

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, liquidation 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.

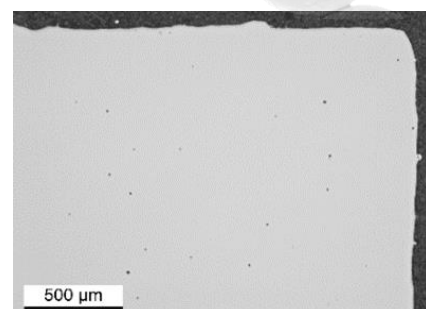
KEY PROPERTIES

Mechanical (800°C)	Yield strength (MPa)	607 ± 16
	Ultimate tensile strength (MPa)	749 ± 8
	Elongation at failure (%)	8.5 Z, 58 XY
Thermo-physical (25-1200°C)	Thermal Conductivity (W(m°C) ⁻¹)	10.7 – 28.5
	CTE (Linear) (x10 ⁻⁶ °C ⁻¹)	11.5 – 18.7
Physical (25°C)	Hardness (HV30)	476 ± 6
	Density (g cm ⁻³)	8.44

All measurements are for the fully heat treated alloy printed with a layer thickness of 30 µm

PRINTABILITY

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

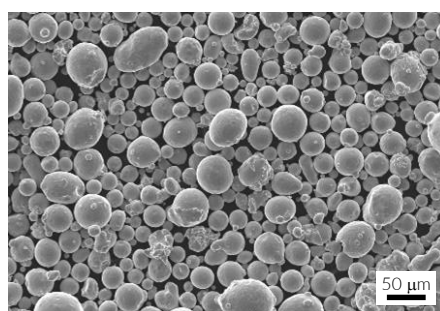


POWDER CHARACTERISTICS

Particle size distributions:

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

Custom size distributions available on request.

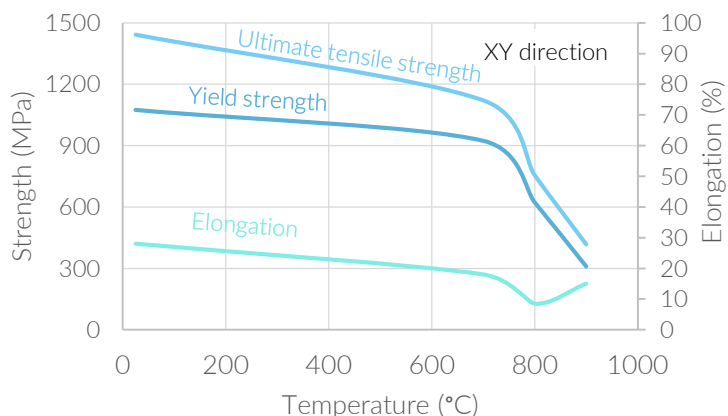
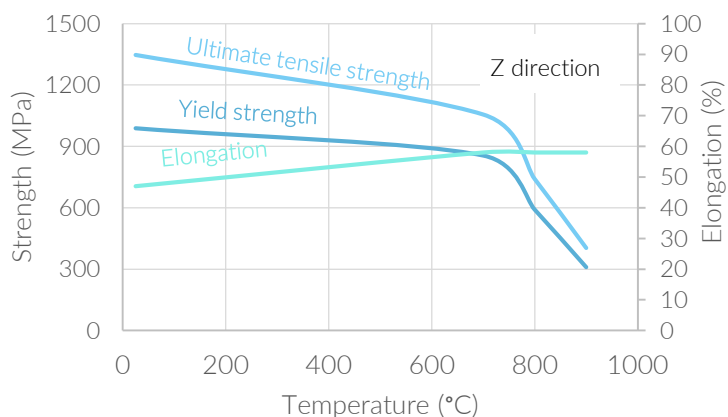


ABD[®]-850AM is well suited for gas atomisation

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

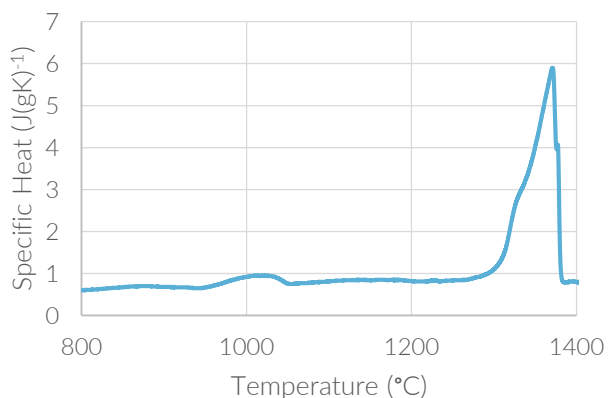
For more details or to make an enquiry please get in touch using the details below

TENSILE PROPERTIES



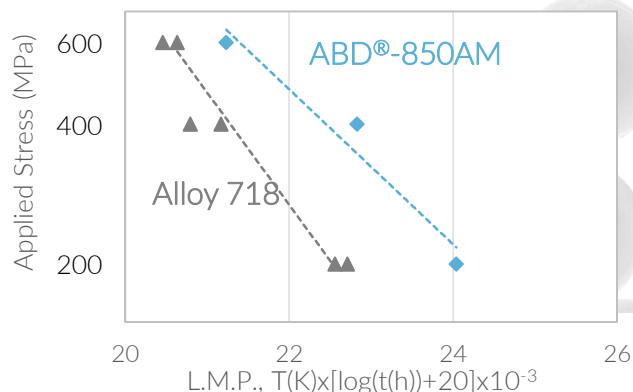
Tensile properties of ABD®-850AM after sub-solvus heat treatment. Measured in accordance to ASTM E8/E8M-16a/E21.

SPECIFIC HEAT



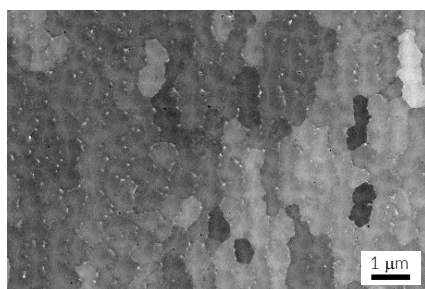
ABD®-850AM in as-printed condition. Cp measured according to ASTM E1269.

CREEP LIFE

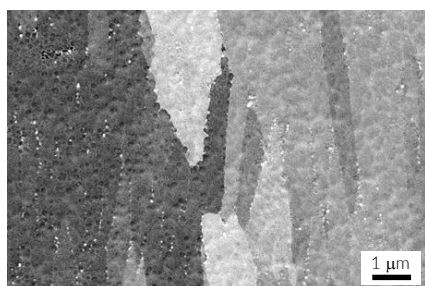


Stress rupture properties of ABD®-850AM after sub-solvus heat treatment in Z build direction.

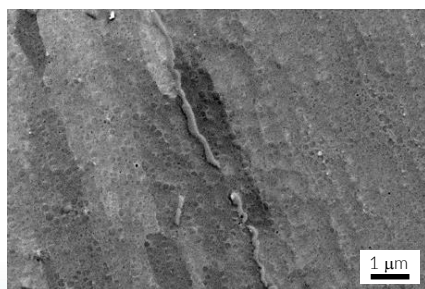
MICROSTRUCTURE



As-printed XY-plane microstructure after processing with 30 µm layer thickness and 2D energy density of 2.5 Jmm⁻²



Microstructure after final heat treatment



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