

1. Indication

Dental alloy on the basis of cobalt, type 5.

Cobalt-chrome bonding alloy which is suitable for laser welding and for the production of fixed restorations in the dental field according to the law for medical products (MPG) class II a.

SHERADENT is „designed to be free of nickel, beryllium and cadmium“ according to DIN EN ISO 22674.

2. Modelling

The wax modelling should not have a smaller wall thickness than 0.5 mm. Massive crown and bridge connectors should be provided with an adequate dimensioned sprue system. We recommend using cooling webs in case of large-volume objects. After elaboration the wall thickness of the metal should be at least 0.3 mm. All wax connections should be formed round in order to avoid impurities.

Please note that the position of the casting objects has to be outside of the muffle centre.

The metal quantity is the sum of the weight of the wax (including sprues) x metal density plus 1 metal cube for the cone.

The framework to blend should correspond to the reduced form of the reconstructed crowns. Avoid a disproportionate apply of ceramic. An even porcelain thickness provides tension free connections. Contact surfaces intended for soldering are to be created laminarily.

Position of sprues

We recommend the indirect method

- connection to the crown: Ø 2.5 mm, length 3.5 mm
- crossbar Ø 3.5 - 4 mm
- casting sprue Ø 3.5 - 4 mm

3. Investing

Invest the modelled wax parts with a phosphate bonded investment (we recommend using SHERA's crown and bridge investments) according to the manufacturer's instructions. We recommend applying a preheating temperature of 850°C.

4. Casting:

Melting crucible

Only use melting crucibles based on ceramic (magnesium-, silicium-, aluminium oxide).

Casting with the induction casting machine / High frequency method

Do not add any melting powder! Heat the metal until it slumps down. Place the mould in the centrifuge and go on heating. The ideal point of casting is when the molten mass is pale from the outside inwardly and the glutinous shadows on the surface have gone. Do not wait for the oxide layer to tear, as the metal then will overheat. After melting, cast as soon as possible (less volume contraction).

Flame casting

Do not add any melting powder! Melt the alloy with the part of the flame which is low in oxygen. The ideal point of casting is when the molten alloy shows a mushy consistency and reacts to the flame pressure. Do not wait for the oxide layer to tear, as the metal then will overheat. After melting, cast as soon as possible (less volume contraction).

Standard values for the flame setting:

- acetylene 0.4 bar / oxygen 2 bar
- propane 0.2 bar / oxygen 2 bar
- line pressure natural gas / oxygen 2 bar

Please note: Overheating the molten alloy may lead to blowholes, micro porosities and formation of coarse grain. These casting defects are often the reason for breaking of a bridge or for fissures in the veneer ceramic.

5. Devesting

After casting place the mould with the sprue face down. The best alloy structure will be obtained, if the mould is cooled down at room temperature. If required, only cool down the muffle in cold water after having ended the air cooling down time of 15 minutes. Remove rests of investment slightly with a plier for devesting or plier for cutting stones. Do not smash on the cone.

Sandblast the investment rests with 250 my / 110 my of highly pure aluminium oxide (purity of 99.7%) with a pressure of 3-4 bar. Do not use more than 2 bar for sandblasting the inside of the crowns.

6. Trimming/Polishing

Ideal results will be obtained with hard metal burs.

Advice:

Never treat the frameworks with diamonds. Diamonds may smear the frameworks during elaboration and may possibly soil the metal framework in such a way that cracks would occur in the ceramic.

In case of using grinding stone it is absolutely necessary to get information from the producer (only ceramic bonded stones), as even these stones might affect the results in the same negative way as diamonds.

7. Ceramic

Preparation for ceramic application

After preparation sandblast the framework with aluminium oxide of 110 my or 250 my (purity of 99.7%) with a maximum pressure of 2.5 - 3 bar.

Advice:

An oxidation is not absolutely necessary. If an oxidation is required, fire for 5 min. under vacuum at 950-980°C (10°C higher than the ground material firing). After firing sandblast the oxide layer as described above with aluminium oxide 110 to 150 my at 2.5-3 bar. If the framework has an evenly grey surface, the ceramic can be applied according to the manufacturer's instructions.

Before firing the ceramic, we recommend cleaning the sandblast framework with FRAME CLEANER. Put the framework into a closing glass or plastic container with a lid filled with FRAME CLEANER and clean it in an ultrasonic bath for 5 minutes. After cleaning the framework must not be touched and should only be held with the artery-clamp. Afterwards do not rinse the framework with water nor steam and never pressure dry the metal, as there are always contaminations in the air. If used regularly, the liquid should be exchanged daily and the container should be washed thoroughly. Please also follow the instructions of the ceramic manufacturer.

Ceramic veneering

Please pay attention to the coefficient of expansion when choosing your ceramic, (coefficient of expansion 25-600°C) is $14.5 \times 10^{-6}K^{-1}$!

Upon cooling, please note the instructions for use of the ceramic's manufacturer.

8. Reusing cones

We recommend using only new material when applying ceramic to the structure. In case of using cones, it should not be used more than 1/3 of the old cone and at least 2/3 of new material.

9. Soldering and laser welding

For soldering and laser welding we recommend using the solder bar SHERALOT-N.

10. Technical data

Vickers hardness (HV 10)	286
Density (g/cm ³)	8.8
Tensile strength (N/mm ²)	734
0.2 yield strength (N/mm ²)	570
Elongation limit (A5%)	10
Modulus of elasticity (N/mm ²)	194,000
Liquidus point (°C)	1,417
Solidus point (°C)	1,309
Casting temperature (°C)	1,520
Coefficient of expansion	(25 / 600°C) $14.6 \times 10^{-6}K^{-1}$ (25 / 500°C) $14.1 \times 10^{-6}K^{-1}$

Composition in %

Chrome 21

Cobalt 64

Molybdenum 6

Tungsten 6

Further elements under 1 % Fe, Mn, Si

11. Security advices

- Cobalt-Chrome-based alloys can seldom cause dermatitis on sensitive subjects. A patch-test is thus advisable.
- Before prosthesis application verify if other metal implants are in patient's oral cavity. Coexistence of different metals can cause a „pile“ effect.
- Metal dusts and smoke are dangerous for health. Use exhaust fans while casting and sandblasting.
- We identify every batch with a number. We recommend to write it down in patient's file to allow its complete traceability.
- It is recommended that the patient be made aware of the possibility for dental alloys to affect MRI results.

Warranty

SHERA Werkstoff-Technologie GmbH & Co. KG is certified according to DIN EN ISO13485 and guarantees for the products, due to a thorough quality control system, a flawless quality of its products. Our instructions for use are based on the results of our test laboratory. The technical data given can only be guaranteed if the processing is carried out as mentioned. The user is self-responsible for processing of the products. We are not liable for faulty results as SHREA has no influence on the processing. Nevertheless possibly arising claims for damages relate to the value of the products only.



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