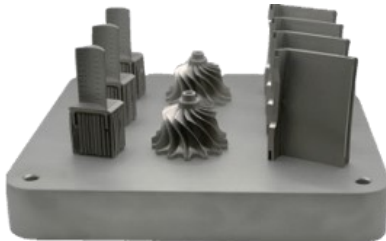


Stellar ABD[®]-1000AM

Powder for Additive Manufacturing

MATERIAL OVERVIEW

- Stellar ABD[®]-1000AM is an age-hardenable nickel-based superalloy designed specifically for use as feedstock in powder bed fusion.
- The alloy provides excellent environmental resistance and high-temperature strength, with a working temperature range beyond 1000°C (1452°F) in its age-hardened state. Compared to cast Ni247, this alloy offers equivalent stress rupture life while having superior resistance to cracking during additive manufacture and heat treatment, enabling complex part design.
- Stellar ABD[®]-1000AM is suitable for complex components within the aerospace, power, automotive and space industries.



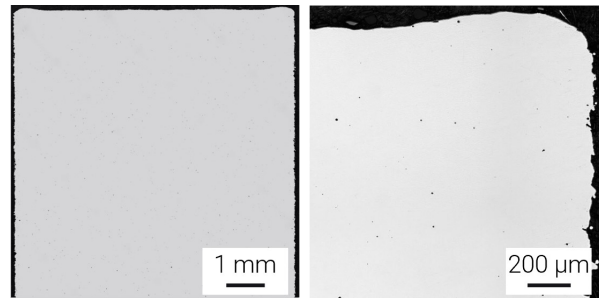
KEY PROPERTIES

Mechanical ^{1,2} (1000°C)	Yield strength (MPa)	298
	Ultimate tensile strength (MPa)	368
	Elongation at failure %	11.6
	Area reduction at failure %	22.2
Physical ⁴	Density/ g cm ⁻³	8.489
	Melting range ² / °C	1252-1372

All measurements are for the alloy printed with a layer thickness of 30 µm. 1 strain rate of 10⁻⁴ s⁻¹, 2 after full heat treatment, 3 properties measured parallel to build direction, 4 as-printed.

PRINTABILITY

Designed to be free of solidification, liquidation, and strain-age cracks, ABD[®]-1000AM showcases exceptional processability. It can be printed with densities above 99.9% and crack lengths below 0.1mm per mm², whilst still being age-hardened with 55% γ'-phase.



POWDER CHARACTERISTICS

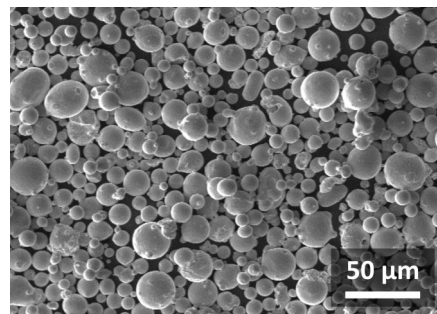
Particle size distributions:

Laser Powder Bed Fusion (LPBF): 15-53 µm

Electron Beam Melting (EBM): 45-106 µm

Directed Energy Deposition (DED): 45-106 µm

Custom size distributions available on request



Stellar ABD[®]-1000AM is well suited for gas atomisation

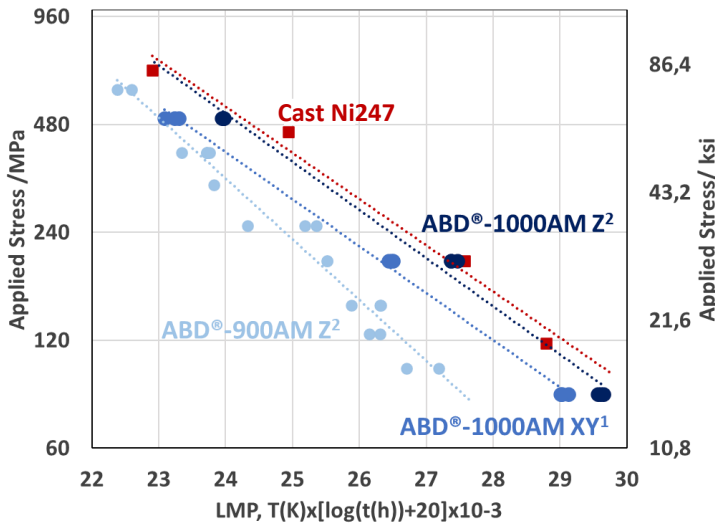
Stellar ABD[®]-1000AM is available in batch sizes suitable for R&T and full production.

Contact: powder@aubertduval.com

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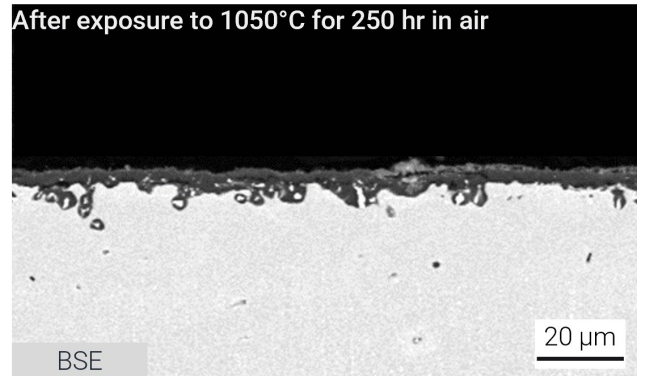
The data provided in this document represent typical or average values rather than maximum or minimum guaranteed values. The applications indicated for the grades described are given by guidance only in order to help the reader in his/her personal assessment. Please note that these do not constitute a guarantee whether implicit or explicit as to whether the grade selected is suited for specific requirements. Aubert & Duval's liability shall not, under any circumstances, extend to product selection or to the consequences of this selection.

