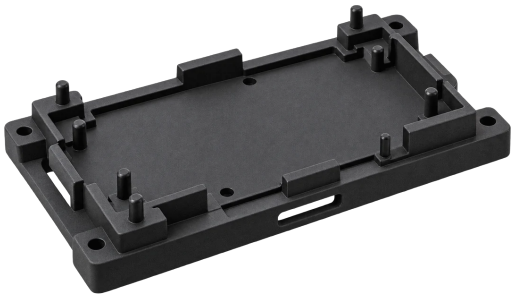
SELECTIVE LASER SINTERING

Nylon PA12 ESD

Electrostatic Dissipative Nylon with Protective Coating

Nylon PA12 with specialized ESD coating provides electrostatic discharge protection for electronics manufacturing and assembly applications. Our proven coating process ensures consistent surface resistance while maintaining the excellent mechanical properties of Nylon PA12.



BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
340 × 340 × 600 mm	**4 business days**	**0.1 mm**	**±0.3% (min ±0.3 mm)**

MECHANICAL PROPERTIES

Nylon PA12 ESD delivers dependable strength and impact resistance for PCB assembly jigs, fixtures and component handling trays. The part is tough in the build plane and more brittle across layers, so orient load paths and snap features in the plane of the build where you can.

Values are for uncoated PA 2200 test bars, as no supplier tests a coated part. Check thin walls and fine snap features on a coated sample before committing to production.

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

PA12 holds its shape at high temperature under light load but softens much sooner under heavy load, so fixtures that carry weight near ovens or other heat sources should be checked against the 1.8 MPa values. PA12 also expands noticeably with heat, so leave clearance on long fixtures that see temperature changes.

The coating service temperature describes the ESD film, not the part; for working temperature under load, use the heat deflection values. The cure row shows the coating can cure at room temperature or faster with gentle heat.

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
ESD Coating Service Temperature	**-40 to 120 °C**	MG Chemicals 844AR TDS
ESD Coating Cure	**24 h at 22 °C or 30 min at 65 °C**	MG Chemicals 844AR TDS

PHYSICAL PROPERTIES

Low density makes fixtures and trays lightweight yet durable, and low moisture absorption keeps them dimensionally stable in varying environmental conditions, so assemblies fit and finish without secondary rework.

The coating rows describe the ESD film: a dark grey, uniform finish applied at the recommended thickness, with strong adhesion on polyamide and a hard, flexible surface for everyday handling. Allow for the film on mating faces and tight fits.

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
ESD Coating Colour	**Dark grey**	MG Chemicals 844AR TDS
ESD Coating Thickness (recommended / minimum)	**50 / 30 µm**	MG Chemicals 844AR TDS
ESD Coating Adhesion on Polyamide	**5B**	ASTM D3359
ESD Coating Pencil Hardness	**H**	ISO 15184
ESD Coating Flexibility	**Excellent**	MG Chemicals 844AR TDS

ELECTRICAL PROPERTIES

The coated surface sits in the static dissipative range, so charge drains away in a controlled way rather than discharging into sensitive components.

The uncoated PA 2200 values show what sits beneath the coating: an electrical insulator with high dielectric strength. Internal features and cavities the spray cannot reach stay insulating, so plan grounding contact through a coated external face.

PROPERTY	VALUE	TEST STANDARD
Surface Resistance (ESD coating, 50 µm)	**1.2×10^{7} Ω/sq**	Calculated, MG Chemicals 844AR TDS
ESD Classification	**Permanent static dissipative**	MG Chemicals 844AR TDS
Surface Resistance (uncoated PA 2200)	**10^{13} Ω**	DIN 53482
Volume Resistance (uncoated PA 2200)	**10^{13}–10^{15} Ω·cm**	DIN 53482
Dielectric Strength (uncoated PA 2200)	**92 kV/mm**	DIN 53481
Relative Permittivity (uncoated PA 2200, 1 kHz)	**3.8**	DIN 53483
Dielectric Dissipation Factor (uncoated PA 2200)	**0.05–0.09**	DIN 53483

CHEMICAL PROPERTIES

The PA12 column shows EOS ratings for the uncoated part at room temperature. PA12 resists alkalis, alcohols, fuel oil, brake fluid and sea water, while strong mineral acids attack it, and several chemicals attack it faster when hot.

On a coated part, the acrylic coating meets the chemical first. MG Chemicals warns that paint solvents such as acetone, MEK, toluene and xylene dissolve 844AR and publishes no other resistance data for the cured coating, so test cleaning agents and process fluids on a coated sample before production release.

CHEMICAL	PA12 PART, 20 °C	ESD COATING
Acetone	**Resistant**	**Not resistant**
MEK	**Not tested**	**Not resistant**
Toluene	**Resistant**	**Not resistant**
Xylene	**Resistant**	**Not resistant**
Ethanol 100%	**Resistant**	**Not published**
Methanol	**Resistant**	**Not published**
Brake fluid	**Resistant**	**Not published**
Fuel oil	**Resistant**	**Not published**
Sea water	**Resistant**	**Not published**
Sodium hydroxide 50%	**Resistant**	**Not published**
Ammonia solution (concentrated)	**Resistant**	**Not published**
Hydrogen peroxide 30%	**Resistant**	**Not published**
Acetic acid 10%	**Resistant**	**Not published**
Sodium hypochlorite 5%	**Practically resistant**	**Not published**
Sulfuric acid 10%	**Practically resistant**	**Not published**
Hydrochloric acid 10%	**Not resistant**	**Not published**

COMPLIANCE

MG Chemicals declares the 844AR coating RoHS compliant, including the 2015/863/EU amendment, and REACH compliant with no substances of very high concern. EOS states that RoHS-restricted substances are not intentionally used in PA 2200 and that PA 2200 complies with REACH.

The PA12 base is rated UL 94 HB by EOS and is not flame retardant. MG Chemicals publishes no flammability rating for the coating.

STANDARD	STATUS
RoHS Directive 2011/65/EU 844AR coating RoHS compliant including the 2015/863/EU amendment; restricted substances not intentionally used in PA 2200	MG Chemicals and EOS declarations
REACH Regulation (EC) No 1907/2006 844AR coating contains no SVHC at reportable thresholds; PA 2200 complies with REACH	MG Chemicals and EOS declarations
UL 94 flammability EOS rating for the PA 2200 base material, which is not flame retardant	HB

MANUFACTURING

Colours & finishes	**Dark grey ESD coating; bead blasting before coating, then coating application and quality testing**
Coating coverage	**External, line-of-sight surfaces; internal features and cavities stay uncoated**

SUPPORTING DOCUMENTS

RoHS declaration