Duramic PLA

Duramic PLA is our next-gen PLA filament with improved printability features and overall printing experience.

Physical Properties

Property	Testing method	Typical value
Density	ASTM D792 (ISO 1183, GB/T 1033)	1.3 (g/cm3 at 21.5˚C)
Glass transition temperature	DSC, 10 °C/min	60.5 (°C)
Vicat Softening temperature	ASTM D1525 (ISO 306 GB/T 1633)	62.7 (˚C)
Melt index	190 °C, 2.16 kg	13 (g/10 min)
Melting temperature	DSC, 10 °C/min	162 (˚C)

Tested with 3D printed specimen of 100% infill

Mechanical Properties

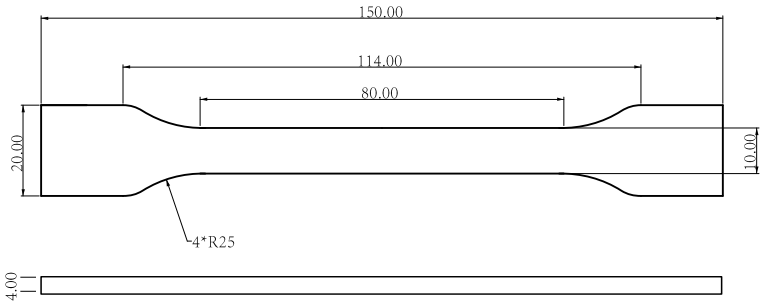
Property	Testing method	Typical value
Young's modulus (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	1882 (MPa)
Tensile strength (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	21 (MPa)
Elongation at break (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	34.5 (%)
Bending modulus (X-Y)	ASTMD790 (ISO 178, GB/T 9341)	2695 (MPa)
Bending strength (X-Y)	ASTMD790 (ISO 178, GB/T 9341)	39.6 (MPa)
Charpy impact strength (X-Y)	ASTM D256 (ISO 179, GB/T 1043)	5.7 (kJ/m^2)
Young's modulus (Z)	ASTM D638 (ISO 527, GB/T 1040)	1869 (MPa)
Tensile strength (Z)	ASTM D638 (ISO 527, GB/T 1040)	18 (MPa)
Elongation at break (Z)	ASTM D638 (ISO 527, GB/T 1040)	2.5 (%)

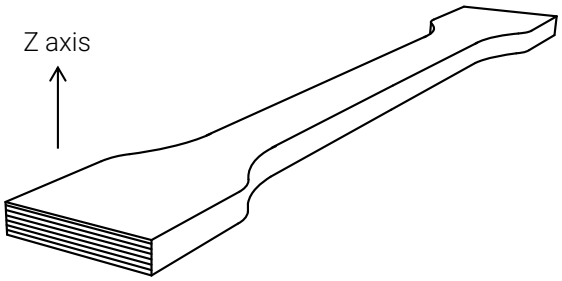
All testing specimens were printed under the following conditions:
nozzle temperature = 200 °C, printing speed = 50 mm/s, build plate temperature = 60 °C, infill = 100%
All specimens were conditioned at room temperature for 24h prior to testing

Recommended printing conditions

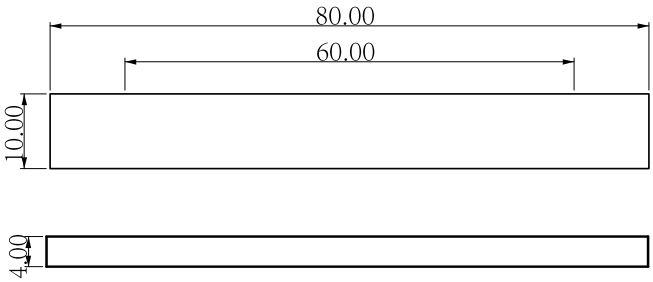
Parameter	
Nozzle temperature	190 - 230 (˚C)
Build Surface material	BuildTAK®, Glass with glue
Build plate temperature	25 -60 (˚C)
Cooling fan	Turn on
Printing speed	40- 70 (mm/s)
Raft separation distance	0.1 -0.2 (mm)
Retraction distance	1 - 3 (mm)
Retraction speed	60 (mm/s)
Recommended environmental temperature	Room temperature (˚C)
Threshold overhang angle	45 (˚C)

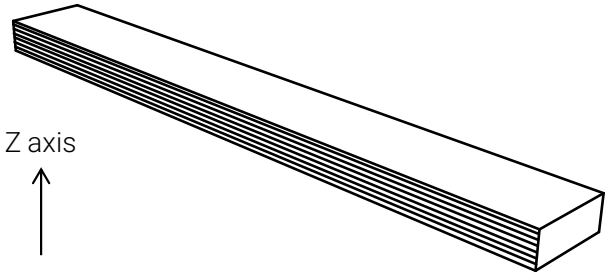
Based on 0.4 mm nozzle and Simplify 3D v.4.0. Printing conditions may vary with different nozzle diameters



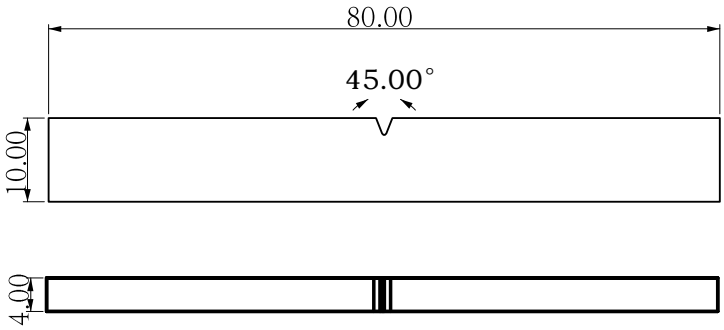


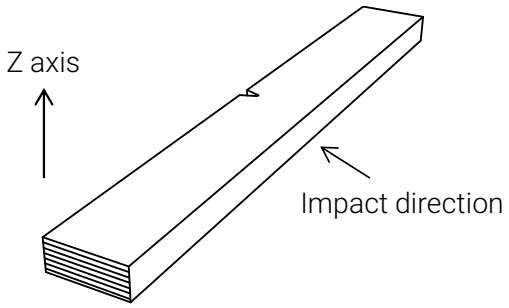
Tensile testing specimen; ASTM D638 (ISO 527, GB/T 1040)





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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