**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**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield strength (MPa)</td>
<td>607 ± 16</td>
</tr>
<tr>
<td>Ultimate tensile strength (MPa)</td>
<td>749 ± 8</td>
</tr>
<tr>
<td>Elongation at failure (%)</td>
<td>8.5 Z,</td>
</tr>
<tr>
<td></td>
<td>58 XY</td>
</tr>
<tr>
<td>Hardness (HV30)</td>
<td>476 ± 6</td>
</tr>
<tr>
<td>Thermal conductivity (W(m°C)^{-1})</td>
<td>10.7–28.5</td>
</tr>
<tr>
<td>CTE (Linear) (x10^{-6} °C^-1)</td>
<td>11.5–18.7</td>
</tr>
<tr>
<td>Physical (25°C) Density (g cm^-3)</td>
<td>8.44</td>
</tr>
</tbody>
</table>

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

**PARTICLE SIZE DISTRIBUTIONS**

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

**POWDERS CHARACTERISTICS**

- 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.

Contact: powder@eramet.com
www.aubertduval.com

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**TENSILE PROPERTIES**

- Ultimate tensile strength
- Yield strength
- Elongation

Strength (MPa) vs. Temperature (°C)

**CREEP LIFE**

- Applied Stress (MPa) vs. L.M.P., T(K)x[log(t(h))+20]x10^{-3}

**STRENGTH VERSUS TEMPERATURE**

- Strength (MPa)
- Temperature (°C)

**Elongation (%)**

- Elongation (%)
- Temperature (°C)

**SPECIAL HEAT**

- Specific Heat (J( gK)^{-1}) vs. Temperature (°C)

**MICROSTRUCTURE**

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


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

**SPECIFIC HEAT**

ABD®-850AM in as-printed condition.

C_p measured according to ASTM E1269.

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