

# CoCr DG1

Dental Co-based metal-ceramic alloy, Type 5.

CoCr DG1 complies with ISO 22674 and ISO 9693-1.  
REF 50522 – 5 kg/REF 50522US – 5 kg

CE 01 97

Standard analysis % by weight (elements)	
Co (wt%)	63.9
Cr (wt%)	24.7
Mo (wt%)	5.0
W (wt%)	5.4
Si (wt%)	1.0

Alloy characteristics	
According to the requirements of ISO 22674, classified as free of nickel, cadmium, beryllium and lead	
Type (according to ISO 22674)	5
Solidus, liquidus temperature [°C]	1375, 1405
Density [g/m <sup>3</sup> ]	8.3
Young's modulus [GPa]	213/224*
Proof strength (R <sub>p0.2</sub> ) [MPa]	1026/625*
Ultimate strength (R <sub>m</sub> ) [MPa]	1213/1076*
Elongation after fracture [%]	3.7/2.7*
Vickers hardness (HV10)	461/430*
BEGO color code	8 (white)
Coefficient of thermal expansion (CTE)	
25 °C – 500 °C, 10 <sup>-6</sup> K <sup>-1</sup>	14.1
20 °C – 600 °C, 10 <sup>-6</sup> K <sup>-1</sup>	14.1
Veneering ceramic	Ceramic with suitable CTE, e. g.: VITA VMK Master
Oxidation firing	Not recommended, but if control firing is requested: 5 min at 900 °C / preferably with vacuum
Highest recommended firing temperature	980 °C
Heating rate	Recommended max. 55 °C/min
Flux	e. g. Minoxid (REF 52530)
Brazing material before firing	Wirobond-Lot (52622)
Brazing material after firing	–
Laser wire	Wiroweld (50003, 50005)

\*stress relieving 750 °C / simulated ceramic firings

**Intended use:** SLM powders are indicated for the fabrication of dental restorations by the selective laser melting (SLM) process.

**Indication:** CoCr DG1 is a cobalt-based dental alloy for SLM process. It is suitable for the fabrication of crowns, bridges, partial dentures and secondary bar structures as well as metal-ceramic restorations. CoCr DG1 is available as powder for SLM process.

**Contraindications:** No contraindications are known. However, unwanted biological reactions such as allergies to contents of the alloy or electrochemically based reactions may very rarely occur. In case of known incompatibilities and allergies to contents of the metallic material, it should not be used.

**Warnings:** Metal dust is harmful to your health. Avoid dust formation! When opening the package, transferring the powder or grinding and blasting dental restorations, be cautious and use suitable air extraction system / ventilation at the workplace and breathing mask type FFP3-EN149, safety glasses with side shields (DIN EN 166), safety gloves (butyl rubber or nitrile rubber, category III, EN 374) and ESD certified safety shoes. In case of eye, contact rinse with plenty of water and in case of skin contact, wash off with soap and water. If irritation persists, consult a physician/specialist.

Clean up spillage mechanically using a damp cloth (water or isopropanol) and treat waste in accordance with local and national regulations.

Metal powder is inflammable. Remove all sources of ignition. Suitable extinguishing media: special powder against metal fire, sand.

Take note of the safety data sheet!

**Precautions:** In case of occlusal or approximal contact with a different alloy, electrochemically based reactions may very rarely occur. Safety and effectiveness in treatment of children or treatment of pregnant or nursing woman have not been established. CoCr DG1 may influence negatively the interpretation of MRI investigations.

**Adverse reactions:** No adverse reactions are known. Nevertheless, the rare case of occurrence of individual reactions against single components of CoCr DG1 can never be excluded completely. In this case, the application of CoCr DG1 should not be continued.

