## Precious metal-free alloy

# CADtools Cobalt-Chrome Dental Alloy

**Delivery forms**
Blank diameter: 98.5 mm step
Heights: 10, 12, 13.5, 15, 18, 20 mm

**Instructions for use**
Please read the contents of this instruction manual carefully. For general and technical questions we are at your disposal under the telephone number: +49 821 455252-0 .

**Description**
CADtools Cobalt-Chrome Dental Alloy is an alloy free of precious metals in accordance with ISO standard 9693: 2012 and 22674: 2016 for the manufacture of medical devices using subtractive manufacturing processes. The alloy is suitable for the production of crowns, bridges and abutments manufactured using milling technology, in the form of fixed and removable dentures as well as for metal-ceramic.

**Design**
The design must be crated in accordance with dental technology standards in order to meet the necessary mechanical requirements.

**Milling**
The processing can be done with all milling machines suitable for CoCr. The supply of coolant depends on the milling strategy used and the associated milling parameters. The milling cutters to be used for the material should be agreed with the milling machine manufacturer beforehand.

**Separation**
The milled structures can be separated out of the blank with cross-cut hard metal burrs suitable for CoCr alloys or with suitable cutting discs.

**Further processing**
The elaboration and finishing of the frameworks and their surface should be done using clean hard metal burrs or ceramic-bonded grinding tools or diamond grinding tools. The post-processing should only be done in one direction on the surface in order to avoid material overlapping. Otherwise, these can lead to the formation of bubbles in the ceramic veneering. During the process, pay attention to the maximum speed recommended by the manufacturer for rotating tools. After the workpiece has been processed, it should be sandblasted with aluminum oxide (125 µm) at a pressure of max. 3 - 4 bar. The cleaning is to be carried out with steam. The workpiece should no longer be touched.

**Oxidation**
The oxidation takes place for 5 minutes without vacuum at the opaque firing temperature. Then blast and clean again as described above.

**Firing**
CADtools Cobalt-chrome Dental Alloy can be veneered with all commercially available ceramic materials with a suitable CTE. Unless otherwise specified by the ceramic manufacturer, slow cooling is recommended.

**Soldering**
If soldering is required, a solder suitable for the composition and melting range of the alloy to be soldered should be used.

**Storage**
The product properties are not affected by normal fluctuations in ambient conditions (e.g. temperature, pressure or light).

**Disposal**
The applicable national regulations and the relevant information in the safety data sheets must be observed.

**Safety instructions**
Intolerance symptoms with non-precious metal alloys are extremely rare if they are manufactured in accordance with the instructions for use. In the event of a proven allergy to a component of the alloy, it should not be used for safety reasons.

In individual cases, galvanic reactions can occur in the event of contact with other metallic elements and the use of different types of alloys in the same oral cavity.

During the mechanical processing of the alloy, metal dust can be generated. In addition, the machining leads to the development of heat and possibly to the formation of burrs. The processed material could therefore be hot and sharp-edged. When processing at temperatures above the solidus temperature, vapors can be generated. A suitable aspiration system or aeration and ventilation of the workplace must be provided. The use of protective gloves, protective clothing and goggles as well as respiratory protection is expressly recommended. The resulting dusts and vapors are hazardous to health. Individual alloy components can have a carcinogenic effect. Warning notices and safety data sheets must be observed.

Each product is identified with a batch number. For traceability purposes, it is recommended to enter this number on the patient's data sheet.

The product solid is not sterile.

**Technical data sheet for CADtools Cobalt-Chrome Dental Alloy**
Cobalt-based tooth alloy for ceramics, type 4*
* according to the ISO norm 22674:2016

| Chemical composition | Concentration |
|---|---|
| Co | 66 % |
| Cr | 27 % |
| Mo | 6 % |
| Si, Mn | traces |

| Material data | |
|---|---|
| Colour | white |
| Density | 8,4 g / $cm^3$ |
| Melting interval | 1307 - 1417 °C |
| Melting temperature | 1470 °C |
| Upper yield point (Rp 0.2) | 395 MPa |
| Percentage elongation at break | 11 % |
| Modulus of elasticity | 233 GPa |
| Vickers hardness | 255 HV10 |
| Coefficient of thermal expansion 25 - 500 °C | $14.3 \cdot 10^{-6}\ K^{-1}$ |
| Coefficient of thermal expansion 25 - 600 °C | $14.5 \cdot 10^{-6}\ K^{-1}$ |
| Highest firing temperature | 980 °C |
| Cytotoxicity test according to the ISO standard 10993-5 | Biological assessment test |