Material Data Sheets

Aluminium (AlSi10Mg)

$AlSi_{10}Mg$ is an aluminium alloy that combines good strength and thermal properties with low weight and flexible post-processing possibilities. For those reasons, it's an often-used material in automotive, aerospace and automation. Applications include housings, ductwork, engine parts, production tools and moulds, both for prototyping and manufacturing purposes.

Technical Specifications :

Standard lead time	Minimum of 10 working days, depending on part size, number of components and finishing degrees (online & offline orders)
Standard accuracy	In accordance with DCTG 8 of DIN EN ISO 8062-3: 2008-09 for dimensions between 30 and 400 mm, DTTG 6 for dimensions below 30 mm and DIN ISO 2768 -1 g (rough) for dimensions between 3 mm and 400mm.
Layer thickness	0.03 – 0.1 mm
Minimum wall thickness	1 mm (standard grade) / 0.5 mm (performance grade)
Minimum detail	0.5 mm
Maximum part dimensions	500 x 280 x 315 mm (offline orders) 440 x 220 x 315 mm (online orders)
Interlocking or enclosed parts?	No
Surface structure	Unfinished parts typically have a rough surface but

Datasheet

MEASUREMENT	STANDARD GRADE	PERFORMANCE GRADE	ASTM/PROCEDURE
Density	>2.59 g/cm³	>2.65 g/cm³	WGE-Prod-067EN
Relative Density	>97.0%	>99.0%	WGE-Prod-067EN
Tensile Strength	>250 MPa	>300 MPa	DIN EN ISO 6892-1:2009
Yield Strength	>180 MPa	>190 MPa	DIN EN ISO 6892-1:2009
E-Modulus	70 GPa	70 GPa	DIN EN ISO 6892-1:2009
Elongation at Break	>1.0%	>2.0%	DIN EN ISO 6892-1:2009
Roughness R_a	<20 µm	<16 µm	ISO 4287 / AITM 1-00070
Roughness R_z	<80 µm	<70 µm	ISO 4287 / AITM 1-00070
Hardness	>80 HV	>100 HV	ISO 6597-1:03-2006

Titanium (Ti6Al4V)

Ti_6Al_4V, one of the widest-known alloys in Metal 3D Printing, combines excellent mechanical properties with very low specific weight. This material is corrosion- resistant and used in a variety of demanding engineering environments such as aeronautics. Applications include functional prototypes, solid end-use parts, medical devices and spare parts.

Technical Specifications:

Standard lead time	Minimum of 10 working days, depending on part size, number of components and finishing degrees (online & offline orders)
Standard accuracy	In accordance with DCTG 8 of DIN EN ISO 8062-3: 2008-09 for dimensions between 30 and 400 mm, DTTG 6 for dimensions below 30 mm and DIN ISO 2768 -1 g (rough) for dimensions between 3 mm and 400mm. (for more details and IT grades have a look at the design guidelines.)
Layer thickness	0.03 – 0.6 mm
Minimum wall thickness	1 mm (standard grade) / 0.5 mm (performance grade)
Minimum detail	0.5 mm
Maximum part dimensions	245 x 245 x 270 mm (offline orders) 220 x 220 x 250 mm (online orders)
Interlocking or enclosed parts?	No
Surface structure	Unfinished parts typically have a rough surface but various finishing degrees can achieve smooth surfaces.

Stainless Steel (SS316L)

SS316L, a low-carbon alloy of stainless steel also known as 1.4404, is highly corrosion-resistant and offers excellent strength. 3D-printed stainless steel has high ductility and good thermal properties. Stainless steel can be used for food-safe applications, machine components and production tools. Other applications include ductwork, durable prototypes, spare parts, medical instruments and wearables.

Technical Specifications

Standard lead time	Minimum of 10 working days, depending on part size, number of components and finishing degrees
Standard accuracy	In accordance with DCTG 8 of DIN EN ISO 8062-3: 2008-09 for dimensions between 30 and 400 mm, DTTG 6 for dimensions below 30 mm and DIN ISO 2768 -1 g (rough) for dimensions between 3 mm and 400mm
Layer thickness	0.03 – 0.1 mm
Minimum wall thickness	1 mm (standard grade) / 0.5 mm (performance grade)
Minimum detail	0.5 mm
Maximum part dimensions	250 x 250 x 280 mm (offline orders) 220 x 220 x 250 mm (online orders)
Interlocking or enclosed parts?	No
Surface structure	Unfinished parts typically have a rough surface but various finishing degrees can achieve smooth surfaces

