MATERIALS FOR 3D PRINTING

TOOL STEEL

DANISH TECHNOLOGICAL INSTITUTE

1.2709 / A646 / M30

Tool steel alloy

This alloy is primarily used for tools and molds. It is characterized by great hardness and high ductility. It is good for parts that are exposed to a lot of wear and/or high temperatures.

We print tool steel using Laser Powder Bed Fusion technology, which works with powder and uses a laser to weld the powder layers together. This technology requires a support structure to attach the part to the build platform. The support is mechanically removed after printing.

The technology can produce parts that comply with ISO 2768-m 1; however, the tolerances depend significantly on the geometry of the part. At the Danish Technological Institute, our 3D printing production is also ISO 9001 certified.

Technology:
- Laser Powder Bed Fusion

Printer:
- SLM Solutions - SLM280

Build volume:
- 280 x 280 x 365 mm

Application:
- Industrial use

Possible post-processing:
- De-stressing
- Heat treatment
- Deburring
- Media blasting
- Conventional processing

Customization:
Contact us if you have specific requests for surface roughness and material properties.

MATERIAL PROPERTIES (HEAT TREATED)	
TENSILE STRENGTH [Rm]	1940 ±34 MPa
YIELD STRENGTH [Rp0,2]	1789 ±35 MPa
ELONGATION AT BREAK [A]	6 ±2 %
VICKERS HARDNESS [HV10]	575 ±10
PART DENSITY	>99,5 %
MATERIAL MASS DENSITY	8 g/cm^3

SURFACE TEXTURE	Media blasted	Deburred	Processed
Average roughness [Ra]	8 ±2	3 ±1	0,8

Design features:
- Minimum feature size 0,6 mm
- Minimum channel size Ø2 mm
- Minimum wall thickness 1 mm
- Support for overhangs less than 45°
- Hole for emptying powder Ø5 mm

Examples of use
- Injection molding tools
- Stamping tools
- Cutting tools
- Gears and cogwheels

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