Technical Data Sheet

Cyro-Weld™ 5414

23 Apr 2016 Revision: 03

Cyro-Weld™ 5414 UV/Visible/LED Curable Multi-Substrate (Plastics) Medical Bonder

PRODUCT DESCRIPTION

Incure Cyro-Weld™ 5414 is a medium viscosity UV/Visible/LED light curing, acid-free form-in-place/cure-in-place (FIPG/CIPG) gasket and sealant for medical devices. Cures on demand and tack-free, it is based on a 100% solids urethane acrylates compound formulation and does not contain VOCs or acids. It is very low in linear shrinkage during cure, and is ideal for optical positioning/alignment application. Incure 5414 bonds well to many different substrates such as glass, metals, ceramics and plastics, and exhibits good thermal and moisture resistance, making it a desired choice for bonding, sealing and gasketing applications.

UNCURED PROPERTIES

Chemical Type	Urethane Acrylate, 100% Solids, No Solvents			
Appearance	Single Component, Slight Yellowish Tint, Clear			
Density, g/ml	1.04	Refractive Index	1.48	@20°C
Flash Point, °C	> 93	Toxicity	Low (Refer to MSDS)	
Viscosity, cP (rpm)	20	2,000 - 3,800	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		D67 to D77	ASTM 2240
Linear Shrinkage		0.10%	ASTM 570
Water Absorption at 24hrs		1.90%	[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		Tack-Free	[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)		108 (15700)	[3] ASTM 638
Average Linear CTE, ppm/°C		85	[2] ISTM D696

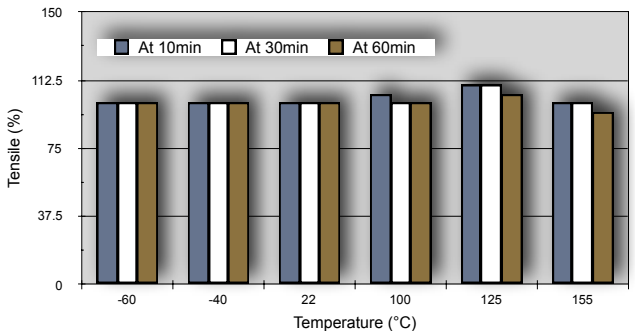
[2] ISTM - refers to Incure Standard Test Method.
[3] ASTM 638 Young's Modulus test speed @5mm/min for rigid and semi-rigid materials, @50mm/min for non-rigid materials, unless otherwise specified.

RECOMMENDED UV CURE SCHEDULE (FULL CURE)

Full Surface Cure			UVA	UVB	UVC	UVV
Fixture Time between glass slides		mJ/cm²	150	43	5	140
Exposure Time (s)	1.0	mWcm²	150	43	5	140
S20™ Spot (4-Pole LG) 0.4" Dist		mJ/cm²	3,000	530	50	3,400
Exposure Time (s)	1.0	mWcm²	3,000	530	50	3,400
L9000™ LED Spot @ 0.67" Dist		mJ/cm²	5,600	84	24	204
Exposure Time (s)	2.0	mWcm²	2,800	42	12	102
F200P™ Flood @ 3.75" Dist		mJ/cm²	3,000	860	100	2,800
Exposure Time (s)	20.0	mWcm²	150	43	5	140
F500™ Focused @ 3.0" Dist		mJ/cm²	3,000	960	90	2,880
Exposure Time (s)	6.0	mWcm²	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.

TENSILE STRENGTH VS TEMPERATURE



UV INTENSITY REFERENCE TABLE

Incure UV Curing Lamp Model	[4] Curing Distance in inches (mm)					
ARC / LED Spot	0.5" (12.6)	1" (25.4)	1.5" (38)	2" (50.8)	2.5" (63.5)	3" (76.2)
S20 ARC (mW/cm²) / Spot (ø mm)	1,400 (3)	1,500 (4)	650 (6)	360 (8)	240 (10)	175 (12)
L9000 LED (mW/cm²) / Spot (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/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
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

[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 distances in grey.

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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RoHS COMPLIANT Pb LEAD FREE HF HALOGEN FREE

CURING SCHEDULE FOR THIS PRODUCT (Not Applicable 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) = 3,000 mW/cm²	UVB (290−320nm) = 960 mW/cm²	UVC (290-220nm) = 90 mW/cm²	VUV (400-700nm) = 2,880 mW/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.

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 remained 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

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