

ABD[®]-850AM

Nickel-based superalloy for additive manufacturing

MATERIAL OVERVIEW

An age-hardenable nickel-based superalloy designed specifically for use as feedstock in powder bed fusion with resistance to cracking during and after AM and heat treatment. ABD[®]-850AM is optimised for damage tolerance, thermal stability, and corrosion/oxidation resistance, with a working temperature range up to 850°C in its age-hardened state. The new alloy has excellent thermal stability and creep strength, surpassing alloy 718.

ABD[®]-850AM is designed to be free of solidification, liquification and strain-age cracks and showcases exceptional printability for such a high temperature γ' strengthened alloy, making it suitable for complex components within the Aerospace, Power, Automotive and Space industries.

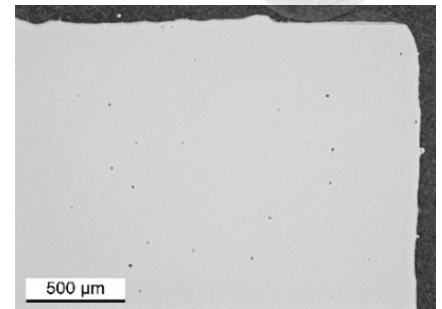
KEY PROPERTIES

Mechanical (800°C)	Yield strength (MPa)	663 ± 48
	Ultimate tensile strength (MPa)	733 ± 33
	Elongation at failure (%)	46 Z, 5 XY
	Area reduction at failure (%)	29 Z, 6 XY
	Hardness (HV10)	410 ± 8
Thermo-physical (25-1200°C)	Thermal Conductivity (W(m°C) ⁻¹)	9.2 - 29.7
	CTE (Linear) (x10 ⁻⁶ °C ⁻¹)	11.5 - 18.7
Physical	Density (g cm ⁻³)	8.47
	Melting range ¹ (°C)	1305 - 1380

All measurements are for the fully heat treated alloy printed with a layer thickness of 30 μ m. ¹as-printed

PRINTABILITY

ABD[®]-850AM shows high part density and no cracking when printed with standard alloy 718 parameters

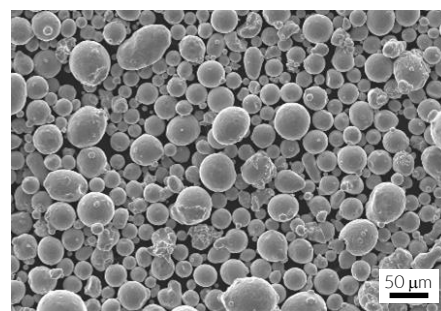


POWDER CHARACTERISTICS

Particle size distributions:

- Laser beam melting (powder bed): 15-53 μ m
- Electron beam melting (powder bed): 45-106 μ m
- Directed energy deposition (LMD): 45-106 μ m

Custom size distributions available on request.



