



ONE CLICK METAL

Aluminum A6061 - RAM2

MATERIAL DATA SHEET

www.oneclickmetal.com

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A6061-RAM2

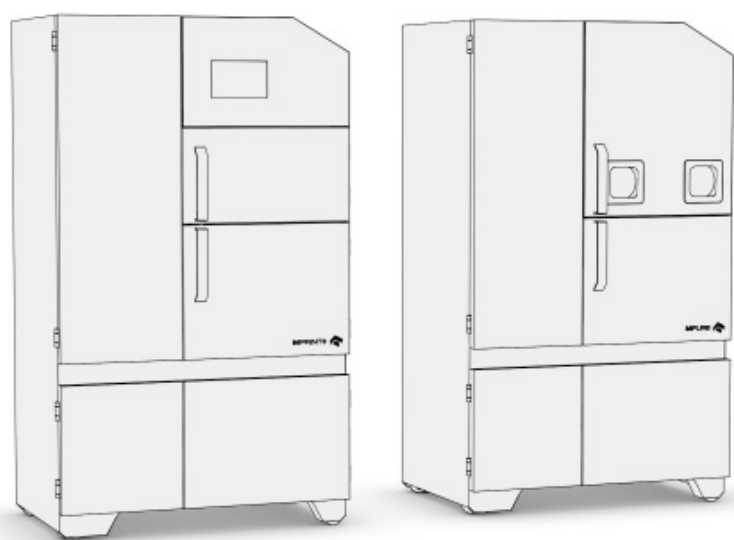
A6061- RAM2, developed by Elementum3D, is an advanced aluminum alloy tailored for metal 3D printing applications. This material combines the well-known A6061 aluminum with a specialized reactive additive manufacturing (RAM) process, enhancing its printability and mechanical properties. Its unique composition reduces the warping and cracking issues typically associated with 3D printing standard aluminum alloys, allowing for precise, high-quality, and reliable prints, even in complex geometries. Apart from that, A6061-RAM2 has higher production speeds and better surface quality in comparison to the widely used AlSi10Mg alloy.

Properties

- Good Corrosion resistance
- Good strength to weight ratio
- Good workability and formability

Applications

- Aviation and aerospace
- Automotive
- Electronics and consumer goods



Process information

A6061- RAM2 powder provided by Elementum is optimized for the production of robust components with the One Click Metal system.

System Set-up	MPRINT
Parameter	A6061 30µm
Build plate preheating	200°C
Powder part-no.	A6061-RAM2
Layer thickness	30µm
Coater	X-Lip
Inert gas	Argon
Sieve	63µm

**Powder properties**

Particle Size Distribution (D10/D50/D90)	12-28µm/23-46µm/34-58µm
Bulk Density	1,33g/ cm ³
Flowability	Hall flow test time of 67 sec.

Physical and Mechanical Properties

The mechanical properties of A6061 - RAM2 are in the medium range. In the annealed condition, it has a tensile strength of about 270 to 300 MPa according to the standard. The Alloy is well balanced between strength, corrosion resistance, machinability and weldability. Given the possibility of heat treatment and strengthening techniques, the alloy is also highly customizable.

Relative Density (%)

≥ 99.8

Surface quality (measured along the z-axis)

As built	Ra [µm]	7
	Rz [µm]	17
Blasted	Ra [µm]	3
	Rz [µm]	8

Mechanical properties ISO6892-1 as built

Vertical	Yield strength Rp0.2 [MPa]	Tensile strength Rm [MPa]	Elongation at break A [%]	Elastic Modulus (GPa)
Average	260	285	4.4	62
Standard deviation absolute	8	9	1	7
Standard deviation percentage	3	3	23	11

Heat treatment

Solution Annealing

The part is heated and held at 530–540 °C for about an hour and then water-quenched. This allows alloying element to dissolve in the Aluminium matrix and fast cooling locks them in place.

Aging

The part is heated and held at 160-180°C for 8 hrs and then left to air cool. Fine precipitates form within the material and thereby increase the strength of the part.

Mechanical properties ISO6892-1 after heat treatment

Vertical	Yield strength Rp0.2 [MPa]	Tensile strength Rm [MPa]	Elongation at break A [%]	Elastic Modulus (GPa)
Average	215	253	6.1	78
Standard deviation absolute	23	18	0.4	3
Standard deviation percentage	11	7	7	4