

MATERIALS DATASHEET



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**PLASTIC
MATERIALS**



SELECTIVE LASER SINTERING

PA2200

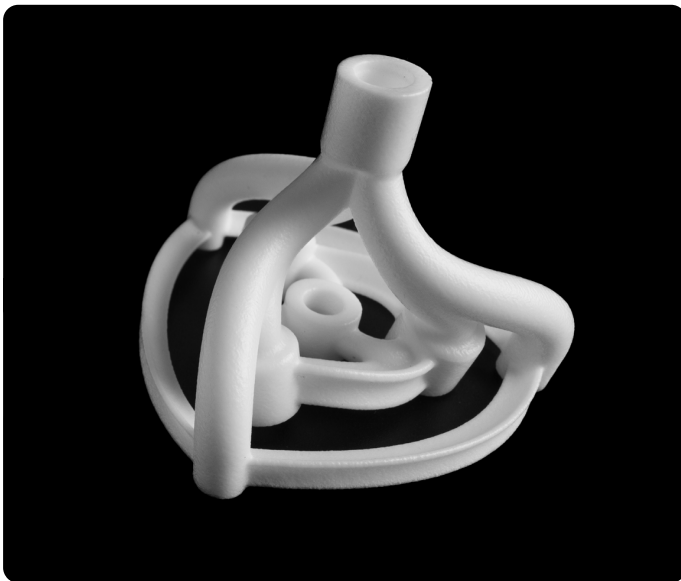
Nylon, as this type of plastic is commonly called, is the most widely used production material for SLS technology. This polyamide 12 (PA12) has a low density and is therefore lightweight. It has long-lasting properties and features good chemical resistance, high flexibility and strength. The raw piece made of PA2200 is pure white in colour and can be easily dyed by dip-dyeing.

Technological specifications

Tensile strength	48 MPa
Modulus of elasticity	1650 MPa
Elongation	18 %
HDT 1,8 MPa	55,1 °C
HDT 0,45 MPa	127,8 °C

Datasheet

Standard delivery time	4 business days
Production accuracy	±0,2 %
Production layer	0,12 mm
Minimum wall thickness	0,5 mm



Appropriate use

Its balanced mechanical properties make it versatile for prototypes and end products.

Polyamide PA2200 is suitable alternative to injection moulded plastics.

Specific applications

- Component assemblies with flexible joints (clips, clasps, hinges)
- Functional parts with active structures
- Orthotic aids

PA3200GF

This material is based on PA12 with the addition of glass particles, which make 30% of the powder content. This gives the material a high stiffness and density. PA3200GF is wear-resistant, easy to machine and has long-lasting properties. In addition, the material shows very good stability during the manufacturing process and undergoes little thermal deformation.

Technological specifications

Tensile strength	51 MPa
Modulus of elasticity	3200 MPa
Elongation	9 %
HDT 1,8 MPa	96 °C
HDT 0,45 MPa	157 °C

Datasheet

Standard delivery time	5 business days
Production accuracy	±0,2 %
Production layer	0,12 mm
Minimum wall thickness	0,5 mm



Appropriate use

This polyamide is most commonly used in functional prototypes that are subject to static loads or require rigidity and abrasion resistance.

PA3200GF in combination with additional machining can be used to produce high precision final parts.

Specific applications

- clamping elements and grips
- gearing
- engine radiator chambers



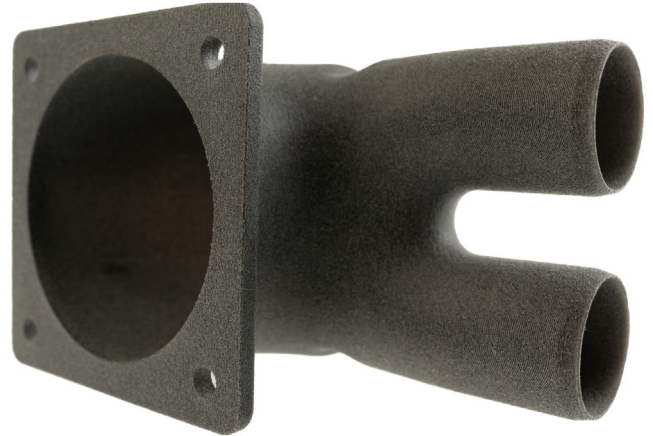
**MULTI
JET
FUSION**

HP PA12

This PA12-based multi-purpose material has good mechanical properties and is chemically resistant to oils, greases, aliphatic hydrocarbons and alkalines.

