



Material Data Sheet

AlMgScZr (Scalmalloy®)

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General Powder Information

Alloy Overview

AlMgScZr, commercially known as Scalmalloy®, is an aluminum-magnesium-scandium-zirconium alloy developed by APWORKS for laser powder bed fusion (L-PBF). It is designed to take advantage of the high cooling rates and rapid solidification inherent to additive manufacturing (AM), producing a refined microstructure that supports high-strength, lightweight components.

These properties, as well as its ductility, corrosion resistance, and thermal performance, make AlMgScZr well suited for applications in aerospace, defence, and motorsports that require low density, highly loaded components.

Powder Overview

Equispheres produces highly spherical powder using patented technology and processing techniques. Its uniform size and consistent microstructure — as well as smoother surface and thinner oxide layer — are designed to support stable spreading, consistent powder-bed behaviour, and reliable processing in L-PBF.

Equispheres produces AlMgScZr powder in North America using Canadian scandium and aluminum feedstocks, supporting a more secure regional supply chain.

This data sheet provides reference data for parts printed with Equispheres AlMgScZr powder on various classes of AM equipment.

To determine the best parameters for your application, contact Equispheres.

[Equispheres.com/Applications-Engineering](https://equispheres.com/Applications-Engineering)

Chemical Composition

Element	Equispheres Specification	
	Lower	Upper
Mg	4.20	5.10
Mn	0.30	0.80
Sc	0.68	0.88
Zr	0.20	0.50
Fe		0.40
Si		0.40
Ti		0.15
P		0.03
Ni		0.03
Al	Balance	

Typical Size Range

32–71 μm

Size Distribution

D10 35–43 μm

D50 44–57 μm

D90 61–71 μm

Density and Moisture Content

Apparent density, Hall: ≥1.30 g/cm³

Apparent density, Carney: ≥1.30 g/cm³

Moisture content: <60 ppm

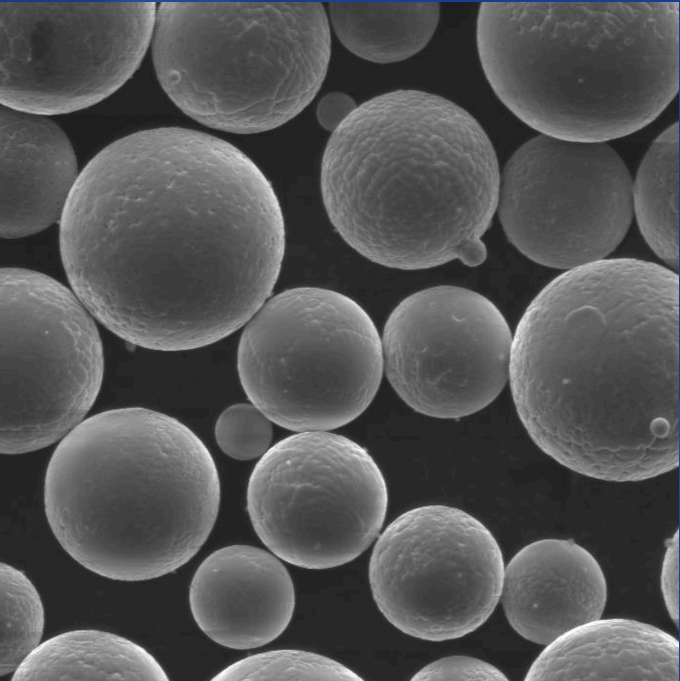
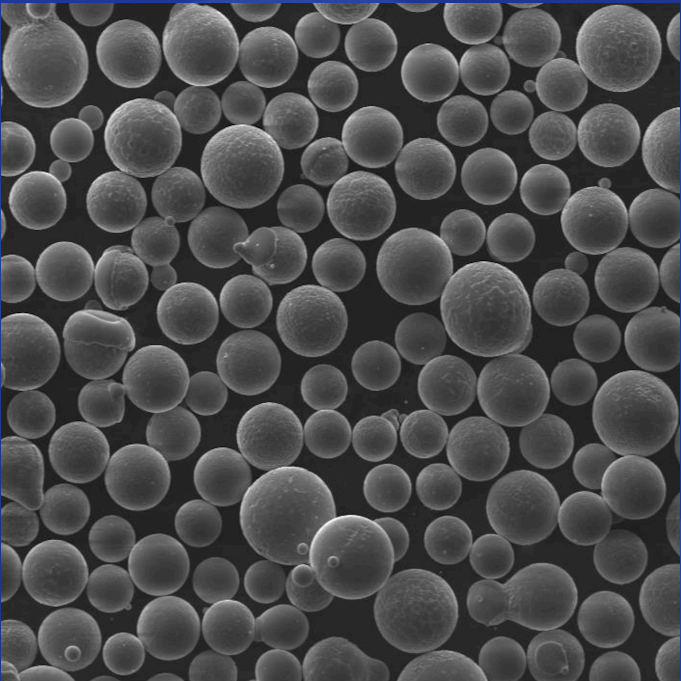
Flow Rate

Measurement	Equispheres Specifications
Flowrate, Hall*	≤55 s/50g
Flowrate, Carney†	≤11 s/50g

* Per ASTM B213-20

† Per ASTM B964-16

Note: Equispheres-specific powder specifications are provided for AlMgScZr (Scalmalloy) Performance powder.



Equispheres
AlMgScZr (Scalmalloy)
Powder Properties

General Properties

Density (g/cm ³)	2.67
Typical Tolerance (µm)	± 100
Smallest Wall Thickness (mm)	1.0
Surface Roughness, As Built (µm)*	Ra 10/Rz 80

* The surface roughness values depend on the measurement method used and the orientation of the surface. The values quoted here give an indication of what can be achieved for certain surfaces.

Typical Mechanical Properties

Young’s Modulus (GPa)	70
Yield Strength (MPa)	480
Ultimate Tensile Strength (MPa)	520
Elongation at Break (%)	13
Vickers Hardness (HV 0.3)	180

General and mechanical properties are typical values based on published APWORKS data for Scalmalloy.

Scalmalloy is a registered trademark of APWORKS GmbH.

Notes:

Built for Performance

What the **future** is made of.



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