

Datasheet

Duplex stainless steels

Osprey® 2205

Osprey® 2205 is a duplex stainless steel with high resistance to SCC, pitting, crevice and general corrosion and very high mechanical strength.

UNS

S31803, S32205

EN Name

X2CrNiMoN 22-5-3

EN Number

1.4462

DIN

X2CrNiMoN 22 5 3

AFNOR

Z2.CND22.05.03

SS

2377

Powder designed for

- Additive Manufacturing (AM)
- Hot Isostatic Pressing (HIP)



Product description

Osprey® 2205 is a duplex (austenitic-ferritic) stainless steel characterized by high resistance to stress corrosion cracking (SCC), pitting, crevice and general corrosion and very high mechanical strength.

Main characteristics of Osprey® 2205

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

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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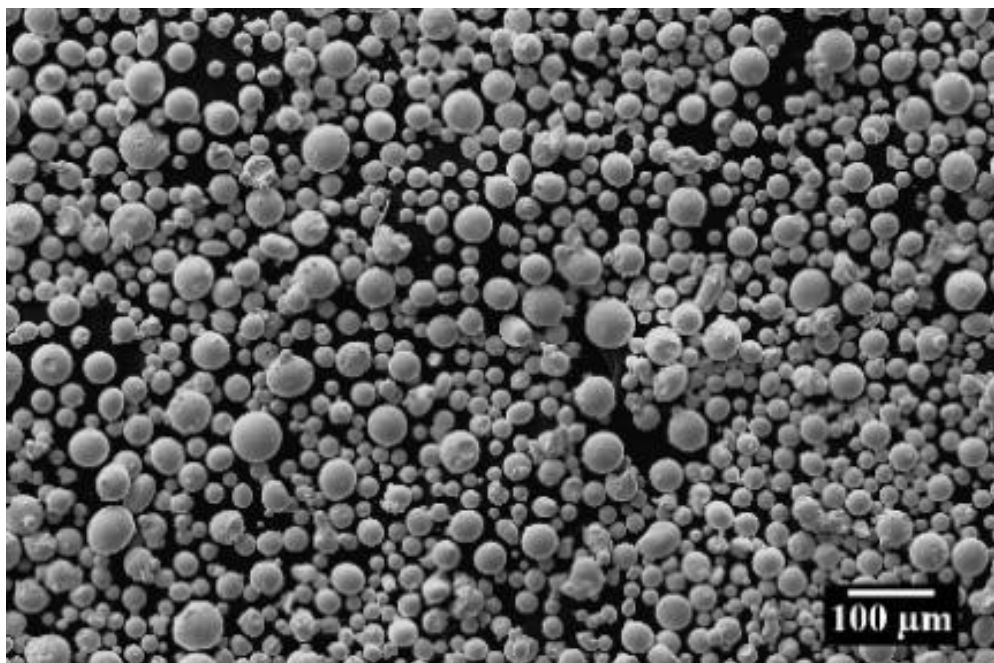
Fe	Bal.
Cr	22
Ni	5
Mo	3.2
C	≤0.030
Si	≤1.0
Mn	≤2.0
P	≤0.030
S	≤0.015
N	0.18

