Technical Data Sheet

**Cyro-Weld™ 5040F**

incure™
ADHESIVES, EPOXIES AND COATINGS

# UV/Visible Light/LED Curable Multi-Substrate Low Shrink Medical Bonder

## PRODUCT DESCRIPTION

Incure Cyro-Weld™ 5040F is a low viscosity UV/Visible Light/LED light curing medical bonder for applications such as respiratory face masks and needle-bonding. Cures on demand and tack-free, it is 100% solids and fluoresces under blacklight to aid out-going quality inspection. Excellent for bonding of dissimilar substrates with different elasticity, Incure 5040F bonds to many materials with bonding strength of up to 7,000PSI. Product exhibits very low linear shrinkage on cure, good thermal and moisture resistance, and it a desired choice for surviving EtO. Formulated to meet ISO 10993-5.

## UNCURED PROPERTIES

| | | | | |
|---|---|---|---|---|
| Chemical Type | Urethane Acrylate, 100% Solids, No Solvents | | | |
| Appearance | Single Component, Slight Yellowish Tint, Fluorescing | | | |
| Density, g/ml | 1.02 | Refractive Index | 1.48 | @20°C |
| Flash Point, °C | > 93 | Toxicity | Low (Refer to MSDS) | |
| Viscosity, cP | 80 - 180 @20rpm | | Spindle | 1 |
| 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.<br><br>Email us at: support@uv-incure.com or your nearest local distributor for more information. | | | ASTM D2556 | |

[1] Viscosity (cP) taken at 25°C - Call to enquiry for other viscosities.

## CURED PROPERTIES

| | | | |
|---|---|---|---|
| Shore Hardness, Durometer | | D78 to D88 | ASTM 2240 |
| Linear Shrinkage / Expansion (-ve) | | 0.05% | ASTM D2566 |
| Water Absorption at 24hrs | | 1.34% | [2] ISTM D570 |
| Tensile (PSI)<br>* PC-PC / SS-SS / S-S / AL-AL<br>^ PC Substrate Failure | PC-PC / PC-SS | 6,900^ / 4,500^ | ASTM 638 |
| | PC-S / PC-AL | 4,100 / 3,800 | |
| Surface After Full Cure | | Tack-Free | [2] ISTM D189 |
| Elongation at Break | | 2% | ASTM 638 |
| Thermal Range (Brittleness / Degrades) °C | | -55 to 150 | [2] ISTM D366 |
| Young's Modulus of Elasticity, MPa (PSI) | | 193 (28,100) | [3] ASTM 638 |
| Linear CTE (α1 & α2), ppm/°C | | α1=28 , α2=104 | [2] ISTM D696 |

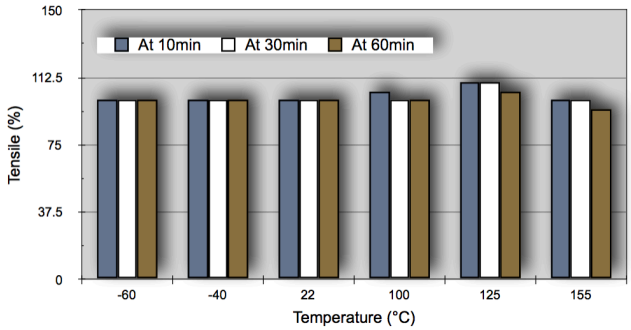
[2] ISTM - refers to Incure Standard Test Method.
[3] ASTM 638 Young's Modulus test speed @5mm/min for rigid and semi-rigid materials, @50mm/min for non-rigid materials, unless otherwise specified.

## RECOMMENDED UV CURE SCHEDULE (FULL CURE)

| Full Cure Exposure Time | | | UVA | UVB | UVC | UVV |
|---|---|---|---|---|---|---|
| Fixture Time between glass slides | | mW/cm² | 223 | 56 | 4 | 215 |
| Exposure Time (s) | 2.0 | mJ/cm² | 446 | 112 | 8 | 430 |
| F200P™ @3.75" Dist | 6.0 | mW/cm² | 223 | 56 | 4 | 215 |
| Belt Speed (ft/min) | 9.0 | mJ/cm² | 1,338 | 336 | 23 | 1,290 |
| F500™ @3.0" Dist | 3.0 | mW/cm² | 436 | 127 | 12 | 390 |
| Belt Speed (ft/min) | 6.0 | mJ/cm² | 1,308 | 381 | 35 | 1,170 |
| S20™ Spot (4-Pole LG) 0.4" Dist | | mW/cm² | 3,000 | 530 | 50 | 3,400 |
| Exposure Time (s) | 2.0 | mJ/cm² | 6,000 | 1,060 | 100 | 6,800 |
| L9000™ LED Spot @ 0.67" Dist | | mW/cm² | 2,800 | 42 | 12 | 102 |
| Exposure Time (s) | 3.0 | mJ/cm² | 8,400 | 126 | 36 | 306 |

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.

## TENSILE STRENGTH VS TEMPERATURE

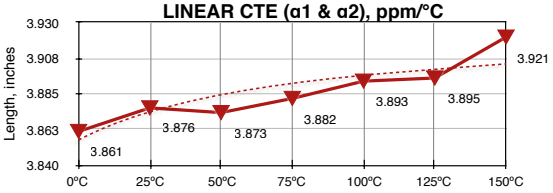



## UV INTENSITY REFERENCE TABLE

| Incure UV Curing Lamp Model | [4] Curing Distance vs UV Intensity | | | | | |
|---|---|---|---|---|---|---|
| Spot Curing (Diameter) | 0.5" (12.6) | 1" (25.4) | 1.5" (38) | 2" (50.8) | 2.5" (63.5) | 3" (76.2) |
| S20™ ARC (mW/cm²) / (ø mm) | 1,400 (3) | 1,500 (4) | 650 (6) | 360 (8) | 240 (10) | 175 (12) |
| L9000™ LED (mW/cm²) / (ø mm) | 7,500 (9) | 5,000 (10) | 2,300 (17) | 1,200 (20) | 700 (25) | 450 (30) |
| Flood/Focus Beam (Area) | UV Intensity (mW/cm²) | | | | | |
| 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 |

[4] 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.

## LINEAR CTE (α1 & α2), ppm/°C




## 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 |

## UV CURING SCHEDULE FOR THIS PRODUCT

| Wavength λ | UVA (320 - 400nm) | UVB (290–320nm) | UVC (290-220nm) | VUV (400-700nm) |
|---|---|---|---|---|
| Minimum Intensity | 223 mW/cm² | 56 mW/cm² | 4 mW/cm² | 215 mW/cm² |
| Total Energy Required | 1,338 mJ/cm² | 336 mJ/cm² | 23 mJ/cm² | 1,290 mJ/cm² |

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

## 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 remained covered when not in use. Product should be stored in a dark cool place of 10°C to 32°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

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 sterilisation. 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.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RoHS COMPLIANT | Pb LEAD FREE | HF HALOGEN FREE