MATERIAL DATA SHEET.

# Maraging Steel.

## TOOL STEEL ALLOY / 1.2709 / MS1[1] — 50 µm

Material data sheet for **tool steel alloy 1.2709** parts produced by **Laser Melting** .

| Additional information | Value | |
|---|---|---|
| Layer thickness | µm | 50 |
| Component density [3] | % | ≈ 99.5 |

| Tensile test [4] | | | | As-built M | As-built SD | Heat-treated [2] M | Heat-treated [2] SD |
|---|---|---|---|---|---|---|---|
| Tensile strength | $R_m$ | MPa | 0° | 1174 | 20 | 1940 | 34 |
| | | | 45° | 1128 | 42 | 2040 | 14 |
| | | | 90° | 1175 | 24 | 2021 | 28 |
| Offset yield strength | $R_{p0,2}$ | MPa | 0° | 965 | 25 | 1789 | 35 |
| | | | 45° | 890 | 45 | 1971 | 14 |
| | | | 90° | 970 | 32 | 1978 | 23 |
| Elongation at break | A | % | 0° | 14 | 5 | 6 | 2 |
| | | | 45° | 10 | 2 | 5 | 2 |
| | | | 90° | 12 | 2 | 5 | 2 |
| Reduction of area | Z | % | 0° | 55 | 11 | 28 | 4 |
| | | | 45° | 56 | 2 | 8 | 1 |
| | | | 90° | 57 | 5 | 22 | 7 |
| Young's modulus | E | GPa | 0° | 170 | 8 | 198 | 40 |
| | | | 45° | 187 | 11 | 199 | 5 |
| | | | 90° | 182 | 6 | 199 | 2 |

| Hardness test [5] | | As-built M | As-built SD | Heat-treated [2] M | Heat-treated [2] SD |
|---|---|---|---|---|---|
| Vickers hardness | HV10 | 342 | 22 | 575 | 10 |
| | HRC | 35 | - | 52 | - |

| Roughness measurement [6] | | | As-built M | As-built SD | Corundum blasted M | Corundum blasted SD |
|---|---|---|---|---|---|---|
| Roughness average | Ra | µm | 9 | 1 | - | - |
| Mean roughness depth | Rz | µm | 67 | 5 | - | - |

## SPECIAL FEATURES:

[1] Material according to ASTM A646 Grade Marage 300
[2] Heat treatment : ageing 500 ° C, 6 h; air-cooling
[3] Optical density determination by light microscopy
[4] Tensile test according to ISO 6892-1:2017 B (DIN 50125:2016 – D6x30); testing machine: Zwick Z100; load range: 100 kN; testing speed: 0,008 1/s; testing temperature: room temperature. Test samples were turned before tensile test.
[5] Hardness testing according to DIN EN ISO 6507-1:2018
[6] Roughness measurement according to DIN EN ISO 4288:1998; λc = 2,5 mm

**Indicative figures only**. Actual figures may be change depending on part geometry and other factors.