impac SYSTEMS ENGINEERING

ONE CLICK METAL

Stainless Steel 1.4542
40µm

MATERIAL DATA SHEET

www.impacsystems.com

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Stainless Steel 1.4542

The material 1.4542 is a corrosion resistant high strength stainless steel. The presence of copper as alloying element facilitates the material to be hardened by heat treatment and age hardening methods. Due to the presence of Niobium in combination with reduced carbon content, the material is highly processable without compromising in hardness. The superior physical and chemical property of the material makes it an excellent choice for numerous applications.

Properties

- High strength and
- toughness
- Good corrosion resistance
- Good processability
- Magnetic

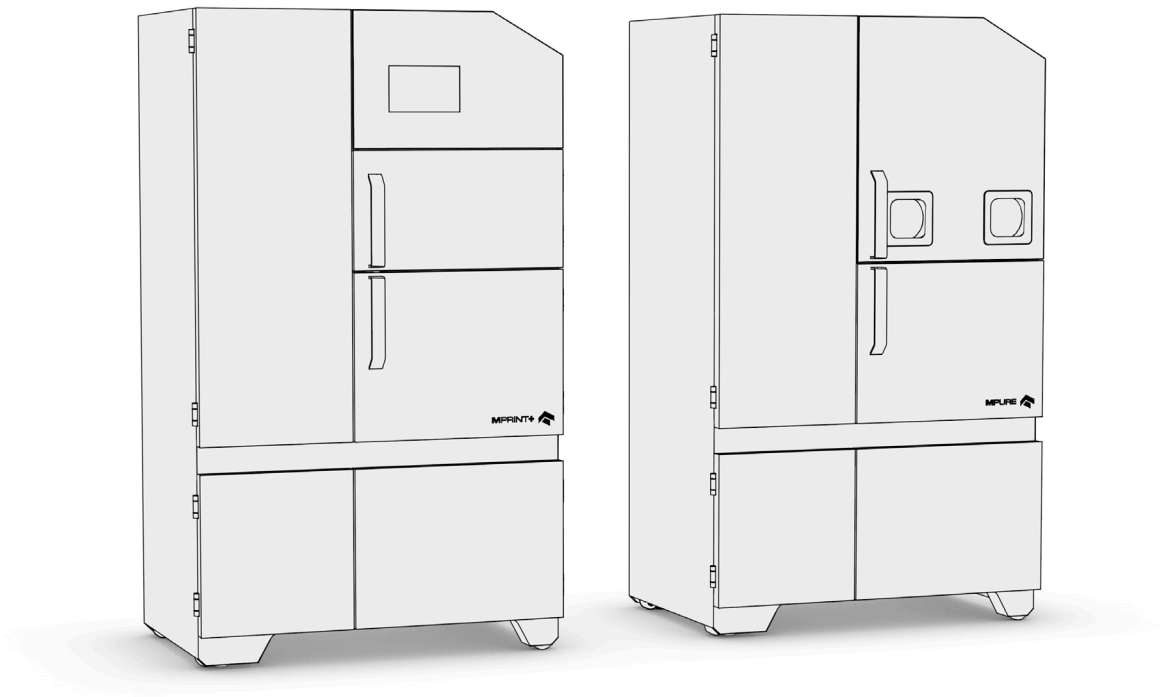
Applications

- Aviation and Aerospace
- Medical components
- Food and chemical industry
- Energy industry

Powder properties

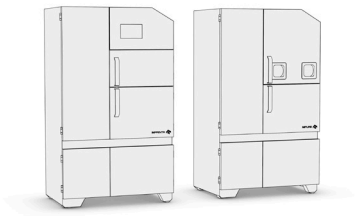
Chemical Composition (wt.-%)

Element	Min.	Max.
C	<0.07	
Si	<1.0	
Mn	<1.0	
Cr	15	17
Ni	3	5
Cu	3.5	5
Nb	<(5x%C)	0.45
Fe	Balance	



Process information

System Set-up	MPRINT
Parameter	1.4542 40µm
Software	Netfabb
Powder part-no.	MSUPPLY 1.4542
Layer thickness	40µm
Coater	X-Lip
Inert gas	Nitrogen
Sieve	80µm



Physical and Mechanical Properties

In annealed condition the tensile strength of the material is ca. 1000 N/mm². But based on the heat treatment method used, the tensile strength can increase to ca. 1370 N/mm². It is optimal to limit the operation temperature up to 300°C, beyond which the material behaviour varies based on the method of heat treatment.

Physical properties

Defects	Result
Average defect (%)	<0.1

Surface quality (measured along the z-axis)

As built	Ra [µm]	5
	Rz [µm]	24
Blasted	Ra [µm]	2
	Rz [µm]	11

Mechanical properties ISO6892-1

Vertical	Yield strength Rp0.2 [MPa]	Tensile strength Rm [MPa]	Elongation at break A [%]	Reduction of area Z [%]
Average	605	1220	16	53
Absolute Standard Deviation	21	5	2	9
Relative Standard Deviation	3	0.4	12	16