

Material Product Data Sheet

Cobalt-Chromium Alloy Powders for Additive Manufacturing

Additive Manufacturing Powder Products: MetcoAdd 75A, MetcoAdd 76A, MetcoAdd 78A

1 Introduction

MetcoAdd™ 75A, MetcoAdd 76A and MetcoAdd 78A are cobalt-chromium-based, gas atomized alloy powders designed for use in powder bed additive manufacturing processes such as Selective Laser Melting (SLM) and powder bed fusion.

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.

The products are of optimized quality for powder bed fusion and SLM additive manufacturing with respect to particle size distribution, tailored chemical composition, outer particle morphology and inner particle morphology. The powder particles are fully dense (free of porosity) and have a spherical morphology. Particle size distribution is designed for homogeneous distribution in powder bed processes with excellent packing density and stability that prevents agglomeration to ensure densely printed parts with minimum to no defects. The carbon content of the powders is optimized for aerospace and medical applications.

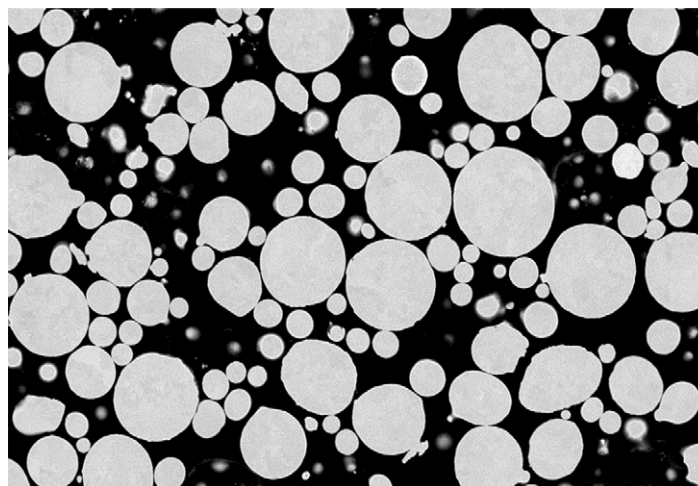
MetcoAdd 75A, MetcoAdd 76A and MetcoAdd 78A are proven in the market to produce dense parts with mechanical properties comparable or better than cast or wrought alloys.

1.1 Typical Uses and Applications:

- Aerospace: Gas turbine parts
- Medical: Orthopedic implants
- Industrial: Various

Quick Facts

Classification	Alloy, cobalt-based
Chemistry	CoCrMoC
Similar To	ASTM F75; ISO 5832-4; UNS R31538
Manufacture	Gas atomized
Morphology	Spheroidal
Purpose	Additive Manufacturing
Process	Selective laser melting and other powder-bed additive manufacturing processes



Typical cross-section of MetcoAdd 75A gas-atomized powder showing its fully dense inner structure.

2 Material Information

2.1 Chemical Composition

Product	Weight Percent (nominal)				
	Co	Cr	Mo	C	Other
MetcoAdd 75A	Balance	28	6	< 0.2	< 1.0
MetcoAdd 76A	Balance	29	6	< 0.12	≤ 0.1
MetcoAdd 78A	Balance	29	6	< 0.06	< 1.0

2.2 Particle Size Distribution

Product	Nominal Range [μm]	D90 [μm]	D50 [μm]	D10 [μm]
MetcoAdd 75A	-45 +10	43	25	12
MetcoAdd 76A	-45 +15	51	33	19
MetcoAdd 78A	-45 +15	49	32	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 Other Properties

Product	Solidus	Liquidus	Similar To	Manufacturing Method
MetcoAdd 75A	1378.5 ± 10 °C (2513.3 ± 18 °F)	1419.2 ± 10 °C (2586.6 ± 18 °F)	ASTM F75 ISO 5832-4 UNS R31538	Gas Atomization
MetcoAdd 76A	1378.5 ± 10 °C (2513.3 ± 18 °F)	1419.2 ± 10 °C (2586.6 ± 18 °F)	ASTM F75 ISO 5832-4 UNS R31538	Gas Atomization
MetcoAdd 78A	1382.8 ± 10 °C (2521.0 ± 18 °F)	1423.4 ± 10 °C (2594.1 ± 18 °F)	ASTM F75 ISO 5832-4 UNS R31538	Gas Atomization

2.4 Key Selection Criteria

- MetcoAdd 75A and MetcoAdd 76A have been engineered for the manufacture of gas turbine components using SLM. The chemistries is optimized so that the required component mechanical properties can be obtained after post heat-treatment processing.
- MetcoAdd 78A is designed for manufacture of medical or dental implants using SLM.
- MetcoAdd 75A, MetcoAdd 76A and MetcoAdd 78A are field-proven to repeatedly and reliably produce dense printed parts when used in powder bed manufacturing processes.
- Powder beds of MetcoAdd 75A and MetcoAdd 78A are stable and resist agglomeration.

2.5 Related Products

- Oerlikon Metco offers other nickel-based 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 MetcoAdd 75A, MetcoAdd 76A and MetcoAdd 78A, but with particle size distributions optimized for powder fed additive manufacturing. Please contact us for more information.

3 Commercial Information

3.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
MetcoAdd 75A	1089475	10 lb (approx. 4.5 kg)	Stock	Global
MetcoAdd 76A	1098044	5 lb (approx. 2.255 kg)	Special Order	Global
MetcoAdd 78A	1092445	10 lb (approx. 4.5 kg)	Stock	Global

3.2 Handling Recommendations

- Store in the original, closed container in a dry location
- Tumble contents prior to use to prevent segregation
- Open containers should be stored in a drying oven to prevent moisture pickup

3.3 Safety Recommendations

See the SDS (Safety Data Sheet) 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).

Product	SDS No.
MetcoAdd 75A	50-1881
MetcoAdd 76A	50-1881
MetcoAdd 78A	50-1908