DUPONT
Fortasun™
Solar Silicones

Fortasun™ PV-6212 Cell Encapsulant

Optically clear silicone encapsulant providing high transmission of light to the solar cell and superior reliability and durability to module

Features and benefits

- High optical transmission
- UV transparent to 250 nm
- Adhesion to glass, PET based PV back-sheet and solar cells
- Inherently UV stable
- Excellent humidity resistance
- Superior electrical insulation
- Fast heat cure (100°C)
- PID resistant

Composition

- Addition cure
- Two-part silicone encapsulant supplied as flowable liquid
- 1:1 mix ratio by weight or volume

Applications

- Encapsulation of Si-Crystalline modules

Typical properties

Specification writers: These values are not intended for use in preparing specifications. Please contact your local DuPont sales office before writing specifications on this product.

Test	Property	Unit	Result
As production			
	Appearance		Clear
ASTM D 1475	Specific gravity part A/part B	g/ml	0.97/0.97
ASTM D 4287	Viscosity part A	Centipoise or mPa s	5320
ASTM D 4287	Viscosity part B	Centipoise or mPa s	51600
	After mixing		
	Working time	Hours	1
	After curing		
CTM 1448	Optical transmission AM 1.5G	%	99
CTM 1437	Reflex index		1.401
ASTM D2240	Hardness, Shore A		11.5
ASTM D991	Volume resistance	Ohm	0.91×10^{15}
ASTM D149	Dielectric strength	KV/mm	20.8
ASTM D177	Thermal conductivity	W/m.k	0.171
ASTM D570	Water absorption	%	0.043

Description

Fortasun™ PV-6212 Cell Encapsulant is supplied as two-part liquid component kits comprised of Part A/Part B to be mixed in a 1:1 ratio by weight or volume. It can be applied by both automated and manual mixing and dispensing.

How to use

Fortasun™ PV-6212 Cell Encapsulant is supplied in two parts as lot-matched base and curing agent that are mixed in a ratio of one part base to one part curing agent, by weight or volume. For further information, consult your local DuPont representative.

Working time

Cure reaction begins with the mixing process. Initially, cure is evidenced by a gradual increase in viscosity, followed by conversion to a gel. Working time is defined as the time required for viscosity to double after Parts A and B (base and curing agent) are mixed. Fortasun™ PV-6212 Cell Encapsulant has a working time of 1 hour.

Processing and curing

Thoroughly mixed Fortasun™ PV-6212 Cell Encapsulant may be poured/dispensed directly onto the surface of which it is to be cured. Care should be taken to minimize air entrapment.

Fortasun™ PV-6212 Cell Encapsulant may be low temperature heat cured at 1 minute at 100°C (212°F).

This data is believed to be typical and should be used as initial estimates of cure times. Times will vary slightly from batch to batch and can be longer or shorter due to thermal mass of your parts and your heating ramp rate. Pretesting is recommended to confirm adequate cure for your application.

Fortasun™ PV-6212 Cell Encapsulant can be placed in service immediately following the completion of the cure schedule. No post cure is required.

Surface preparation

Surfaces should be clean and dry. Some applications requiring adhesion may require priming. For best results, the primer should be applied in a very thin, uniform coating and then wiped off after application. The surface should be thoroughly air-dried prior to application of the silicone elastomer. For further instructions on primer usage, please contact your DuPont representative.

Useful temperature ranges

For most uses, Fortasun™ PV-6212 Cell Encapsulant should be operational over the typical solar ranges of -40 to 90°C (-40 to 194°F) for long periods of time. However, at both the low and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations.

For low-temperature performance, performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history.

At the high-temperature end, the durability of the cured silicone elastomer is time-and-temperature-dependent.

Compatibility

Certain materials, chemicals, curing agents, and plasticizers can inhibit the cure of Fortasun™ PV-6212 Cell Encapsulant.

Most notable of these include:

- Organotin and other organometallic compounds
- Silicone rubber containing organotin catalyst
- Sulfur, polysulfides, polysulfones, or other sulfur-containing materials
- Amines, urethanes, or amine containing materials
- Unsaturated hydrocarbon plasticizers
- Some solder flux residues

If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small-scale compatibility test be run to ascertain suitability in a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

Handling precautions

Product safety information required for safe use is not included in this document. Before handling, read product and material safety data sheets and container labels for safe use, physical and health hazard information. The material safety data sheet is available on photovoltaics.dupont.com or from your DuPont sales application engineer, or distributor, or by calling DuPont customer service.

Usable life and storage

For best results, Fortasun™ PV-6212 Cell Encapsulant should be stored at or below 25°C (77°F). Special precautions must be taken to prevent moisture from contacting this material. Containers should be kept tightly closed and head or air space minimized. Partially filled containers should be purged with dry air or other gases, such as nitrogen.

Packaging information

Fortasun™ PV-6212 Cell Encapsulant is supplied in drums. Detailed container size information may be obtained from your DuPont representative.

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Health and environmental information

To support customers in their product safety needs, DuPont has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, photovoltaics.dupont.com or consult your local DuPont representative.

Limited warranty information—please read carefully

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customers' tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

The DuPont sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

To the fullest extent permitted by applicable law, DuPont specifically disclaims any other express or implied warranty of fitness for a particular purpose or merchantability.

DuPont disclaims liability for any incidental or consequential damages.

Materials Matter™

DUPONT

Fortasun™

Solar Silicones

photovoltaics.dupont.com

(06/19) Form. No. 06-1094-01