

FOTOCHEM FSR-8000 Series

Purely White

LED-393W

已修訂
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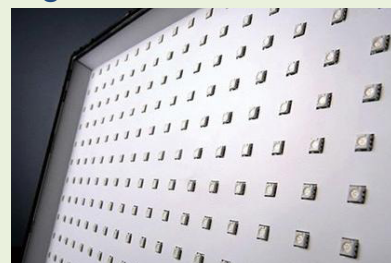
Low Discoloration &

High Reflectance Rate

Photoimageable Solder Mask

1. Feature :

FOTOCHEM FSR-8000 LED-393W is a high class white photoimageable solder mask. This product has high reflectance rate (between 400~700nm, the average value above 90%) 、 low heat discoloration degree 、 excellent coverage and width pre-cure windows. So, it can be used to apply to LED related products.



2. Specifications :

Model	FOTOCHEM FSR-8000 LED-393W
Color	Cool White
Mix Ratio	80 : 20
Viscosity (dPa.s)	180±30
Pre-cure	70℃ * 60min / 75℃ * 55min / 80℃ * 45min
Exposure Energy	400~500mJ/cm ²
Photo Guide	7~9 Steps Stoufer 21-Step Photo Guide
Break Point	30~35 Sec
Post Curing	150±5℃ * 50min~90min
Holding Time	8 Hr(Between Pre-Cure and Develop)
Pot Life	About 24 Hr(Store below 25℃)
Shelf Life	About 180 Days (Store below 25℃)

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3. Example of Operation Process :

Operation Process		Suitable for the Range
Base plate material	FR-4 T=1.6mm / aluminium base plate	
Pretreatment	Mechanical brushing or acid treatment	
Screen Printing	100mesh / Use nylon, polyester or stainless steel screen for printing.	90~125 mesh
Holding Time	15 min	15~25 min
Pre-cure	1. Single side : 70°C * 60min / 75°C * 50min	70°C * 60min / 75°C * 50min
	2. Two sides toasted specifically (The back is exposed and tested) 1 st side : 70°C * 20min 2 nd side : 70°C * 25min	70°C * 20~25min 70°C * 25~30min
	3. Toast at the same time in the two sides	70°C * 30~40min
	Hot wind circulating oven : 70°C * 30min	
Holding Time	10min	10~20min / Max 8Hr
Exposure	1. Exposure Energy : 450±30mJ/cm ²	400~500mJ/cm ²
Holding Time	10min	10~20min
Developing	1. Solution Consistency : 1wt% Na ₂ CO ₃ (PH=10.9)	PH=10.9~11.3 以上
	2. Spraying Pressure : 2Kgf/cm ² / 0.196MPa	Spraying Pressure : 1.8~2.3Kgf/cm ² 0.196~0.245MPa
	3. Temperature : 30~32°C	Temp.=30 ± 2°C
	4. Time : 60 Sec	Time : 60~90 Sec
Post Curing	For air circulation oven : 150°C / 60min	150±5°C * 50~90min

4. Characteristics :

a. Tack Dry Window

Pre-cure time (mine)		40	45	50	55	60	65
Developability	70°C	○	○	○	○	△	X
	75°C	○	○	○	○	△	X
	80°C	○	○	○	△	X	X

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b. Photo properties

Item	Coating Thickness	Exposing Energy	Developing Time	Photo Sensitivity
Photo Sensitivity Kodak No.2	25 μ m	400mJ/cm ²	40 Sec	8 Step
		450mJ/cm ²		8~9 Step
		500mJ/cm ²		9 Step
Resolution (QFP)	40 $\pm$ 2 μ m	400mJ/cm ²	40 Sec	60 μ m
		450mJ/cm ²		50 μ m
		500mJ/cm ²		50 μ m

Exposing energy in upper columns indicate values under mylar film.