Datasheet

MEASUREMENT	STANDARD GRADE	PERFORMANCE GRADE	ASTM/PROCEDURE
Density	>7.91 g/cm³	>7.95 g/cm³	WGE-Prod-067EN
Relative Density	>99.0%	>99.5%	WGE-Prod-067EN
Tensile Strength	>510 MPa	>530 MPa	DIN EN ISO 6892-1:2009
Yield Strength	>300 MPa	>340 MPa	DIN EN ISO 6892-1:2009
E-Modulus	180 GPa	180 GPa	DIN EN ISO 6892-1:2009
Elongation at Break	>45%	>50%	DIN EN ISO 6892-1:2009
Roughness R_a	<20 µm	<15 µm	ISO 4287 / AITM 1-00070
Roughness R_z	<90 µm	<70 µm	ISO 4287 / AITM 1-00070
Hardness	>170 HV	>200 HV	ISO 6597-1:03-2006

Inconel (IN718)

Inconel 718 exhibits an exceptional thermal resistance, up to 700°C, and high resistance to oxidation and corrosion. It also offers excellent strength, with high yield, tensile and creep-rupture properties. 3D-printed Inconel retains strength over a wide temperature range, making IN718 an attractive choice for extreme environments, whether in high-temperature applications like turbines and engine parts or low-temperature applications like cryogenic environments. Inconel is ideal for the aerospace and automotive industries, with common applications including ductwork, valves and heat exchangers.

Technical Specifications

Standard lead time	Minimum of 10 working days, depending on part size, number of components and finishing degrees (online & offline orders)
Standard accuracy	In accordance with DCTG 8 of DIN EN ISO 8062-3: 2008-09 for dimensions between 30 and 400 mm, DTTG 6 for dimensions below 30 mm and DIN ISO 2768 -1 g (rough) for dimensions between 3 mm and 400mm. (for more details and IT grades have a look at the design guidelines.)
Layer thickness	0.03 – 0.1 mm
Minimum wall thickness	1 mm
Minimum detail	0.5 mm
Maximum part dimensions	250 x 250 x 280 mm (offline orders) 220 x 220 x 250 mm (online orders)
Interlocking or enclosed parts?	No
Surface structure	Unfinished parts typically have a rough surface but various finishing degrees can achieve smooth surfaces

Datasheet

MEASUREMENT	STANDARD GRADE	ASTM/PROCEDURE
Density	>8.07 g/cm³	WGE-Prod-067EN
Relative Density	>99%	WGE-Prod-067EN
Tensile Strength	>940 MPa	DIN EN2002-1
Yield Strength	>750 MPa	DIN EN2002-1
E-Modulus	220 GPa	DIN EN2002-1
Elongation at Break	>8%	DIN EN2002-1
Roughness R_a	<15 µm	ISO 4287 / AITM 1-00070
Roughness R_z	<60 µm	ISO 4287 / AITM 1-00070
Hardness	>300 HV	ISO 6597-1:03-2006

ABS

ABS is a widely used engineering thermoplastic with high durability and fine feature detail. Printed ABS has up to 80% of the strength of injection-moulded ABS, making it highly suitable for functional applications. This material is opaque and available in several colour options. Applications include snap-fits, end-use components, jigs and fixtures, concept modelling, and testing for form, fit and function.

Technical Specifications

Standard lead time	Minimum of 5 working days, depending on part size, number of components and finishing degrees (online & offline orders) 48 hours (Fast Lane orders)
Standard accuracy	±0.15% (with lower limit on ±0.2 mm)
Layer thickness	0.25 mm
Minimum wall thickness	1 mm
Maximum part dimensions	600 x 500 x 600 mm (offline orders) 406 x 355 x 406 mm (online orders) 250 x 250 x 300 mm (Fast Lane orders)
Interlocking or enclosed parts?	Yes
Surface structure	Unfinished parts typically have a rough surface but all kinds of fine finishes are possible. FDM parts can be smoothed, painted and coated

PA-AF (Previously called Alumide)

PA-AF is a blend of aluminium powder and polyamide powder, which allows metallic-looking, non-porous components to be machined easily and is resistant to high temperatures (130°C). Typical applications include parts for wind tunnel testing in the automotive industry, small production runs, jig manufacturing, education and illustrative models with a metallic appearance.

