

## Instructions for use

Cobalt-based dental alloy, type 5

Grain size 10–45 µm

WIRONIUM® RP satisfies ISO 22674

REF 50530 – 5 kg

### Alloy characteristics

Acc. to ISO 22674 free of nickel, cadmium, beryllium and lead		
Type (according to ISO 22674)		5*
Solidus, liquidus temperature °C	1380, 1420	
Density	g/cm <sup>3</sup>	8.5*
Modulus of elasticity	GPa	235*
0.2% elongation limit (R <sub>p0.2</sub> ) MPa		800*
Tensile strength (R <sub>m</sub> ) MPa		1300*
Ductile yield (A <sub>5</sub> ) %		13*
Hardness (HV10)		395*
BEGO shade code		8 (white)
Veneering ceramic	cannot be veneered with ceramics	
Flux	e.g. Minoxid (REF 52530)	
Solder:	Cobalt-chrome solder (REF 52520)	
Laser wire:	Wiroweld (REF 50003, 50005)	
*Stress relief heat treatment 800°C		

**Intended purpose:** WIRONIUM® RP is intended for the fabrication of dental restorations using the Selective Laser Melting (SLM) process.

**Indication:** WIRONIUM® RP is a cobalt-based dental alloy for the SLM process. It is suitable for the fabrication of partial dentures. WIRONIUM® RP is available in powder form for SLM processes.

**Contraindications:** Brackets, tubes, archwires and attachments for orthodontic appliances.

Further, 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 health. Avoid dust formation! The opening of packages, filling of powders, grinding and blasting of dental restorations should be performed carefully and using an appropriate extraction system. Respiratory protection of type FFP3-EN149, protective goggles with side protection (DIN EN 166), protective gloves (made of butyl rubber or nitrile rubber, category III, EN 374) and ESD-certified safety shoes are recommended. In the event of contact with eyes, rinse with plenty of water. In the event of skin contact, wash with water and soap. If irritation persists, seek a physician's care.

Collect any spilled amounts mechanically with a moist rag (water or isopropanol) and dispose of in accordance with local or national statutory regulations.

Metal powders are combustible. Remove all sources of ignition. Suitable extinguishing media: special powders against metal fires, sand.

Pay attention to safety data sheet!

**Precautions:** In the case of approximal or occlusal contact with other metals, electrochemically-related numbness may occur in very rare cases. Frames fabricated from WIRONIUM® RP may disrupt the analysis of MRI exams and should be separated before such examinations.

**Adverse effects:** WIRONIUM® RP has no known adverse effects. However, individual reactions to components of WIRONIUM® RP in very rare cases cannot be excluded. In such cases, WIRONIUM® RP should not be used.

**Digital wax-up:** Wax-up is performed using suitable CAD software under consideration of dental technology regulations. In order to achieve the clinically required stability, the base should possess, as part of the design process, a minimum thickness of 0.6 mm, and 0.5 mm after finishing.

**Please note:** Since the stability of an upper jaw base consists of a combination of shape, expansion and material thickness, 0.5 mm should be considered as the minimum. The design basics for the partial denture technique must be adhered to.

Standard bases possess base thicknesses of approx. 0.75 – 0.85 mm, smaller bands or skeletonised frames 1.0 – 1.2 mm.

Lower jaw brackets should possess a thickness of approx. 1.8 – 2.0 mm X 4.0 – 4.2 mm.

The parameters must be selected and set accordingly in the design software!

At critical object locations, e.g. at the transition of a minor connector to a clasp, the wall thickness should be set to approx. 1.2 – 1.5 mm X 1.8 – 2.0 mm.

### Clasp design

The design of the clasps is based on their position and function, on the expansion of the restoration and on the specifications of the practitioner. In the clasp shoulder area, the transition from minor connector to clasp is to be rounded off. In this area, clasps ideally possess a thickness of approx. 1.5 mm X 2.0 mm and taper off toward the clasp tip to 1.2 mm - 1.5 mm. The clasp tip is to be rounded off.

