MATERIALS FOR 3D PRINTING
TITANIUM

DANISH
TECHNOLOGICAL
INSTITUTE

Ti6Al4V (Grade 5)
Titanium alloy

With high strength, low weight, and resistance to corrosion, Ti6Al4V is the most widely used titanium alloy in the world. When we print with Ti6Al4V at the Danish Technological Institute, the material also meets the requirements for food contact.

We print titanium 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 - SLM500

Build volume:
· 500 x 280 x 360 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	
TENSILE STRENGTH [Rm]	1280 ±80 MPa
YIELD STRENGTH [Rp0,2]	1180 ±180 MPa
ELONGATION AT BREAK [A]	9 ±5 %
VICKERS HARDNESS [HV10]	365
PART DENSITY	>99,9 %

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
· Lightweight grippers with high strength for robotic handling and industrial machinery.
· Implants, surgical solutions, and medical equipment
· Drones for the aerospace and defense industries
· Hygienic nozzles and manifolds for food applications
· Tools for the offshore sector

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