



BEDROCK 3D
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BEDROCK 3D PA

Engineering-Grade Polyamide (Nylon) for
Demanding Applications

Technical Documentation Sheet

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Technical Data Sheet

PA

Engineering-Grade Polyamide (Nylon) for Demanding Applications

BEDROCK 3D® PA is based on a copolyamide 6/66 grade with a viscosity carefully selected for additive manufacturing purposes. With BEDROCK 3D® PA, it is possible to print semi-flexible thin parts; however, it is very rigid at higher thicknesses. It has a lower melting temperature compared to PA6 and PA66, meaning it is more accessible on common 3D printers as it can be printed at a lower temperature. It also has better impact resistance versus PA6 and PA66, opening up a whole new application field for end-users.

| Filament Properties | | |
|----------------------------|-----------|-----------|
| Filament Diameter | 1.75 mm | 2.85 mm |
| Average diameter Tolerance | ±0.050 mm | ±0.075 mm |
| Average ovality | <0.050 mm | <0.075 mm |
| Available Spool size | 750 g | 750 g |
| Available colors | natural | natural |

| Spool Properties | |
|------------------|---------|
| Spool size | 750 g |
| Outer diameter | 200 mm |
| Inner diameter | 50.5 mm |
| Width | 55 mm |

| Recommended 3D-Print processing parameters | | Used for test specimens |
|--|-------------|--------------------------------------|
| Printer | FFF printer | Ultimaker S5 |
| Nozzle Temperature ¹⁾ | 220 - 270°C | 245 °C |
| Build Chamber Temperature | 60°C | Passively heated with closed chamber |
| Bed Temperature | 90 - 120°C | 90°C |

Please check your standard and/or high speed print profile availability for an easy start at www.bedrock3d.com.



| | | |
|-----------------|---|--------------------|
| Bed Material | Glass + PVA / Kapton tape / PA adhesive | Glass + Magigoo PA |
| Nozzle Diameter | 0.4 mm 0.6 mm 0.8 mm | 0.4 mm |
| Print Speed | 30 - 150 mm/s | 30 - 60 mm/s |

Recommended. Use a closed printer for best results. If no active heating is available, keep the printer enclosed and preheat the bed for ~30 minutes before printing to stabilize the chamber temperature.

Further Recommendations

Drying¹ recommendations to ensure printability 70°C in a hot dryer for 4 to 16 hours

Optimum drying¹ recommendations for best mechanical part properties 80°C in a vacuum oven for at least 40 hours.

Keep filament dry at all times to maintain consistent material properties.

| | |
|--------------------------------|---------------------------------------|
| Support material compatibility | BEDROCK 3D, single material breakaway |
|--------------------------------|---------------------------------------|

Warehousing
 BEDROCK 3D PA filament should be stored at 15 - 25°C in its originally sealed package in a clean and dry environment. If the recommended storage conditions are observed the products will have a minimum shelf life of 12 months.

¹Yellowing of polyamides can be mitigated by drying in oxygen deprived atmospheres.

| General Properties | Standard | Average Values |
|-------------------------------------|------------|------------------------|
| Printed Part Density (dry) | ISO 1183-1 | 1115 kg/m ³ |
| Printed Part Density (conditioned*) | ISO 1183-1 | 1050 kg/m ³ |

*Samples were conditioned in standard climate (80°C, 504h)

| Tensile Properties** | Standard | Average Values | | |
|--------------------------------|----------|----------------|--------------|--------------|
| | | XY-Direction | XZ-Direction | ZX-Direction |
| Tensile strength ³⁾ | ISO 527 | 61.4 MPa | - | 16.4 MPa |

³ Testing speed: 5 mm/min



| | | | | |
|-----------------------------------|---------|----------|---|----------|
| Elongation at Break ³⁾ | ISO 527 | 9.6% | - | 0.8% |
| Young's Modulus ⁴⁾ | ISO 527 | 2419 MPa | - | 2122 MPa |

