FUSED DEPOSITION MODELING

ASA

UV-Resistant Thermoplastic for Outdoor Applications

ASA (Acrylonitrile Styrene Acrylate) is a thermoplastic known for its exceptional resistance to ultraviolet (UV) light, weather, and environmental conditions, making it ideal for outdoor applications. ASA possesses similar mechanical and thermal properties to ABS, but with enhanced UV stability and superior aesthetics. It retains colour in outdoor exposure.



BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
914 × 610 × 914 mm	**2-4 business days**	**0.127-0.508 mm**	**±0.25 mm or ±0.3%, whichever is greater**

MECHANICAL PROPERTIES

ASA delivers dependable strength and impact resistance, giving teams a proven FDM baseline for automotive exterior trim, marine hardware and outdoor equipment.

FDM parts are strongest along their layers. The XZ value is measured on specimens printed on edge and the ZX value on specimens printed upright, across the layers, so orient load-bearing features, clips and thin walls to carry load along the layers.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength, Yield (XZ / ZX)	**32.8 MPa / No yield**	ASTM D638
Tensile Strength at Break (XZ / ZX)	**31.9 / 28.3 MPa**	ASTM D638
Tensile Modulus (XZ / ZX)	**2140 / 2050 MPa**	ASTM D638
Elongation at Yield (XZ / ZX)	**2.5 % / No yield**	ASTM D638
Elongation at Break (XZ / ZX)	**5.9 / 1.8 %**	ASTM D638
Flexural Strength at 5% Strain (XZ)	**61.5 MPa**	ASTM D790, Procedure A
Flexural Strength at Break (XZ / ZX)	**No break / 51.0 MPa**	ASTM D790, Procedure A
Flexural Strain at Break (XZ / ZX)	**No break / 3.93 %**	ASTM D790, Procedure A
Flexural Modulus (XZ / ZX)	**1980 / 1760 MPa**	ASTM D790, Procedure A
Compressive Yield Strength (XZ / ZX)	**75.4 / 188 MPa**	ASTM D695
Compressive Modulus (XZ / ZX)	**2050 / 2420 MPa**	ASTM D695
Izod Impact Strength, Notched (XZ / ZX)	**43.1 / 23.8 J/m**	ASTM D256
Izod Impact Strength, Unnotched (XZ / ZX)	**285 / 91.1 J/m**	ASTM D4812

THERMAL PROPERTIES

ASA's heat resistance suits parts in sun-heated enclosures, vehicle exteriors and equipment near heat sources.

Heat deflection sits just below the glass transition, so parts hold their shape under load almost up to the softening point. Low thermal conductivity makes ASA an insulating enclosure material, and the expansion coefficient helps size clearances where large parts mount to metal.

PROPERTY	VALUE	TEST STANDARD
HDT @ 0.45 MPa (XY / XZ)	**103 / 102 °C**	ASTM D648, Method B
HDT @ 1.8 MPa (XY / XZ)	**98.2 / 97.6 °C**	ASTM D648, Method B
Glass Transition Temperature	**104 °C**	ASTM D7426 (inflection point), moulded plaque
Coefficient of Linear Expansion (XY / XZ, −50 to 90 °C)	**69.38 / 63.55 ×10^{-6}/K**	ASTM E831
Thermal Conductivity (0–90 °C)	**0.156–0.169 W/m·K**	ASTM E1952, moulded plaque (ASA Natural)
Thermal Diffusivity (0–90 °C)	**0.077–0.108 mm²/s**	ASTM E1952, moulded plaque (ASA Natural)

PHYSICAL PROPERTIES

Consistent density and surface quality keep critical features in tolerance and downstream finishing predictable, and low density keeps large parts light.

The weathering rows compare upright specimens before and after accelerated UV exposure to ASTM G154, in alternating cycles of UV light and condensation, and show how little ASA's strength changes. They were measured on a separate set of natural-colour specimens, so read these rows against each other rather than against the mechanical table.

PROPERTY	VALUE	TEST STANDARD
Specific Gravity (23 °C)	**1.08**	ASTM D792, moulded plaque
Stress at Break, Before / After 1,000 h UV (ZX)	**30.5 / 29.5 MPa**	ASTM G154 exposure; ASTM D638
Elongation at Break, Before / After 1,000 h UV (ZX)	**2.8 / 2.3 %**	ASTM G154 exposure; ASTM D638
Tensile Modulus, Before / After 1,000 h UV (ZX)	**1.82 / 1.95 GPa**	ASTM G154 exposure; ASTM D638

ELECTRICAL PROPERTIES

Volume resistivity shows how well ASA blocks leakage current through a wall, and dielectric strength how much voltage a wall withstands before it breaks down: the two values to check for electrical housings, connectors, insulating features and outdoor enclosures.

The dissipation factor helps evaluate dielectric losses in signal-sensitive or high-frequency use cases, such as covers over antennas and sensors.

PROPERTY	VALUE	TEST STANDARD
Volume Resistivity	**> 6.89×10^{14} Ω·cm**	ASTM D257, moulded plaque
Dielectric Constant, 1 kHz (XY / XZ)	**3.14 / 4.74**	ASTM D150
Dielectric Constant, 2 MHz (XY / XZ)	**2.82 / 2.83**	ASTM D150
Dissipation Factor, 1 kHz (XY / XZ)	**0.009 / 0.009**	ASTM D150

Dissipation Factor, 2 MHz (XY / XZ)	**0.022 / 0.024**	ASTM D150
Dielectric Strength (XZ / ZX)	**329 / 414 V/mil**	ASTM D149-09, Method A (Fortus 400mc, ASA Natural, 2015 Stratasys spec sheet)

CHEMICAL PROPERTIES

ASA is rated relative to other FDM materials for exposure at room temperature: excellent means unlikely to degrade in prolonged contact, and good means unlikely to degrade in short-term contact. ASA resists weak acids, bases and water, and handles fuels, coolant and washer fluid in short-term contact.

Ketones such as acetone and MEK, phenols, silicone oils and halogenated hydrocarbons attack it, and motor oil, brake fluid and transmission fluid are rated limited. Chemical ratings are screening guidance; confirm them with application-specific testing before production release.

CHEMICAL	RATING
Weak acids (pH 3–6)	**Excellent**
Strong acids (pH below 3)	**Limited**
Weak bases (pH 8–10)	**Excellent**
Strong bases (pH above 10)	**Excellent**
Deionized water	**Excellent**
Alcohol / ethanol	**Good**
Windshield washer fluid	**Good**
Antifreeze / engine coolant	**Good**
Brake fluid	**Limited**
Esters	**Limited**
Ketones (e.g. MEK, acetone)	**Poor**
Phenols	**Poor**
Petroleum fuels	**Good**
Petroleum greases	**Good**
Aliphatic hydrocarbons (e.g. propane, butane)	**Good**
Motor oil	**Limited**
Transmission fluid	**Limited**
Aromatic hydrocarbons (e.g. benzene)	**Limited**
Silicone greases / oils	**Poor**
Halogenated hydrocarbons (e.g. CFCs)	**Poor**

COMPLIANCE

Stratasys ASA carries a UL 94 HB flame classification and is not a flame-retardant grade; for flame-rated parts, choose a flame-retardant material such as ULTEM 9085.

Stratasys ASA has no food-contact or biocompatibility statement.

STANDARD	STATUS
UL 94 flammability Stratasys rating, not a flame-retardant grade	HB

MANUFACTURING

Colours & finishes	**Black, white, gray, dark gray, red, orange, yellow, green or blue, with a matte finish; support removal, sanding, vapor smoothing, painting, drilling and tapping**