FUSED DEPOSITION MODELING

ABS

Industrial-Grade FDM Thermoplastic

ABS is a high-performance thermoplastic designed for industrial FDM applications. This reliable material offers excellent mechanical properties, dimensional stability, and surface finish quality, making it ideal for functional prototypes, tooling, and end-use parts across diverse industrial applications.



BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
914 × 610 × 914 mm	**2-4 business days**	**0.127-0.330 mm**	**±0.25 mm or ±0.3%, whichever is greater**

MECHANICAL PROPERTIES

ABS delivers dependable strength and impact resistance, helping teams move from prototype to production with confidence. Its balanced mechanical profile suits jigs and fixtures, enclosures and functional prototypes.

FDM parts are strongest along their layers. XZ values come from specimens printed on edge, with the load along the layers, and ZX values from upright specimens, with the load across them, so orient loaded features, snap-fits and impact faces along the build plane.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength, Yield (XZ)	**30.8 MPa**	ASTM D638
Tensile Strength, Yield (ZX)	**27.5 MPa**	ASTM D638
Tensile Strength at Break (XZ)	**28.1 MPa**	ASTM D638
Tensile Strength at Break (ZX)	**26.8 MPa**	ASTM D638
Tensile Modulus (XZ)	**2400 MPa**	ASTM D638
Tensile Modulus (ZX)	**2300 MPa**	ASTM D638
Elongation at Yield (XZ)	**1.8 %**	ASTM D638
Elongation at Yield (ZX)	**1.7 %**	ASTM D638
Elongation at Break (XZ)	**8.1 %**	ASTM D638
Elongation at Break (ZX)	**1.8 %**	ASTM D638
Flexural Strength at 5% Strain (XZ, no break)	**58.7 MPa**	ASTM D790
Flexural Strength at Break (ZX)	**47.7 MPa**	ASTM D790
Flexural Modulus (XZ)	**2220 MPa**	ASTM D790
Flexural Modulus (ZX)	**1960 MPa**	ASTM D790
Flexural Strain at Break (ZX)	**3.4 %**	ASTM D790

Compressive Yield Strength (XZ)	**88.3 MPa**	ASTM D695
Compressive Yield Strength (ZX)	**208 MPa**	ASTM D695
Compressive Modulus (XZ)	**2200 MPa**	ASTM D695
Compressive Modulus (ZX)	**2160 MPa**	ASTM D695
Izod Impact, Notched (XZ)	**101 J/m**	ASTM D256
Izod Impact, Notched (ZX)	**32.2 J/m**	ASTM D256
Izod Impact, Unnotched (XZ)	**291 J/m**	ASTM D4812
Izod Impact, Unnotched (ZX)	**103 J/m**	ASTM D4812

THERMAL PROPERTIES

Heat deflection is measured at two loads and in two print directions. ABS holds its shape close to its glass transition temperature under both loads, so parts keep their dimensions in warm service, from shop-floor fixtures to equipment near heat sources.

Vicat softening marks where a loaded surface begins to soften, and the expansion coefficients help size clearances on assemblies that see temperature swings.

PROPERTY	VALUE	TEST STANDARD
HDT @ 0.45 MPa / 66 psi (XY / XZ)	**104.4 / 103.2 °C**	ASTM D648 Method B
HDT @ 1.82 MPa / 264 psi (XY / XZ)	**100.0 / 99.7 °C**	ASTM D648 Method B
Glass Transition Temperature (Tg, moulded plaque)	**105.2 °C**	ASTM D7426
Vicat Softening Temperature (B/50)	**99 °C**	ASTM D1525
Coefficient of Linear Expansion (XY, 40–140 °C)	**60.77 ×10^{-6}/K**	ASTM E831
Coefficient of Linear Expansion (XZ, 40–80 °C)	**58.65 ×10^{-6}/K**	ASTM E831

PHYSICAL PROPERTIES

Consistent density and surface quality keep critical features in tolerance and downstream finishing predictable. Low density makes parts lightweight yet durable, and Rockwell hardness indicates how well surfaces resist denting and scuffing on handled tooling and enclosures.

