SELECTIVE LASER SINTERING

Nylon PA12 (EOS PA 2200)

Engineering-Grade Thermoplastic for Production Parts



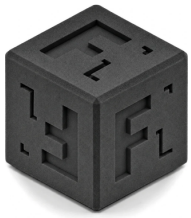
Nylon PA12 is a production-grade SLS 3D printing material valued for its strength, durability, dimensional stability, and chemical resistance. It is widely used for functional prototypes, end-use components, and repeatable low-volume production parts that need reliable mechanical performance and complex geometry freedom. EOS PA 2200 is the grade for medical, food-handling and electrical parts. It is tested for biocompatibility, made from food-contact-grade powder and electrically insulating, so device casings, food-handling components and electrical housings can be made in the same strong, durable nylon.

SURFACE FINISHES



Standard Finish Natural White

Parts are depowdered by media blasting to a fine-textured matte finish in bright white. The surface is durable and uniform with well-defined detail, though the porous nature of PA12 leaves a slightly rough feel that post-processing can improve.



Deep Color Dye Enhanced Finish

DyeMansion deep colour dyeing gives a rich, uniform colour across the entire part, even on complex geometries and intricate designs. The dye also improves scratch resistance, making parts more durable in handling and use.



Vapour Finishing Smoothed Surface

Parts are sealed inside and out on a DyeMansion Powerfuse S, including channels and cavities, for a smooth, semi-gloss surface close to injection molding. Sealed parts repel water, wash clean and slide with less friction, while fine details soften slightly. Finished parts are suitable for repeated food contact under FDA regulations.



Performance Paint Premium Finish

A highly durable, automotive-grade coating, hand-finished for smooth surfaces and applied with professional-grade equipment for exceptional adhesion. It comes in matte to semi-gloss, with custom colour matching for parts that need specific branding or visual impact.

BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
340 × 340 × 600 mm	2-4 business days	0.06–0.10 mm	±0.3% (min ±0.3 mm)

MECHANICAL PROPERTIES

Nylon PA12 delivers dependable strength and impact resistance, giving teams a proven SLS baseline for production-ready aerospace, automotive and industrial applications. Its balanced mechanical profile handles demanding load conditions without turning brittle in critical parts.

It holds its dimensions over time and keeps its integrity under repeated stress and changing temperatures, which suits aircraft ducting and brackets, automotive fuel lines and air ducts, and medical prosthetics and surgical guides that need precise geometry and tight tolerances.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength (X / Y / Z)	**50 MPa**	ISO 527-1/-2
Tensile Modulus (X / Y / Z)	**1700 MPa**	ISO 527-1/-2
Elongation at Break (X / Y)	**20 %**	ISO 527-1/-2
Elongation at Break (Z)	**10 %**	ISO 527-1/-2
Flexural Modulus	**1500 MPa**	ISO 178
Flexural Strength	**58 MPa**	EN ISO 178
Charpy Impact Strength, Unnotched	**53 kJ/m²**	ISO 179/1eU
Charpy Impact Strength, Notched	**4.8 kJ/m²**	ISO 179/1eA
Izod Impact Strength, Notched	**4.4 kJ/m²**	ISO 180/1A

THERMAL PROPERTIES

Nylon PA12 maintains dimensional accuracy and mechanical properties through temperature swings and repeated thermal cycling, which suits aerospace and automotive programs, from under-hood automotive components to industrial equipment exposed to heat sources.

PROPERTY	VALUE	TEST STANDARD
Melting Point	**176 °C**	ISO 11357-1/-3
HDT @ 0.45 MPa (X / Z)	**157 / 145 °C**	ISO 75-1/-2
HDT @ 1.8 MPa (X / Z)	**64 / 57 °C**	ISO 75-1/-2
Vicat Softening Temperature, 50 N	**163 °C**	ISO 306
Thermal Conductivity	**0.13–0.14 W/m·K**	DIN 52616
Coefficient of Linear Expansion	**109 ×10⁻⁶/K**	DIN 53752-A

PHYSICAL PROPERTIES

Consistent density and surface quality keep critical features in tolerance and downstream finishing predictable. Low density makes parts lightweight yet durable, and low moisture absorption keeps them dimensionally stable in varying environmental conditions.

Minimal warpage holds tight tolerances throughout the part lifecycle, so parts meet specifications straight from the build platform and assemblies fit and finish without secondary rework.

