VACREL® 8120, 8130 and 8140
Dry Film Solder Mask

DuPont Electronics

Printed Circuit Fabrication Materials, Chemicals and Equipment

VACREL 8120, 8130 and 8140 are negative working photopolymers that are processable in aqueous alkaline solution. They are supplied sandwiched between protective layers of polyester and polyolefin.

Application
When processed correctly, VACREL 8100 solder mask coatings are compatible with soldering and hot air levelling processes common to the Printed Circuit Board Industry. The VACREL 8100 solder masks provide the PCB with a tough uniform protection with excellent chemical and mechanical resistance.

Storage
VACREL photopolymer dry film soldermasks are complex chemical systems designed to be sensitive to ultraviolet radiation. Like all photosensitive materials, they exhibit some sensitivity to other forms of energy such as mechanical pressure and heat. Care in storage and handling will ensure that products remain fully functional.

It is recommended to operate a first-in, first-out inventory control system, thereby reducing the chances of the VACREL becoming overaged in your warehouse.

Store VACREL 8100 soldermask rolls horizontally in their original packing at temperatures between 5 and 21 °C and 30 to 60% relative humidity.

When storing partially used rolls, the last lap must be taped to maintain roll integrity.

Product description

VACREL	8120	8130	8140
Thickness (µm)	50	75	100
Colour (as supplied) Colour (after final curing)	Matt transparent medium green Matt transparent light green		
Spectral Sensitivity (nm)	320-700	320-700	320-700
Max. Circuit height (µm)	50	80	110

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Process recommendation

Please refer to the "VACREL Process Manual", which contains detailed information on standard processing.

Reference guide for VACREL 8120, 8130 and 8140

Process Step		VACREL 8120	VACREL 8130	VACREL 8140
Prelamination cleaning and processing		In order to ensure optimum end use properties the panel surface must be free from organic and inorganic contamination. (See VACREL Process Manual for further details.)		
Drying				
Oven	Temperature (°C)	120	120	120
	Time (minutes)	15-20	15-20	15-20
I.R. double sided conveyorised dryer Board Surface	Temperature (°C)	80-100	80-100	80-100
	Time (seconds)	45-60	45-60	45-60
Vacuum lamination				
Using the VACREL SMVL 100/130, 200/230, 300/330. Cycle time	range (seconds)	35-70	35-70	35-70
	average (seconds)	45	45	45
Board exit temperature (°C)		65 ± 5	65 ± 5	65 ± 5
SMVL Temperature:	Upper chamber (°C)	95	95	95
	Lower chamber (°C)	85	85	85
Post lamination				
Hold time[1]	Minimum (minutes)	30	30	30
	Maximum (days)	1	1	1
Exposure				
Stouffer Step Wedge, 21 steps (SST)		8-10	8-10	8-10
Energy (mJ/cm^2) (measured under the phototool)		100-200	100-250	100-300
Time (seconds)[2]		15-50	15-50	15-50
Exposure Range (nm)		350-450	350-450	350-450
Post exposure				
Hold Times[1]	Minimum (minutes)	15	15	15
	Maximum (days)	1	1	1
Development				
Time (seconds)		100-150	120-165	140-180
Temperature (°C)		40 ± 2	40 ± 2	40 ± 2
Chemistry (Sodium Carbonate Anhydrous)		1%	1%	1%
Antifoam ml/l (FoamFREE® 940)		2-3	2-3	2-3
Recommended loading with automatic replenishment (m^2 of developed VACREL/litre)		0.16	0.12	0.08
Dry panels after development				
Post Development				
Hold Time[1]	(minutes)	15	15	15
Cure				
VACREL 8100 products require a double stage cure. These recommendations, and cure sequence must be followed. 1) Oven Bake	Temperature (°C)	150 ± 5	150 ± 5	150 ± 5
	Time at temperature (hours)	1	1	1
2) UV Cure (J/cm^2 per side)		4-5	4-5	4-5

[1] For optimum process performance the hold times should be held to a minimum.
[2] Typical exposure times using Du Pont's PC 130 Printer at 5000 W.

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Notes on curing
(See VACREL Process Manual.)

Integrated double sided UV-IR-UV curing
Details available upon request.

Nomenclature
The nomenclature should be applied after the final UV cure.

