

# ProtoGen™ 18920

a DSM Product

## Product Description

DSM Somos® ProtoGen™ 18920 is a liquid photopolymer that produces accurate, ABS-like parts ideal for general purpose applications. ProtoGen resins are the first stereolithography resins to demonstrate different material properties based on machine exposure control. Based on Somos Oxetane™ chemistry, ProtoGen 18920 offers superior chemical resistance, a wide processing latitude and excellent tolerance to a broad range of temperatures and humidities, both during and after build.

## Applications

This high-temperature resistant, ABS-like photopolymer is used in solid imaging processes, like stereolithography, to build three-dimensional parts. Somos ProtoGen 18920 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 humidity & temperature resistant parts.

## Technical Data: Liquid Properties

Appearance	Gray
Viscosity	~350 cps @ 30°C
Density	1.16 g/cm <sup>3</sup> @ 25°C

## Technical Data: Optical Properties

E <sub>c</sub>	7.0 mJ/cm <sup>2</sup>	[critical exposure]
D <sub>p</sub>	4.20 mils	[slope of cure-depth vs. ln(E) curve]
E <sub>10</sub>	76 mJ/cm <sup>2</sup>	[exposure that gives 0.254 mm (.010 inch) thickness]



ProtoGen™ 18920 is a liquid, photopolymer that produces accurate parts ideal for general purpose applications.

## Key Product Benefits:

- Humidity & Temperature Tolerant
- Excellent Dimensional Stability
- Fast Processing Speeds

(continued)

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Rev Date: 10/09

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## Technical Data: Mechanical Properties

		ProtoGen™ 18920 UV Postcure		ProtoGen™ 18920 UV Postcure at HOC +3*		ProtoGen™ 18920 UV & Thermal Postcure	
ASTM Method	Property Description	Metric	Imperial	Metric	Imperial	Metric	Imperial
D638M	Tensile Strength	46.6 – 47.8 MPa	6.8 – 6.9 ksi	56.1 – 56.9 MPa	8.1 – 8.3 ksi	69.2 – 69.6 MPa	10.0 – 10.1 ksi
D638M	Tensile Modulus	2,103 – 2,317 MPa	305.0 – 336.0 ksi	2,577 – 2,623 MPa	373.7 – 380.4 ksi	2,544 – 2,916 MPa	369.0 – 423.0 ksi
D638M	Elongation at Break	13 - 19%	13 - 19%	5 – 12%	5 – 12%	4 – 9 %	4 – 9.0 %
D638M	Poisson's Ratio	N/A	N/A	N/A	N/A	N/A	N/A
D790M	Flexural Strength	73.0 – 75.0 MPa	10.6 – 10.9 ksi	85.0 – 87.0 MPa	12.3 – 12.6 ksi	92.1 – 98.1 MPa	13.4 – 14.2 ksi
D790M	Flexural Modulus	2,126 – 2,314 MPa	308.3 – 335.6 ksi	2,442 – 2,518 MPa	354.2 – 365.2 ksi	2,504 – 2,696 MPa	363.1 – 391.0 ksi
D2240	Hardness (Shore D)	85 – 86	85 – 86	86 – 87	86 – 87	86 – 88	86 – 88
D256A	Izod Impact-Notched	0.18 – 0.28 J/cm	0.26 - 0.52 ft-lb/in	0.22 - 0.26 J/cm	0.41 – 0.49 ft-lb/in	0.20 – 0.24 J/cm	0.37 – 0.45 ft-lb/in
D570-98	Water Absorption	0.78%	0.78%	0.74%	0.74%	0.38 %	0.38 %

## Technical Data: Thermal/Electrical Properties

		ProtoGen™ 18920 UV Postcure		ProtoGen™ 18920 UV Postcure at HOC +3*		ProtoGen™ 18920 UV & Thermal Postcure	
E831-05	C.T.E. -40°C - 0°C (-40°F – 32°F)	69.4 µm/m°C	38.6 µin/in°F			64.7 µm/m°C	35.9 µin/in°F
E831-05	C.T.E. 0°C - 50°C (32°F – 122°F)	74.0 µm/m°C	41.1 µin/in°F			74.2 µm/m°C	41.2 µin/in°F
E831-05	C.T.E. 50°C - 100°C (122°F – 212°F)	106.0 µm/m°C	58.9 µin/in°F			79.2 µm/m°C	44.0 µin/in°F
E831-05	C.T.E. 100°C - 150°C (212°F – 302°F)	130.3 m/m°C	72.4 µin/in°F			138.8 µm/m°C	77.1 µin/in°F
D150-98	Dielectric Constant 60 Hz	3.53	3.53			3.28	3.28
D150-98	Dielectric Constant 1KHz	3.44	3.44			3.23	3.23
D150-98	Dielectric Constant 1MHz	3.21	3.21			3.04	3.04
D149-97a	Dielectric Strength	15.4 – 15.9 kV/mm	391 - 403 V/mil			14.3 – 15.2 kV/mm	364 – 386 V/mil
E1545-00	Tg	69.0°C	156°F			97.5°C	208°F
D648	HDT @ 0.46 MPa (66 psi)	58.7°C	137°F	62.8°C	145°F	96.5°C	205°F
D648	HDT @ 1.81 MPa (264 psi)	51.0°C	123°F	53.3°C	128°F	78.6°C	175°F

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

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