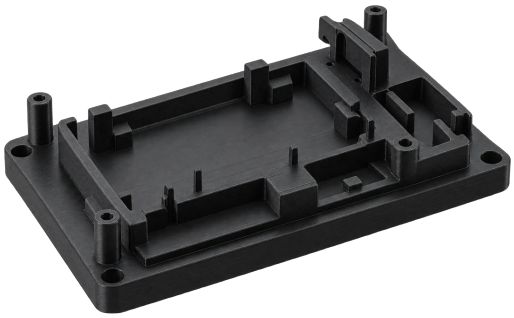
FUSED DEPOSITION MODELING

ABS-ESD7

Electrostatic Dissipative Thermoplastic for Electronics



ABS-ESD7 is an acrylonitrile butadiene styrene material with carbon additives that provide electrostatic dissipative (ESD) properties. This specialized material prevents static charge buildup, making it ideal for applications where static electricity could damage electronic components, alter magnetic media, or cause safety hazards. ABS-ESD7 will not produce static discharge or attract materials like powders, dust, and fine particles.

BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
914 × 610 × 914 mm	**2-4 business days**	**0.178-0.254 mm**	**±0.25 mm or ±0.3%, whichever is greater**

MECHANICAL PROPERTIES

ABS-ESD7 delivers dependable strength and stiffness for fixtures and handling tooling. Its balanced mechanical profile carries clamping loads and holds the precise geometries that tight-tolerance fixtures need.

FDM parts are strongest along their layers. XZ values come from specimens printed on edge and ZX values from upright specimens, so orient loaded features and clips along the build plane. Elongation and impact strength are lower than standard ABS, so fixtures that see drops or sharp blows benefit from thicker sections and generous fillets.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength, Yield (XZ)	**35.4 MPa**	ASTM D638
Tensile Strength at Break (XZ)	**33.9 MPa**	ASTM D638
Tensile Strength at Break (ZX, no yield)	**27.0 MPa**	ASTM D638
Tensile Modulus (XZ)	**2690 MPa**	ASTM D638
Tensile Modulus (ZX)	**2280 MPa**	ASTM D638
Elongation at Yield (XZ)	**2.1 %**	ASTM D638
Elongation at Break (XZ)	**3.4 %**	ASTM D638
Elongation at Break (ZX)	**1.59 %**	ASTM D638
Flexural Strength at 5% Strain (XZ, no break)	**67.5 MPa**	ASTM D790
Flexural Strength at Break (ZX)	**44.3 MPa**	ASTM D790
Flexural Modulus (XZ)	**2410 MPa**	ASTM D790
Flexural Modulus (ZX)	**2040 MPa**	ASTM D790
Flexural Strain at Break (ZX)	**2.67 %**	ASTM D790
Compressive Yield Strength (XZ)	**95.3 MPa**	ASTM D695
Compressive Yield Strength (ZX)	**202 MPa**	ASTM D695
Compressive Modulus (XZ)	**2390 MPa**	ASTM D695
Compressive Modulus (ZX)	**2400 MPa**	ASTM D695

Izod Impact, Notched (XZ)	**36.2 J/m**	ASTM D256
Izod Impact, Notched (ZX)	**20.5 J/m**	ASTM D256
Izod Impact, Unnotched (XZ)	**198 J/m**	ASTM D4812
Izod Impact, Unnotched (ZX)	**85.4 J/m**	ASTM D4812

THERMAL PROPERTIES

Heat deflection is measured at two loads, and ABS-ESD7 holds its shape close to its glass transition temperature at both, so fixtures retain dimensional accuracy in warm production environments, from test benches to industrial equipment exposed to heat sources.

Vicat softening marks where a loaded surface begins to soften, the expansion coefficients help size clearances on fixtures that see temperature swings, and thermal conductivity and diffusivity describe how quickly heat moves through the part.

PROPERTY	VALUE	TEST STANDARD
HDT @ 0.45 MPa / 66 psi	**104.6 °C**	ASTM D648 Method B
HDT @ 1.82 MPa / 264 psi	**101.4 °C**	ASTM D648 Method B
Glass Transition Temperature (Tg)	**105.46 °C**	ASTM D7426
Vicat Softening Temperature (B/50)	**99 °C**	ASTM D1525
Coefficient of Linear Expansion (XY / XZ-ZX, −50 to 100 °C)	**63.26 / 56.15 ×10^{-6}/K**	ASTM E831
Thermal Conductivity (0–90 °C)	**0.313–0.318 W/m·K**	ASTM E1952
Thermal Diffusivity (0–90 °C)	**0.174–0.227 mm²/s**	ASTM E1952

PHYSICAL PROPERTIES

Consistent density and surface quality keep critical features in tolerance and downstream finishing predictable, so assemblies fit without secondary rework. Rockwell hardness indicates how well surfaces resist denting and scuffing on handled trays and fixtures.

The conductive additive is carbon nanotubes dispersed through the filament, which gives ABS-ESD7 its black colour.

PROPERTY	VALUE	TEST STANDARD
Specific Gravity (23 °C)	**1.07**	Stratasys MDS
Rockwell Hardness	**109.5**	ASTM D785
Conductive Additive (carbon nanotubes)	**3–10 wt%**	Stratasys SDS-400616
Colour	**Black**	Stratasys

ELECTRICAL PROPERTIES

Surface and volume resistance both sit in the static-dissipative range used for ESD-safe tooling, so charge drains through the part in a controlled way instead of discharging into sensitive components.

Very thin walls show more variation, which thicker walls or a changed build orientation correct, and faces printed against support read slightly higher. Not every geometry behaves the same, so where resistance testing is part of your ESD control program, define the test method for your own part geometry.

PROPERTY	VALUE	TEST STANDARD
Surface Resistance (all tested orientations)	**10^4–10^9 Ω**	ANSI/ESD S11.11
Volume Resistance (all tested orientations)	**10^4–10^9 Ω**	ASTM D257 / ANSI/ESD STM11.12

CHEMICAL PROPERTIES

ABS-ESD7 has no chemical resistance ratings. Its safety data sheet lists strong bases and oxidizing agents as incompatible, so keep fixtures away from caustic cleaners and oxidizing chemicals.

Treat these incompatibilities as screening guidance, and confirm cleaning agents and process fluids with application-specific testing before production release.

CHEMICAL	RATING
Strong bases	**Poor**
Oxidizing agents	**Poor**

COMPLIANCE

ABS-ESD7 is tested per ANSI/ESD S20.20, with surface and volume resistance measured by the S11.11 and STM11.12 methods, and is an ESD-compliant grade of ABS. S20.20 itself governs a facility's ESD control program rather than a material, and ABS-ESD7 fits into that program as static-dissipative tooling.

ABS-ESD7 has no flammability rating, biocompatibility data or RoHS declaration, and its safety data sheet lists no Proposition 65 chemicals.

STANDARD	STATUS
ANSI/ESD S20.20, S11.11 and STM11.12 Surface and volume resistance in the ESD-safe range (10^4–10^9 Ω) across tested orientations and build positions, with some variability in thin-walled parts; ESD properties validated by an external test laboratory	Stratasys tested

MANUFACTURING

Colours & finishes	**Black only; support removal, sanding, drilling and tapping**