Stripping
If processing errors necessitate, then VACREL 8100 may be stripped prior to the final cure.

Activation of Pads and Plated Throughholes
All conventional methods to activate copper prior to Hot-Air levelling, or soldering can be used.

Note: After H.A.L. ensure complete flux removal. Follow flux manufacturers recommendations.

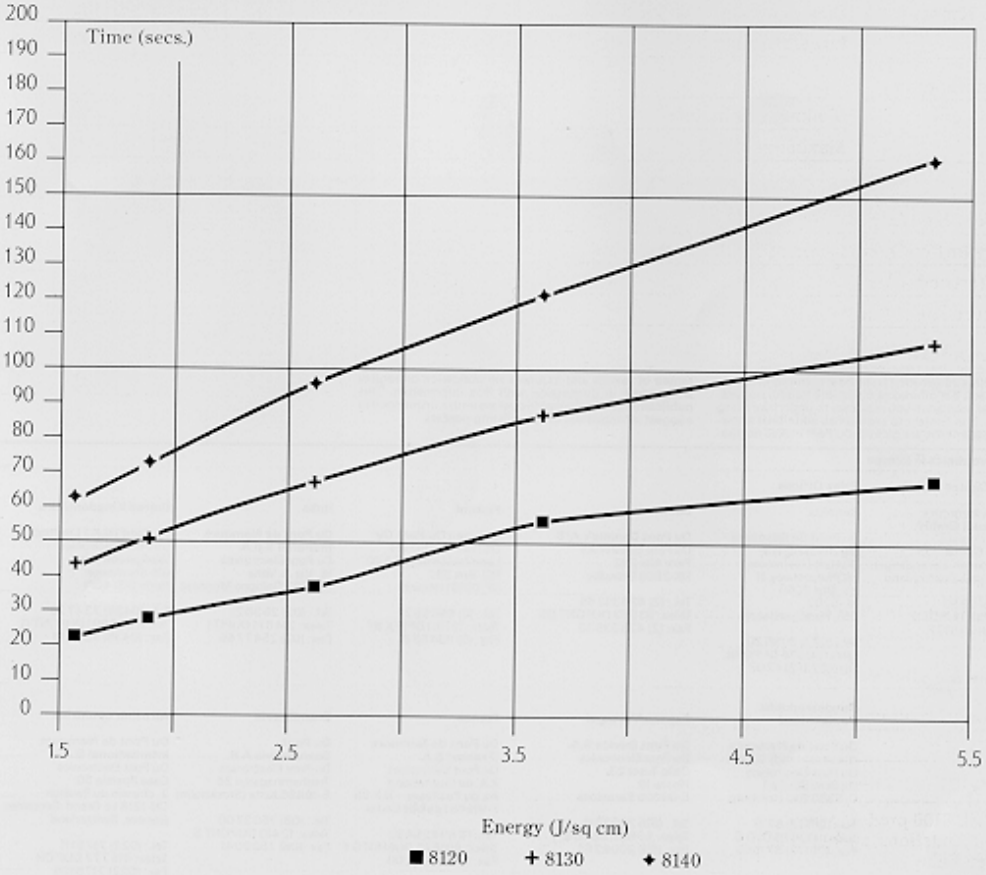
Assembly, Soldering and Cleaning
(See VACREL Process Manual for Specific details.)

Automation of the VACREL Process
For details of in-line fully automatic processing of VACREL 8100 dry film soldermasks please contact your Du Pont Technical Representative.

Environmental considerations
For specific details on the disposal of spent developing and stripping solutions please refer to our Environmental Protection Brochure.

Safety
Detailed information regarding the safe handling of VACREL products can be found in Du Pont's Brochure "Safe Working with RISTON* & VACREL Photopolymer Systems".

Methylene Chloride Test VACREL 8100



For details on how to perform UV curing test, please refer to the "VACREL Process Manual".

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We believe this information is the best currently available on the subject. It is offered as a possible helpful suggestion in experimentation you may care to undertake along these lines. It is subject to revision as additional knowledge and experience are gained. Du Pont makes no guarantee of results and assumes no obligation or liability whatsoever in connection with this information. This publication is not a license to operate under, or intended to suggest infringement of any existing patents.

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