NICKEL 718

Description

Nickel 718 represents a material of exceptional significance. This alloy, primarily composed of nickel, chromium, and iron, offers a unique blend of properties. Nickel 718 is renowned for its outstanding high-temperature strength and resistance to corrosion, making it a pivotal choice for applications in extreme environments, such as aerospace and oil and gas industries. In 3D metal printing, it allows for the creation of complex, intricately designed components, ensuring precision and durability. Nickel 718 is synonymous with critical applications, from aerospace engine parts to downhole oil tools. Its ability to maintain structural integrity in demanding conditions sets it apart as a superior material, making it indispensable for high-performance functional parts in various sectors.

Benefits

- High-Temperature Stability
- Corrosion Resistance
- Improved Mechanical Properties
- Precision and Intricacy
- Enhanced Durability
- Wide Range of Applications

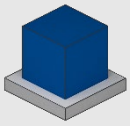
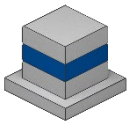
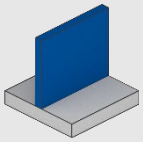
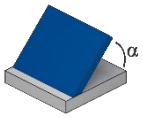
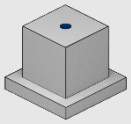
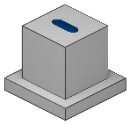
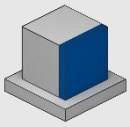
Application

- Aerospace
- Oil and Gas
- Energy
- Chemical
- Medical
- Automotive

Data sheet

	Units	**Print direction**	**Nickel 718**
DIN	-	-	2.4667
Wire diameter	mm	-	1.0
Density	g/cm³	-	8.2
Ultimate tensile Strength	MPa	XY XZ	833 ± 50 833 ± 50
Yield strength	MPa	XY XZ	537 ± 32 537 ± 32
Elongation at break	%	XY XZ	25 ± 3 25 ± 3
Hardness Vickers	HV	-	245

Technical specifications

	Description		Standalone Printer (M450)	Robot Integration
Maximum dimensions	Largest printable size		145 x 168 x 430 mm3	3000 x 3000 x 2500 mm3
Min feature size in z-direction	Print layer height		0.6 – 1.2 mm	0.6 – 1.2 mm
Minimum Wall Thickness	Smallest wall thickness available for printing		2.0 mm (smaller possible on request)	2.0 mm (smaller possible on request)
Unsupported Overhang	Minimum angle at which a wall can be printed without requiring support		>70°	>70° standard 0° when two external axes are used
Holes	Minimum diameter available for printing holes		2.0 mm (smaller possible on request)	2.0 mm
Slot width	Minimum width of a slot		1.2 mm	1.2 mm
General Tolerances	Expected tolerance (dimensional accuracy)		± 0,5% With a minimum of 0,5 mm (smaller possible on request)	± 0,5% With a minimum of 0,5 mm (smaller possible on request)

NICKEL ** 718 ** AGEING HEAT TREATMENT

Description

Nickel 718 undergoes a transformation that enhances its mechanical properties and overall performance. This heat treatment process involves heating the material to a specific temperature and maintaining it for a designated time, followed by controlled cooling. The resulting benefits include increased strength, improved ductility, and a reduction in residual stresses. Ageing heat treatment for Nickel 718 is particularly advantageous for parts that require long-term use under high mechanical stress or challenging environmental conditions, ensuring they remain reliable and durable over time. This treatment enables the production of components with enhanced mechanical properties, making Nickel 718 a preferred choice for a wide range of critical applications, including aerospace, energy, and industrial sectors.

Benefits

- Enhanced Mechanical Properties
- Reduced Residual Stresses
- High-Temperature Performance
- Fatigue Resistance
- Precision and Durability
- Versatility

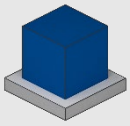
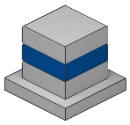
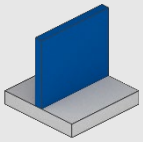
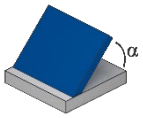
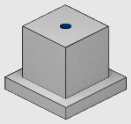
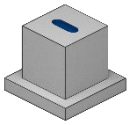
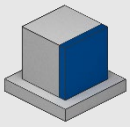
Application

- Aerospace
- Energy
- Oil and gas
- Medical
- Chemical
- Automotive

Data sheet

	Units	**Print direction**	**Nickel ** 718**
DIN	-	-	2.4667
Wire diameter	mm	-	1.0
Density	g/cm³	-	8.2
Ultimate tensile Strength	MPa	XY XZ	1256 ± 11 1208 ± 49
Yield strength	MPa	XY XZ	1025 ± 7 980 ± 2
Elongation at break	%	XY XZ	11 ± 1 10 ± 5
Hardness Vickers	HV	-	332

Technical specifications

	Description		Standalone Printer (M450)	Robot Integration
Maximum dimensions	Largest printable size		145 x 168 x 430 mm3	3000 x 3000 x 2500 mm3
Min feature size in z-direction	Print layer height		0.6 – 1.2 mm	0.6 – 1.2 mm
Minimum Wall Thickness	Smallest wall thickness available for printing		2.0 mm (smaller possible on request)	2.0 mm (smaller possible on request)
Unsupported Overhang	Minimum angle at which a wall can be printed without requiring support		>70°	>70° standard 0° when two external axes are used
Holes	Minimum diameter available for printing holes		2.0 mm (smaller possible on request)	2.0 mm
Slot width	Minimum width of a slot		1.2 mm	1.2 mm
General Tolerances	Expected tolerance (dimensional accuracy)		± 0,5% With a minimum of 0,5 mm (smaller possible on request)	± 0,5% With a minimum of 0,5 mm (smaller possible on request)