Datasheet
Low-alloy steel

Osprey® 8620

Osprey® 8620 is a medium-carbon, hardenable, low-alloy steel alloyed with nickel.

UNS

G86200

ASTM, AISI

8620

Powder designed for

Metal Injection Moulding (MIM)
Additive Manufacturing (AM)

Product description

Osprey® 8620 is a medium-carbon, hardenable, low-alloy steel alloyed with nickel, and characterized by

Good mechanical properties
Good impact toughness
Excellent carburizing properties

Osprey® Alloy 8620 is a versatile alloy that can be tailored with different core and surface properties due to the possibility to perform different hardening treatments on the alloy. The alloy is suitable for use in products like camshafts, fasteners, gears, and products that needs a hard and wear-resistant surface.

This metal powder is manufactured by Inert Gas Atomization (IGA), producing a powder with a spherical morphology which provides good flow characteristics and high packing density. In addition, the powder has a low oxygen content and low impurity levels, resulting in a metallurgically clean product with enhanced mechanical performance.

Chemical composition (nominal), %

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Fe	Bal.
C	0.18-0.23
Cr	0.4-0.6
Ni	0.4-0.7
Mo	0.15-0.25
Si	0.15-0.35
Mn	0.7-0.9
S	0.04
P	0.035

Powder characteristics and morphology

Powder for Metal Injection Moulding (MIM)

Osprey® MIM powder has a spherical morphology, resulting in high packing density. This enables the manufacture of feedstocks with high powder loading, which not only minimizes binder costs but also reduces part shrinkage during debinding and sintering. Spherical powder also has excellent flow characteristics, resulting in reduced tool wear and consistent mould filling.

Osprey® MIM powder's low oxygen content allows better control of carbon and consistency during sintering. Low oxygen levels, together with high packing density, also facilitate faster sintering.

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Particle size distribution

Powder for Metal Injection Moulding (MIM)

Osprey® metal powder for Metal Injection Moulding (MIM) is available in a wide range of particle size distributions, from under 5 µm up to 38 µm. The table shows our standard particle size distributions for MIM powders.

Size (µm)	D10 (µm)	D50 (µm)	D90 (µm)
≤ 38	5.5	13.0	31.0
≤ 32	5.0	12.0	29.0
80% ≤ 22	4.5	11.5	27.0
90% ≤ 22	4.0	10.5	22.0
90% ≤ 16	3.5	8.0	16.0

*Particle size measurements performed using a Malvern laser particle size analyzer, typical D10, D50 and D90 provided.

Tailor-made particle size distributions are available on request.Contact us to discuss your specific requirements.

Mechanical properties

The table below displays typical mechanical properties for as-built powder bed fusion – laser beam evaluated in room temperature.

Condition	Direction	Proof strength	Tensile strength	E-modulus	Elongation
		$R_{p0.2}$	R_m		A
		MPa	MPa	MPa1	%
L-PBF, as built	Horizontal	1070	1120	228	15.2
L-PBF, as built	Vertical	1040	1090	228	13.8

1 x103

Condition	Direction	Proof strength	Tensile strength	E-modulus	Elongation
		$R_{p0.2}$	R_m		A

		ksi	ksi	ksi1	%
L-PBF, as built	Horizontal	155	162	33.1	15.2
L-PBF, as built	Vertical	151	158	33.1	13.8

Source: Chalmers University of Technology

Condition	Direction	Impact toughness
		Charpy V
		J
L-PBF, as built	Horizontal	174
L-PBF, as built	Vertical	148

1 x103

Source: Sandvik and Chalmers University of Technology

Physical properties

Wrought material data
Density: 7.85 g/cm3, 0.28 lb/in3
Thermal conductivity: 46.6 W/mK
Coefficient of thermal expansion: 12.8 10-6 K-1
Melting point: 1290°C to 1350°C (2354°F to 2462°F)

Testing

All Osprey® metal powders are supplied with a certificate of analysis containing information on the chemical composition and particle size distribution. Information on other powder characteristics is available upon request.

Packaging

A wide range of packaging options is available, from 5kgs plastic bottles to 250kg metal drums.

5 kg (11 lbs) Plastic bottles
6 kg (13 lbs) Plastic bottles
10 kg (22 lbs) Plastic bottles
20 kg (44 lbs) Metal cans
100 kg (220 lbs) Steel drums
150 kg (330 lbs) Steel drums
250 kg (551 lbs) Steel drums
All packaging materials are suitable for air, sea and road freight.

Contact us for more information and to discuss your packaging requirements.

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