

Processing Guide

cara CoCr SLM

cara CoCr SLM (Selective Laser Melting Process) is a beryllium and cadmium-free cobalt-chromium-based ceramic bonding alloy (in accordance to EN ISO 9693-1 and EN ISO 22674) for frameworks up to 16 units.

Chemical composition

(Content in mass %)

Co	61.8 – 65.8
Cr	23.7 – 25.7
Mo	4.6 – 5.6
W	4.9 – 5.9
Si	< 1.2
Mn	< 0.1
Fe	< 0.5

Technical specifications

0.2% Yield strength*	850 MPa
Elongation*	3.0 %
Young's modul*	e.g. 200 GPa
Thermal expansion coefficient CTE (25–500 °C):	14.3 µm/mK
Hardness:	420 HV10
Density*	8.5 g/cm ³
Melting range:	1410–1450°C

*based on simulated ceramic firing

CoCr
SLM

Software Setting Parameters; Dental Designer™ (3Shape)

(all values in mm):

Software Designation	Internal crown surface				External crown surface / core build-up					
	Extra cement gap	Cement cap	Dist. to margin line	Transition width	Wall thickness	Wall height	Marginline offset	Offset angle	Extension offset	Connector thickness mm ²
Indication										
Single crowns	0.115	0.030	1.0 – 2.5	1.5	0.40	1	0.15	75°	0.1	
Bridges (3 units) Anterior	0.115	0.035	1.0 – 2.5	1.5	0.40	1	0.15	75°	0.1	min. 5
	0.120	0.035	1.0 – 2.5	1.5	0.40	1	0.20	75°	0.1	min. 6
Bridges (4 – 8 units)	0.120	0.035	1.0 – 2.5	1.5	0.40	1	0.20	75°	0.1	min. 7
Bridges (9 – 16 units)	0.120	0.035	1.0 – 2.5	1.5	0.50	1	0.20	75°	0.1	min. 8
Primary Telescope*	0.115	0.030	1.0 – 2.5	1.5	0.45	1	0.15	55°	0.1	

* Primary telescopes are not available in SLM anatomic+.

Indications cara CoCr SLM:

- Crowns and Bridges with up to 16 units and no more than 2 adjacent pontics between the abutments
- Implant superstructures
- Full anatomic
- Primary telescope

Indications cara CoCr SLM anatomic+:

- Full anatomic crowns and bridges
- Occlusal Stops
- Including all frameworks with anatomic parts

Considerations in the design for CoCr SLM orders:

- The milling radius correction is not required because an additive technique is used.
- The "Remove undercutting" field always remains activated.
- Design the connector between pontic and coping with a smooth transition.
- The cement gap parameters are intended as guidelines or averages. Pre-defined parameters (standard, narrow and broad) should be used variably.

Giving a hand to oral health.



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Considerations in the design for CoCr SLM anatomic+ orders:

- Processing of the occlusal surfaces is carried out by our experienced dental technicians. Utmost care is taken in processing the occlusal surfaces and possible contact points. A minimal allowance in the CAD-design of the contact points can prevent the loss of contact points during processing.

We fabricate your frameworks based on your design specifications. We offer no guarantee for constructions beyond our specific range of indications.

Outer/inner surfaces of fabricated frameworks:

- The surfaces can feel rough and uneven. This is only on the surface and a result of the process used. It does not at all interfere with the ceramic veneering.
- The surfaces of the framework should be fully ground using a cross cut tungsten carbide burr before veneering.
- Before fitting, check the interior surfaces and remove any weld spatter that may still be sticking to the surface.

Finishing:

- Use appropriate cross cut tungsten carbide burrs suitable for CoCr.
- After grinding the surface sandblast the framework with Al₂O₃; 125 µm; 4 bar pressure.
- After sandblasting clean the framework thoroughly with a steam cleaner.
- △ Metal dust poses a health hazard. When performing machining and blasting, provide suitable suction and wear a type FFP3-EN 149-2001 breathing mask!

Lasering / soldering:

- cara CoCr SLM is excellent for laser welding.
- Use only soldering and welding materials suitable for the thermal expansion coefficient (CTE_{25 – 500°C}) of cara CoCr SLM. Always observe the manufacturer specification for the soldering and welding material!
- Recommendation: Kulzer CoCr laser welding wire Ø 0.5 mm.
- We recommend using Heraenium P solder 1 for soldering prior to firing.

Oxide firing:

- Oxide firing is not recommended.
- If oxide firing is performed for the purposes of controlling the surface (950°C/5 minutes under vacuum conditions), always blast off oxide afterwards (Al₂O₃; 125 µm; 4 bar). Afterwards clean the framework thoroughly with a steam cleaner.

Warning: Only remove ceramic by mechanical means. Hydrofluoric acid (HF) will corrode the metal framework.

Ceramic veneering:

When veneering the framework, observe the appropriate instructions for your preferred veneering ceramic that is appropriate for the material being used.

HeraCeram recommendation:

- We recommend using **HeraCeram NP Primer**.
- Opaque and dentine firings as described in the HeraCeram instructions for use.
- HeraCeram **does not require** any long term cooling.

Composite veneering:

When veneering the framework, observe the appropriate instructions for your preferred veneering composite.

Signum recommendation:

- To support the mechanical bonding of the framework, always construct with mechanical retention.
- For the chemical bonding, apply **Signum metal bond** on the cleaned and dried framework.
- Finally apply **Signum composite** according to the Instructions for Use.

The general safety regulations for handling dental products are applicable.

Contraindications: Should not be used in cases of oversensitivity (allergy) to ingredients used in the alloy. • **Side effects:** In isolated cases, hypersensitivity reactions (allergies) and electrochemically-caused discomfort, local discomfort and taste-related complaints and gum irritations were described. • **Interactions with other dental alloys:** Approximal or antagonistic contact with dental restorations not made of similar alloys can cause galvanic effects. If localised electrochemical-related discomfort is experienced due to contact with other alloys and persists, the work must be replaced with other materials. CoCr alloys may contain less than 0.1 mass % of trace elements, e.g. Nickel. • **Remarks:** Observe the safety data sheets or national regulations.
• cara = registered trademark of Kulzer GmbH • Technical data subject to change.

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