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Material Product Data Sheet

Cobalt-Chromium-Molybdenum Alloy Powder for Additive Manufacturing of Medical Components

Powder Products:
MetcoMed CoCr F75-A

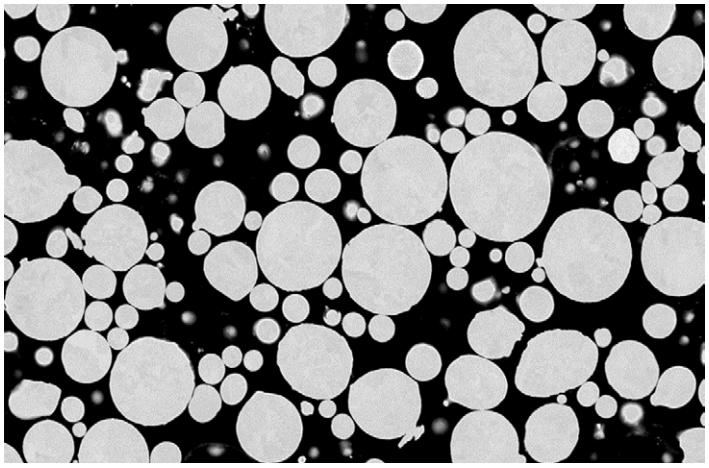
1 Introduction

MetcoMed CoCr F75-A is a cobalt-chromium based , gas atomized alloy powder that conforms to ASTM F75 and is similar to ISO 5832-4 and UNS R31538. It has been optimized for the use in laser powder bed fusion (PBF-LB) additive manufacturing processes.
The processes used to manufacture these materials are tightly controlled to ensure repeatable and consistent powder quality to ensure consistent printing performance when used with defined parameters and equipment.
In tensile testing, all averages and all individual samples easily exceed the minimum requirements of ASTM F75-07 and ASTM F3213 for strength and ductility.

1.1 Typical Uses and Applications:

- Medical: Orthopedic implants

Quick Facts	
Classification	Alloy, cobalt-based
Chemistry	CoCrMo
Similar To	ISO 5832-4 and UNS R31538
Manufacture	Gas atomized (nitrogen)
Morphology	Spheroidal
Apparent Density	> 4.0 g/cm^3 (typical)
Solidus	1378.5 ± 10 °C (2513.3 ± 18 °F)
Liquidus	1419.2 ± 10 °C (2586.6 ± 18 °F)
Purpose	Additive Manufacturing
Process	Laser Powder Bed Fusion (PBF-LB)



Typical cross-section of MetcoMed CoCr F75-A gas-atomized powder.

2 Material Information

2.1 Chemical Composition

Product	Weight Percent (nominal)					
	Co	Cr	Mo	C	Ni	Other
MetcoMed CoCr F75-A	Balance	28	6	< 0.2	< 0.1	< 0.1

2.2 Particle Size Distribution

Product	Nominal Range [µm]	D90 [µm]	D50 [µm]	D10 [µm]
MetcoMed CoCr F75-A	-45 +15	51	33	19

For the nominal range, particle size analysis 45 µm or above measured by sieve (ASTM B214), analysis below 45 µm by laser diffraction (ASTM C 1070, Microtrac). Fractional analysis (D90, D50, D10) by laser diffraction.

2.3 Key Selection Criteria

- MetcoMed CoCr F75-A has been engineered for the manufacture of medical components using PBF-LB. The chemistry is optimized so that the required component mechanical properties can be obtained after post heat-treatment processing.

2.4 Related Products

- Oerlikon Metco offers other Cobalt, Nickel and Iron-based powders designed for additive manufacturing that have been optimized for either powder fed or powder bed processes. Please contact your Oerlikon Metco Account Representative for more information.
- Oerlikon Metco can produce powders with chemistries similar to MetcoMed CoCr F75-A, but with particle size distributions optimized for powder fed additive manufacturing. Please contact us for more information.

2.5 Specifications

Product	Specification (similar to)
MetcoMed CoCr F75-A	ISO 5832-4 ASTM F75-07 ASTM F3213 UNS R31538

3 Key Processing Information

3.1 Typical Post Heat Treatment Properties (MetcoMed CoCr F75-A) [a, b, c]

Specification Concept		EOS M290
Ultimate Tensile Strength (MPa), XY/Z	ASTM E8	1075 / 995
Yield Strength (MPa), XY/Z		604 / 580
Elongation at break %, XY/Z		43 / 24
Reduction of Area %		27 / 20
Relative Density %	Internal Spec.	> 99.9%

[a] Disclaimer: All data published in this datasheet has been shared for reference purposes only and is not sufficient to design or certify parts. No warranty or guarantee is made against these results.
[b] Material was subsequently heat treated and then machined to provide tensile bars to be tested at room temperature to ASTM E8, DIN 50125 – B 8 X 40 (M12) sample).
[c] Stress Relieve at 1200 ± 30 °C (2190 °F) for 3 ± 0.5 hr in vacuum and furnace cooled

3.2 Post heat treatment microstructure (heat treated, etched)

3.3 Additive Manufacturing Services

Oerlikon AM is an excellent source for pilot and production run additive manufacturing services and is ready to serve your needs. Please contact your Orlikon Metco account manager for more information or contact Oerlikon AM directly through their web site at www.oerlikon.com/am.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
MetcoMed CoCr F75-A	2442245	5 kg (approx. 11 lb)	Stock	Global

4.2 Handling Recommendations

- Blend contents prior to use to prevent segregation
- Keep in the original container, or an approved alternative, tightly closed when not in use
- Powder from previously opened containers should be stored in a humidity-controlled environment

4.3 Safety Recommendations

See the SDS (Safety Data Sheet) 50-4004 in the version localized for the country where the material will be used. SDS are available from the Oerlikon web site at www.oerlikon.com/metco (Resources – Safety Data Sheets).

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