



Product Data Sheet

Somos[®] WaterClear 10110

Description

DSM's Somos[®] WaterClear 10110 is a high-speed, liquid photopolymer that produces strong, robust, and durable parts with optical clarity using stereolithography machines. This material requires a minimal post-cure by UV fluorescent light. Prolonged exposure to UV light will create a yellow tinge to the parts.

Applications

Somos[®] WaterClear 10110 photopolymer is used in the solid imaging process to build three-dimensional parts. This material is especially useful in applications requiring optical clarity such as fluid flow analysis, stress analysis and light pipes. Other applications include those that require a strong and durable product without the brittleness normally associated with a rigid stereolithography resin.

TECHNICAL DATA - LIQUID PROPERTIES

| | |
|------------|--------------------------------|
| Appearance | Optically clear, colorless |
| Viscosity | ~130 cps @ 30°C |
| Density | ~1.12 g/cm ³ @ 25°C |

TECHNICAL DATA - OPTICAL PROPERTIES

| | | |
|-----------------|------------------------|--|
| E _c | 9.0 mJ/cm ² | [critical exposure] |
| D _p | 5.75 mils | [slope of cure-depth vs. ln (E) curve] |
| E ₁₀ | 51 mJ/cm ² | [exposure that gives 0.254 mm (.010 inch) thickness] |

| TECHNICAL DATA | | | | | | | |
|-----------------------|---------------------------|--|---------------|----------------------|--------------------|---------------------------------|-------------|
| Mechanical Properties | | Somos® WaterClear 10110 UV Postcure | | ABS (Transparent) | | Polybutylene (Optical Grade) | |
| ASTM Method | Property Description | Metric | Imperial | Metric | Imperial | Metric | Imperial |
| D638M | Tensile Strength at Break | 43.4 MPa | 6.3 ksi | 45.7 MPa | 6.6 ksi | 62.5 MPa | 9.1 ksi |
| D638M | Elongation at Break | 37% | 37% | 41.6% | 41.6% | 110% | 110% |
| D638M | Elongation at Yield | 4.2% | 4.2% | N/A | N/A | 6% | 6% |
| D638M | Modulus of Elasticity | 2,040 MPa | 296 ksi | 2,000 MPa | 290 ksi | 2,300 MPa | 334 ksi |
| D790M | Flexural Strength | 57.7 MPa | 8.4 ksi | 73.5 MPa | 10.1 ksi | 94.2 MPa | 13.7 ksi |
| D790M | Flexural Modulus | 1,720 MPa | 250 ksi | 2,300 MPa | 334 ksi | 2,300 MPa | 334 ksi |
| D256A | Izod Impact (Notched) | 0.45 J/m | 0.85 ft-lb/in | 1.6 J/m | 1.5 - 2.0 ft-lb/in | 7.1 J/m | 13 ft-lb/in |
| D542 | Index of Refraction | 1.51 | 1.51 | 1.52 | 1.52 | 1.59 | 1.59 |
| D2240 | Hardness (Shore D) | 83 | 83 | N/A | N/A | N/A | N/A |
| D1004-09 | Graves Tear | 343 kg | 758 lb | N/A | N/A | N/A | N/A |
| D570-98 | Water Absorption | 0.98% | 0.98% | 0.20 - 0.45% | 0.20 - 0.45% | 0.17% | 0.17% |

| TECHNICAL DATA | | | | | | | |
|-------------------------------|----------------------------------|--|--------------|----------------------|--------------------|---------------------------------|----------------|
| Thermal/Electrical Properties | | Somos® WaterClear 10110 UV Postcure | | ABS (Transparent) | | Polybutylene (Optical Grade) | |
| ASTM Method | Property Description | Metric | Imperial | Metric | Imperial | Metric | Imperial |
| E831-05 | C.T.E. -40 - 0°C (-40 - 32°F) | 75.9 µm/m°C | 42 µin/in°F | 60 - 130 µm/m°C | 37 µin/in°F | 66 µm/m°C | 37 µin/in°F |
| E831-05 | C.T.E. 0 - 50°C (32 - 122°F) | 109.2 µm/m°C | 61 µin/in°F | | | | |
| E831-05 | C.T.E. 50 - 100°C (122 - 212°F) | 156 µm/m°C | 87 µin/in°F | | | | |
| E831-05 | C.T.E. 100 - 150°C (212 - 302°F) | 180 µm/m°C | 100 µin/in°F | | | | |
| D150-98 | Dielectric Constant 60 Hz | 3.9 | 3.9 | 3.7 | 3.7 | 3.1 | 3.1 |
| D150-98 | Dielectric Constant 1 KHz | 3.8 | 3.8 | N/A | N/A | N/A | N/A |
| D150-98 | Dielectric Constant 1 MHz | 3.5 | 3.5 | 3.7 | 3.7 | 3 | 3 |
| D149-97A | Dielectric Strength | 15.3 kV/mm | 389 V/mil | 13.8 - 19.7 kV/mm | 350 - 500 V/mil | 26.4 kV/mm | 671 V/mil |
| E1545-00 | Tg | 41°C | 106°F | N/A | N/A | 150°C | 302°F |
| D648 | HDT @ 0.46 MPa (66 psi) | 51.2°C | 124°F | 94 - 207°C | 201 - 405°F | 130°C | 266°F |
| D648 | HDT @ 1.81 MPa (264 psi) | 44.9°C | 113°F | 86.4 - 194°C | 187 - 381°F | 130°C | 266°F |

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