**Prescription device:** Caution: US Federal law restricts this device to sale by or on the order of a licensed dentist.

**Digital wax up:** Use appropriate CAD software and follow the dental design rules. Minimum metal thickness (after grinding) 0.3 mm. Avoid sharp edges and corners. Framework should be anatomic reduced. Connectors should be modelled as strong and high as possible (height: min. 3.5 mm, width: min. 2.5 mm).

**Manufacturing steps in production centre**

**Storage conditions:** Dry in tightly closed containers.

**SLM process:** When opening the package, transferring the powder or filling the powder into the SLM equipment, avoid dust formation! Use SLM equipment with laser and settings as optimised by Renishaw plc for your application (e. g. Ytterbium Fiber Laser or Nd:YAG Laser (wavelength approximately 1060 nm – 1100 nm), layer height of powder 0.03 mm, laser power 195 W, scanning velocity 1200 mm/s and hatch spacing 0.09 mm with laser beam width 0.1 mm).

In case of application of not-melted powder, the powder should be sieved using 63 µm ultrasonic sieve or 80 µm powder sieve.



**Manufactured by:**  
 BEGO Bremer Goldschlägerei  
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**Stress relieving:** Under an argon atmosphere, held at 750 °C for one hour and allowed to cool naturally.

**Removal of restorations from platform:** Avoid dust formation! After stress relieving and cooling down of the platform, remove the restorations using e. g. a band saw, rotary cutter or pliers. Remove the remains of the supports using pliers.

**No reuse of laser sintered material:** Do not reuse items produced by selective laser melting (e. g. bridgework or bar) for the re-fabrication of dental restorations (e. g. by casting).

**Grinding:** Use tungsten carbide burs.

**Polishing:** To ease polishing, blasting with Perlablast® micro (REF 46092, lead-free soda glass) may be suitable. Afterwards, polish with rubber polisher and brushes with suitable polishing paste. Partial dentures: Electropolishing (Eltropol polishing unit, Wirolyt polishing fluid). Clean surface thoroughly by steam cleaning or boiling in aqua dest.

**Ceramic veneering:** Use veneering ceramics with suitable CTE (ISO 9693-1). Follow instructions for use of ceramic manufacturers. Before ceramic firings, the framework must be blasted (250 µm/3 bar – 4 bar; e. g. with Korox 250, REF 46014). Where applicable, the oxides after ceramic firings must be blasted (250 µm/3 bar – 4 bar; e. g. with Korox 250, REF 46014). Clean surface thoroughly by steam cleaning or boiling in aqua dest. Do not touch surfaces afterwards with hands. Use artery clamps or similar devices.

Support the frameworks adequately during firing cycles.

**Acrylic veneering:** For veneering with acrylic material, follow the recommendations of the manufacturers.

**Soldering/brazing:** Fixate the parts with soldering investment material (e. g. Bellatherm® REF 51105). The prepared gab shall not exceed 0.2 mm with parallel walls. Use a suitable BEGO flux. The flux residues and oxides must etched off. Clean surface thoroughly by steam cleaning or boiling in aqua dest.

**Laser welding:** If applicable, use X-seam and filler material. Follow manufacturer's instructions for use and hazard notes of the laser welder devices.

**Limit of liability:** Except where prohibited by law, Renishaw will not be liable for any loss or damage arising from this product, whether direct, indirect, special incidental or consequential, regardless of the theory asserted, including warranty, contract, negligence or strict liability.

**Warranty:** Whether given verbally, in writing or by practical instructions, our recommendations for use are based upon our own experience and trials and can be considered as standard values. Our products are subject to a constant further development. Therefore alterations in construction and composition are reserved.

**US labeling requirements:** The device labeling meets the recommendations of FDA applicable guidance documents.

Any serious incident that has occurred in relation to CoCr DG1 should be reported to BEGO Bremer Goldschlägerei Wilh. Herbst GmbH & Co. KG and the competent authority.



Consult instructions for use



Caution



Use-by date



Batch code



Non-sterile

**Rx only**  
 For professional use only



Catalogue number



Manufacturer