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## Product Data Sheet

# Somos<sup>®</sup> ProtoTherm 12120

### Description

DSM's Somos<sup>®</sup> ProtoTherm 12120 is a liquid photopolymer that produces strong, high-temperature tolerant, water-resistant parts. Parts created with Somos<sup>®</sup> ProtoTherm 12120 have a cherry-red appearance which turns to an orange-red color after thermal treatment.

### Applications

Somos<sup>®</sup> ProtoTherm 12120 differentiates itself from other high temperature stereolithography materials by increasing in tensile strength and maintaining decent elongation at break after thermal treatment. This makes the material ideal for many applications in the automotive and aerospace markets where strong parts that can resist high temperatures are needed.

#### TECHNICAL DATA - LIQUID PROPERTIES

Appearance	Red
Viscosity	~550 cps @ 30°C
Density	~1.15 g/cm <sup>3</sup> @ 25°C

#### TECHNICAL DATA - OPTICAL PROPERTIES

E <sub>c</sub>	11.8 mJ/cm <sup>2</sup>	[critical exposure]
D <sub>p</sub>	6.0 mils	[slope of cure-depth vs. ln (E) curve]
E <sub>10</sub>	63 mJ/cm <sup>2</sup>	[exposure that gives 0.254 mm (.010 inch) thickness]

TECHNICAL DATA					
Mechanical Properties		Somos® ProtoTherm 12120 UV Postcure		Somos® ProtoTherm 12120 Thermal Postcure	
ASTM Method	Property Description	Metric	Imperial	Metric	Imperial
D638M	Tensile Strength	70.2 MPa	10.2 ksi	77.0 MPa	11.2 ksi
D638M	Elongation at Break	4.0%	4.0%	4.5%	4.5%
D638M	Modulus of Elasticity	3,520 MPa	511 ksi	3,250 MPa	471 ksi
D790M	Flexural Strength	109 MPa	15.8 ksi	103 MPa	15 ksi
D790M	Flexural Modulus	3,320 MPa	482 ksi	3,060 MPa	444 ksi
D256A	Izod Impact (Notched)	0.12 J/cm	0.22 ft-lb/in	0.17 J/cm	0.32 ft-lb/in
D2240	Hardness (Shore D)	85.3	85.3	86.7	86.7
D570-98	Water Absorption	0.37%	0.37%	0.24%	0.24%

TECHNICAL DATA					
Thermal/Electrical Properties		Somos® ProtoTherm 12120 UV Postcure		Somos® ProtoTherm 12120 Thermal Postcure	
ASTM Method	Property Description	Metric	Imperial	Metric	Imperial
E831-05	C.T.E. -40 - 0°C (-40 - 32°F)	58.1 µm/m°C	32 µin/in°F	56.7 µm/m°C	32 µin/in°F
E831-05	C.T.E. 0 - 50°C (32 - 122°F)	80.7 µm/m°C	45 µin/in°F	66.3 µm/m°C	37 µin/in°F
E831-05	C.T.E. 50 - 100°C (122 - 212°F)	111.4 µm/m°C	62 µin/in°F	92.7 µm/m°C	52 µin/in°F
E831-05	C.T.E. 100 - 150°C (212 - 302°F)	136.1 µm/m°C	76 µin/in°F	158.7 µm/m°C	88 µin/in°F
D150-98	Dielectric Constant 60 Hz	4.14	4.14	3.89	3.89
D150-98	Dielectric Constant 1 KHz	4.04	4.04	3.84	3.84
D150-98	Dielectric Constant 1 MHz	3.81	3.81	3.53	3.53
D149-97A	Dielectric Strength	15.5 kV/mm	394 V/mil	16.4 kV/mm	417 V/mil
E1545-00	Tg	74°C	165°F	111°C	232°F
D648	HDT @ 0.46 MPa (66 psi)	56.5°C	134°F	126.2°C	259°F
D648	HDT @ 1.81 MPa (264 psi)	51.9°C	125°F	110.7°C	231°F

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