**Tests performed on dry samples (50°C 16h)

| Flexural Properties ^{6) 5)**} | Standard | Average Values | | |
|--|----------|----------------|--------------|--------------|
| | | XY-Direction | XZ-Direction | ZX-Direction |
| Flexural Strength ⁶ | ISO 178 | 77 MPa | 95 MPa | 40.2 MPa |
| Flexural Modulus ⁶ | ISO 178 | 2051 MPa | 2246 MPa | 2149 MPa |
| Flexural Elongation at Break | ISO 178 | No break | No break | 1.8% |

| Impact Properties** | Standard | Average Values | | |
|---|-----------|-----------------------|------------------------|-----------------------|
| | | XY-Direction | XZ-Direction | ZX-Direction |
| Impact Strength Charpy (notched) | ISO 179-2 | 5.6 kJ/m ² | 3.3 kJ/m ² | 1.2 kJ/m ² |
| Impact Strength Charpy (notched), -30°C | ISO 179-2 | - | - | - |
| Impact Strength Charpy (unnotched) | ISO 179-2 | 23 kJ/m ² | 29.7 kJ/m ² | 3.5 kJ/m ² |
| Impact Strength Charpy (unnotched), -30°C | ISO 179-2 | - | - | - |
| Impact Strength Izod (notched) | ISO 180 | 5.8 kJ/m ² | 3.9 kJ/m ² | 1.7 kJ/m ² |
| Impact Strength Izod (unnotched) | ISO 180 | 28 kJ/m ² | 45.6 kJ/m ² | 3.2 kJ/m ² |

**Tests performed on dry samples (50°C 16h)

| Thermal Properties** | Standard | Average Values |
|-----------------------------|----------|----------------|
| HDT A at 1.8 MPa | ISO 75-2 | 57°C |
| HDT A at 1.8 MPa (annealed) | ISO 75-2 | - |
| HDT B at 0.45 MPa | ISO 75-2 | 113°C |

⁴ Testing speed: 1 mm/min

⁵ Testing speed: 2 mm/min

⁶ No break

Measured on milled specimens



BEDROCK 3D PA

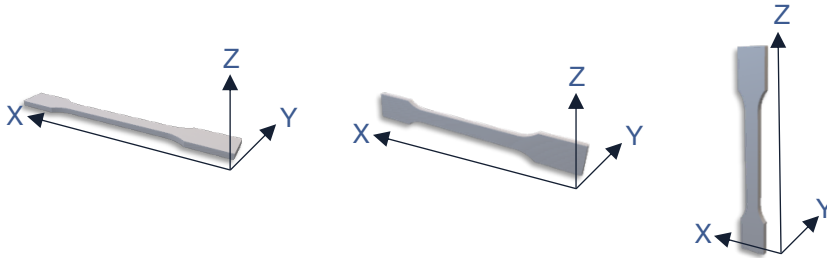
| | | |
|--|-------------|---|
| HDT B at 0.45 MPa (annealed) | ISO 75-2 | - |
| Vicat softening point at 50 N | ISO 306 | 160°C |
| Vicat softening point at 50 N (annealed) | ISO 306 | - |
| Vicat softening point at 10 N | ISO 306 | 189°C |
| Vicat softening point at 10 N (annealed) | ISO 306 | - |
| Glass Transition Temperature | ISO 11357-2 | 49°C |
| Melting Temperature | ISO 11357-3 | 195 – 197°C |
| Melt Volume-Flow Rate (MVR) | ISO 1133 | 49.5 cm ³ /10 min /3.02 in ³ /10 min (275°C, 5 kg) |
| Melt Mass-Flow Rate (MFR) | ISO 1133 | - |
| Coefficient of Thermal Expansion | ISO 11359-2 | - |

**Tests performed on dry samples (50°C 16h)



Print direction explanation

The orientation of the 3D printed part in the printer is always aligned with the longest axis first. The print direction is consistently along the Z-axis.





BEDROCK 3D PA

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Please contact us for further product information, like for example REACH, RoHS, FCS.

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Process materials in a well-ventilated room, or use professional extraction systems.