Holes that must be precise are best drilled or reamed after printing, and long bolt patterns opened or slotted in CAD, so assemblies fit within normal FDM tolerance.

PROPERTY	VALUE	TEST STANDARD
Specific Gravity (moulded plaque)	**1.05**	ASTM D792
Rockwell Hardness (literature value)	**109.5**	ASTM D785

ELECTRICAL PROPERTIES

ABS is an electrical insulator, and its volume resistivity and dielectric strength suit housings and insulating features in electrical assemblies.

Dielectric constant and dissipation factor are given at 1 kHz and 2 MHz in two print directions, which helps evaluate dielectric losses in signal-sensitive or high-frequency use cases.

PROPERTY	VALUE	TEST STANDARD
Volume Resistivity (moulded plaque)	**> 6.75×10^{14} Ω·cm**	ASTM D257
Dielectric Constant, 1 kHz (XY / XZ)	**2.64 / 2.78**	ASTM D150
Dielectric Constant, 2 MHz (XY / XZ)	**2.49 / 2.61**	ASTM D150
Dissipation Factor, 1 kHz (XY / XZ)	**0.003 / 0.005**	ASTM D150
Dissipation Factor, 2 MHz (XY / XZ)	**0.004 / 0.007**	ASTM D150
Dielectric Strength (XZ)	**100–360 V/mil**	ASTM D149 Method A

CHEMICAL PROPERTIES

ABS-M30 is rated on a relative scale for common chemical classes. It resists water, weak acids and bases, and holds up well to petroleum fuels, petroleum greases, alcohols, engine coolant and washer fluid. Resistance is limited to motor oil, brake fluid, transmission fluid, esters, aromatic hydrocarbons and strong acids, while ketones such as acetone, halogenated hydrocarbons, phenols and silicone greases attack it.

The ratings are relative rather than based on specific testing, so treat them as screening guidance and confirm them with application-specific testing before production release.

CHEMICAL	RATING
Petroleum fuels (gasoline)	**Good**
Aliphatic hydrocarbons (methane, propane, butane)	**Good**
Aromatic hydrocarbons (benzene)	**Limited**
Halogenated hydrocarbons (CFCs)	**Poor**
Ketones (acetone, MEK)	**Poor**
Alcohols (ethanol)	**Good**
Phenols	**Poor**
Esters	**Limited**
Motor oil	**Limited**
Transmission fluid	**Limited**
Brake fluid	**Limited**
Antifreeze / engine coolant	**Good**
Windshield washer fluid	**Good**
Petroleum greases	**Good**
Silicone greases and oils	**Poor**
Weak acids (pH 3–6)	**Excellent**
Strong acids (pH < 3)	**Limited**

Weak bases (pH 8–10)	**Excellent**
Strong bases (pH > 10)	**Excellent**
Deionized water	**Excellent**

COMPLIANCE

ABS-M30 is rated UL 94 HB at 2.5 mm and is not flame retardant. Aircraft interior parts that need FAR 25.853 move to ULTEM 9085.

ABS-M30 has no biocompatibility data; the biocompatible FDM grade, ABS-M30i, is a separate material.

STANDARD	STATUS
UL 94 flammability Stratasys 2015 spec sheet literature value at 2.5 mm (0.09 in), UL file E345258; not flame retardant	HB
Biocompatibility (ISO 10993 / USP Class VI) Stratasys publishes no biocompatibility data for ABS-M30; ABS-M30i is its separate biocompatible grade	No supplier data

MANUFACTURING

Colours & finishes	**Black, white, gray, dark gray, red, orange, yellow, green or blue; support removal, sanding, drilling, tapping, chemical smoothing, priming and painting**