FUSED DEPOSITION MODELING

Polycarbonate (Stratasys PC)

High-Performance Engineering Thermoplastic for Demanding Applications



Polycarbonate (PC) is an exceptional engineering thermoplastic renowned for its superior impact strength, heat resistance, and dimensional stability. With an impressive heat deflection temperature up to 144 °C and outstanding toughness, PC delivers dependable performance for functional prototypes, end-use parts, and manufacturing tooling that require the highest levels of mechanical integrity and thermal stability. Stratasys PC is the grade for heat-loaded tooling, fixtures and housings: it holds its shape up to 141 °C under a 1.82 MPa load and is UL 94 HB listed for horizontal and vertical builds.

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

MECHANICAL PROPERTIES

Polycarbonate delivers dependable strength and impact resistance for heat-exposed automotive components, aerospace tooling and cabin prototypes, helping teams move from prototype to production with confidence. Its balanced mechanical profile handles demanding load conditions without turning brittle in critical parts.

FDM parts are strongest along the build plane. XZ values describe parts printed on edge and ZX values parts printed upright, so orient the main load path along the layers. Polycarbonate maintains dimensional stability and integrity under repetitive stress, for parts that need precise geometries.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength, Yield (XZ)	**93.9 MPa**	ASTM D638
Tensile Strength, Yield (ZX)	**53.1 MPa**	ASTM D638
Tensile Strength, Break (XZ)	**54.1 MPa**	ASTM D638
Tensile Strength, Break (ZX)	**52.6 MPa**	ASTM D638
Tensile Modulus (XZ)	**2940 MPa**	ASTM D638
Tensile Modulus (ZX)	**2880 MPa**	ASTM D638
Elongation at Yield (XZ)	**4.8 %**	ASTM D638
Elongation at Yield (ZX)	**1.9 %**	ASTM D638
Elongation at Break (XZ)	**12 %**	ASTM D638
Elongation at Break (ZX)	**1.9 %**	ASTM D638
Flexural Strength at 5% Strain (XZ)	**144 MPa**	ASTM D790, Procedure A
Flexural Strength at Break (XZ)	**No break**	ASTM D790, Procedure A
Flexural Strength at Break (ZX)	**85.3 MPa**	ASTM D790, Procedure A
Flexural Modulus (XZ)	**3430 MPa**	ASTM D790, Procedure A

Flexural Modulus (ZX)	**2800 MPa**	ASTM D790, Procedure A
Flexural Strain at Break (XZ)	**No break**	ASTM D790, Procedure A
Flexural Strain at Break (ZX)	**3.1 %**	ASTM D790, Procedure A
Compressive Yield Strength (XZ)	**106 MPa**	ASTM D695
Compressive Yield Strength (ZX)	**106 MPa**	ASTM D695
Compressive Modulus (XZ)	**2600 MPa**	ASTM D695
Compressive Modulus (ZX)	**2560 MPa**	ASTM D695
Izod Impact, Notched (XZ)	**45.8 J/m**	ASTM D256
Izod Impact, Notched (ZX)	**30.7 J/m**	ASTM D256
Izod Impact, Unnotched (XZ)	**1930 J/m**	ASTM D4812
Izod Impact, Unnotched (ZX)	**143 J/m**	ASTM D4812

THERMAL PROPERTIES

Polycarbonate is amorphous, so it has no melting point; it softens around its glass transition, and its heat deflection temperatures sit close to it. Because it keeps its stiffness almost up to that point, parts stay dimensionally stable through temperature swings, from automotive interiors to industrial equipment exposed to heat sources.

Thermal expansion is listed by direction and temperature range. Use the range that matches the service temperature when sizing clearances and fits.

PROPERTY	VALUE	TEST STANDARD
HDT @ 0.45 MPa / 66 psi (XY / XZ)	**144.0 / 144.3 °C**	ASTM D648, Method B
HDT @ 1.82 MPa / 264 psi (XY / XZ)	**140.7 / 141.1 °C**	ASTM D648, Method B
Glass Transition Temperature (Tg, inflection point, moulded plaque)	**142.5 °C**	ASTM D7426
Coefficient of Thermal Expansion (XZ, −50 to 120 °C)	**49.2 ×10^{-6}/K**	ASTM E831
Coefficient of Thermal Expansion (XY, −50 to 30 °C)	**51.6 ×10^{-6}/K**	ASTM E831
Coefficient of Thermal Expansion (XY, 30 to 75 °C)	**35.8 ×10^{-6}/K**	ASTM E831
Coefficient of Thermal Expansion (XY, 75 to 130 °C)	**11.5 ×10^{-6}/K**	ASTM E831
Thermal Conductivity (0 to 90 °C, moulded plaque)	**0.280–0.290 W/m·K**	ASTM E1952
Thermal Diffusivity (0 to 90 °C, moulded plaque)	**0.146–0.189 mm²/s**	ASTM E1952

PHYSICAL PROPERTIES

Consistent density and surface quality keep critical features in tolerance and downstream finishing predictable. Parts meet specifications once supports are removed, and assemblies fit without secondary rework.

PROPERTY	VALUE	TEST STANDARD
Specific Gravity (23 °C, moulded plaque)	**1.20**	ASTM D792

ELECTRICAL PROPERTIES

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

Dielectric constant is given at 1 kHz and 2 MHz and dissipation factor at 2 MHz, each in two build directions; the dissipation factor helps evaluate dielectric losses in signal-sensitive or high-frequency use cases. Dielectric strength comes from an earlier Stratasys PC datasheet.

PROPERTY	VALUE	TEST STANDARD
Volume Resistivity (moulded plaque)	**> 6.78×10^{14} Ω·cm**	ASTM D257
Dielectric Constant, 1 kHz (XY / XZ)	**2.66 / 2.84**	ASTM D150
Dielectric Constant, 2 MHz (XY / XZ)	**2.53 / 2.69**	ASTM D150
Dissipation Factor, 2 MHz (XY / XZ)	**0.003 / 0.008**	ASTM D150
Dielectric Strength	**80–360 V/mil**	ASTM D149, Method A

CHEMICAL PROPERTIES

Stratasys PC is rated good against alcohol, windshield washer fluid, deionized water and weak acids and bases. Oils, greases, fuels, brake fluid, coolant, esters and strong bases are rated limited, meaning short-term exposure will likely degrade the part. Ketones, halogenated solvents, phenols, strong acids and silicone greases are rated poor and will likely attack and aggressively degrade it, and PC is susceptible to stress cracking with certain solvents.

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

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

Phenols	**Poor**
Silicone greases and oils	**Poor**

COMPLIANCE

Stratasys PC holds a UL Blue Card listing at UL 94 HB for horizontal and vertical builds. Aircraft cabin parts that must meet FAR 25.853 call for ULTEM 9085 or Antero 800NA, which carry that data.

Stratasys PC has no biocompatibility, food-contact or sterilization rating.

STANDARD	STATUS
UL 94 flammability UL Blue Card E345258: HB at 0.30–0.66 mm minimum thickness, horizontal and vertical builds	HB

MANUFACTURING

Colours & finishes	**White or black; support removal, surface finishing, painting and threading**