CREEP RESISTANCE



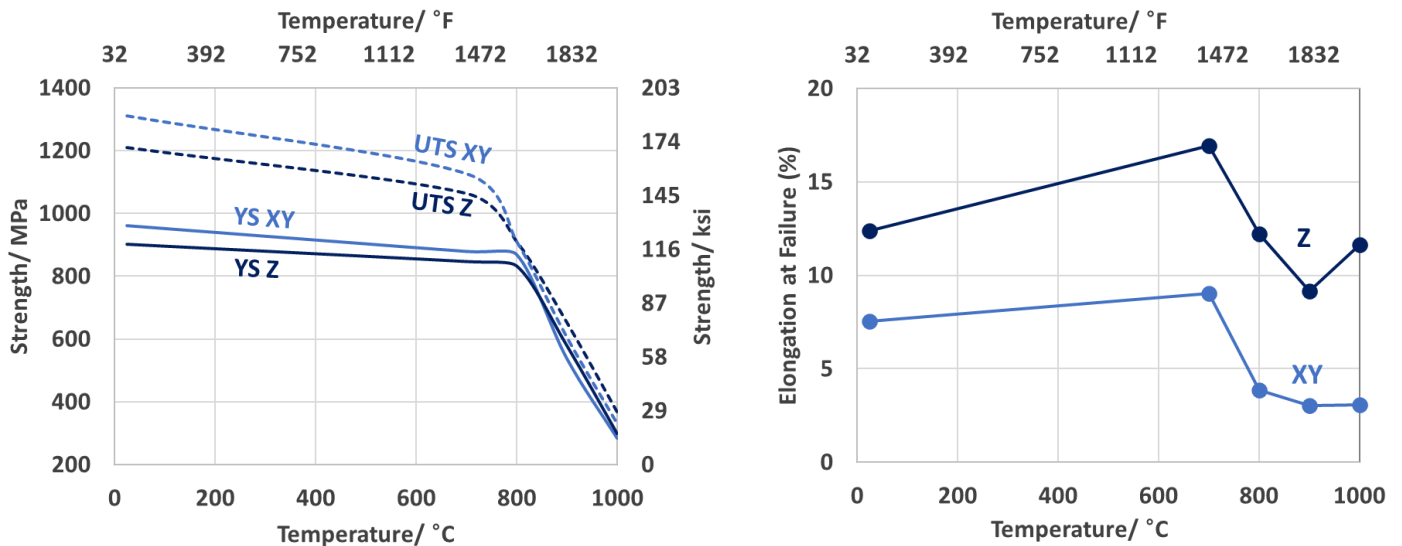
Stress rupture properties of heat treated additively manufactured ABD[®]-1000AM, in accordance to ASTM E139. Larson-Miller Parameter evaluated with temperature (T) in Kelvin and time (t) in hours. ¹Properties measured perpendicular to and ²properties measured parallel to, the build direction.

OXIDATION RESISTANCE



ABD[®]-1000AM forms a continuous alumina scale (dark grey) in oxidising environments, providing comprehensive oxidation resistance beyond 1000°C.

TENSILE PROPERTIES



Tensile properties of additively manufactured ABD[®]-1000AM, evaluated at a strain rate of 10⁻⁴ s⁻¹, all other test conditions in accordance to ASTM E8/E8M-16a/E21. No HIP applied. Yield Strength (YS) shown is Rp0.2% stress, Ultimate Tensile Strength (UTS) is stress at maximum force.

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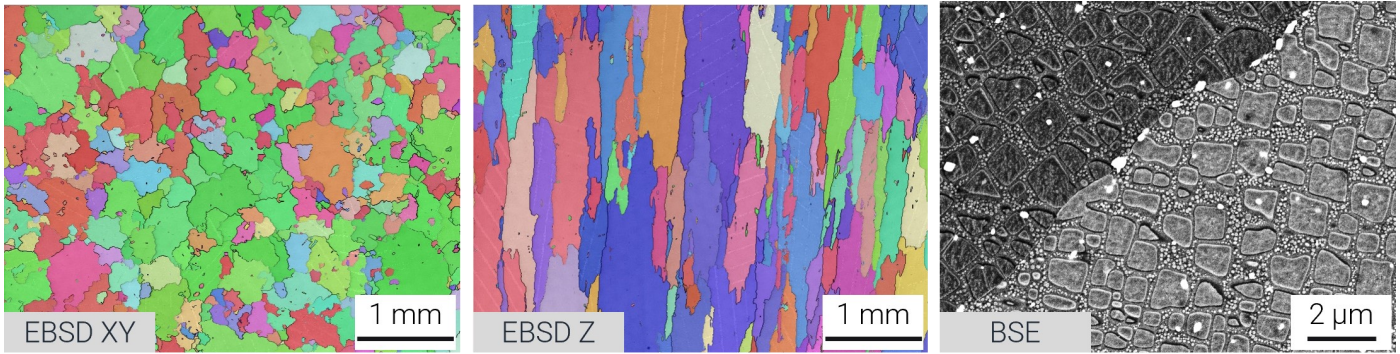
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MICROSTRUCTURE AND HEAT TREATMENT

Typical EBSD maps and SEM images of ABD[®]-1000AM, manufactured by Laser-Powder Bed fusion using a Renishaw AM500Q, with the standard heat treatment applied: 1230°C 2 hrs, 1100°C 4 hrs, 850°C 20 hrs.



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