

VDM® Powder 780

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VDM® Powder 780 is the powder variant of an age-hardenable nickel-cobalt-chromium alloy for use in additive manufacturing. Hardenability is achieved by means of admixtures of niobium, titanium and aluminum.

VDM® Powder 780 is characterized by:

- Spherical particles
- High purity
- Low oxygen content
- Good weldability
- Higher application temperature (potentially up to 750° C)
- High temperature oxidation resistance

Designations and standards (based on VDM® Alloy 718)

Standard	Material designation
EN	2.4960 - NiCr18Co25Nb5Mo3Al2

Table 1 – Designations and standards

Chemical composition

	Cr	Fe	Ni	C	Mn	Si	Cu	Mo	Co	Nb+Ta	Al	Ti	B	P	S
Min.	16.0							2	22	4	1	0,1			
Max.	20.0	4.0	bal	0.1	0,5	0.3	0.5	4	28	6	3	1	0,02	0,03	0,015

Table 2 – Chemical composition (wt. %)

Depending on the use conditions, stricter analysis limits apply to certain alloy elements. VDM® Powder 780 contains low amounts of oxygen of up to 0.03%.

Physical properties

Density	Melting range
8.25 g/cm ³ at 20 °C	1,240 – 1,355 °C
0.36 lb/in ³ at 68 °F	2,264 – 2,471 °F

Microstructural properties

VDM® Powder 780 has an austenitic microstructure where different phases can occur. By means of different heat treatments, graduated mechanical properties of the material can be achieved. The excellent mechanical properties of VDM® Powder 780 result from the γ' -formation during precipitation hardening.

Corrosion resistance

As a result of the high chromium and cobalt content, conventionally manufactured VDM® Alloy 780 has a good high temperature oxidation resistance.

Applications

VDM® Powder 780 can be used for many demanding applications. Originally, it was developed for static and rotating components in aircraft turbines such as housings, mounting elements and turbine disks.

The material can also be used for static and rotating components in stationary gas turbines, rocket drives and spacecraft, motor vehicle turbo chargers, high-strength screws, springs and mounting elements, and for heat-resistant tools in forgeries, extruders and separating shearers.

Availability

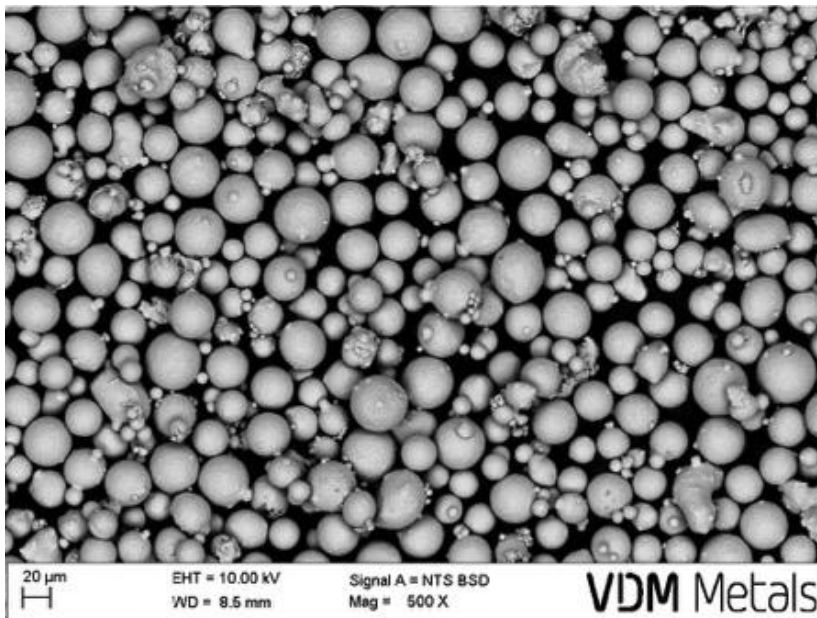
According to the AM process requirements of our customers, VDM® Powder 780 is available in a wide range of particle fractions from 10 to 250 µm.

Standard particle fractions

Particle size distribution µm	Oxygen content %	Porosity < 10µ (pore area) %
15-53		
53-150	< 0,03*	< 0,5

*typically below 0,02%

Additional particle fractions are available on request. Please contact us.



The picture shows a typical micrograph of VDM® Powder 780 as an example.

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Disclaimer

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