Technological specifications

Tensile strength	48 MPa
Modulus of elasticity	1700 MPa
Elongation	20 %
HDT 1,8 MPa	106 °C
HDT 0,45 MPa	175 °C



Datasheet

Standard delivery time	4 business days
Production accuracy	±0,2 %
Production layer	0,08 mm
Minimum wall thickness	0,5 mm



Appropriate use

Its very affordable price makes it suitable for use in serial parts or for prototype and end parts where balanced mechanical properties are required.

HP PA12 can also be used for the production of orthotic appliances.

Specific applications

- prototype parts
- guiding elements for different media
- orthotic aids

TPU Ultrasint

Ultrasint TPU01 is a material developed for MJF technology and its characteristics belong to hard rubber (Shore A 88-90). Not only it provides excellent surface quality and detail, but also has good flexibility, shock absorption, good chemical resistance and UV resistance.

Technological specifications

Tensile strength	10 MPa
Modulus of elasticity	85 MPa
Elongation	291 %



Datasheet

Standard delivery time	5 business days
Production accuracy	$\pm 0,2 \%$
Production layer	0,8 mm
Minimum wall thickness	1 mm



Appropriate use

Ultrasint TPU01 is the ideal material for flexible and shock absorbing applications.

It can also be used for volumetric structures in a wide range of industries, such as cushioning or ergonomic linings, protective sleeves, etc.

Specific applications

- sports protective equipment
- shoe soles
- linings and fillings
- orthopedic models
- silencers



STEREOLITOGRAPHY

WaterClear

The main advantage of this material is its transparency. WaterClear is absolutely pure without any colouring. At the same time, WaterClear features high rigidity and strength. The final parts achieve high precision and the material can be heat hardened during post-processing to provide higher temperature resistance.



Technological specifications

Tensile strength	56 MPa
Modulus of elasticity	2880 MPa
Elongation	7,5 %
HDT 1,8 MPa	50 °C
HDT 0,45 MPa	60 °C

Datasheet

Standard delivery time	7 business days
Production accuracy	±0,1 %
Production layer	0,1 mm
Minimum wall thickness	0,2 mm

Appropriate use

WaterClear is applied for the prototype transparent parts production. Due to the good detail, the material can also be used for parts with challenging optical surfaces.

It can be used for final parts where visual inspection is carried out or where there is a requirement for component transparency.