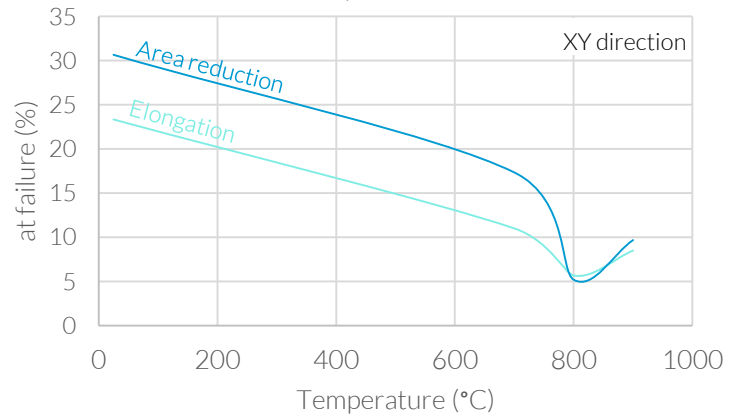
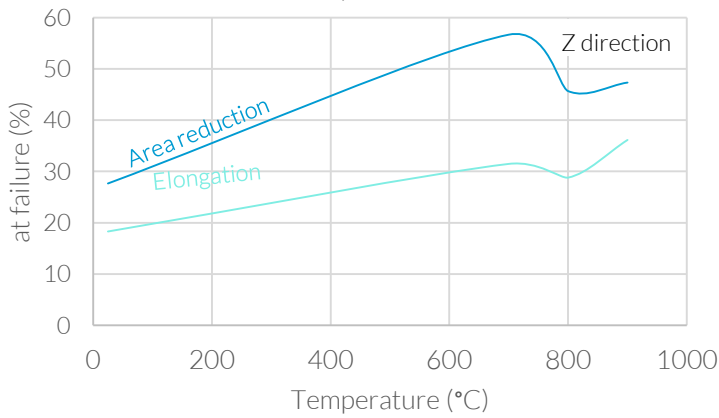
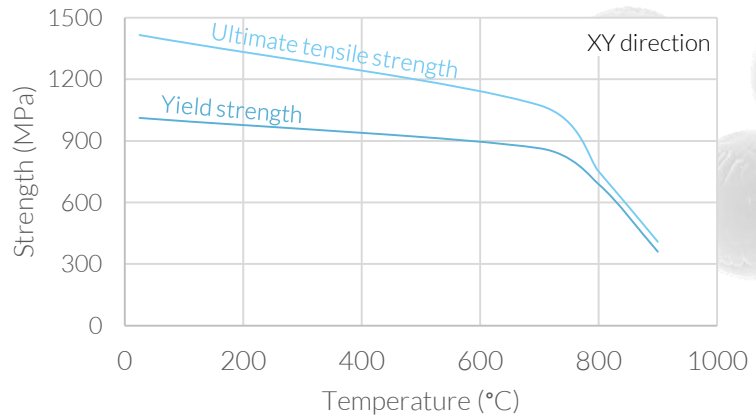
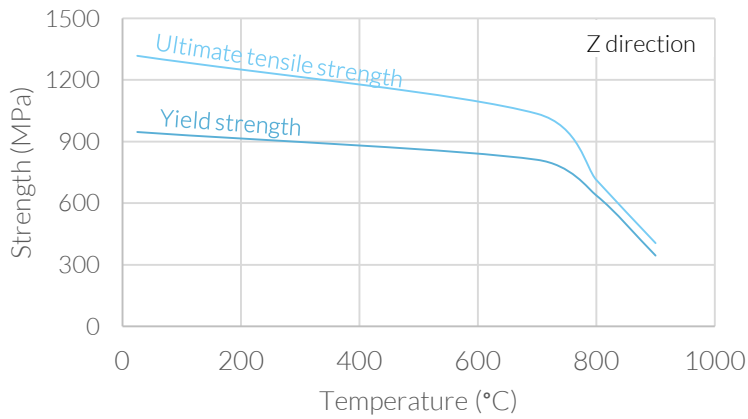
ABD[®]-850AM is well suited for gas atomisation

ABD[®]-850AM is available in batch sizes suitable for R&T and full production.

For more details or to make an enquiry please get in touch using the details below

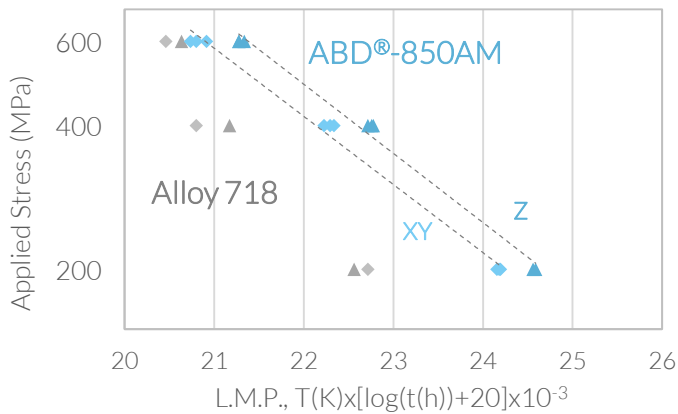


TENSILE PROPERTIES



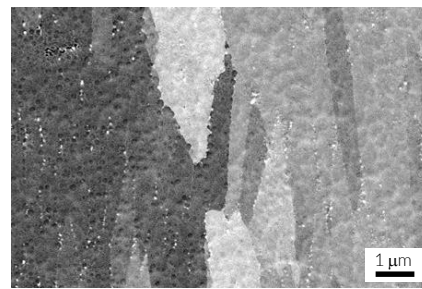
Tensile properties of ABD[®]-900AM after sub-solvus heat treatment. Measured in accordance to ASTM E8/E8M-16a/E21 for a strain rate of 10^{-3} s^{-1} .

CREEP LIFE

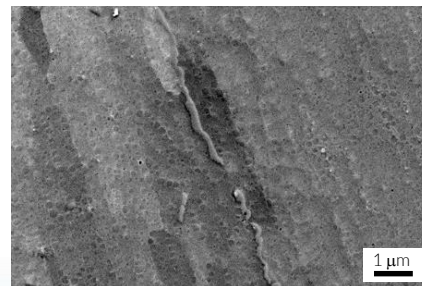


Stress rupture properties of ABD[®]-850AM after sub-solvus heat treatment. Measured in accordance to ASTM E139

MICROSTRUCTURE



Microstructure after final heat treatment



Microstructure after thermal exposure at 760°C for 1,000 hours showing excellent microstructural stability