

WaterShed® 11110

Durable, strong, semi-transparent, water-resistant resin for stereolithography
For Helium Cadmium (325 nm) Laser Systems

Description

DSM Somos® 11110 is a low viscosity liquid photopolymer that produces strong, tough, water-resistant parts. Parts created with Somos® 11110 have a light green tinge, similar in color to plate glass.

Application

Somos® 11110 offers many properties that mimic traditional engineering plastics including ABS and PBT. This makes the material ideal for many applications in the automotive, medical and consumer electronics markets and include:

- Water flow analysis
- RTV patterns
- Durable concept models
- Wind tunnel testing



"The Noom" © 2000
Bathsheba Grossman

Physical Properties – Liquid

Appearance	Optically clear
Viscosity	~92 cps at 30°C
Density	~1.12 g/cm ³ at 25°C

Optical Properties at 325 nm

E_c	~11.5 mJ/cm ² [critical exposure]
D_p	5.45 mils [slope of cure-depth vs. ln(E) curve]
E_{10}	72 mJ/cm ² [exposure that gives 0.254 mm (.010 inch) thickness]



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Mechanical Properties (Metric)

ASTM Method	Description	WaterShed™ 11110	ABS* (transparent)	Polybutylene Terephthalate*
D638M	Tensile Strength	48.3 MPa	45.7 MPa	55 MPa
	Elongation at Break	25 %	41.6 %	20 %
	Elongation at Yield	3.4 %	N/A	3.5 - 9 %
	Modulus of Elasticity	2,640 MPa	2,000 MPa	2,700 MPa
D790M	Flexural Strength	63.7 MPa	73.5 MPa	80 MPa
	Flexural Modulus	2,140 MPa	2,300 MPa	2,500 MPa
D256A	Izod Impact-Notched	0.193 J/cm	1.6 J/cm	1.2 J/cm
D542	Index of Refraction	N/A	1.52	N/A
D2240	Hardness (Shore D)	N/A	N/A	98 - 120 (Rockwell R)
D1004	Graves Tear	132,746 N/m	N/A	N/A
D570-98	Water Absorption	0.35 %	0.20 – 0.45 %	0.16 %

* <http://www.matweb.com>

N/A: Not Available

Thermal & Electrical Properties (Metric)

ASTM Method	Description	WaterShed™ 11110	ABS* (transparent)	Polybutylene Terephthalate*
E831-00	C. T. E. -40°C – 0°C	68.6 $\mu\text{m}/\text{m}^\circ\text{C}$	60 – 130 $\mu\text{m}/\text{m}^\circ\text{C}$ (notemprangegiven)	50 - 145 $\mu\text{m}/\text{m}^\circ\text{C}$ (notemprangegiven)
	C. T. E. 0°C – 50°C	103.9 $\mu\text{m}/\text{m}^\circ\text{C}$		
	C. T. E. 50°C – 100°C	186.8 $\mu\text{m}/\text{m}^\circ\text{C}$ ¹		
	C. T. E. 100°C – 150°C	176.6 $\mu\text{m}/\text{m}^\circ\text{C}$		
D150-98	Dielectric Constant 60Hz	3.5	3.7	2.9 - 4.0 (no frequency specified)
	Dielectric Constant 1KHz	3.5		
	Dielectric Constant 1MHz	3.2	3.7	
D149-97a	Dielectric Strength	2,995 kV/mm	13.8 – 19.7 kV/mm	14.7 - 30 kV/mm
E1545-00	Tg	41 °C		41 °C
D648-98c	HDT @ 0.46 MPa	49.6 °C	94 – 207 °C	150 °C
	HDT @ 1.81 MPa	46.2 °C	86.4 – 194 °C	61.3 °C

* <http://www.matweb.com>

N/A: Not Available

Mechanical Properties (Imperial)

ASTM Method	Description	WaterShed™ 11110	ABS* (transparent)	Polybutylene Terephthalate*
D638M	Tensile Strength	7,005 psi	6,628 psi	7977 psi
	Elongation at Break	25 %	41.6 %	20 %
	Elongation at Yield	3.4 %	N/A	3.5 - 9 %
	Modulus of Elasticity	382,900 psi	290,000 psi	391,602 psi
D790M	Flexural Strength	9,239 psi	10,660 psi	11,603 psi
	Flexural Modulus	310,381 psi	344,000 psi	362,594 psi
D256A	Izod Impact-Notched	0.362 ft lb/in	1.5 - 2.0 ft lb/in	0.56 ft lb/in
D542	Index of Refraction	N/A	1.52	N/A
D2240	Hardness (Shore D)	N/A	N/A	98 - 120 (Rockwell R)
D1004	Graves Tear	758 lbf/in	N/A	N/A
D570-98	Water Absorption	0.35 %	0.2 - 0.45 %	0.16 %

* <http://www.matweb.com>

N/A: Not Available

Thermal & Electrical Properties (Imperial)

ASTM Method	Description	WaterShed™ 11110	ABS* (transparent)	Polybutylene Terephthalate*
E831-00	C. T. E. 10°F – 32°F	38 µin/in-°F	33 – 72 µin/in-°F (notemprangegiven)	28 - 81 µin/in-°F (notemprangegiven)
	C. T. E. 32°F – 60°F	58 µin/in-°F		
	C. T. E. 60°F – 88°F	104 µin/in-°F		
	C. T. E. 88°F – 115°F	98 µin/in-°F		
D150-98	Dielectric Constant 60Hz	3.5	3.7	2.9 - 4.0 (no frequency specified)
	Dielectric Constant 1KHz	3.5		
	Dielectric Constant 1MHz	3.2	3.7	
D149-97a	Dielectric Strength	17.1 V/mil	350 - 500 V/mil	373 -762 V/mil
E1545-00	Tg	106 °F		106 °F
D648-98c	HDT @ 0.46 MPa	121 °F	201 - 405 °F	302 °F
	HDT @ 1.81 MPa	115 °F	187 - 381 °F	142.3 °F

* <http://www.matweb.com>

N/A: Not Available