

Somos® ProtoGen™ O-XT 18420

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

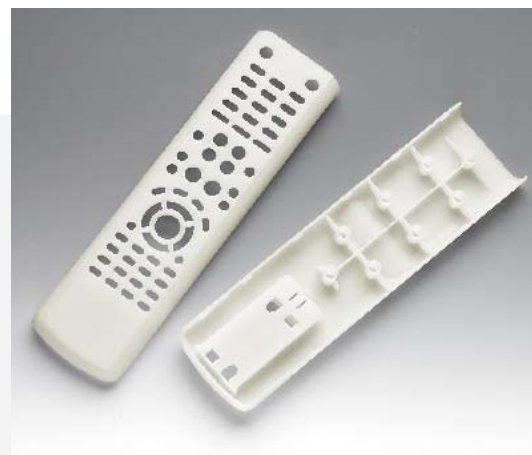
Description

DSM Somos® ProtoGen O-XT 18420 is a liquid, ABS-like, 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 18420 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 18420 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



Physical Properties – Liquid

Appearance	White
Viscosity	~350 cps at 30°C
Density	~1.16 g/cm ³ at 25°C

Optical Properties at 355 nm

E_c	6.73 mJ/cm ² <small>[critical exposure]</small>
D_p	0.11 mm (0.00434 inch) <small>[slope of cure-depth vs. ln(E) curve]</small>
E_{10}	67.6 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® 18420 UV Postcure at HOC -2	Somos® 18420 UV Postcure at HOC +3*	Somos® 18420 UV & Thermal Postcure
D638M	Tensile Strength	42.2 - 43.8 MPa	56.9 - 57.1 MPa	66.1 - 68.1 MPa
	Tensile Modulus	2,180 - 2,310 MPA	2,540 - 2,620 MPA	2,880 - 2,960 MPA
	Elongation at Break	8 - 16 %	8 - 12 %	6 - 9 %
	Poisson's Ratio	0.43 - 0.45		0.40 - 0.42
D790M	Flexural Strength	66.7 - 70.5 MPa	83.8 - 86.7 MPa	84.9 - 87.7 MPa
	Flexural Modulus	1,990 - 2,130 MPa	2,400 - 2,450 MPa	2,280 - 2,340 MPa
D256A	Izod Impact-Notched	0.20 - 0.22 J/cm		0.09 - 0.21 J/cm
D2240	Hardness (Shore D)	86 - 88		86 - 87
D570-98	Water Absorption	0.68 %		0.61%

N/A: Not Available

Thermal & Electrical Properties (Metric)

ASTM Method	Description	Somos® 18420 UV Postcure at HOC -2	Somos® 18420 UV Postcure at HOC +3*	Somos® 18420 UV & Thermal Postcure
E831-00	C.T.E. -40°C–0°C	74.6 - 75.5 $\mu\text{m}/\text{m}^{\circ}\text{C}$		67.3 - 68.2 $\mu\text{m}/\text{m}^{\circ}\text{C}$
	C.T.E. 0°C–50°C	101.2 - 110.3 $\mu\text{m}/\text{m}^{\circ}\text{C}$		82.2 - 86.4 $\mu\text{m}/\text{m}^{\circ}\text{C}$
	C.T.E. 50°C–100°C	114.4 - 135.8 $\mu\text{m}/\text{m}^{\circ}\text{C}$		110.4 - 116.0 $\mu\text{m}/\text{m}^{\circ}\text{C}$
	C.T.E. 100°C–150°C	129.5 - 138.1 $\mu\text{m}/\text{m}^{\circ}\text{C}$		152.7 - 163.2 $\mu\text{m}/\text{m}^{\circ}\text{C}$
D150-98	Dielectric Constant 60Hz	3.5 - 3.6		3.1 - 3.3
	Dielectric Constant 1KHz	3.4 - 3.5		3.1 - 3.2
	Dielectric Constant 1MHz	3.1 - 3.3		2.9 - .30
D149-97a	Dielectric Strength	13.2 - 14.2 kV/mm		13.8 - 14.1 kV/mm
E1545-00	Tg	57 - 59 °C		78 - 96 °C
D648-98c	HDT@ 0.46 MPa	53 - 56 °C	65 - 70 °C	93 - 98 °C
	HDT @ 1.82 MPa	46 - 47 °C	53 - 54 °C	74 - 78 °C

N/A: Not Available

*The data in this column was collected from internal testing

Mechanical Properties (Imperial)

ASTM Method	Description	Somos® 18420 UV Postcure at HOC -2	Somos® 18420 UV Postcure at HOC +3*	Somos® 18420 UV & Thermal Postcure
D638M	Tensile Strength	6.1 - 6.4 ksi	8.2 - 8.3 ksi	9.6 - 9.9 ksi
	Tensile Modulus	316 - 336 ksi	370 - 380 ksi	417 - 430 ksi
	Elongation at Break	8 - 16 %	8 - 12 %	5 - 9 %
	Poisson's Ratio	0.43 -0.45		0.40 - 0.42
D790M	Flexural Strength	9.7 - 10.2 ksi	12.2 - 12.6 ksi	12.3 - 12.7 ksi
	Flexural Modulus	289 - 309 ksi	350 - 355 ksi	331 - 339 ksi
D256A	Izod Impact-Notched	0.37 - 0.41 ft-lb/in		0.17 - 0.39 ft-lb/in
D2240	Hardness (Shore D)	87 - 88		86 - 87
D570-98	Water Absorption	0.68 %		0.61 %

N/A: Not Available

Thermal & Electrical Properties (Imperial)

ASTM Method	Description	Somos® 18420 UV Postcure at HOC -2	Somos® 18420 UV Postcure at HOC +3*	Somos® 18420 UV & Thermal Postcure
E831-00	C.T.E. -40°F – 32°F	41.4 - 41.9 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$		37.4 - 37.9 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$
	C.T.E. 32°F – 122°F	56.2 - 61.3 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$		45.7 - 48.0 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$
	C.T.E. 122°F – 212°F	63.6 - 75.4 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$		61.3 - 64.4 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$
	C.T.E. 212°F – 302°F	71.9 - 76.7 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$		84.8 - 90.7 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$
D150-98	Dielectric Constant 60Hz	3.5 - 3.6		3.1 - 3.3
	Dielectric Constant 1KHz	3.4 - 3.5		3.1 - 3.2
	Dielectric Constant 1MHz	3.1 - 3.3		2.9 - 3.0
D149-97a	Dielectric Strength	334 - 359 V/mil		350 - 357 V/mil
E1545-00	Tg (TMA)	135 - 138 °F		172 - 205 °F
D648-98c	HDT@ 66 psi	127 - 133 °F	149 - 158 °F	199 - 208 °F
	HDT @ 264 psi	114 - 116 °F	127 - 129 °F	166 - 173 °F

*The data in this column was collected from internal testing

N/A: Not Available