PROPERTY	VALUE	TEST STANDARD
Part Density	**0.93 g/cm³**	ISO 1183
Shore Hardness D	**75**	ISO 7619-1
Water Absorption (23 °C, 50% RH)	**0.52 %**	DIN 53495
Water Absorption (23 °C, 96% RH)	**1.33 %**	DIN 53495

ELECTRICAL PROPERTIES

Controlled resistivity and dielectric strength suit electrical housings, connectors, insulating features and functional prototypes, and give enclosures in integrated electrical systems dependable insulation.

The dissipation factor helps evaluate dielectric losses in signal-sensitive or high-frequency use cases. The values are measured at 23 °C and 50% relative humidity.

PROPERTY	VALUE	TEST STANDARD
Volume Resistance	**10^{13}–10^{15} Ω·cm**	DIN 53482
Surface Resistance	**10^{13} Ω**	DIN 53482
Relative Permittivity	**3.8**	DIN 53483
Dielectric Strength	**92 kV/mm**	DIN 53481
Dielectric Dissipation Factor	**0.05–0.09**	DIN 53483
Comparative Tracking Index	**≥ 600**	IEC 60112

CHEMICAL PROPERTIES

Nylon PA12 was tested for six months at 20 °C and four weeks at 60 °C. It resists petrol, fuel oil, brake fluid, glycol antifreeze, acetone, sea water and strong alkalis, while strong mineral acids attack it.

Chemical ratings are screening guidance; confirm them with application-specific testing before production release.

CHEMICAL	20 °C, 6 MONTHS	60 °C, 4 WEEKS
Petrol (gasoline)	**Resistant**	**Resistant**
Fuel oil	**Resistant**	**Resistant**
Brake fluid	**Resistant**	**Resistant**
Glycol antifreeze	**Resistant**	**Resistant**
Silicone oil	**Resistant**	**Resistant**
Paraffin	**Resistant**	**Resistant**
Acetone	**Resistant**	**Resistant**
Sea water	**Resistant**	**Resistant**
Sodium hydroxide 50%	**Resistant**	**Resistant**

Ethanol 100%	**Resistant**	**Practically resistant**
Methanol	**Resistant**	**Practically resistant**
Xylene	**Resistant**	**Conditionally resistant**
Toluene	**Resistant**	**Little resistant**
Acetic acid 10%	**Resistant**	**Little resistant**
Hydrogen peroxide 30%	**Resistant**	**Not tested**
Sulfuric acid 10%	**Practically resistant**	**Little resistant**
Sodium hypochlorite 5%	**Practically resistant**	**Little resistant**
Battery acid	**Little resistant**	**Not resistant**
Hydrochloric acid 10%	**Not resistant**	**Not resistant**
Nitric acid 10%	**Not resistant**	**Not resistant**

BIOCOMPATIBILITY AND COMPLIANCE

Each status comes from the supplier's test reports and declarations for this grade, so teams can start biocompatibility and food-contact reviews from supplier data.

PA 2200 is a food-contact-grade powder under EU 10/2011, with printed test parts meeting migration limits for all foods except alcoholic foods up to hot fill, and under FDA 21 CFR 177.1500 for non-alcoholic foods. Food-contact status covers natural, undyed parts and is confirmed for the finished part's intended use. RoHS-restricted substances are not used in PA 2200, and it is rated UL 94 HB, not flame retardant.

STANDARD	STATUS
ISO 10993-5 (Cytotoxicity) No leachables released in cytotoxic concentrations	EOS tested
ISO 10993-10 (Irritation and sensitization) No signs of irritation; no sensitizing properties	EOS tested
EU 10/2011 (Food contact) Raw materials approved under EU 10/2011; printed test parts met migration limits for all foods except alcoholic foods, up to hot fill	EOS declaration
FDA 21 CFR 177.1500 Polymer composition complies for non-alcoholic foods, within the regulation’s restrictions	EOS declaration
RoHS Directive 2011/65/EU Restricted substances not intentionally used	EOS declaration
UL 94 flammability Not flame retardant; PA 2241 FR is EOS’s FAR 25.853 grade	HB

SUPPORTING DOCUMENTS

Biocompatibility and regulatory information
Food-contact declarations
Vapour finishing FDA declaration
Vapour solvent safety data sheet
RoHS declaration