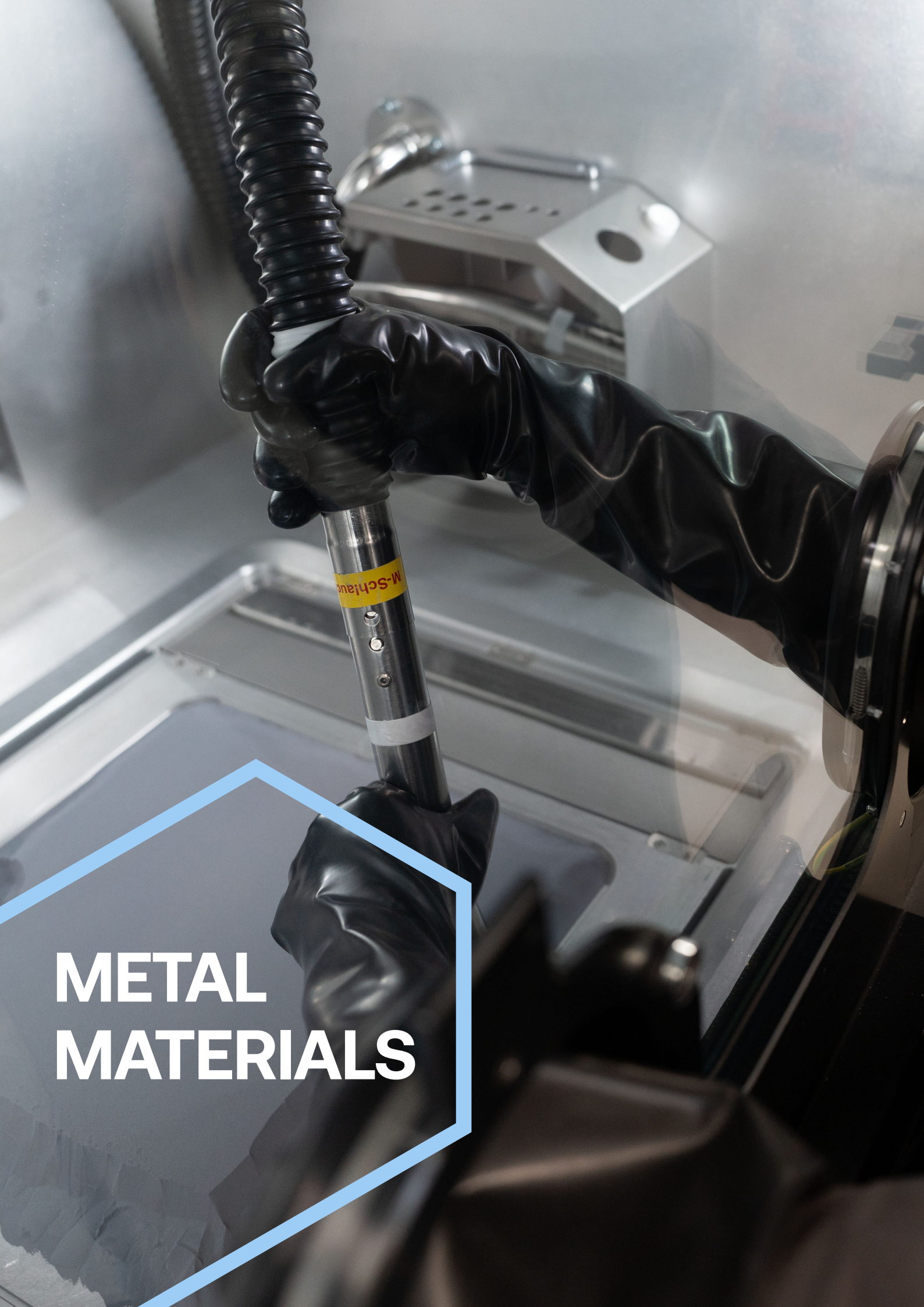
Specific applications

- headlights components
- transparent lenses
- transparent parts for liquid analysis

Plastic materials comparison

All the information at one place. In the table below you can easily compare the technical specifications of our materials.

Material	PA2200	PA3200GF	HP PA12	TPU Ultrasint	WaterClear
Tensile strenght (XY)	48 MPa	51 MPa	48 MPa	10 MPa	56 MPa
Modulus of elasticity (XY)	1650 MPa	3200 MPa	1700 MPa	85 MPa	2880 MPa
Elongation (XY)	18 %	9 %	20 %	291 %	7,5 %
HDT 1,8 MPa	55,1 °C	96 °C	106 °C	-	50 °C
HDT 0,45 MPa	127,8 °C	157 °C	175 °C	-	60 °C
Production accuracy	±0,2 %	±0,2 %	±0,2 %	±0,2 %	±0,1 %
Production layer	0,12 mm	0,12 mm	0,08 mm	0,8 mm	0,1 mm
Minimum wall thickness	0,5 mm	0,5 mm	0,5 mm	1 mm	0,2 mm



**METAL
MATERIALS**



DIRECT METAL LASER SINTERING

AlSi10Mg Alloy

This Aluminium alloy, which belongs to the narrower group of silumines, is mainly characterised by its high thermal and electrical conductivity, low density, high corrosion resistance and good mechanical properties. The heat treatment of this material can significantly affect its properties.

Technological specifications

Standard delivery time	10 business days
Production layer	0,03 - 0,08 mm
Minimum wall thickness	1 mm
Max. part's dimensions	390 x 390 x 390 mm



Datasheet

Production layer	30 µm		80 µm	
Status	Without heat treatment		Without heat treatment	Dissolution annealing
Orientation	XY	Z		
Tensile strength Rm (MPa)	410	440	370	310
Yield strength Rp0,2 (MPa)	265	240	230	220
Elongation at break ε (%)	6	4	2,5	6
Density ρ (kg/m3)	2650			

Appropriate use

Good ratio between mechanical properties and density make AlSi10Mg a suitable choice for a large number of engineering applications in aerospace and automotive applications such as radiators and heat exchangers.

