



EVOLV3D™ Olefin Block Copolymer (OBC)

Introduction

EVOLV3D™ OBC, a polyethylene-based 3D-printable filament, brings polyolefin properties to 3D-printed parts. This material demonstrates significantly improved warpage and printability for a polyolefin, enabling lightweight, durable parts with excellent chemical resistance.

Application

Polyolefin build material for 3D-printing

Features and Benefits

- Z-axis layer adhesion – retained properties across all print orientations
- Low density – enabling lightweight, durable parts
- Chemical resistance – stands up to several common solvents
- Low water pickup – not affected by changes in humidity
- Low warpage – faster startup and less fine tuning
- Recyclable – can be reused in future prints

Basic Printer Requirements

Direct drive extruder	Required
Enclosed printer chamber	Required
Heated bed	Required
Ventilated area	Recommended
Active cooling fan	Recommended

Recommended Print Conditions*

Nozzle Temperature	170 – 210 °C
Bed Temperature	60 – 100°C, varies based on bed
Bed Modification	Polyolefin film/tape, varies based on bed
Print Speed	10 – 30 mm/s

Recommended to print with raft or brim

*Settings are based on a 0.4 mm nozzle

General Material Properties

Test	Property	Result	Units
ASTM D792	Density	0.905	g/cm ³
ASTM 1238	Melt Flow Rate	9.5	g/10 minutes
DSC	Melting Temperature	130	°C
DSC	Glass Transition Temperature	-13	°C
ASTM D2240	Hardness	53	Shore D
N/A	Solubility	Insoluble in water	N/A

All results are typical values, not to be construed as specifications. Results may vary based on use and application.

Tensile Properties

Test	Property	Deformation Type	Print Orientation	Infill	Result	Units
ASTM D1708	Tensile Strength	Yield	XY-axis	100%	14	MPa
ASTM D1708	Elongation	Yield	XY-axis	100%	10	%
ASTM D1708	Tensile Strength	Break	XY-axis	100%	14	MPa
ASTM D1708	Elongation	Break	XY-axis	100%	700	%
ASTM D1708	Tensile Strength	Yield	Z-axis	100%	11	MPa
ASTM D1708	Elongation	Yield	Z-axis	100%	24	%
ASTM D1708	Tensile Strength	Break	Z-axis	100%	12	MPa
ASTM D1708	Elongation	Break	Z-axis	100%	480	%

All test samples were printed using a FlashForge Creator Pro with a print temperature of 200°C, bed temperature of 65°C, print speed of 20mm/s, 2 shells, and 45° infill. All results are typical values, not to be construed as specifications. Results may vary based on use and application.

Flexural Modulus Properties

Test	Property	Strain value	Print Orientation	Infill	Result	Units
ASTM D790	Flexural Modulus	1%	XY-axis	100%	244	MPa
ASTM D790	Flexural Stress	5%	XY-axis	100%	7.8	MPa
ASTM D790	Deformation	N/A	XY-axis	100%	>5	%
ASTM D790	Flexural Modulus	1%	Z-axis	100%	217	MPa
ASTM D790	Flexural Stress	5%	Z-axis	100%	6.8	MPa
ASTM D790	Deformation	N/A	Z-axis	100%	>5	%

All test samples were printed using a FlashForge Creator Pro with a print temperature of 200°C, bed temperature of 65°C, print speed of 20mm/s, 2 shells, and 45° infill. All results are typical values, not to be construed as specifications. Results may vary based on use and application.

Impact Strength Properties

Test	Property	Qualifier	Print Orientation	Infill	Result	Units
ASTM D256	Impact Strength	Notched	XY-axis	100%	347	J/m
ASTM D256	Impact Energy		XY-axis	100%	34.3	kJ/m ²
ASTM D256	Impact Strength	Notched	Z-axis	100%	352	J/m
ASTM D256	Impact Energy		Z-axis	100%	43.1	kJ/m ²

All test samples were printed using a FlashForge Creator Pro with a print temperature of 200°C, bed temperature of 65°C, print speed of 20mm/s, 2 shells, and 45° infill. All results are typical values, not to be construed as specifications. Results may vary based on use and application.



Chemical Resistance

EVOLV3D™ OBC shows excellent chemical resistance compared to common filaments

Acetone	++	Petroleum	+
Ethanol	++	Propylene Glycol	++
Ethanol (60 °C)	++	Acetic Acid (80%)	++
Isopropanol	++	Nitric Acid (10%)	++
Limonene	+	Phosphoric Acid (40%)	++
Methanol	++	Sulfuric Acid (70%)	++
Methyl Ethyl Ketone	+		

Samples were tested by immersion in solvent for 24 hours at room temperature and conditions

++ : no change in appearance, retention of mechanical properties

+ : little or no change in appearance, slight drop in mechanical properties

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