

## Ultra-Illumina™ 3511B UV/Heat Curable, Low Shrink High Quality PCBA Conformal Coating

### PRODUCT DESCRIPTION

Incure Ultra-Illumina™ 3511B is a UL-compliant, 100% solids true UV light curable black conformal coating used on PCB assembly. It is designed for use in high volume spray system, does not clog valves as it contains no volatiles and is environmentally-friendly. With full cure, Incure 3511B forms a glossy and hard and resilient protective opaque coating of up to 600 microns thickness and works as a moisture barrier with excellent adhesion in harsh environments. Formulated to meet UL 746C, rated indoor/outdoor, to 120°C and 94V-0 flame class.

### UNCURED PROPERTIES

Chemical Type	Urethane Acrylate, 100% Solids, No Solvents			
Appearance	Single Component Opaque Black			
Density, g/ml	1.05	Refractive Index	1.48	@20°C
Flash Point, °C	> 93	Toxicity	Low (Refer to MSDS)	
Viscosity, cP (rpm)	20	110 - 210	Spindle	2
Other viscosities are available upon request. If the viscosity range requested is not our standard offering, this product may be produced with a small lab fee.				ASTM D2556
Email us at: support@uv-incure.com or your nearest local distributor for more information.				

<sup>1</sup> Viscosity (cP) taken at 25°C - Call to enquiry for other viscosities.

### CURED PROPERTIES

Shore Hardness, Durometer	D75 to D85	ASTM 2240
Linear Shrinkage	0.20%	ASTM 570
Water Absorption at 24hrs	0.50%	<sup>2</sup> ISTM D2566
Tensile (PSI) <small>* PC-PC / SS-SS / S-S / AL-AL * PC Substrate Failure</small>	PC-PC / SS-SS	N.A. / 4,400*
	S-S / AL-AL	5,600* / 5,700*
ASTM 638		
Surface After Full Cure	Sleek	<sup>2</sup> ISTM D189
Elongation at Break	15%	ASTM 638
Thermal Range (Brittleness / Degrades) °C	-55 to 155	<sup>2</sup> ISTM D366
Young's Modulus of Elasticity, MPa (PSI)	693 (100,600)	<sup>3</sup> ASTM 638
Average Linear CTE, ppm/°C	101	<sup>2</sup> ISTM D696

<sup>2</sup> ISTM - refers to Incure Standard Test Method.

<sup>3</sup> ASTM 638 Young's Modulus test speed @5mm/min for rigid and semi-rigid materials, @50mm/min for non-rigid materials, unless otherwise specified.

### RECOMMENDED UV CURE SCHEDULE (FULL CURE)

Full Surface Cure		UVA	UVB	UVC	UVV	
Fixture Time between glass slides	mJ/cm <sup>2</sup>	150	43	5	140	
Exposure Time (s)	1.0	mWcm <sup>2</sup>	150	43	5	140
S20™ Spot (4-Pole LG) 0.4" Dist	mJ/cm <sup>2</sup>	6,000	1,060	100	6,800	
Exposure Time (s)	2.0	mWcm <sup>2</sup>	3,000	530	50	3,400
L9000™ LED Spot @ 0.67" Dist	mJ/cm <sup>2</sup>	5,600	84	24	204	
Exposure Time (s)	2.0	mWcm <sup>2</sup>	2,800	42	12	102
F200P™ Flood @ 3.75" Dist	mJ/cm <sup>2</sup>	4,500	1,290	150	4,200	
Exposure Time (s)	30.0	mWcm <sup>2</sup>	150	43	5	140
F500™ Focused @ 3.0" Dist	mJ/cm <sup>2</sup>	5,000	1,600	150	4,800	
Exposure Time (s)	10.0	mWcm <sup>2</sup>	500	160	15	480

Above table is for reference only. Fixture Time using F200P @100% intensity, 3.75" distance. Moderate intensity conveyor systems C9000-F100x1AC/200x1AB/400x1AC/500x1AC with lamp height set at 2.5". U8000-F300x1D conveyor lamp height set at 2.1" focal point. Please consult IncureLab™ for belt speed recommendations.

