PolyMide™ CoPA

PolyMide™ CoPA is a Nylon 6/6,6 copolymer based 3D printing filament combining excellent heat resistance, mechanical properties and printability. The material exhibits near-zero warping with no heated bed/chamber required.

Physical Properties

Property	Testing method	Typical value
Density	ASTM D792 (ISO 1183, GB/T 1033)	1.12 (g/cm3 at 21.5˚C)
Glass transition temperature	DSC, 10 °C/min	67 (°C)
Vicat Softening temperature	ASTM D1525 (ISO 306 GB/T 1633)	180 (˚C)
Melt index	260 °C, 1.2 kg	12 (g/10 min)
Melting temperature	DSC, 10 °C/min	190 (˚C)
Crystallization temperature	DSC, 10 °C/min	128 (˚C)
Decomposition temperature	TGA, 20 °C/min	370 (˚C)

Tested with 3D printed specimen of 100% infill

Mechanical Properties (Dry State)

Property	Testing method	Typical value
Young's modulus (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	2223 ± 199 (MPa)
Tensile strength (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	66.2 ± 0.9 (MPa)
Elongation at break (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	9.9 ± 1.5 (%)
Bending modulus (X-Y)	ASTMD790 (ISO 178, GB/T 9341)	1667 ± 118 (MPa)
Bending strength (X-Y)	ASTMD790 (ISO 178, GB/T 9341)	97.0 ± 1.1 (MPa)
Charpy impact strength (X-Y)	ASTM D256 (ISO 179, GB/T 1043)	9.6 ± 1.4 (kJ/m^2)

All testing specimens were printed under the following conditions:
nozzle temperature = 240 °C, printing speed = 45 mm/s, build plate temperature = 80 °C, infill = 100%
All specimens were conditioned at room temperature for 24h prior to testing

Mechanical Properties (Moisture Conditioned)

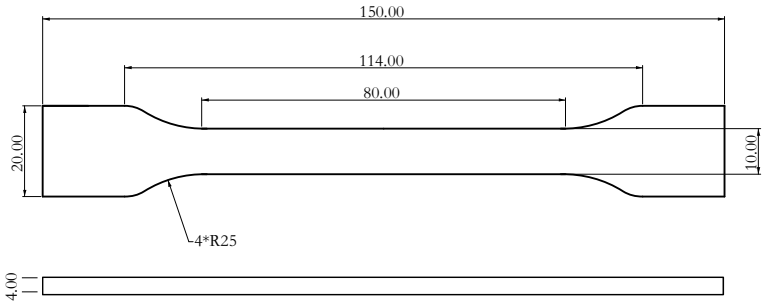
Property	Testing method	Typical value
Young's modulus (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	1053 ± 235 (MPa)
Tensile strength (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	31.4 ± 1.5 (MPa)
Elongation at break (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	216.5 ± 12.1 (%)
Bending modulus	ASTMD790 (ISO 178, GB/T 9341)	862.8 ± 133.3 (MPa)
Bending strength	ASTMD790 (ISO 178, GB/T 9341)	41.6 ± 11.6 (MPa)
Charpy impact strength	ASTM D256 (ISO 179, GB/T 1043)	17.2 ± 1.4 (kJ/m^2)

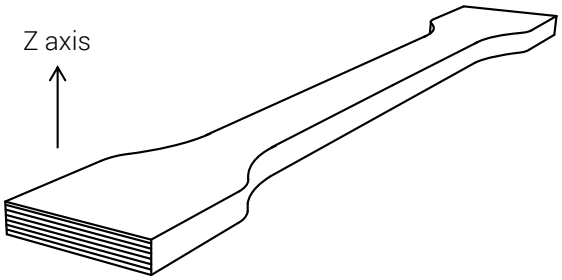
All specimens were annealed at 80 °C for 30 min, and conditioned at 50% relative humidity and ambient temperature for 15 days prior to testing

Recommended printing conditions

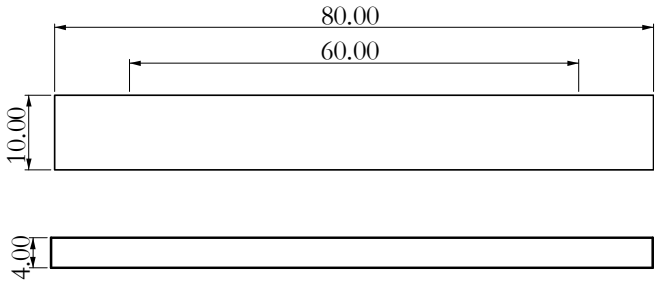
Parameter	
Nozzle temperature	250 - 265 (˚C)
Build Surface material	PA film, PI film
Build surface treatment	Applying PVA glue to the build surface
Build plate temperature	0 - 70 (˚C)
Cooling fan	Turned off
Printing speed	40 - 60 (mm/s)
Raft separation distance	0.1 - 0.2 (mm)
Retraction distance	3-6 (mm)
Retraction speed	40 - 60 (mm/s)
Recommended environmental temperature	40 - 60 (˚C)
Threshold overhang angle	55 (˚)
Recommended support material	PVA

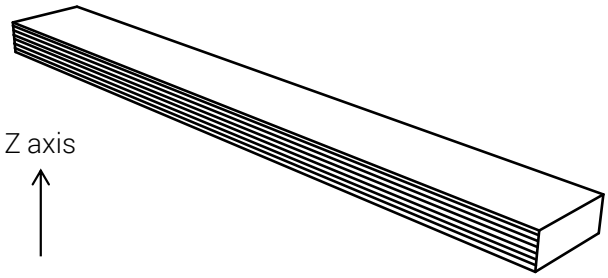
Based on 0.4 mm nozzle and Simplify 3D v.3.1. Printing conditions may vary with different nozzle diameters



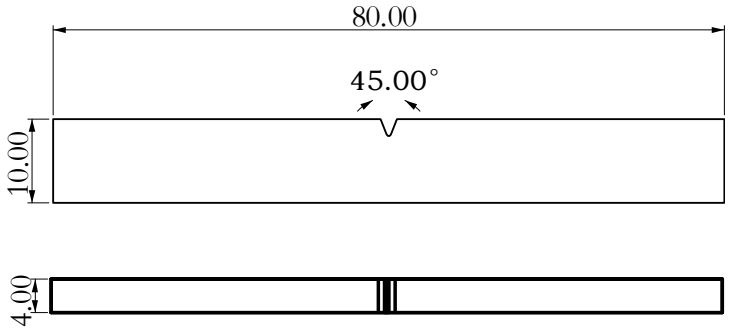


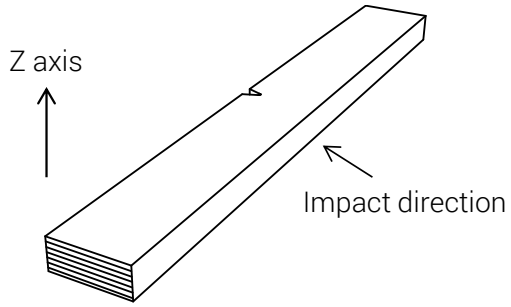
Tensile testing specimen; ASTM D638 (ISO 527, GB/T 1040)





Flexural testing specimen; ASTMD790 (ISO 178, GB/T 9341)





Impact testing specimen; ASTM D256 (ISO 179, GB/T 1043)

Disclaimer:

The typical values presented in this data sheet are intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. Actual values may vary significantly with printing conditions. End- use performance of printed parts depends not only on materials, but also on part design, environmental conditions, printing conditions, etc. Product specifications are subject to change without notice.

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