

## UV/Moisture Curable Conformal Coating (Water Resistant) for PCBA

### PRODUCT DESCRIPTION

Incure Ultra-Illumina™ 3502 is a UL-compliant, 100% solids UV light curable 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 3502 forms a hard and resilient protective coating thickness of 30 to 150 microns and works as a moisture barrier with excellent adhesion in harsh environments. Permanent fluorescing properties allows for quick in-process and quality inspection of coating coverage. Coated components in shadowed areas are moisture-cured within 72hrs.

### UNCURED PROPERTIES

|   |  |                  |                     |            |
|---|--|------------------|---------------------|------------|
| Chemical Type   | Urethane Acrylate, 100% Solids after full cure |                  |                     |            |
| Appearance  | Slight Yellow Tint, Clear Fluorescing          |                  |                     |            |
| Density, g/ml   | 1.03   | Refractive Index | 1.48                | @20°C      |
| Flash Point, °C   | > 93   | Toxicity         | Low (Refer to MSDS) |            |
| Viscosity, cP (rpm)   | 20   | 300 - 400        | 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  | D35 to D45        | ASTM 2240               |
| Linear Shrinkage / Expansion (-ve)   | 2.16%             | ASTM 570                |
| Water Absorption at 24hrs  | 0.01%             | <sup>2</sup> ISTM D2566 |
| Tensile (PSI)<br><sup>1</sup> PC-PC / SS-SS / S-S / AL-AL<br><sup>4</sup> PC Substrate Failure | PC-PC / PC-SS     | Good / Good             |
|  | PC-S / PC-AL      | Good / Good             |
| Surface After Full Cure  | Sleek             | <sup>2</sup> ISTM D189  |
| Elongation at Break  | 74.3307086614173% | ASTM 638                |
| Thermal Range (Brittleness / Degrades) °C  | -55 to 150        | <sup>2</sup> ISTM D366  |
| Young's Modulus of Elasticity, MPa (PSI)   | 226 ( )           | <sup>3</sup> ASTM 638   |
| Average Linear CTE, ppm/°C   | 142               | <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 Cure Exposure Time           |                    | UVA                | UVB   | UVC   | UVV   |
|-----------------------------------|--------------------|--------------------|-------|-------|-------|
| Fixture Time between glass slides | mW/cm <sup>2</sup> | 150                | 43    | 5     | 140   |
| Exposure Time (s)                 | 1.0                | mJ/cm <sup>2</sup> | 150   | 43    | 140   |
| F200P™ @3.75" Dist                | 40.0               | mW/cm <sup>2</sup> | 150   | 43    | 140   |
| Belt Speed (ft/min)               | 1.5                | mJ/cm <sup>2</sup> | 6,000 | 1,720 | 200   |
| F500™ @3.0" Dist                  | 9.0                | mW/cm <sup>2</sup> | 500   | 160   | 15    |
| Belt Speed (ft/min)               | 1.5                | mJ/cm <sup>2</sup> | 4,500 | 1,440 | 135   |
| S20™ Spot (4-Pole LG) 0.4" Dist   | mW/cm <sup>2</sup> | 3,000              | 530   | 50    | 3,400 |
| Exposure Time (s)                 | 3.0                | mJ/cm <sup>2</sup> | 9,000 | 1,590 | 150   |
| L9000™ LED Spot @ 0.67" Dist      | mW/cm <sup>2</sup> | 2,800              | 42    | 12    | 102   |
| Exposure Time (s)                 | 3.0                | mJ/cm <sup>2</sup> | 8,400 | 126   | 36    |

Cure times on 8mm Ø adhesive sample. Belt speeds using C9000-F200Px1AB (Flood) and C9000-F500x1AC (Focused Beam) conveyors for area curing. Please consult IncureLab™ for any other requirements.

### UV INTENSITY REFERENCE TABLE

| Incure UV Curing Lamp Model               | <sup>4</sup> Curing Distance vs UV Intensity |            |            |            |             |           |
|---|--|------------|------------|------------|-------------|-----------|
|   | 0.5" (12.6)                                  | 1" (25.4)  | 1.5" (38)  | 2" (50.8)  | 2.5" (63.5) | 3" (76.2) |
| Spot Curing (Ø mm)                        | 0.5" (12.6)                                  | 1" (25.4)  | 1.5" (38)  | 2" (50.8)  | 2.5" (63.5) | 3" (76.2) |
| 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)  |
| Flood/Focus Beam - Area Curing            | 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       |
| L1044-365™ LED Flood (4" x 4")            | 2,675  | 2,380      | 1,900      | 1,625      | 1,430       | 1,280     |
| L1044-405™ 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 parameters 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) = 4,500 mW/cm <sup>2</sup> | UVB (290-320nm) = 1,440 mW/cm <sup>2</sup> | UVC (290-220nm) = 135 mW/cm <sup>2</sup> | UVV (400-700nm) = 4,320 mW/cm <sup>2</sup> |
|--|--|--|--|

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 a minimum of 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 2°C to 20°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.

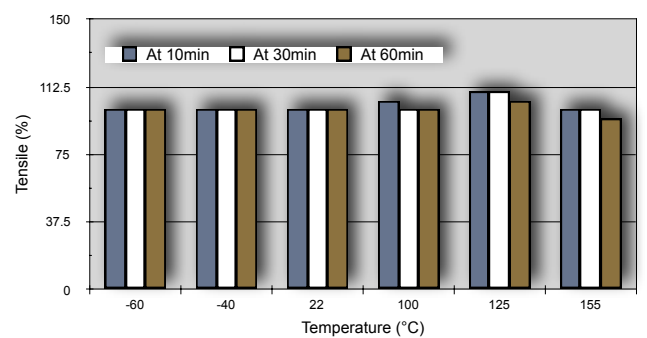
### EtO and GAMMA STERILIZATION (Not Applicable for this Product)

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 (Not Applicable)

| 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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