5. Physical Properties :

a. Physical Properties

Item	Test Method	Result
Adhesion	JIS D 0202 4.15 Crosscut adhesion test : JIS K 5400 8.5 Cellophane adhesive tape : JIS Z 1522 Width : 12mm Coated film on copper and base material	100/100
Film Hardness	JIS K5400 8.4 Pencil scratching test Pencil : Mitsubishi pencil, Coated film on copper and base material	6H
Adhesion Resistance	IPC SM-840B 3.5.1 * Taber method 3.5.1.1 Testing method manual TM-650 2.4.27.1 : There shall be no film reduction in excess of 25 μ m completion of 50 cycle of abrasion. * Pencil method 3.5.1.2 Testing method manual TM-650 2.4.27.2 : To be above F	No abnormality in cured film
Adhesive Property	IPC SM-840B 3.5.2 Rigid base plate 3.5.2.1 Testing method manual TM-650 2.4.28.1	No abnormality in cured film
Cutting Property	IPC SM-840B 3.5.3 No crack or rent shall develop on the film, when visually examined at drilling, sawing and press punching operations	No abnormality in cured film

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b. Chemical Properties

Item	Test Method				Result
Solvent Resistance	IPC SM-840B 3.6.1 or JIS K 5400 8.24 No blister, separation, swelling or color change shall occur on the film				No abnormality in cured film
	Isopropanol		Room temp. 60 min		
	1.1.1 Trichloroethane		Room temp. 60 min		
	4% ethyalcohol, 96% trichloro-trifluoroethane in the vapor 10min				
Chemical Resistance	JIS K 5400 8.22 & 8.23				No abnormality in cured film
	10 wt% HCl _(aq)		Room temp. 30 min		
	10 wt% H ₂ SO _{4 (aq)}		Room temp. 30 min		
	10 wt% NaOH _(aq)		Room temp. 60 min		
Hydrolysis Resistance	IPC SM-840B 3.6.2				No abnormality in cured film
	Class 1	35℃	90%RH	4-Days	
	Class 2	85℃		7-Days	
	Class 3	97℃		28-Days	
	To be free from any change in appearance and from sticky surface.				
Adhesion after boiling	JIS D 0202 4.15				No abnormality in cured film
	100℃		5 Hrs		
Adhesion after treatment in pressure cooker	JIS D 0202 4.15				No abnormality in cured film
	121℃		2 atm		

c. Solder Properties

Item	Test Method	Result
Solder Resistance & Solderability	IPC SM-840B 3.7 * Solder Resistance 3.7.2 No deterioration shall occur in the film after application of flux and dipping for 10 sec. In solder bath of 255±5℃ 4.8.9.1 * Solderability and peeling property 3.7.3 Perfrom soldering and peeling of rinned lead wire twice using solder. The result shall be satisfactory.	No abnormality in cured film
Solder Heat Resistance	JIS C 6481 5.5 No blister and separation on cured film Appearance : Separation test by tape peeling Flux : Soldering temp. 260℃ X 10 sec X 3 times	No abnormality in cured film

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Hot Air Leveler Resistance	No bister and separation on cured film Appearance : Separation test by tape peeling Flux : Duration of immersion : 4 Sec Soldering temp. : 260°C Hot air temp. : 220°C Pressure : 3.8 kg/cm ² immersion 3 times	No abnormality in cured film
Thermal Shock	IPC SM-840C 3.4.10 & IPC TM-650 2.6.7.3 65°C X 15 min + 125°C X 15 min, 100 cycles. Transfer time less than 2 min.	No abnormality in cured film

d. Electrical Properties

Item	Test Method				Result
Dielectric Strength	IPC SM-840B 3.8.1 500V DC/mil more than 500V DC/mil				2500V DC/mil
Volume	JIS C 6481 5.9				1 X 10 ¹⁵ Ω . cm Resistivity
Surface Resistance	JIS C 6481 5.10				1 X 10 ¹⁵ Ω
Insulation Resistance	IPC SM-840B 3.8.2 & JIS C 6481 5.11				1 X 10 ¹⁴ Ω
	Class 1	35℃	90 %RH	4 Applied Voltage 110V ≥ 5 X 10 ⁸ Ω	
	Class 2	50℃		7 Applied Voltage 110V ≥ 5 X 10 ⁸ Ω	
	Class 3	25~60℃			
	1 cycle = 8 ± 1/4 Hrs				
Dielectric Loss Tangent (δ)	JIS C 6481 5.12 Impedance Analyzer				0.03 / 1 MHz
Dielectric Factor (ε)	JIS C 6481 5.12 Impedance Analyzer				3.5 / 1 MHz
Electrochemical	IPC SM-840C 3.4.10 85 ± 2 °C / 90%RH / 168 Hrs / Bias Voltage 10 VDC				Resistance ≥ 2 Ω

* All test data mentioned above in this technical data sheet and example of operation process are base on our test result and only for reference, not to guarantee the same in your Process.

7. Caution :

All chemicals used in this product might have unknown toxicity. Please handle eith your most care referring to the Product Guide and MSDS for use.