

Quad-Cure™ 1931 Multi-cure, High Performance, Very Low Shrink Metal-Glass Bonder

PRODUCT DESCRIPTION

InCure Quad-Cure™ 1931 UV/Visible/Heat/Activator Curing adhesive is a very low viscosity, high strength general bonder. High in clarity and non-yellowing, it cures in seconds with UV/visible light. With activator Actif 398, bonding strength starts increasing in 10 minutes before achieving 95% of bond-strength within 24 hours. It is an excellent choice for applications for bonding of metals, glass and ceramics. InCure 1931 exhibits enhanced excellent moisture and temperature resistance and has very low water absorption and shrinkage properties. Formulated to survive thermal-cycling.

UNCURED PROPERTIES

Chemical Type	Urethane Acrylate, 100% Solids, No Solvents				
Appearance	Single Component, Slight Tint				
Density, g/ml	1.04	Refractive Index	1.50	@20°C	
Flash Point, °C	> 93	Toxicity	Low (Refer to MSDS)		
Viscosity, cP (rpm)	20	80 - 180	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.					

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

CURED PROPERTIES

Shore Hardness, Durometer	D75 to D85	ASTM 2240
Linear Shrinkage	0.11%	ASTM 570
Water Absorption at 24hrs	0.60%	² ISTM D2566
Tensile (PSI) <small>* PC-PC / SS-SS / S-S / AL-AL * PC Substrate Failure</small>	PC-PC / SS-SS	500* / 9,800*
	S-S / AL-AL	10,000* / 7,400*
Surface After Full Cure	Tack-Free	² ISTM D189
Elongation at Break	4%	ASTM 638
Thermal Range (Brittleness / Degrades) °C	-55 to 150	² ISTM D366
Young's Modulus of Elasticity, MPa (PSI)	1,589 (230500)	³ ASTM 638
Average Linear CTE, ppm/°C	91	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/cm ²	1,200	344	40	1,120
Exposure Time (s)	mW/cm ²	150	43	5	140
S20™ Spot (4-Pole LG) 0.4" Dist	mJ/cm ²	60,000	10,600	1,000	68,000
Exposure Time (s)	mW/cm ²	3,000	530	50	3,400
L9000™ LED Spot @ 0.67" Dist	mJ/cm ²	84,000	1,260	360	3,060
Exposure Time (s)	mW/cm ²	2,800	42	12	102
F200P™ Flood @ 3.75" Dist	mJ/cm ²	6,000	1,720	200	5,600
Exposure Time (s)	mW/cm ²	150	43	5	140
F500™ Focused @ 3.0" Dist	mJ/cm ²	6,000	1,920	180	5,760
Exposure Time (s)	mW/cm ²	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 ²) / (ø mm)	1,400 (3)	1,500 (4)	650 (6)	360 (8)	240 (10)	175 (12)
L9000™ LED (mW/cm ²) / (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 ²)					
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.

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) = 6,000 mW/cm ²	UVB (290-320nm) = 1,920 mW/cm ²	UVC (290-220nm) = 180 mW/cm ²	VUV (400-700nm) = 5,760 mW/cm ²
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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 SIX (6) months 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.

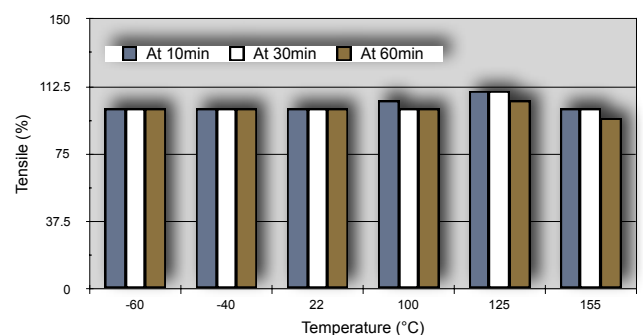
EtO and GAMMA STERILIZATION (Not Applicable for this Product)

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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