISO 9693): IPS d'SIGN, Noritake Ex-3, Willi Geller Creation CC

**16. Gilding of frameworks**

Gilding is carried out at the users own risk.

**17. Joining techniques****17.1 Soldering before firing to connect several individually cast bridge segments**

CM-solder S.W 1100, for the joining of bridgework. If possible, prepare the soldering-areas already at the modelling stage and ensure, that the width of the soldering gap does not exceed 0.2mm. In case of unplanned soldering before firing, separate the framework by cutting through an intermediary element in order to obtain a large and stable soldering area.

**17.2 Repair soldering prior to firing in order to seal holes**

CM-solder S.W 1100.

**17.3 Soldering after firing**

First brazing material CM-solder S.G 750, for furnace soldering after firing. Prepare the soldering areas so that the solder strip has contact with both metallic parts. The width of the soldering gap must not exceed 0.2 mm. After the hardening of the soldering block and the removal of the fixations of sticky wax or modelling resin, the now accessible soldering gap must be filled with soldering flux (Flux C of Cendres+Métaux), then placed in a preheating furnace at 500°C and held at this temperature for 10–20 minutes, depending on the size of the bridgework.

**17.4 Laser welding**

Esteticor® Blancor can be laser-welded with the laser welding wire LW N° 3, Ø 0.4 mm, as filler metal.

The following laser parameters should be set: focus 0.9 mm / voltage 260 V / pulse duration 8.0 ms / frequency 2.5 Hz.

The ideal welding-parameters (basic values for connecting and filling of an x-shaped joint) can be found in the instructions for use of the laser welding wire. Further information on laser welding can be obtained from the Cendres+Métaux website [www.cmsa.ch/dental](http://www.cmsa.ch/dental) (Interesting Facts / Laser welding).

**18. Polishing**

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

**19. Further information**

This alloy is resistant to tarnishing.

We reserve the right to improve the product or adapt these instructions for use.

**20. Storage conditions**

Store in a dry place.