

## Somos® ProtoGen™ O-XT 18120

**General Purpose, Accurate, Epoxy Resin for Stereolithography  
For Solid State (355 nm) Laser Systems  
A Translucent Material that Mimics Engineering Plastics**

### Description

DSM Somos® ProtoGen O-XT 18120 is a liquid photopolymer that produces accurate parts ideal for general purpose applications. ProtoGen resins are the first SL resins to demonstrate different material properties based on machine exposure control. Based on Somos oxetane chemistry, ProtoGen O-XT 18120 offers superior chemical resistance, a wide processing latitude and excellent tolerance to a broad range of temperatures and humidities, both during and after build.

### Application

This high-temperature, ABS-like photopolymer is used in the solid imaging process to build three-dimensional parts. Somos® ProtoGen O-XT 18120 provides considerable processing latitude and is ideal for the medical, electronic, aerospace and automotive markets that demand:

- Accurate RTV patterns
- Durable concept models
- Highly accurate parts
- Humidity and temperature tolerant parts

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### Physical Properties – Liquid

Appearance	Translucent
Viscosity	~300 cps at 30°C
Density	~1.16 g/cm <sup>3</sup> at 25°C

### Optical Properties at 355 nm

E <sub>c</sub>	6.38 mJ/cm <sup>2</sup> <small>[critical exposure]</small>
D <sub>p</sub>	0.12 mm (0.00457 inch) <small>[slope of cure-depth vs. ln(E) curve]</small>
E <sub>10</sub>	57.0 mJ/cm <sup>2</sup> <small>[exposure that gives 0.254 mm (0.010 inch) thickness]</small>



# Mechanical Properties (Metric)

ASTM Method	Description	Somos® 18120 UV Postcure at HOC -2	Somos® 18120 UV Postcure at HOC +3*	Somos® 18120 UV & Thermal Postcure
D638M	Tensile Strength	51.7 - 54.9 MPa	56.9 - 57.1 MPa	68.8 - 69.2 MPa
	Tensile Modulus	2,620 - 2,740 MPA	2,540 - 2,620 MPA	2,910 - 2,990 MPa
	Elongation at Break	6 - 12 %	8 - 12 %	7 - 8 %
	Poisson's Ratio	0.43 - 0.45		0.43
D790M	Flexural Strength	81.8 - 83.8 MPa	83.8 - 86.7 MPa	88.5 - 91.5 MPa
	Flexural Modulus	2,360 - 2,480 MPa	2,400 - 2,450 MPa	2,330 - 2,490 MPa
D256A	Izod Impact-Notched	0.14 - 0.26 J/cm		0.13 - 0.25 J/cm
D2240	Hardness (Shore D)	84 - 85		87 - 88
D570-98	Water Absorption	0.77 %		0.75 %

N/A: Not Available

# Thermal & Electrical Properties (Metric)

ASTM Method	Description	Somos® 18120 UV Postcure at HOC -2	Somos® 18120 UV Postcure at HOC +3*	Somos® 18120 UV & Thermal Postcure
E831-00	C.T.E. -40°C – 0°C	65.1 - 68.1 $\mu\text{m}/\text{m}\cdot\text{°C}$		63.7 - 71.8 $\mu\text{m}/\text{m}\cdot\text{°C}$
	C.T.E. 0°C – 50°C	84.7 - 95.3 $\mu\text{m}/\text{m}\cdot\text{°C}$		75.0 - 107.5 $\mu\text{m}/\text{m}\cdot\text{°C}$
	C.T.E. 50°C – 100°C	93.8 - 116.9 $\mu\text{m}/\text{m}\cdot\text{°C}$		99.4 - 111.0 $\mu\text{m}/\text{m}\cdot\text{°C}$
	C.T.E. 100°C – 150°C	147.0 - 155.4 $\mu\text{m}/\text{m}\cdot\text{°C}$		143.4 - 173.3 $\mu\text{m}/\text{m}\cdot\text{°C}$
D150-98	Dielectric Constant 60Hz	3.4-3.5		3.5 - 3.6
	Dielectric Constant 1KHz	3.3-3.4		3.4 - 3.5
	Dielectric Constant 1MHz	3.1-3.2		3.2 - 3.3
D149-97a	Dielectric Strength	14.4 - 15.3 kV/mm		15.2 - 15.7 kV/mm
E1545-00	Tg	71 - 86°C		76 - 94 °C
D648-98c	HDT@ 0.46 MPa	55 - 58°C	65 - 70 °C	95 - 97 °C
	HDT @ 1.82 MPa	48 - 50°C	53 - 54 °C	79 - 82 °C

\*The data in this column was collected from internal testing

N/A: Not Available

# Mechanical Properties (Imperial)

ASTM Method	Description	Somos® 18120 UV Postcure at HOC -2	Somos® 18120 UV Postcure at HOC +3*	Somos® 18120 UV & Thermal Postcure
D638M	Tensile Strength	7.5 - 8.0 ksi	8.2 - 8.3 ksi	9.9 - 10.0 ksi
	Tensile Modulus	381 - 397 ksi	370 - 380 ksi	422 - 433 ksi
	Elongation at Break	6 - 12 %	8 - 12 %	7 - 8 %
	Poisson's Ratio	0.43 - 0.45		0.43
D790M	Flexural Strength	11.9 - 12.2 ksi	12.2 - 12.6 ksi	13.2 ksi
	Flexural Modulus	343 - 359 ksi	350 - 355 ksi	361 ksi
D256A	Izod Impact-Notched	0.26 - 0.49 ft-lb/in		0.24 - 0.47 ft-lb/in
D2240	Hardness (Shore D)	85 - 87		87 - 88
D570-98	Water Absorption	0.77 %		0.75 %

N/A: Not Available

# Thermal & Electrical Properties (Imperial)

ASTM Method	Description	Somos® 18120 UV Postcure at HOC -2	Somos® 18120 UV Postcure at HOC +3*	Somos® 18120 UV & Thermal Postcure
E831-00	C.T.E. -40°F – 32°F	36.2 - 37.8 $\mu\text{in/in-}^\circ\text{F}$		35.4 - 39.9 $\mu\text{in/in-}^\circ\text{F}$
	C.T.E. 32°F – 122°F	47.1 - 52.9 $\mu\text{in/in-}^\circ\text{F}$		41.7 - 59.7 $\mu\text{in/in-}^\circ\text{F}$
	C.T.E. 122°F – 212°F	52.1 - 64.9 $\mu\text{in/in-}^\circ\text{F}$		55.2 - 61.7 $\mu\text{in/in-}^\circ\text{F}$
	C.T.E. 212°F – 302°F	81.7 - 86.3 $\mu\text{in/in-}^\circ\text{F}$		79.7 - 96.3 $\mu\text{in/in-}^\circ\text{F}$
D150-98	Dielectric Constant 60Hz	3.4 - 3.5		3.5 - 3.6
	Dielectric Constant 1KHz	3.3 - 3.4		3.4 - 3.5
	Dielectric Constant 1MHz	3.1 - 3.2		3.2 - 3.3
D149-97a	Dielectric Strength	365 - 387 V/mil		386 - 398 V/mil
E1545-00	T <sub>g</sub> (TMA)	160 - 187 °F		168.8 - 201.2 °F
D648-98c	HDT@ 66 psi	137 °F	149 - 158 °F	203 - 207 °F
	HDT @ 264 psi	118 - 123 °F	127 - 129 °F	175 - 180 °F

\*The data in this column was collected from internal testing

N/A: Not Available