Technical Specifications

Standard lead time	Minimum of 4 working days, depending on part size, number of components and finishing degrees (offline orders) 7 working days (online orders)
Standard accuracy	±0.3% (with lower limit on ±0.3 mm)
Layer thickness	0.15 mm
Minimum wall thickness	1 mm, but living hinges are possible at 0.3 mm
Minimum detail	0.3 mm
Minimum clearance	0.6 mm between parts that need to be assembled 0.5 – 0.6 mm between shells of an interlocking part
Maximum part dimensions	650 x 330 x 560 mm (offline orders) 400 x 300 x 400 mm (online orders)
Interlocking or enclosed parts?	Yes
Surface structure	Unfinished parts typically have a grainy surface but all kinds of fine finishes are possible. Laser-sintered parts can be sandblasted, coloured/impregnated, painted, covered and coated.

Datasheet

MEASUREMENT	VALUE	STANDARD
Density	1.36 ±0.05 g/cm³	
Tensile Strength	48 ±3 MPa	DIN EN ISO527
Tensile Modulus	3800 ±150 MPa	DIN EN ISO527
Flexural Modulus	3600 ±150 MPa	DIN EN ISO178
Charpy – Impact strength	29 ±2 kJ/m²	DIN EN ISO179
Charpy – Notched Impact Strength	4.6 ±0.3 kJ/m²	DIN EN ISO179
Shore D/A-hardness	D76 ±2	DIN 53505
Heat Deflection Temperature	130 °C	ASTM D648 @ 1.82 MPa
Elongation at Break	3.5 ±1%	DIN EN ISO527

PA 12 (MJF) Nylon

No matter how complex your designs, polyamide is a great and versatile choice. The self-supporting powder needs no support structure and works equally well for fully functional prototypes or end-use parts. The PA 12 material used by Multi Jet Fusion technology has a very fine grain, resulting in parts with higher density and lower porosity than parts produced with Laser Sintering. That feature also makes PA 12 for MJF the ideal choice when you need more detailed surface resolution or thinner walls than are possible with Laser Sintering. Think crisp textures, embossing, and engraving, or labels.

Technical Specifications

Standard lead time	5 working days (online & offline orders)
Standard accuracy	±0.3% (with lower limit on ±0.3 mm)
Layer thickness	0.08 mm
Minimum wall thickness	1 mm, but living hinges are possible at 0.5 mm
Minimum detail	0.25 mm
Minimum clearance	0.4 mm between parts that need to be assembled 0.5 mm between shells of an interlocking part
Maximum part dimensions	256 x 340 x 360 mm
Interlocking or enclosed parts?	Yes
Surface structure	Unfinished parts typically have a smooth surface, without visible layers, and a stone-grey color. Multi Jet Fusion parts can be sandblasted and colored/impregnated.

Datasheet

MEASUREMENT	VALUE	STANDARD
Density of parts	1.01 g/cm^3	ASTM D792
Tensile Strength, Max Load - XY	48 MPa/6960 psi	ASTM D638
Tensile Strength, Max Load - Z	48 MPa/6960 psi	ASTM D638
Tensile Modulus[4] - XY	1700 MPa/245 ksi	ASTM D638
Tensile Modulus[4] - Z	1800 MPa/260 ksi	ASTM D638
Elongation at Break[4] - XY	20%	ASTM D638
Elongation at Break[4] - Z	15%	ASTM D638
Heat Deflection Temperature - Z	175°C 95°C	ASTM D648 @ 0.45 MPa @ 1.82 MP

Ultrasint TPU 90A-01

Ultrasint TPU 90A-01, a thermoplastic polyurethane, is a fully-functional and flexible material with high elongation at break. Ultrasint TPU 90A-01 combines durable elasticity with good wear resistance and abrasion resistance, making it an ideal material for prototyping and manufacturing applications that require good shock absorption and rubber-like elasticity over a wide range of temperatures. Produced with Multi Jet Fusion technology, Ultrasint TPU 90A-01 exhibits smooth surfaces and high detail.

Technical Specifications

Standard lead time	Minimum of 4 working days (online & offline orders)
Standard accuracy	±0.3% (with lower limit on ±0.3 mm)
Layer thickness	0.1 mm
Minimum wall thickness	1 mm
Maximum part dimensions	274 x 370 x 380 mm (online & offline orders)
Interlocking or enclosed parts?	Yes
Surface structure	Unfinished parts typically have a smooth surface, without visible layers, and a stone-grey color.