### UV INTENSITY REFERENCE TABLE

Incure UV Curing Lamp Model	Curing Distance in inches (mm)					
	0.5" (12.6)	1" (25.4)	1.5" (38)	2" (50.8)	2.5" (63.5)	3" (76.2)
ARC / LED Spot						
S20™ ARC (mW/cm <sup>2</sup> ) / (ø mm)	1,400 (3)	1,500 (4)	650 (6)	360 (8)	240 (10)	175 (12)
L9000™ LED (mW/cm <sup>2</sup> ) / (ø mm)	7,500 (9)	5,000 (10)	2,300 (17)	1,200 (20)	700 (25)	450 (30)
ARC / LED Flood/Focus Beam	UV Intensity (mW/cm <sup>2</sup> )					
F200™ ARC Flood (6" x 8")	325	280	245	215	190	165
F400™ ARC Flood (4" x 4")	860	570	440	345	270	215
F500™ ARC Focused (3" x 5")	1,040	685	530	415	325	260
L1000-365™ LED Flood (4" x 4")	2,675	2,380	1,900	1,625	1,430	1,280
L1000-405™ LED Flood (4" x 4")	2,950	2,625	2,150	1,900	1,650	1,450

<sup>4</sup> Curing Distance is defined by the tip of light-guide or base of lamp housing to the bond area. All values are nominal with ±10% variation, with LED Flood Static Uniformity at ±78% and Dynamic Uniformity at ±90%. Recommended curing distances in grey.

### CURING SCHEDULE FOR THIS PRODUCT

If you are unable to fully cure this product for some reasons, pls email us for assistance with your curing information. Below are the curing parameters:

UVA (320-400nm) = 5,000 mW/cm <sup>2</sup>	UVB (290-320nm) = 1,600 mW/cm <sup>2</sup>	UVC (290-220nm) = 150 mW/cm <sup>2</sup>	VUV (400-700nm) = 4,800 mW/cm <sup>2</sup>
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Note: This product has been thoroughly tested to cure with F200P™ UV Flood Lamp. Intensity wavelengths (shaded) are crucial for curing this product. All measurements are made with EIT UV PowerPuck II.

### SHELF-LIFE, STORAGE, USE AND HANDLING OF THIS PRODUCT

Shelf-Life of this unopened product is ONE (1) year from date of manufacture. Avoid direct exposure of bottle to visible light at all times. Containers should remain covered when not in use. Product should be stored in a dark cool place of 10°C to 28°C. Transfer of product into other packages void all warranties. Users should ensure all bonding surfaces are free of grease, mold release, or any contaminants, as bonding performance will be compromised. All tests for cured bonds should be carried out at ambient temperature. For safe handling of this product, please read Material Safety Data-sheet (MSDS) prior to use. Organic solvents, such as IPA, may be used to wipe away uncured material from surfaces.

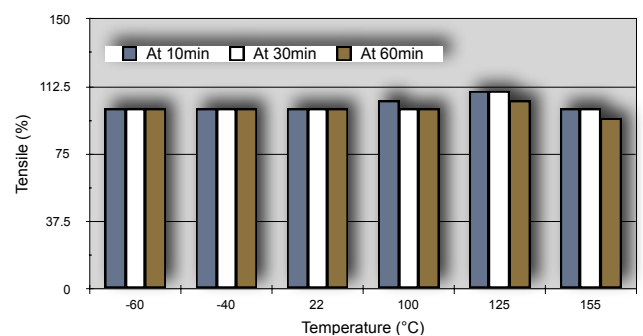
### EtO and GAMMA STERILIZATION (Not Applicable for this Product)

All Incure Medical products are formulated to subject to standard sterilization methods, such as EtO and Gamma Radiation of 25 to 50 kGrays (cumulative). Enhanced moisture and thermal resistance of this product show excellent adhesion and bonding strength after one cycle of steam auto-clave test. Depending on bond design and structure of the application, users should test specific assemblies after subjecting them to the test requirements. Please consult Incure Support Team for assistance, if your devices are subjected to more than one sterilization cycles.

### NOTE

The data contained in this document are furnished for information only. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein. INCURE will not be liable for any indirect, special, incidental or consequential loss or damage arising from this INCURE product, regardless of the legal theory asserted. INCURE recommends that each user adequately test its proposed use and application before repetitive use, using this data as a guide.

### TENSILE STRENGTH VS TEMPERATURE



### SECONDARY HEAT CURE SCHEDULE

Continuous Oven Bake	Duration
95°C (203°F)	120 mins
110°C (230°F)	60 mins
125°C (257°F)	30 mins

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