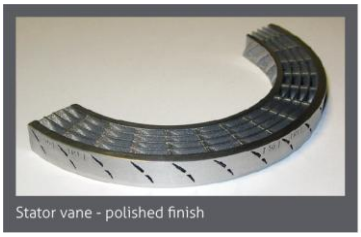
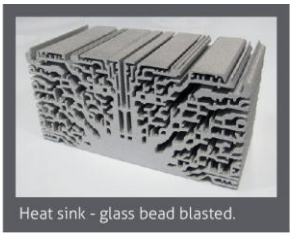

Stator vane - polished finish


Heat sink - glass bead blasted.

A6061-RAM2™

(Highly versatile, cost effective)

Product

Elementum 3D's A6061-RAM2 is a general-purpose AM aluminum alloy featuring a good combination of ductility, strength, and thermal conductivity. A6061-RAM2 solves the printability problems of AA6061 to achieve properties in line with wrought AA6061 and excellent as-printed surface finish. Additionally, A6061-RAM2 has a real part deposition rate approximately 50% higher than AlSi10Mg on an EOS M290, delivering economical production. * A6061-RAM2 requires a T6 heat treatment to achieve the typical properties reported here.

Properties

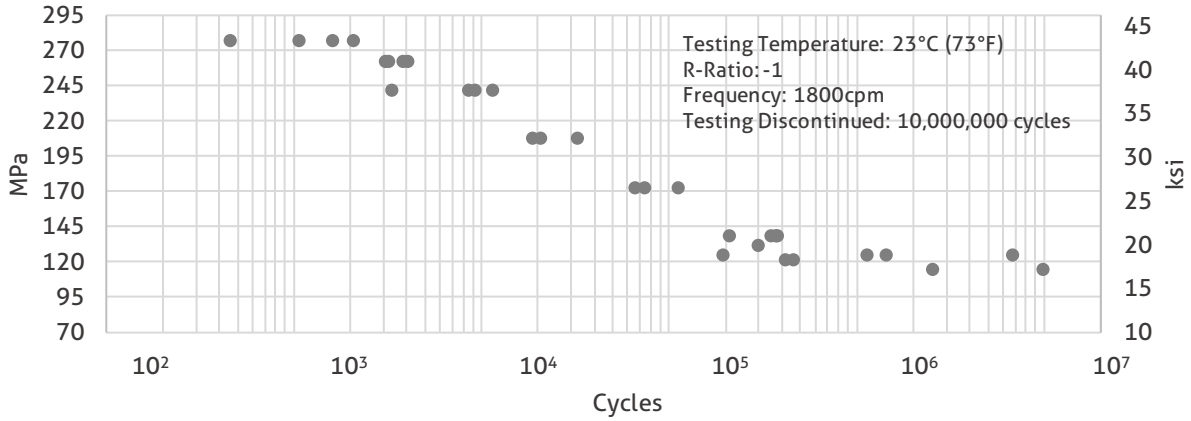
Nominal Composition: Proprietary A6061 (Al-1.0Mg-0.6Si-0.28Cu-0.2Cr with 2% RAM additives)
Theoretical maximum density: 2.74 g/cm^3
Printed relative density: >99.5%
Deposition rate[1]**:** 2.3 in^3/hr (10.4 mm^3/s)

Ultimate Tensile Strength (ksi/MPa)[2]	0.2% Offset Yield Strength (ksi/MPa)[2]	Elongation (%)[2]	Hardness (HRB)[3]	Young's Modulus (Msi/GPa)[4]	CTE (ppm/°C)[5]	Thermal Conductivity (W/m·K)[6]
48 ± 3.0 / 331 ± 21	43 ± 2.0 / 297 ± 12	12 ± 1.5	60 ± 2.0	11.0 ± 0.10 / 76 ± 0.70	22.4	162

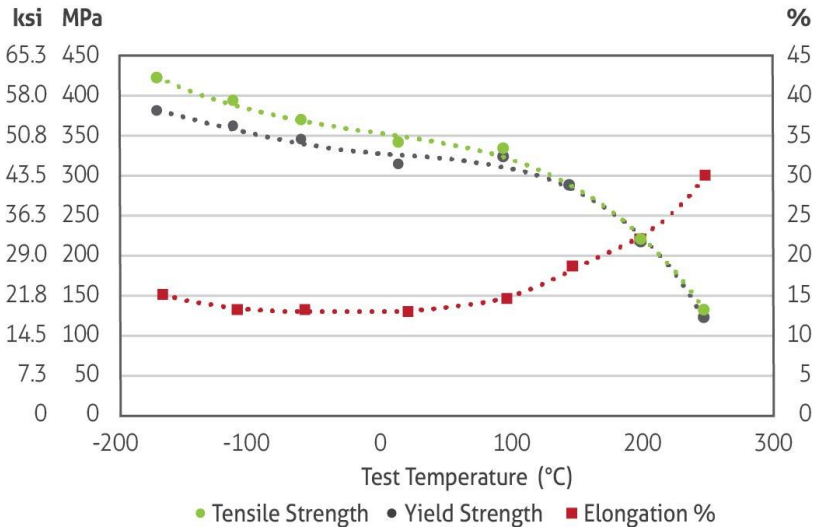
As-Built Surface Roughness[7]

Angle	Upskin		Downskin	
Deg. °	Ra µm	Ra µin	Ra µm	Ra µin
0 (top)	2.2±0.6	86±22	NA	NA
40	6.8±0.8	269±30	8.5±0.9	336±36
45	6.4±0.7	250±27	7.6±1.0	299±41
50	6.1±0.4	240±14	6.8±0.7	266±28
90 (vertical)	5.9±0.6	232±25	NA	NA

Fatigue[8]



Elevated temperature tensile[9]



All stated values are from T6 heat treated samples. [1]Deposition rate calculation is for comparison purposes on an EOS M290 and does not include recoating time, laser migration time, contour exposures, etc [2]ASTM E8, [3]ASTM E18, [4]ASTM E494-15, [5]ASTM E228, [6]ISO/DIS 22007-2.2 (Transient Plane Source, TPS), [7]Surface roughness determined by stylus profilometry, 40 µm layer thickness parameters, [8]ASTM E466, [9]ASTM E21.

*Print speed comparison is based on simulation of various real parts for our standard A6061-RAM2 parameter set A6061-RAM2_40um_M290_v0.70 and standard AlSi10Mg parameter set AlSi10Mg_FlexM291 2.01. The theoretical laser exposure rate of the A6061-RAM2 standard M290 parameter set is 2x the rate of the standard M290 Alsi10Mg set which results in approximately 50% higher print rate for real parts after accounting for recoater time, thin-walled geometries, etc.

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 sales@elementum3d.com for additional information.