This material is also a suitable alternative for the rapid production of aluminium castings.

Specific applications

- topologically optimised bracket for the aerospace industry
- heat exchanger for the energy industry
- prototype of an electric motor skeleton with cooling

Tool steel 1.2709

Martensitic precipitation hardenable tool steel 1.2709 (MS1) is characterized by very high hardness, strength and yield strength. These properties can be further improved by heat treatment.

Technological specifications

Standard delivery time	10 business days
Production layer	0,04 mm
Minimum wall thickness	1 mm
Max. part's dimensions	390 x 390 x 390 mm



Datasheet

Status	Without heat treatment		Precipitation hardening	
Orientation	XY	Z	XY	Z
Tensile strength Rm (MPa)	1200	1200	2060	2080
Yield strength Rp0,2 (MPa)	1020	1050	1990	2010
Elongation at break ε (%)	13	11	4	3
Rockwell HRC hardness	36-37		50-57	
Density ρ (kg/m3)	8000 - 8100			

Appropriate use

Typically in molds for injection molding, where the potential of additive manufacturing can be used to advantage to create internal conformal cooling cavities.

As a result of its excellent mechanical properties, this material is used in a wide range of engineering applications.

Specific applications

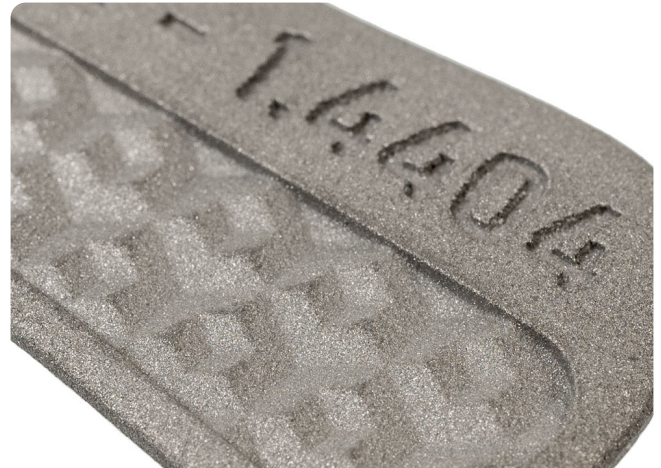
- mold insert including conformal cooling for injection molding tool
- components with high strength, hardness and abrasion resistance requirements
- prototypes of sheet metal seat parts for the automotive industry

Stainless steel 1.4404

This stainless austenitic steel is characterized by increased resistance to corrosion in a chloride environment due to its increased molybdenum content. Stainless steel 1.4404, also referred to as 316L, is characterized by high strength, ductility, toughness and heat resistance.

Technological specifications

Standard delivery time	10 business days
Production layer	0,04 - 0,08 mm
Minimum wall thickness	1 mm
Max. part's dimensions	390 x 390 x 390 mm



Datasheet

Status	Without heat treatment	
Orientation	XY	Z
Tensile strength Rm (MPa)	650	590
Yield strength Rp0,2 (MPa)	550	490
Elongation at break ϵ (%)	40	45
Rockwell HRB hardness	85	
Density ρ (kg/m3)	7900	

Appropriate use

Due to its excellent corrosion resistance, this material is widely used in the food, chemical, shipbuilding or medical industries.

One of the most commonly used steels. Steel 316L is suitable for applications where maximum corrosion resistance is required.

Specific applications

- heat shield for the energy industry
- product prototypes for the food industry
- products for the chemical and pharmaceutical industry

Metal materials comparison (without heat treatment)

Material	Slitina AISi10Mg		Nástrojová ocel 1.2709		Nerezová ocel 1.4404	
Standard production layer (μm)	80		40		80	
Orientation	XY	Z	XY	Z	XY	Z
Tensile strength R _m (MPa)	370	310	1200	1200	650	590
Yield strenght R _{p0,2} (Mpa)	230	220	1020	1050	550	490
Elongation at break ε (%)	2,5 - 6		13	11	40	45
Density ρ (kg/m3)	2650		8000 - 8100		7900	
Minimum wall thickness	1 mm		1 mm		1 mm	
Maximum part's dimensions	390 x 390 x 390 mm					
Alternative production layer (μm)	30		-		40	