

# WaterShed® XC 11112

Clear, near colorless, durable, water-resistant resin for Stereolithography  
For Helium Cadmium (325 nm) Laser Systems

## Description

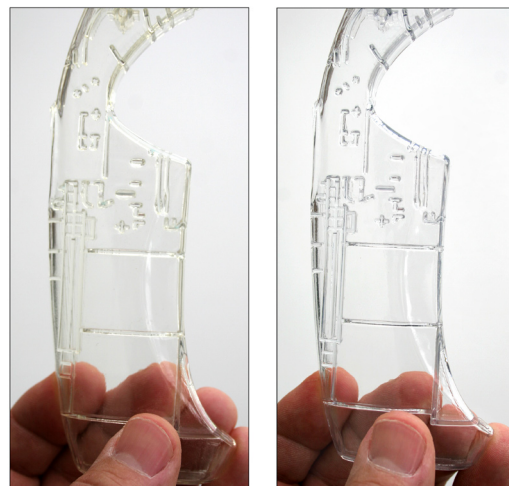
WaterShed XC is a low viscosity liquid photopolymer that produces strong, tough, water-resistant, ABS-like parts. Most importantly parts created with WaterShed 11112 are nearly colorless, and look more like true, clear engineered plastic.

In addition, WaterShed XC has been formulated with the DSM Somos Oxetane Advantage™— an advanced chemistry platform that produces parts with outstanding water resistance and high dimensional stability.

## Application

WaterShed XC 11112 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:

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



WaterShed 11120

WaterShed XC 11122

Photo courtesy of Dynacept

## Physical Properties – Liquid

Appearance      Optically clear, near Colorl  
Viscosity          ~150 cps at 30°C  
Density             ~1.12 g/cm<sup>3</sup> at 25°C

## Optical Properties at 325 nm

$E_c$                   ~11.5 mJ/cm<sup>2</sup>  
                         [critical exposure]  
 $D_p$                   0.14 mm (~.00545 inch)  
                         [slope of cure-depth vs. ln(E) curve]  
 $E_{10}$                 72 mJ/cm<sup>2</sup>  
                         [exposure that gives 0.254 mm (.010 inch) thickness]

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# Mechanical Properties (Metric)

ASTM Method	Description	WaterShed™ 11112	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™ 11112	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 $\mu\text{m}/\text{m}^\circ\text{C}$ <sup>1</sup>		
	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™ 11112	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™ 11112	ABS* (transparent)	Polybutylene Terephthalate*
E831-00	C. T. E. 10°F – 32°F	38 µin/in-°F		
	C. T. E. 32°F – 60°F	58 µin/in-°F		
	C. T. E. 60°F – 88°F	104 µin/in-°F	33 – 72 µin/in-°F (notemprängegiven)	28 - 81 µin/in-°F (notemprängegiven)
	C. T. E. 88°F – 115°F	98 µin/in-°F		
D150-98	Dielectric Constant 60Hz	3.5	3.7	
	Dielectric Constant 1KHz	3.5		2.9 - 4.0 (no frequency specified)
	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