Powder characteristics and morphology

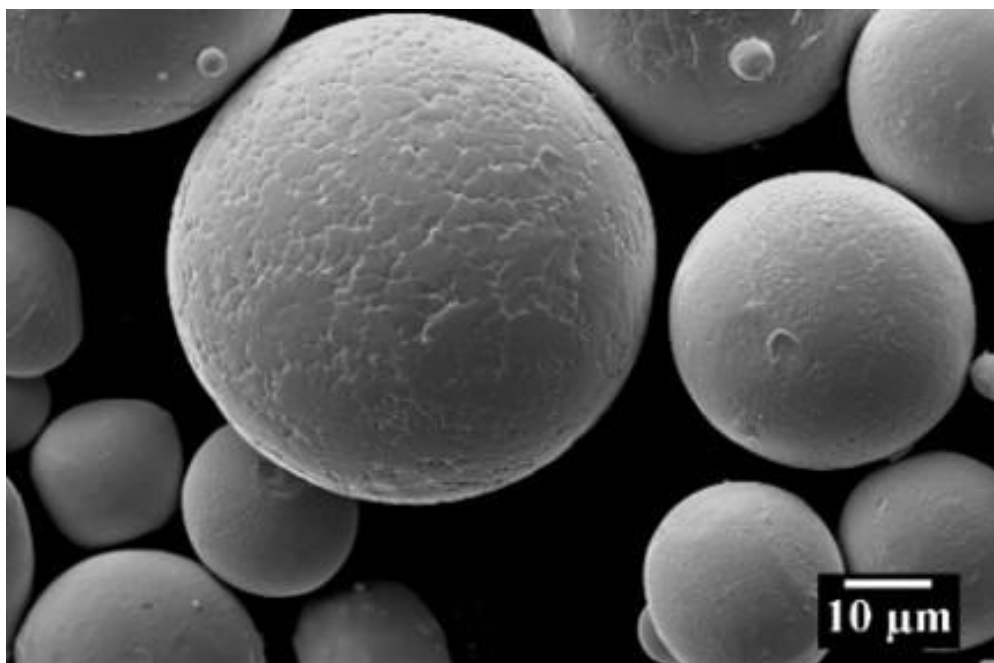
Powder for Additive Manufacturing

Osprey® metal powder for Additive Manufacturing is characterized by a spherical morphology and high packing density, which confer good flow properties. For powder bed processes these are essential when applying fresh powder layers to the bed to ensure uniform and consistent part build.

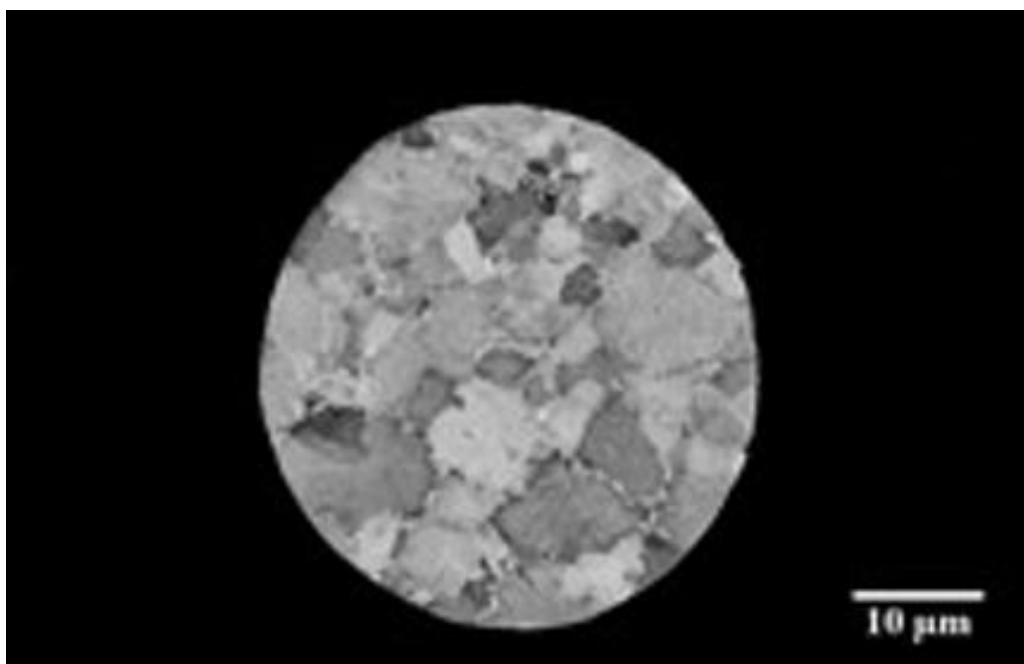
For blown powder processes, such as Direct Energy Deposition (DED), good flow ensures uniform build rates. Tight control of the particle size distribution also helps ensure good flowability. Low oxygen powders result in clean microstructures and low inclusion levels in the finished parts.



-53 +15 μm powder with a spherical morphology.



Smooth surface and low level of powder satellites.



Powder in cross-section, in back scatted electron mode, highlighting the fine cellular structure Powder in cross-section, in back scatted electron mode, highlighting the fine cellular structure.

