Technical data sheet

CoCr – (Cobalt-chromium)
Magnum Splendidum, type 4

Manufacturer

MESA DI SALA GIACOMO & C. S.N.C.
Via dell'Artigianato, 35/37/39
25039 Travagliato (BS)
Italy

MESA is certified according to:

- **DIN EN ISO 13485**
- **RL 93/42/ECC (CE 0546)**
- **ISO 9001**

Description

Cobalt-chromium ***Magnum Splendidum, type 4***
Non-**p**recious **m**etal alloy
ISO 9693-1/ISO 22674

Description

When using the CoCr discs, a high-quality non-precious (base) metal alloy is available for all applications in the VMC (veneering metal-ceramic) technology. The industrially manufactured material offers a high degree of processing reliability, with outstanding mechanical properties, and guarantees a consistent quality.

The most important features are:

- nickel- and beryllium-free, therefore biocompatible
- easy to work with due to low hardness
- low thermal expansion coefficient (CTE)
- high corrosion resistance and temperature resistance
- oxide firing is not necessary during machining
- excellent machinability

Indication

The scope of application covers dental crowns and bridges in the anterior and posterior tooth area, as well as the use in cone and telescopic technology (primary and secondary parts). The connector cross-section must not be less than 6 mm², however, a connector cross-section of at least 9 mm² is recommended. Furthermore, bars, implant bridges and superstructure can be produced.

Finishing/cleaning

First, aluminium oxide should be used to sand the substructures. Subsequently, clean carbide milling tools or diamond abrasives suitable for CoCr alloys should be used for the final procedure. To do this, the tools must only be pulled over the surface in one direction in order to avoid material overlaps and possible bubble formation during ceramic veneering. In addition, the maximum speed of the instruments recommended by the manufacturer must be observed. Subsequently, pure aluminium oxide (approx. 180 µm) should be used to sand the surfaces, using a pressure of 3 - 4 bar. Afterwards, thoroughly rinse the substructure under running water, or evaporate with hot steam and degrease with ethyl alcohol. Never use hydrofluoric acid!

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Modelling

The wall thickness of the virtual crown model must not be less than 0.4 mm. This will ensure that the wall thickness after finishing and before the ceramic or synthetic veneering is at least 0.3 mm. The crown and bridge units resemble the anatomical tooth shapes exactly in order to allow a uniform ceramic coating. Avoid sharp edges during the modelling process. Ensure to make the bars between the pontics as strong and high as possible.

Oxidation firing

Oxidation firing is not required. However, if an oxide firing (rapid heating to 1,000°C without vacuum, after the temperature has been immediately cooled) is carried out for visual inspection of the substructure's conditioning, the oxide is to be emitted with one-shot blasting media (aluminium oxide, approx. 180 µm)

Veneering/firing process (ceramic)

Substructures, made of non-precious (base) metal alloy can be veneered with a suitable veneering ceramic. When veneering using high-temperature melting ceramics, exceptional aesthetic results can be achieved.

All commercially available ceramic compounds, with a suitable CTE value, can be used. It is recommended to use a two-step base composition firing process; in the case of further ceramic processing, the instructions of the ceramics manufacturer must be followed, in particular with regard to cooling after the ceramic firing.

Long-term cooling should be observed!

When using VITA VM13 during the veneering process, ensure that the base compositions slowly cool down on both metals - and/or a bonder (for example, universal by Bredent) is helpful.

Always follow instructions of the respective supplier of the applicable veneering ceramic.

We recommend using IPS InLine® (conventional metal ceramics) or IPS InLine® One (one-layer metal ceramic) by Ivoclar Vivadent, which can be used in the CET range from 13.8 to 15.0 10-6/K-1 (at 25-500 °C)

CADstar Digital Dental Solutions

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Burnishing

Shot-peen visible surfaces to a gloss, using ceramic abrasive compounds and rubber bonding. Subsequently, pre-polish the surface using a suitable pre-polish paste and burnish with a suitable polishing paste until a high-gloss effect is achieved. Finally, thoroughly and carefully clean the surface with a steam jet, ultrasonic cleaner or use boiling distilled water.

Chemical composition

Co (in %)	**Cr** (in %)	**W** (in %)	Other components: **Si, Mn** (in %)
60.0	**28.0**	**9.0**	**3.0**

Physical properties (guidelines)

Elongation at break		**16**	[%]
Elasticity modulus		**183,000**	[MPa] or [N/mm²]
Vickers hardness		**273 HV10**	
Density **ρ** (at 20°C)		**8.5**	[g/cm³]
CTE value **α** (Coefficient of thermal expansion)	**25 - 600°C**	**14.4**	[10^{-6} K^{-1}] or [10^{-6} C^{-1}]
CTE value **α** (Coefficient of thermal expansion)	**25 - 500°C**	**14.2**	[10^{-6} K^{-1}] or [10^{-6} C^{-1}]

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