Metalloy® CC

Instructions for use

Cobalt-Chrome-based dental alloy for porcelain bonding, white

Weight per ingot: approx. 6 g

Indication
Porcelain-to-metal applications, cast partial dental frames.

Physical properties
Composition in weight %

Co	61.50
Cr	27.50
W	8.60
Si	1.30
Mn	< 1.00
N	< 1.00
Nb	< 1.00
Density g/cm³	8.5
Melting range °C	1325–1415
CTE (25–500 °C) $10^{-6} K^{-1}$	14.0
Young's Modulus GPa *	200

Mechanical properties

Hardness HV10 *	290
0.2 % Proof stress, Rp 0.2 % MPa *	630
Elongation A5 % *	10

Solders	**Melting range**
Meta CC S1 °C	1110–1200
Meta CC F1	Solderflux

Laser welding

Meta CC LW

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

Preventive measure (contraindication) and important notes
These instructions for use must be precisely followed. It has been suggested in specialised literature that some of its components can, in extremely rare cases, have allergic effects. The choice of the material is the decision of the practitioner based on his knowledge of the sensitivity of the patient.

Biocompatibility and corrosion resistance
Metalloy® CC has been submitted to the following tests:
Cytotoxicity test according to ISO 10993/5.
Corrosion resistance according to standard ISO 10271.

Launch year 2005

Metalloy® CC corresponds to the standards EN ISO 9693 and EN ISO 22674

Metalloy® CC has been manufactured according to the quality standards ISO 9001 / ISO 13485.

Rx only

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

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Waxing up
The ultimate thickness of the cast metal coping should not be less than 0.4 mm. The shape of the copings should represent a reduced form of the reconstructed form of the crowns. Therefore a uniform thickness of porcelain and stress free adhesion to the metal will be ensured. Round Interfaces between metal and porcelain will provide neat junctures. A parallel gap between surfaces to be soldered ensures adequate strength of the joint.

Spruing
Direct (**Ø 3.5–4.00 mm**) and cross bar (**Ø 4.00–5.0 mm**) spruing produce excellent results. Feeder sprues to heavy pontics should be of at least **Ø 4 mm**. 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 direct spruing method.

Investing
When using steel casting rings always use refractory liner in order to allow free expansion of the investment. For precise castings use **phosphate-bonded** (e.g. **multiVest®**) **investment** material recommended for non precious metal alloys. Follow the procedures recommended by the manufacturer.

Preheating
Observe manufacturer's recommendations with regard to setting times, temperature levels etc. On reaching the end temperature a soaking period of **30** to **60 min.** is advisable depending on the size of the cylinder.
Note: If not otherwise recommended maintain the temperature of the cylinder at 950 °C (1742 °F).

Crucibles
Always cast the alloy in a non glazed ceramic crucible. Reserve this crucible for this alloy only.
Note: Preheat the crucible without the metal. Do not use carbon crucibles.

Re-melting
Use only new metal for ceramic application. When re-melting the metal several times parts of the elements forming the adhesive oxide are lost. Add at least ½ of **new alloy** for non ceramic application. The used copings have to be clean, free of investment and flux residue.

Melting
With an open flame: Use **Meteor handle with O-NP nozzle** for non precious and propane (**0.5–1 bar**) - Oxygen (**2.5–3 bar**) mixture. Preheat the crucible and move the flame over the entire metal surface. It is normal that some superficial parts of metal remain in the crucibles after casting. Clean the crucible before further usage. Do not use flux. When the last metal ingot collapses an oxide layer will be observed. Continue to melt the alloy with a circular movement of the flame until the oxide layer moves. Start the casting procedure before this oxide layer cracks.
With induction: Check the furnace calibration and use only furnaces compatible with the casting temperature. Introduce and melt the ingots one after the other in order to ensure optimal fusion. Release the casting machine arm immediately after the oxide layer collapse.
With Vacuum pressure: Adjust the vacuum as low as possible when casting
Display: 150 mbar = high Vacuum, 450 mbar = low Vacuum.

Cooling
Bench cool the casting ring.

Devesting / Cleaning
Clean by blasting with glass beads or pure aluminium oxide (Al_2O_3) particle size (110 μm to 250 μm) at 2.0 to 3.0 bar (29 to 43.5 psi) pressure.

Trimming and Cleaning
First trim the copings preferably using carbide burs and then fine grinding points at a low speed. Finish the surface treatment by blasting with pure aluminium oxide (Al_2O_3) particle size (110 μm) at 2.0 bar and clean in an ultrasonic unit for 5 min. with distilled water or with a steam cleaner. Rotary instruments and abrasives that are used for Metalloy® CC should be kept for that purpose only.

Pre-Soldering
We recommend using a propane/oxygen torch (**Meteor Type «L»**) for soldering and the use of a soldering paste. The design of the soldering block is a compromise between minimising its thermal mass whilst retaining sufficient strength to avoid fracturing during soldering. Apply the solder paste with an instrument to the cold surfaces that are to be soldered and preheat the solder model for 10 min. at 600 °C (1112 °F). Apply for a second time the solder flux to the solder joints. Heat the solder model to working temperature. Dip the solder in the solder paste and place it between the solder joints. During soldering wear dark goggles for eye protection. Should repeat applications of solder be necessary, only dip the solder into the solder paste. Do not apply more solder paste to the metalwork. Remove the soldering block and allow to bench cool. Slow cooling with porcelain firing is recommended when copings are pre-soldered.

Oxidation
An oxidation is not required. An oxidation for a visual check of the surface condition is possible if specified by the ceramic manufacturer. The surface of the copings should then be blasted with pure aluminium oxide (Al_2O_3) particle size (**110 µm** to **250 µm**) at 2.0 bar and then cleaned in an ultrasonic unit for 5 min. with distilled water or with a steam cleaner.

Porcelain application
Porcelain or resin applications are subject to the manufacturers instructions. For best results slow cooling is in general recommended. Brush and clean the copings after each ceramic firing under running water. Allow to dry. Excellent results have been obtained with the following porcelains (in alphabetical order):
Carmen, CCS, Creation &, dSign, Ducera Plus, Heraceram, IPS Classic, Omega 900 (list not exhaustive).

Laser welding
Metalloy® CC is easy to laser weld. For best results use the laser welding wire of ∅ 0,35 mm (Meta CC LW) or custom made pieces of the alloy Metalloy® CC.

Polishing
To smooth the surface trim with tungsten carbide burs and ceramic-bonded grinding tips. Pre-polish with rubber wheels to a dull shine. Continue with soft brushes, felts and cotton wheels using Legabril Diamond polishing paste to acheive a high lustre. «Whiting chalk» (chalk-powder) mixed with water on soft brushes or cotton wheels may be used for final high lustre polish. Clean the copings with a steam-cleaner.