

Product Data

Somos[®] NanoTool

Description

DSM's Somos[®] NanoTool produces strong, stiff, high-temperature resistant composite parts on conventional stereolithography machines. This material is heavily filled with non-crystalline nanoparticles allowing for faster processing. It exhibits superior sidewall quality, along with excellent detail resolution compared to other composite stereolithography materials.

Applications

Somos[®] NanoTool's smooth surface quality and high initial modulus make it an excellent resin for metal plating—a growing application which saves time and money as an alternative to metal prototypes. It's also ideal for creating strong, stiff parts with excellent high heat resistance, including wind tunnel models for aerospace and automotive applications, as well as rapid tooling for injection molding.

TECHNICAL DATA - LIQUID PROPERTIES

Appearance	Off White
Viscosity	~2,500 cps @ 30°C
Density	~1.65 g/cm ³ @ 25°C

TECHNICAL DATA - OPTICAL PROPERTIES

E _c	8.3 mJ/cm ²	[critical exposure]
D _p	4.3 mils	[slope of cure-depth vs. ln (E) curve]
E ₁₀	84 mJ/cm ²	[exposure that gives 0.254 mm (.010 inch) thickness]

TECHNICAL DATA					
Mechanical Properties		Somos® NanoTool UV Postcure		UV & Thermal Postcure	
ASTM Method	Property Description	Metric	Imperial	Metric	Imperial
D638M	Tensile Strength	61.7 - 78.0 MPa	8.9 - 11.3 ksi	66.3 - 80.3 MPa	9.6 - 11.6 ksi
D638M	Tensile Modulus	11,000 - 11,400 MPa	1,590 - 1,650 ksi	10,400 - 11,200 MPa	1,510 - 1,620 ksi
D638M	Elongation at Break	0.7 - 1.0%	0.7 - 1.0%	0.7 - 1.0%	0.7 - 1.0%
D638M	Poisson's Ratio	0.34 - 0.38	0.34 - 0.38	0.29 - 0.36	0.29 - 0.36
D790M	Flexural Strength	79 - 121 MPa	11.5 - 17.5 ksi	103 - 149 MPa	14.9 - 21.6 ksi
D790M	Flexural Modulus	10,200 - 10,800 MPa	1,480 - 1,570 ksi	9,960 - 10,200 MPa	1,440 - 1,480 ksi
D256A	Izod Impact (Notched)	0.12 - 0.15 J/cm	0.23 - 0.29 ft-lb/in	0.14 - 0.16 J/cm	0.26 - 0.31 ft-lb/in
D2240	Hardness (Shore D)	94	93 - 95	94	93 - 94
D570-98	Water Absorption	0.23%	0.23%	0.15 - 0.16%	0.15 - 0.16%

TECHNICAL DATA					
Thermal/Electrical Properties		Somos® NanoTool UV Postcure		UV & Thermal Postcure	
ASTM Method	Property Description	Metric	Imperial	Metric	Imperial
E831-05	C.T.E. -40 - 0°C (-40 - 32°F)	25.3 - 26.0 µm/m°C	14.1 - 14.4 µin/in°F	25.0 - 25.7 µm/m°C	13.9 - 14.3 µin/in°F
E831-05	C.T.E. 0 - 50°C (32 - 122°F)	30.4 - 32.4 µm/m°C	16.9 - 18.0 µin/in°F	25.5 - 31.3 µm/m°C	14.2 - 17.4 µin/in°F
E831-05	C.T.E. 50 - 100°C (122 - 212°F)	75.9 - 87.4 µm/m°C	42.2 - 48.6 µin/in°F	57.0 - 58.9 µm/m°C	31.7 - 32.7 µin/in°F
E831-05	C.T.E. 100 - 150°C (212 - 302°F)	90.0 - 95.7 µm/m°C	50.1 - 53.2 µin/in°F	95.2 - 99.6 µm/m°C	52.9 - 55.3 µin/in°F
D150-98	Dielectric Constant 60 Hz	4.0	4.0	3.9	3.9
D150-98	Dielectric Constant 1 KHz	3.9	3.8 - 3.9	3.8	3.8
D150-98	Dielectric Constant 1 MHz	3.6	3.6 - 3.7	3.6	3.6
D149-97A	Dielectric Strength	15.6 - 16.8 kV/mm	396 - 427 V/mil	16.1 - 16.9 kV/mm	408 - 428 V/mil
E1545-00	Tg	57 - 62°C	135 - 144°F	86 - 89°C	187 - 192°F
D648	HDT @ 0.46 MPa (66 psi)	225°C	437°F	258 - 263°C	496 - 506°F
D648	HDT @ 1.81 MPa (264 psi)	85 - 90°C	185 - 193°F	104°C	220°F

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