



# OSPREY® 17-4PH FOR ADDITIVE MANUFACTURING

## DATASHEET

### GENERAL DESCRIPTION

Osprey® 17-4PH is a precipitation-hardened, stainless-steel powder, manufactured by Inert Gas Atomization, for advanced applications requiring high strength & high hardness, achieved by aging heat treatment and good corrosion resistance.

### APPLICATIONS

- Surgical & dental instruments
- Aerospace applications, including turbine blades
- Valves & engine components
- Gears & shafts
- Aircraft structures
- Paper mill, chemical, oil & gas industry
- General engineering

### STANDARDS

- UNS S17400
- AMS 5643, AMS 5604, ASTM A564

### CHEMICAL COMPOSITION

Chemical composition (nominal), wt%

Fe	Cr	Ni	Cu	Nb	C	Mn	Mo	P	S	Si	O*	N*
Balance	15.5- 17.5	3.0- 5.0	3.0- 5.0	0.15- 0.45	<0.07	<1.0	<0.3	<0.04	<0.03	<1.0	<0.1	<0.1

\*Typical levels for Inert Gas Atomized (IGA) powder

### 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

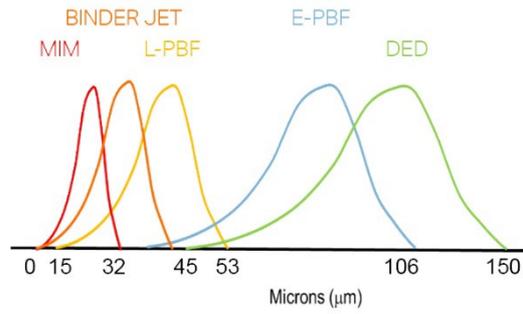
<45 µm, <38 µm, <22 µm, <16 µm

Laser Powder Bed Fusion (L-PBF)  
e.g. 53 to 15  $\mu\text{m}$ , and 45 to 20  $\mu\text{m}$

Electron Beam Powder Bed Fusion (E-PBF)  
106 to 45  $\mu\text{m}$

Direct Energy Deposition (DED)  
150 to 53  $\mu\text{m}$  and 90 to 45  $\mu\text{m}$

Other powder size range distributions are available by request.



## MECHANICAL PROPERTIES

Typical mechanical properties for as-built and heat-treated condition for Laser- Powder Bed Fusion (L-PBF) Osprey® 17-4PH material evaluated in room temperature, as measured in independent research.<sup>1</sup> Heat treatment: H900 Solution Annealed (1051 °C for 1 hour in hydrogen) and Aged (482 °C for 1 hour in nitrogen).

Metric units

Condition	Proof strength	Tensile strength	Elongation	Hardness	Density	Density
	R <sub>p0.2</sub>	R <sub>m</sub>	A			
	MPa	MPa	%	HRC	g/cc	%
Heat treated	1116	1358	5.1	45	7.7	99

Imperial units

Condition	Proof strength	Tensile strength	Elongation	Hardness	Density	Density
	R <sub>p0.2</sub>	R <sub>m</sub>	A			
	ksi	ksi	%	HRC	g/cc	%
Heat treated	162	197	5.1	45	7.7	99

## PHYSICAL PROPERTIES

Wrought material

Density: 7.8 g/cm<sup>3</sup>, 0.28 lb/in<sup>3</sup>

Thermal conductivity: (H900 heat treatment tested at 149°C), 17.9 W/mK

Melting range: 1404°C to 1440°C; (2559°F to 2624°F)

Coefficient of thermal expansion\*: 10.8  $\mu\text{m}/\text{m}^\circ\text{C}$

\*In the range of 21 °C to 93 °C; (70°F to 200°F)

Reference: 1. Effects of atomizing media and post processing on mechanical properties of 17-4 PH stainless steel manufactured via selective laser melting. Additive Manufacturing 22 (2018) 127–137, Somayeh Pasebania et al.

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Disclaimer: Data and recommendations are provided for information and guidance only, and the performance or suitability of the material for specific applications are not warranted or guaranteed. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Sandvik materials.