AZ DENTAL GMBH
Siemensstrasse 5
DE- 78467 Konstanz

Instructions for METAPLUS CC
Non- precious alloy for ceramic

CE 0044

Manufacturer: German Special Alloys GmbH | Carl-Friedrich-Benz-Str. 1b | 47877 Willich | Germany

Produced for:
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METAPLUS CC is a dental metal-ceramic alloy based on cobalt. **METAPLUS CC** is free from nickel, cadmium, beryllium and lead and fulfils the standards of EN ISO 22674 type 4 for appliances with thin sections that are subject to very high forces, e.g. removable partial dentures, clasps, thin veneered crowns, wide-span bridges or bridges with small cross sections, bars, attachments and implant retained superstructures.

Composition w_i

Co	%	61,7
Cr	%	27,8
W	%	8,5
Si	%	1,6
Mn, Fe, Nb, N	%	< 1

Properties

Density ϱ	$g \cdot cm^{-3}$	8,4
Vickers hardness	HV 10	290
Linear CTE α (25 - 500 °C)	$10^{-6} \cdot K^{-1}$	14,1
Linear CTE α (20 - 600 °C)	$10^{-6} \cdot K^{-1}$	14,4
Melting range T_S - T_L	°C	1310-1400
Casting temperature T_{Cast}	°C	1520
Highest recommended firing temperature $T_{F,max}$	°C	980
0,2-% Yield strength $R_{p\,0,2}$	MPa	400
Modulus of elasticity E	GPa	195
Tensile elongation at break A_5	%	8
Tensile strength R_m	MPa	560

Recommendations for Use

Waxing-up

Prepare wax-up as usual but avoid material thickness lower than 0,35 mm. Lead sprues indirectly. Use round wax wires for sprues with ∅ 2-2,5 mm for single crowns and ∅ 2,5-3 mm for bridges. For frames with more than 4 teeth prepare a distribution funnel with ∅ 3,5-4 mm, for massive pontics prepare a distribution funnel with up to ∅ 5 mm.

Investing and Casting

Suitable investment materials are phosphate-bounded investments for crowns and bridges. Preheat the investment to 850-900 °C and hold final temperature for 30 minutes. Follow the manufacturer's instructions for use for the casting machine. Always use an individual ceramic crucible for **METAPLUS CC** to prevent contamination with other alloys. Clean crucible after each use to avoid residues of slag. Do not overheat the alloy. Start casting as soon as the ingots have collapsed giving a uniform melt. For melting by flame heat the ingots and give a rotary motion by use of the flame. Start casting as soon as the bath begins to vibrate. Allow the cylinder to cool down slowly to the ambient temperature and deflask without hitting the cone.

Firing of Ceramics

Use commercially available dental ceramics for cobalt based metal alloys with a suitable linear thermal expansion coefficient. Please follow the associated work instructions and cooling schemes given by the ceramic manufacturer. After deflasking:

1. Separation of sprues and finishing of the object. Carbide cutters are recommended.
2. Sand blast the surface by use of a pencil-blaster with aluminium oxide 100 µm or 250 µm.
3. Ultrasonically clean the frame in distilled water or degrease with ethyl acetate.
4. The oxide firing is optional, to be done at about 960 °C under vacuum for 5 minutes. Always remove the oxide layer after oxide firing by sand blasting with aluminium oxide and degrease again.
   Note: A clean surface is best to avoid bubbles in ceramics.
5. The opaque is applied on the surface by a first thin wash firing and a second evenly covering opaque layer.
   Before firing always let the opaque dry for 5-10 minutes at 600 °C.
6. Firing and cooling should be carried out in accordance to the ceramic manufacturer's instructions.
7. After every firing step (dentine bake, build-up and glazing) cooling phase until ca. 750 °C.

Finishing

After firing of the ceramic, polish the frame with suitable grinding and polishing instruments for dental alloys up to high gloss.

Soldering and Welding

Soldering before firing of the frame can be carried out with commercially available solders und high temperature flux. The width of the solder gap should be 0,05-0,2 mm. For welding with laser use suitable commercially available metal welding wires.

Safety Note
Metal dusts are harmful to health. Use a dust extractor. Consider allergic hypersensitivities to contents of the alloy. In case of suspected incompatibility with individual elements of this alloy, this should not be used.

Warranty
These application recommendations are based on own experiments and experiences and can therefore only be regarded as guidelines. The dentist or dental technician is responsible for the correct processing of this alloy.

LOT Batch number | Refer to instructions for use | Manufacturer | Not for reuse