At critical object locations, e.g. at the transition of a minor connector to a clasp, the wall thickness should be set to approx. 1.2 – 1.5 mm X 1.8 – 2.0 mm.

The shapes of the clasp profiles and the parameters must be selected and set accordingly in the design software!

### Work steps in the manufacturing centre

For equipment-specific work steps and settings, the device manufacturer's specifications must be adhered to!

Please follow the instructions for use and safety instructions of the equipment manufacturers!

**Storage conditions:** Store dry in the tightly closed original container.

**SLM procedures:** Prevent the formation of dust when opening the packaging and during transportation as well as when filling the powder into the SLM system. Use an SLM system with suitable laser (e.g. Ytterbium fibre laser or Nd:YAG laser (wavelength approximately 1060 - 1100 nm) with the following settings: powder layer thickness 0.03 mm, laser output 195 W, scan speed 1200 mm/s and track spacing 0.09 mm, with a laser beam diameter of 0.1 mm.

If unmelted powder is to be reused, it must be sifted beforehand using an ultrasound sieve (63 µm) or a powder sieve (80 µm).

**Stress relief heat treatment:** The removable part of the production platform with the fabricated objects is inserted in a suitable oven with a temperature of 800°C. As soon as the oven has once again reached 800°C after insertion of the production platform, the temperature must be maintained for 45 min. The platform is removed from the oven at 800°C for further processing. After the stress relief heat treatment, allow platform to cool to lukewarm with air, on a protected and well-labelled location. Do not chill in water!

**Separation of the restorations from the platform:** Avoid dust formation! After the stress relief heat treatment and cooling of the platform, remove the restorations using a band saw, rotary instruments or forceps, for example. Also remove the supports from the object with forceps or smooth down using a dental grinding stones.

**No reuse of laser-sintered material:** Materials (e.g. partial denture frames) that have already been melted via SLM may not be reused for fabrication of a new restoration (e.g. by casting). WIRONIUM® RP may not be processed through casting.

**Finishing:** Use fine-toothed carbide bur.

**Polishing:** In order to facilitate the rubber-polishing, it is possible to blast polish with Perlablast® micro (REF 46092, lead-free soda lime glass), and electrolytic glazing if needed (Eltrapol, Wirolyt polishing liquid). Then, rubber-polish with a suitable rubber polisher, and polish using suitable pre- and post-polishing pastes. Finally, clean thoroughly (e.g. clean in an ultrasonic bath or steam blast).

**Acrylic saddle:** In order to fabricate the acrylic parts, the relevant instructions of the acrylics manufacturer must be observed. The retention areas for acrylic saddles are not polished, instructions for preparation can be found in the instructions for use of the respective acrylics manufacturer.

**Soldering:** Affix parts to be soldered (e.g. with soldering investment material Bellatherm® REF 51105), parallel-walled soldering gap: max. 0.2 mm. Use suitable BEGO flux. After soldering, flux residue and metal oxides must be removed and the surfaces are to be cleaned through steam blasting.

**Laser welding:** When possible, work with X-sutures and filler material.

Please follow the instructions for use and safety instructions of the equipment manufacturer!

**Warnings:** Application-related recommendations provided by us, whether given verbally, in writing or by way of practical instructions, are based on our own experience and tests and may therefore only be regarded as general guidelines. Our products are subject to continuous development. Therefore we reserve the right to make modifications in design and composition.

If any severe incidents should occur in relation to the use of WIRONIUM® RP, please notify BEGO Bremer Goldschlägerei Wilh. Herbst GmbH & Co. KG and the responsible authorities.

### Instructions for disposal

#### Waste treatment procedures

##### Product

The assignment of a waste key number as per the European Waste Catalogue Ordinance (AVV) must be carried out in consultation with the regional waste disposal contractor. Do not dispose of with household waste.

##### Packaging

Packaging must be fully emptied and properly disposed of in compliance with statutory regulations. Packaging that is not fully emptied must be disposed of in coordination with the regional waste disposal contractor.



Consult instructions for use



Caution



Use-by date



Batch code



Non-sterile

Rx only  
For professional use only



Catalogue number



Manufacturer

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