Material Data Sheet
Balanced Parameter

M300/ 1.2709

Typical Mechanical Properties
(Heat Treated)

Ultimate tensile strength	1237 MPa (2032 MPa)
Yield strength	867 MPa (1933 MPa)
Elongation at break	16% (8%)

Process Parameter

Quality — Balanced — Productivity

Tool Steel Alloy

A pre-alloyed maraging steel, this alloy is characterized by its high strength which it retains at mildly elevated temperatures up to 450°C and can be hardened to use for a range of mold & die tooling applications and engineering parts.

Highlights

- High strength & toughness
- Hardenable
- Good thermal & electrical conductivity
- Applications in mould and die tooling, engineering parts in aerospace, automotive and industrial sectors

- Layer thickness: 60µm
- Density >99.8%
- ASTM standard mechanical properties
- Good productivity
- Minimum controlled features 0.5mm

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Process Readiness Level (PRL)

R&D				Foundation		Production		
1	2	3	4	5	6	7	8	9

M300/ 1.2709

Tool Steel Alloy

To learn more, contact us: info@additiveindustries.com

or visit: additiveindustries.com

Powder Chemistry[2,3]

Composition	Fe	Ni	Co	Mo	Ti	Si	Cu	Cr	Mn	C	P	S	O	N	Al
Min (wt%)	Bal	17.00	8.50	4.50	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max (wt%)	Bal	19.00	10.00	5.20	0.80	0.10	0.50	0.25	0.15	0.03	0.01	0.01	0.10	0.10	0.10

Process details

Layer thickness	60	[µm]
Build rate[8] (per laser)	21.4	[cm3/hr]
Optical density[4]	≥ 99.8	[%]
Volumetric density[11]	≥ 8.04	[g/cm3]

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Mechanical properties[5]	Orientation	As-built (Mean)	Standard Dev.	Heat-treat (Mean)	Standard Dev.	Units
Ultimate tensile strength	Horizontal	1237	5	2032	15	[MPa]
	Vertical	1148	20	2034	40	[MPa]
Yield strength	Horizontal	867	20	1933	15	[MPa]
	Vertical	850	15	1947	45	[MPa]
Elongation at break	Horizontal	16	1	8	1	[%]
	Vertical	15	1	8	2	[%]
Youngs modulus	Horizontal	154	5	188	5	[GPa]
	Vertical	163	10	183	10	[GPa]
Vickers Hardness[6]		385	5	582	10	[HV10]

Surface Roughness[7]	Mean	Standard Deviation	Units
Vertical Surface Roughness (Ra)	11	2	[µm]
Vertical Surface Roughness (Rz)	60	10	[µm]
45° Surface Roughness (Ra)	17	3	[µm]
45° Surface Roughness (Rz)	95	15	[µm]

Notes

1. The material is processed under Argon shielding atmosphere.
2. Powder Chemistry as per Additive Industries specification O6187 Rev. 1.0.
3. Additive Industries consolidated material is in line with literature values,
4. Density measured by Optical Measurement Method as per internal process. This is the minimum guaranteed value that is achieved under standard processing conditions, manufactured using Additive Industries' qualification jobs.
5. Tensile test samples were produced as round blanks. These were machined to size and tested in accordance with ASTM E8m at a NADCAP approved supplier.
6. Hardness measured in accordance with DIN EN ISO6507-1:2018 as per internal process. Hardness values measured in XY and XZ planes from components manufactured using Additive Industries' qualification jobs.
7. Surface Roughness measured in as-printed condition in accordance with internal process. Roughness measurement conducted on specimens with varying unsupported manufacturing angle.
8. Build Rate stated is a typical value per laser. It is calculated using the formula: Layer Thickness x Laser Scan Speed x Hatch Distance.
9. Parameter released: M300_60_BAL_MF1A64_INT_2.1.
10. Heat Treatment : Solution at 825C for 2h and Age at 460C for 8hr.
11. Volumetric density measured according to ASTM B962. This is a minimum volumetric density measurement achieved on samples manufactured using Additive Industries' qualification jobs.

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Disclaimer

The data presented in this material datasheet is valid only for Additive Industries' released powder, machine, and parameter sets, processed under the defined shielding atmosphere. The properties of the printed parts have been measured on test coupons according to industry standards where available, and the data correspond to our state-of-the-art at the time of publication. These results are based on Additive Industries' signoff build layout and reflect material performance under the specified conditions; for more information, please contact Additive Industries. Users should be aware that variations in the presented values may arise due to differences in process conditions, including but not limited to thermal management, build plate temperature, job-specific heat accumulation, inter-layer time, part positioning, and overall machine calibration. The data provided do not warrant any guarantee for printed parts, and it remains the responsibility of the producer or purchaser to verify the ultimate properties of the printed material for their specific application. The listed data are subject to change without notice as we continuously strive to develop and improve our machine performance and the properties of printed materials. Users are advised to exercise caution and consider material selection, build layout, and machine configuration when interpreting and applying this information.

Specifications are subject to change without notice. Additive Industries is certified in accordance with ISO 9001

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