

► A1000-RAM10 (high temperature performance)

Product Information

A1000-RAM10 is one of the most versatile aluminum alloy products offered by Elementum 3D. Key advantages include high strength at elevated temperatures, thermal stability, no post process heat treatment required and is economically priced for small and large production runs. A1000-RAM10 is also one of Elementum 3D's metal-matrix composite (MMC) products, which provides the added benefit of combining the ductility, conductivity and toughness of metals with the strength, hardness, stiffness, and wear resistance of ceramic reinforcing phases. A1000-RAM10 is an all-purpose material and is well suited for aerospace, automotive, and military applications.

Physical and Chemical Properties

Material composition: Proprietary A1000 w/10% ceramic

Density: 2.91 g/cc

Relative density: > 99.9%

Ultimate tensile strength: ¹Approx. 49.7 ksi (343 MPa)

Yield strength: ¹Approx. 38 ksi (262 MPa)

Elongation: ¹11%

Hardness: ²55 ±2 HRB

Wear: Pending

Modulus of elasticity: ³Approx. 93 GPa

Thermal conductivity: 108 W/(m·K) (measured in xy)

Deposition rate: 6.8 mm³/s

¹ASTM E8, ²ASTM E18, ³ASTM E494-15

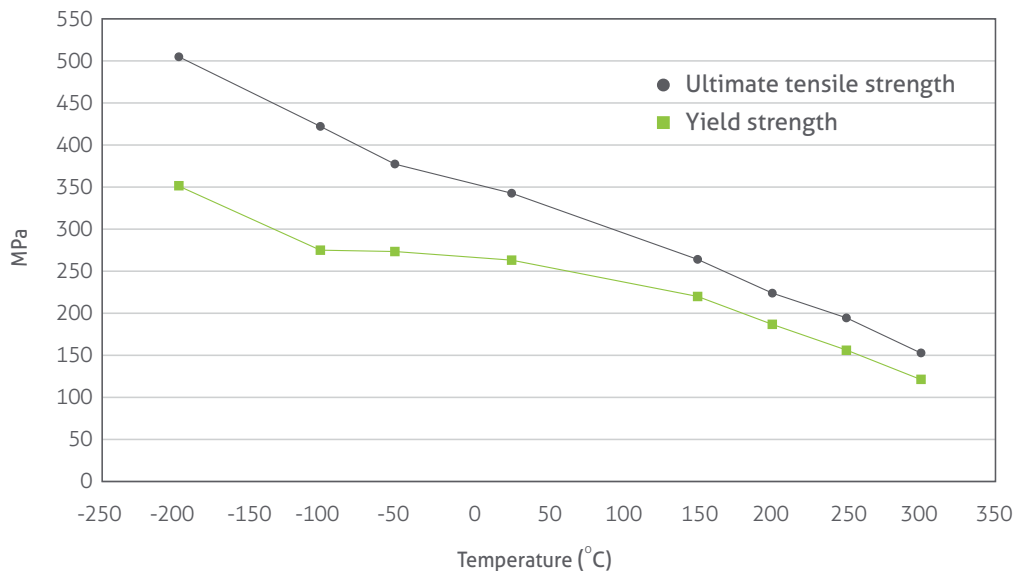


Elevated Temperature Testing

Testing temperature		Ultimate tensile strength ¹		Yield strength ¹		Elongation ¹
°C	°F	MPa	ksi	MPa	ksi	%
-195	-319	505	73.2	351	50.9	38
-100	-148	422	61.2	275	39.5	27
-50	-58	377	54.6	273	39.5	35
25	77	343	49.7	263	38.2	11
150	302	264	38.3	220	31.9	12
200	395	224	32.4	187	27.1	13
250	482	193	27.9	166	24.1	13
300	572	152	22.0	121	17.6	15

All samples above were stress relieved at 300°C for 2 hours.

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All stated values are approximate values. All details given above are our current knowledge and experience, and are dependent on the equipment, parameters and operating conditions. The data provided in this document is subject to change and only intended as general information on a material set that is continually improving and developing. The data does not provide a sufficient basis for engineering parts. All samples were produced on an EOS M290. All tensile tests were performed at third party certified test labs such as Westmoreland Mechanical Testing & Research.

Please contact us at jacob@elementum3d.com for additional information.