Technical Data Sheet

Cyro-Weld™ 5414

incure™
ADHESIVES, EPOXIES AND COATINGS

UV/Visible Light/LED Curable Multi-Substrate (Plastics) Medical Bonder

PRODUCT DESCRIPTION

Incure Cyro-Weld™ 5414 UV/Visible light curing is a multi-substrate, low-medium viscosity medical grade adhesive widely used for the bonding of plastics such as PC, PET and thermoplastic elastomers. Tack-free surface can be achieved with prolonged curing. Incure 5414 has enhanced moisture and heat resistance properties, and is ideal for bonding of medical devices requiring very high bond strength on difficult-to-bond substrates. Product is 100% solids, contains no volatiles and is formulated to pass EtO, gamma sterilization and ISO 10993-5.

UNCURED PROPERTIES

Chemical Type	Urethane Acrylate, 100% Solids, No Solvents			
Appearance	Single Component, Slight Yellowish Tint			
Density, g/ml	1.04	Refractive Index	1.48	@20°C
Flash Point, °C	> 93	Toxicity	Low (Refer to MSDS)	
Viscosity, cP (rpm)	2,000 - 3,500 @20rpm		Spindle	4
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. 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		D70 to D80	ASTM 2240
Linear Shrinkage / Expansion (-ve)		0.05%	ASTM 570
Water Absorption at 24hrs		1.39%	[2] ISTM D2566
Tensile (PSI) * PC-PC / SS-SS / S-S / AL-AL ^ PC Substrate Failure	PC-PC / PC-SS	7,100^ / 2,400	ASTM 638
	PC-S / PC-AL	3,300 / 3,600	
Surface After Full Cure		Slight Tack	[2] ISTM D189
Elongation at Break		73%	ASTM 638
Thermal Range (Brittleness / Degrades) °C		-55 to 150	[2] ISTM D366
Young's Modulus of Elasticity, MPa (PSI)		Not Available	[3] ASTM 638
Linear CTE (α1 & α2), ppm/°C		α1=31 , α2=40	[2] ISTM D696

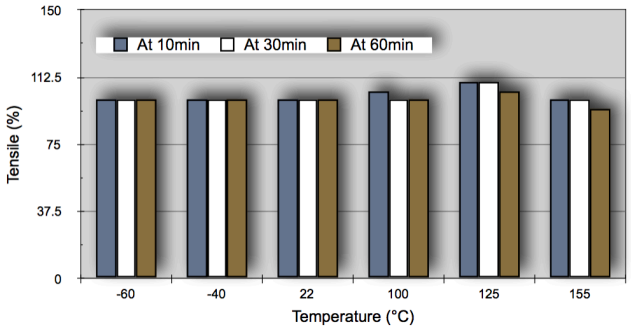
[2] ISTM - refers to Incure Standard Test Method.
[3] ASTM 638 Young's Modulus test speed @5mm/min for rigid and semi-rigid materials, @50mm/min for non-rigid materials, unless otherwise specified.

RECOMMENDED UV CURE SCHEDULE (FULL CURE)

Full Cure Exposure Time			UVA	UVB	UVC	UVV
Fixture Time between glass slides		mW/cm²	150	43	5	140
Exposure Time (s)	2.0	mJ/cm²	300	86	10	280
F200P™ @3.75" Dist	4.0	mW/cm²	150	43	5	140
Belt Speed (ft/min)	22.0	mJ/cm²	600	172	20	560
F500™ @3.0" Dist	2.0	mW/cm²	500	160	15	480
Belt Speed (ft/min)	14.0	mJ/cm²	1,000	320	30	960
S20™ Spot (4-Pole LG) 0.4" Dist		mW/cm²	3,000	530	50	3,400
Exposure Time (s)	1.0	mJ/cm²	3,000	530	50	3,400
L9000™ LED Spot @ 0.67" Dist		mW/cm²	2,800	42	12	102
Exposure Time (s)	1.0	mJ/cm²	2,800	42	12	102

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

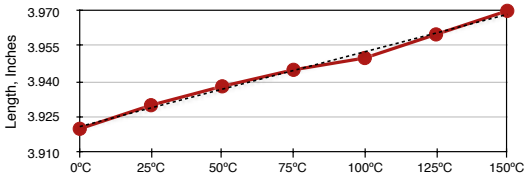


UV INTENSITY REFERENCE TABLE

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	150 mW/cm²	43 mW/cm²	5 mW/cm²	140 mW/cm²
Total Energy Required	600 mJ/cm²	172 mJ/cm²	20 mJ/cm²	560 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 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

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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