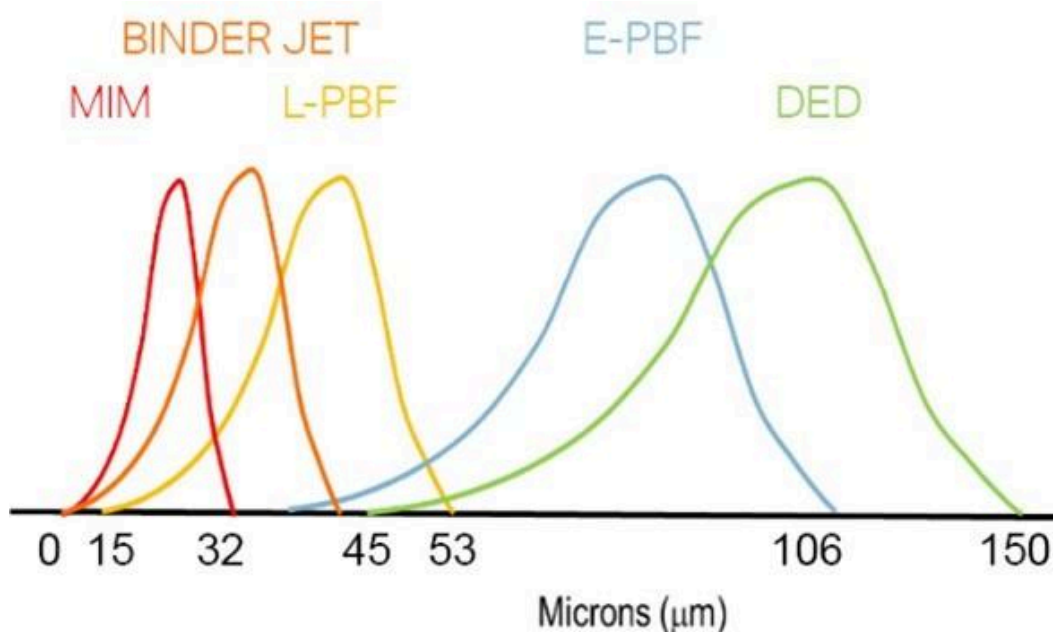
Powder for Hot Isostatic Pressing (HIP)

Osprey® HIP powder has a spherical morphology, resulting in 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.

Particle size distribution

Powder for Additive Manufacturing

Osprey® metal powder for Additive Manufacturing is available in a wide range of particle size distributions that are tailored to the individual Additive Manufacturing systems. They can also be tailored to the particular requirements of the end application, both in terms of mechanical performance and surface finish.



Typical particle size distributions for Additive Manufacturing.

Process technology	Size (μm)
Binder jetting	≤ 16, ≤ 22, ≤ 32, ≤ 38, ≤ 45
Laser - Powder Bed Fusion (L-PBF)	15 to 53 and 10 to 45
Electron beam - Powder Bed Fusion (E-PBF)	45 to 106
Direct Energy Deposition (DED)	53 to 150

Powder for Hot Isostatic Pressing (HIP)

Osprey® powder for Hot Isostatic Pressing (HIP) is available in a broad size range, typically <250 microns, resulting in a high packing density and tap density. Low oxygen levels, together with high packing density, also facilitate faster sintering.

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

Mechanical properties

Typical mechanical properties of material produced by Laser - Powder Bed Fusion (L-PBF) in as-built and heat-treated conditions (solution annealing 1,000°C/1,832°F for 5 minutes followed by air or water cooling) evaluated at room temperature, as measured in independent research.

Condition	Direction	Temperature (T), °C	Yield strength (Rp0.2), MPa	Tensile strength (Rm), MPa	E-modulus, GPa	Elongation (A), %
As built	Vertical	20	950	1,071	7.0	16.0
Heat treated	Vertical	20	549	848	23.9	45.8

Condition	Direction	Temperature (T), °C	Yield strength (Rp0.2), ksi	Tensile strength (Rm), ksi	E-modulus, GPa	Elongation (A), %
As built	Vertical	20	138	155	7.0	16.0
Heat treated	Vertical	20	79	123	23.9	45.8

Hardness

Typical Vickers Hardness levels (ASTM E92, ISO 6507-1, JIS Z2244, GB/T 4340.1) as well as HRC values in the Laser - Powder Bed Fusion (L-PBF) heat-treated condition.

Condition	HV	HRC
As built	337	33
Heat treated	280	26

Typical application areas

Osprey® 2205 powder is typically used in the following areas

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

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 are available, from 1 kg (2.2 lb) to 200 kg (440 lb)*.

Contact our team who can support you with selecting the right packaging for your product and application.

*Some packaging options may not be available for all products due to international shipping regulations.