Datasheet

MEASUREMENT	VALUE X Y	VALUE Z		STANDARD
Density	1.1	1.1	g/cm^3	
Hardness Shore A	88	88		DIN ISO 7619-1
Tensile Strength	9	7	MPa	DIN 53504, S2
Tensile Elongation at break	220	120	%	DIN 53504, S2
Tensile Modulus	75	85	MPa	ISO 527-2, 1A
Flexural Modulus	75	75	MPa	DIN EN ISO 178
Tear resistance (Trouser)	20	16	kN/m	DIN ISO 34-1, A
Tear resistance (Graves)	36	32	kN/m	DIN ISO 34-1, B
Compression set B (23°C, 72h)	20	20	%	DIN ISO 815-1
Rebound resilience	63	63	%	DIN 53512
Abrasion resistance	140	100	mm^3	DIN ISO 4649
Charpy Impact Strength (notched, 23°C)	Partial Break	No Break		DIN EN ISO 179-1
Charpy Impact Strength (notched, -10°C)	21	29	kJ/m2	DIN EN ISO 179-1
Rossflex testing (100k cycles, 23°C)	No Cut Growth			ASTM D1052
Rossflex testing (100k cycles, -10°C)	No Cut Growth			ASTM D1052
Vicat/ A (10N)	84	96	°C	DIN EN ISO 306
Melting temperature	120 – 150	120 – 150	°C	ISO 11357 (20K/min)

Polypropylene (PP)

Polypropylene is one of the most versatile and commonly used plastics in industrial production. 3D-printed PP is a translucent off-white material with exceptionally high elongation at break (>500%), and properties comparable to injection moulded PP. Tough, fatigue-resistant and lightweight, PP is suited for form-, fit- and function-testing. Prototypes and test parts in 3D-printed PP carry the unique advantage of being produced in the same material as the end-part. Ideal applications include functional prototypes for snap-fit assemblies or living hinges in automotive components, packaging, and consumer goods.

Technical Specifications

Standard lead time	Minimum of 7 working days, depending on part size, number of components and finishing degrees (online & offline orders)
Standard accuracy	±0.3% (with lower limit on ±0.3 mm)
Layer thickness	0.12 mm
Minimum wall thickness	1 mm, but living hinges are possible at 0.4 mm
Minimum detail	0.3 mm
Minimum clearance	0.6 mm between parts that need to be assembled 0.5 – 0.6 mm between shells of an interlocking part
Maximum part dimensions	500 x 500 x 480 mm (online & offline orders)
Interlocking or enclosed parts?	Yes
Surface structure	Unfinished parts typically have a grainy surface.

Datasheet

MEASUREMENT	VALUE	STANDARD
Density	0.84 g/cm³	
Tensile Strength	21.4 MPa	DIN EN ISO527
Tensile Modulus	907 MPa	DIN EN ISO527
Elongation at Break	529%	DIN EN ISO527
Flexural Modulus	698 MPa	DIN EN ISO178

PA 2210 FR

PA 2210 FR is a flame-resistant, halogen-free polyamide (PA 12) material, with excellent long-term stability and chemical resistance. This high-performance plastic is Blue Card-certified, meaning it is tested and approved regularly by an independent test lab. Since it also passes the UL 94 V0 test and tests part of FAR 25.853, it is suitable for even electrical and electronic, and aeronautics and aerospace applications.

Technical Specifications

Standard lead time	On demand
Standard accuracy	±0.3 % (with lower limit on ±0.3 mm)
Layer thickness	0.15 mm
Minimum wall thickness	1 mm, but living hinges are possible at 0.3 mm
Minimum detail	0.3 mm
Minimum clearance	0.4 mm between parts that need to be assembled 0.5 mm between shells of an interlocking part
Maximum part dimensions	280 x 280 x 550 mm
Interlocking or enclosed parts?	Yes
Surface structure	Unfinished parts typically have a grainy surface but all kinds of fine finishes are possible. Laser-sintered parts can be sandblasted, coloured/impregnated, painted, covered and coated. Please note that the all finishes like coloured/impregnated, painted, covered and coated have an impact on the flammability properties, smoke generation, toxic gas generation and burning behaviour.

Datasheet

MEASUREMENT	VALUE	STANDARD
Density of parts	1.06 g/cm^3	
Tensile Strength	46 MPa	DIN EN ISO 527
Elongation at Break	4%	DIN EN ISO 527
Tensile Modulus	2500 MPa	DIN EN ISO 527
Flexural Modulus	2300 MPa	DIN EN ISO 178
Flexural Strength	65 MPa	DIN EN ISO 179
Melting Temperature (20°C/min)	185°C	ISO 11357-1/-3
Flammability properties	1.7/2.0 mm	JAR/FAR 25, App. F, part 1| AITM 2.0002 B Vertical Bunsen Burner Test 12s Ignition Time
Smoke generation	1.7/2.0 mm	JAR/FAR 25, App. F – Part V & AITM 2.0007
Toxic gas generation	1.7/2.0 mm	AITM 3.0005
Burning behavior	3.0 mm	UL 94 V-0 Blue Card-Certified