

Somos® 9420 EP White

**Robust, Accurate, Functional Epoxy Resin for Stereolithography
For Solid State (355 nm) Laser Systems
A White Material that Mimics Engineering Plastics**

Description

DSM Somos® 9420 is a liquid photopolymer that produces robust, functional and accurate parts using stereolithography machines. The material offers superior chemical resistance and a wide processing latitude. With mechanical properties that mimic many engineering plastics, parts created from Somos® 9420 exhibit superior fatigue properties, strong memory retention and high quality up-facing and down-facing surfaces. Somos® 9420 also offers a good balance of properties between rigidity and functionality. This material is also useful in creating parts for applications where durability and robustness are critical requirements (e.g., automobile components, electronic housings, medical products, large panels and snap-fit parts).

Application

Somos® 9420 Photopolymer is used in the solid imaging process to build three-dimensional parts.



Physical Properties – Liquid

| | |
|------------|---------------------------------|
| Appearance | White |
| Viscosity | ~475 cps at 30°C |
| Density | ~1.13 g/cm ³ at 25°C |

Optical Properties at 355 nm

| | |
|-----------------|---|
| E _c | 15.0 mJ/cm ² <small>[critical exposure]</small> |
| D _p | 0.14 mm (0.0054 inch) <small>[slope of cure-depth vs. ln(E) curve]</small> |
| E ₁₀ | 95 mJ/cm ² <small>[exposure that gives 0.254 mm (0.010 inch) thickness]</small> |

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Mechanical Properties (Metric)

| ASTM Method | Description | Somos® 9420 UV | Polypropylene* |
|-------------|-----------------------|------------------|-----------------------|
| D638M | Tensile Strength | 17 - 20 MPa | 31 - 37.2 MPa |
| | Elongation at Break | 25 - 30 % | 7 - 13% (yield) |
| | Poisson's Ratio | 0.43 | N/A |
| | Modulus of Elasticity | 553 - 850 MPa | 1,138 - 1551 MPa |
| D790M | Flexural Strength | 24 - 30 MPa | 41 - 55 MPa |
| | Flexural Modulus | 768 - 900 MPa | 1,172 MPa - 1,724 MPa |
| D256A | Izod Impact-Notched | 0.44 - 0.48 J/cm | 0.21 - 0.75 J/cm |
| D2240 | Hardness (Shore D) | 70 - 74 | N/A |
| D570-98 | Water Absorption | 0.93 % | |

* <http://www.matweb.com>

N/A: Not Available

Thermal & Electrical Properties (Metric)

| ASTM Method | Description | Somos® 9420 UV | Polypropylene* |
|-------------|--------------------------|--|---|
| E831-00 | C.T.E. -40°C – 0°C | 96.8 $\mu\text{m}/\text{m}\cdot\text{°C}$ | 50 - 146 $\mu\text{m}/\text{m}\cdot\text{°C}$ <i>(no temp range given)</i> |
| | C.T.E. 0°C – 50°C | 149.5 $\mu\text{m}/\text{m}\cdot\text{°C}$ | |
| | C.T.E. 50°C – 100°C | 178.7 $\mu\text{m}/\text{m}\cdot\text{°C}$ | |
| | C.T.E. 100°C – 150°C | 144.0 $\mu\text{m}/\text{m}\cdot\text{°C}$ | |
| D150-98 | Dielectric Constant 60Hz | 5.33 | 2.9 - 4 <i>(no frequency specified)</i> |
| | Dielectric Constant 1KHz | 4.66 | |
| | Dielectric Constant 1MHz | 3.94 | |
| D149-97a | Dielectric Strength | 14.1 kV/mm | 14.7 - 30.0 kV/mm |
| E1545-00 | Tg | 57 - 60 °C | 41 °C |
| D648-98c | HDT @ 0.46 MPa | 47 - 50 °C | 150 °C |
| | HDT @ 1.81 MPa | 36 - 38 °C | 61.3°C |

* <http://www.matweb.com>

N/A: Not Available

Mechanical Properties (Imperial)

| ASTM Method | Description | Somos® 9420 UV | Polypropylene* |
|-------------|-----------------------|-----------------------|-----------------------|
| D638M | Tensile Strength | 2,450 - 2,900 psi | 4,500 - 5,400 psi |
| | Elongation at Break | 25 - 30 % | 7 - 13 % (yield) |
| | Poisson's Ratio | 0.43 | N/A |
| | Modulus of Elasticity | 80,000 - 123,000 psi | 165,000 - 225,000 psi |
| D790M | Flexural Strength | 3,480 - 4,350 psi | 6,000 - 8,000 psi |
| | Flexural Modulus | 111,000 - 130,500 psi | 170,000 - 250,000 psi |
| D256A | Izod Impact-Notched | 0.82 - 0.90 ft lb/in | 0.4 - 1.4 ft-lb/in |
| D2240 | Hardness (Shore D) | 70 - 74 | N/A |
| D570-98 | Water Absorption | 0.93 % | |

* <http://www.matweb.com>

N/A: Not Available

Thermal & Electrical Properties (Imperial)

| ASTM Method | Description | Somos® 9420 UV | Polypropylene* |
|-------------|--------------------------|---|--|
| E831-00 | C.T.E. 10°F – 32°F | 53.8 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$ | 28 - 81 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$ <i>(no temp range given)</i> |
| | C.T.E. 32°F – 60°F | 83.0 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$ | |
| | C.T.E. 60°F – 88°F | 99.3 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$ | |
| | C.T.E. 88°F – 115°F | 80.0 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$ | |
| D150-98 | Dielectric Constant 60Hz | 5.33 | 2.9 - 4.0 <i>(no frequency specified)</i> |
| | Dielectric Constant 1KHz | 4.66 | |
| | Dielectric Constant 1MHz | 3.94 | |
| D149-97a | Dielectric Strength | 358 V/mil | 373 -762 V/mil |
| E1545-00 | Tg | 134.6 - 140 °F | 106 °F |
| D648-98c | HDT @ 66 psi | 117 - 122 °F | 302 °F |
| | HDT @ 264 psi | 97 - 100 °F | 142.3 °F |

* <http://www.matweb.com>

N/A: Not Available