

# Somos® 9120 Epoxy Photopolymer

Robust, Accurate, Functional Epoxy Resin for Stereolithography  
For Solid State (355 nm) Laser Systems

## Description

DSM Somos® 9120 is a liquid photopolymer that produces robust, functional and accurate parts using stereolithography machines. The material offers superior chemical resistance, a wide processing latitude and excellent tolerance to a broad temperature and humidity range during and after build. Parts created from Somos® 9120 exhibit superior fatigue properties, strong memory retention and high quality up-facing and down-facing surfaces. Somos® 9120 also offers a good balance of properties between rigidity and functionality. The resulting part properties are ideal for master patterns in rubber molding applications. 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® 9120 Photopolymer is used in the solid imaging process to build three-dimensional parts. It is for

use with layer thicknesses of approximately 0.10 mm to 0.25 mm (0.004 inch to 0.010 inch). After part formation, via UV laser exposure, rinsing with a solvent such as tripropylene glycol monomethyl ether (TPM) or propylene carbonate followed by a rinse in 2 - propanol (isopropyl alcohol, IPA) removes the excess resin. Then the part is post-cured by UV fluorescent light.

## Physical Properties – Liquid

**Appearance** Transparent amber

**Viscosity** ~450 cps at 30°C

**Density** ~1.13 g/cm<sup>3</sup> at 25°C

## Optical Properties at 355 nm

Initial values for determining working curve for a solid state laser operating at 355 nm.

$E_C$  10.9 mJ/cm<sup>2</sup>  
[critical exposure]

$D_p$  0.14 mm (0.0056 inch)  
[slope of cure-depth vs. ln (E) curve]

$E_{10}$  65 mJ/cm<sup>2</sup>  
[exposure that gives 0.254 mm (0.010 inch) thickness]

## Physical Properties

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

ASTM Test	Description	Somos® 9120 UV		Polypropylene*	
D638M	Tensile Strength at Yield	4,400 - 4,700 psi	30 - 32 MPa	4,500 - 5,400 psi	31 - 37.2 MPa
	Elongation at Yield	15 - 25 %	15 - 25 %	7 - 13 %	7 - 13 %
	Young's Modulus	178,000 - 212,000 psi	1,227 - 1,462 MPa	165,000 - 225,000 psi	1,138 - 1,551 MPa
D790M	Flexural Strength	6,000 - 6,700 psi	41 - 46 MPa	6,000 - 8,000 psi	41 - 55 MPa
	Flexural Modulus	190,000 - 211,000 psi	1,310 - 1,455 MPa	170,000 - 250,000 psi	1,172 - 1,724 MPa
D2240	Hardness (Shore D)	80 - 82	80 - 82	N/A**	N/A**
D256A	Izod Impact - notched	0.9 - 1.0 ft-lb/in	48 - 53 J/m	0.4 - 1.4 ft-lb/in	21 - 75 J/m
D648	Deflection Temperature	126 - 142 °F	52 - 61 °C	225 - 250 °F	107 - 121 °C

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

N/A: Not Available

The ProtoFunctional™ Materials Company

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