

Caverna™ PP Microporous Build Material for Additive Manufacturing

Rev 2: 9/8/23

| GENERAL INFORMATION | | | | | | | | |
|--|---|--------|------------------|--------|--------------|--------------|-----------|------------|
| Resin | Polypropylene Copolymer | | | | | | | |
| Filler | Carbohydrate | | | | | | | |
| Fill Level | 0 – 100% | | | | | | | |
| Uses | Extrusion, Injection Molding, 3D Printing | | | | | | | |
| Form | Pellets or Filament (1.75mm or 2.85mm) | | | | | | | |
| PHYSICAL PROPERTIES | PRE DISSOLUTION | | POST DISSOLUTION | | UNITS | METHOD | | |
| Specific Gravity | 1.12 | | 0.68 | | | ASTM D792 | | |
| Coefficient of Thermal Expansion | 5.8 E-05 | | 9.5E-05 | | in/in°C | ASTM D696 | | |
| Durometer | 74 D | | 28 D | | | | | |
| ELECTRICAL PROPERTIES | PRE DISSOLUTION | | POST DISSOLUTION | | UNITS | METHOD | | |
| Dissipation Factor, 1 kHz | 0.013 | | 0.002 | | | ASTM D150 | | |
| Dissipation Factor, 1 MHz | 0.021 | | 0.005 | | | ASTM D150 | | |
| Dielectric Constant, 1 kHz | 1.78 | | 1.22 | | | ASTM D150 | | |
| Dielectric Constant, 1 MHz | 1.65 | | 1.20 | | | ASTM D150 | | |
| Dielectric Strength | 670 | | 480 | | V/mil | ASTM D149 | | |
| MECHANICAL PROPERTIES | | | | | | | | |
| | Injection Molded | | X-Axis Print | | Y-Axis Print | Z-Axis Print | Units | Method |
| | Pre | Post | Pre | Post | Post | Post | | |
| Tensile Modulus | 458,800 | 49,200 | 373,600 | 21,900 | 113,000 | 12,000 | psi | ASTM D638 |
| Tensile Strength | 4,300 | 1,500 | 3,800 | 1,000 | 2,000 | 400 | psi | ASTM D638 |
| Tensile Elongation @ Break | 9.5 | 19.4 | 1.6 | 5.6 | 2.9 | 5 | % | ASTM D638 |
| Flexural Modulus | 408,800 | 54,300 | 303,900 | 39,800 | 75,300 | 13,900 | psi | ASTM D790 |
| Flexural Strength | 7,700 | 1,300 | 6,700 | 1,200 | 2,300 | 400 | psi | ASTM D790 |
| IZOD Impact, Unnotched | 15.8 | 7.56 | | | | | ft-lbf/in | ASTM D4812 |
| IZOD Impact, Notched | 0.81 | 2.28 | | | | | ft-lbf/in | ASTM D256 |
| THERMAL PROPERTIES | | | | | | | | |
| Melt Flow Index (230°C, 5 kg) | 20 °C | | | | | | | |
| Glass Transition Temperature | 80 °C | | | | | | | |
| Melting Temperature | 170 °C | | | | | | | |
| RECOMMENDED DRYING CONDITIONS (OPTIONAL) | | | | | | | | |
| Oven dry for at least 4-6 hours at 85 °C | | | | | | | | |
| RECOMMENDED MOLDING CONDITIONS | | | | | | | | |
| Barrel temperatures | 193 – 204 °C | | | | | | | |
| Mold temperatures | 21 – 49 °C | | | | | | | |

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| RECOMMENDED PRINT SETTINGS | |
|--|---|
| Extruder Inlet Temperature | 160-200°C |
| Extruder Outlet Temperature | 200-250°C |
| Chamber Temperature | Ambient to 70°C |
| Build Plate Temperature | Ambient to 100°C |
| Build Plate Material | Glass, PEI |
| Build Plate Adhesive | Optional |
| Nozzle Size (mm) | 0.8 |
| Layer Height (mm) | 0.4 |
| Print Speed (mm/s) | 30-60 |
| Post Processing | Soluble Phase Removal in Tap Water 50-80°C with Agitation |
| Feedstock Drying Conditions (Optional) | 70°C for 3-4 hours |

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