

Somos[®] 9100 Epoxy Photopolymer

**Robust, Accurate, High-Speed, Functional Epoxy Resin for Stereolithography
For Single-line (351 nm) Ar⁺ Laser Systems**

Description

DSM Somos[®] 9100 is a high-speed liquid photopolymer that produces robust, functional and accurate parts using stereolithography machines. It has a wide processing latitude and excellent tolerance to a broad temperature and humidity range during and after build as well as offering superior chemical resistance. Somos[®] 9100 offers a good balance of properties between rigidity and functionality. This material is especially useful in applications where durability and robustness are critical requirements (e.g., automobile components, electronic housings, medical products, large panels and snap-fit parts).

Application

Somos[®] 9100 Photopolymer is used in the solid imaging process to build three-dimensional parts.



Physical Properties – Liquid

| | |
|------------|---------------------------------|
| Appearance | Transparent amber |
| Viscosity | ~560 cps at 30°C |
| Density | ~1.11 g/cm ³ at 25°C |

Optical Properties at 351 nm

| | |
|-----------------|----------------------------------------------------------------------------------------------|
| E _c | 6.8 mJ/cm ² <small>[critical exposure]</small> |
| D _p | 0.13 mm (0.0051 inch) <small>[slope of cure-depth vs. ln(E) curve]</small> |
| E ₅ | 18 mJ/cm ² <small>[exposure that gives 0.127 mm (.005 inch) thickness]</small> |
| E ₁₀ | 48 mJ/cm ² <small>[exposure that gives 0.254 mm (.010 inch) thickness]</small> |

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Physical Properties (Metric)

The numbers reported below are only approximate values. The actual values may vary with build conditions.

| ASTM Test | Description | Somos® 9100 UV | Polypropylene* |
|-----------|---------------------------|-------------------|-------------------|
| D638M | Tensile Strength at Yield | 27.6 - 31.7 MPa | 31 - 37.2 MPa |
| | Elongation at Yield | 14 - 17 % | 7 - 13 % |
| | Young's Modulus | 1,144 - 1,413 MPa | 1,138 - 1,551 MPa |
| D790M | Flexural Strength | 46 - 62 MPa | 41 - 55 MPa |
| | Flexural Modulus | 1,234 - 1,537 MPa | 1,172 - 1,724 MPa |
| D2240 | Hardness (Shore D) | 85 | N/A ** |
| D256A | Izod Impact - notched | 32 - 43 J/m | 21 - 75 J/m |
| D648 | Deflection Temperature | 60 - 65 °C | 107 - 121 °C |

* Unfilled polypropylene (Reference: Modern Plastics Encyclopedia, 1997)

** N/A: Not Available

Physical Properties (Imperial)

The numbers reported below are only approximate values. The actual values may vary with build conditions.

| ASTM Test | Description | Somos® 9100 UV | Polypropylene* |
|-----------|---------------------------|-----------------------|-----------------------|
| D638M | Tensile Strength at Yield | 4,000 - 4,600 psi | 4,500 - 5,400 psi |
| | Elongation at Yield | 14 - 17 % | 7 - 13 % |
| | Young's Modulus | 166,000- 205,000 psi | 165,000 - 225,000 psi |
| D790M | Flexural Strength | 6,600 - 9,000 psi | 6,000 - 8,000 psi |
| | Flexural Modulus | 179,000 - 223,000 psi | 170,000 - 250,000 psi |
| D2240 | Hardness (Shore D) | 85 | N/A ** |
| D256A | Izod Impact - notched | 0.6 - 0.8 ft-lb/in | 0.4 - 1.4 ft-lb/in |
| D648 | Deflection Temperature | 140 - 149 °F | 225 - 250 °F |

* Unfilled polypropylene (Reference: Modern Plastics Encyclopedia, 1997)

** N/A: Not Available