SANDVIK

OSPREY® 2205
FOR ADDITIVE MANUFACTURING

DATASHEET

GENERAL DESCRIPTION

Osprey® 2205 duplex (austenitic-ferritic) stainless steel powder manufactured by inert gas atomization, characterized by high resistance to corrosion and mechanical strength, typically double the proof strength of austenitic stainless steel. This grade of metal powder is designed for processing by Additive Manufacturing including Laser - Powder Bed Fusion, to achieve high density.

- High resistance to stress corrosion cracking (SCC) in chloride-bearing environments
- High resistance to stress corrosion cracking (SCC) in environments containing hydrogen sulfide
- High resistance to general corrosion, pitting, and crevice corrosion
- High resistance to erosion corrosion and corrosion fatigue
- High mechanical strength - roughly twice the proof strength of austenitic stainless steel
- Good weldability

APPLICATIONS

- Oil and gas industry
- Pulp and paper industry
- Chemical industry
- Refineries and petrochemical plants
- On-shore and off-shore industry

STANDARDS

- UNS: S31803, S32205
- EN Number: 1.4462
- EN Name: X2CrNiMoN 22-5-3
- W.Nr.: 1.4462
- DIN: X2CrNiMoN 22 5 3
- SS: 2377
- AFNOR: Z2.CND22.05.03

CHEMICAL COMPOSITION

Chemical composition (nominal), wt%

Fe	Cr	Ni	Mo	Mn	Si	N	C	P	S
Balance	22	5.0	3.2	≤2.0	≤1.0	0.18	≤0.030	≤0.030	≤0.015

POWDER SIZE DISTRIBUTION

Available in a range of customized powder sizes suitable for different applications and AM platforms.

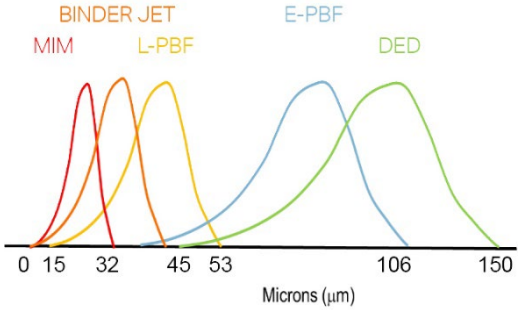
Metal Injection Moulding
<32 µm, <22 µm, <16 µm, <10 µm, <5 µm

Binder Jet
<45 µm, <38 µm, <22 µm, <16 µm

Laser Powder Bed Fusion (L-PBF)
e.g. 53 to 15 µm, and 45 to 20 µm

Electron Beam Powder Bed Fusion (E-PBF)
106 to 45 µm

Direct Energy Deposition (DED)
150 to 53 µm and 90 to 45 µm



Other powder size range distributions are available by request.

MECHANICAL PROPERTIES

Typical mechanical properties Osprey® 2205 powder L-PBF in as-built & heat-treated condition (solution annealing 1000 °C for 5 minutes followed by air or water cooling) evaluated at room temperature, as measured in independent research.[1]

Metric units

Condition	Direction	Proof strength	Tensile strength	Uniform Elongation	Elongation at Break
		$R_{p0.2}$	R_m	A	Z
		MPa	MPa	%	%
As built	Horizontal	950	1071	7.0	16.0
	Vertical	549	848	23.9	45.8

Imperial units

Condition	Direction	Proof strength	Tensile strength	Uniform Elongation	Elongation at Break
		$R_{p0.2}$	R_m	A	Z
		ksi	ksi	%	%
As built	Horizontal	138	155	7.0	16.0
	Vertical	79	123	23.9	45.8

Typical Vicker's Hardness levels (ASTM E92, ISO 6507-1, JIS Z2244, GB/T 4340.1), in the L-PBF heat-treated conditions.

Condition	Hardness HV
As built	337
Heat treated	280

Reference: 1. Selective Laser Melting of Duplex Stainless Steel 2205: Effect of Post-Processing Heat Treatment on Microstructure, Mechanical Properties, and Corrosion Resistance. Materials 2019, 12, 2468; Suvi Papula et al.