

SOLAR ASCE™

TECHNICAL DATA

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(*) Measured values and results described in this document are representative one, not specification. Process conditions are also examples of the representative, and it needs adjustment according to actual equipment, design of PV modules and etc.

1. Introduction

SOLAR ASCE™ is the brand name of polyolefin base cross-linked type encapsulating materials, which contains various chemicals required for encapsulating materials of PV modules.

Its main characteristics are;

- (1) Excellent durability.
(Weather resistance, high-temperature resistance and high humidity resistance)
- (2) Excellent long term adhesion to glass, metal and plastics.
- (3) Good encapsulating properties.
- (4) Excellent optical transmission and transparency.
- (5) Flexibility which prevents solar cells from physical stress during processing.

2. Basic properties

Table1. Basic properties of SOLAR ASCE™

Item	Testing Method	Unit	SOLAR ASCE™ (Typical Value)	
			TR02BA	VR01BA
Melting point (Before cross-linking)	Referred to JIS K7121	deg.C	<60	
Optical transmission (After cross-linking)	Referred to JIS K7361	%	92	
Optical transmission at 400nm (After cross-linking)	MCTI method	%	≥90%	
UV cutoff wavelength (T=5%, After cross-linking with glass)	MCTI method	%	280nm	355nm
Refractive index at 589nm	Referred to JIS K7142	-	1.49	
Volume Resistivity at 23deg.C	Referred to JIS K6911	Ω·10mm	5 × 10 ¹⁷	
Dielectric strength	Referred to JIS C2110	kV/mm	60	
Adhesive strength to glass (0.45mm thickness sheet)	MCTI method	N/10mm	18	
Tensile strength at break (After cross-linking)	Referred to JIS K7113	MPa	24	
Elongation at break (After cross-linking)		%	900	
Tensile modulus (After cross-linking)		MPa	10	
Shore A hardness	Referred to JIS K6253	-	65	
Water absorption (After cross-linking)	Referred to JIS K7209	%	≤0.01	

3. Optical transmittance

Sample Structure : Solar Glass(3.2mmt) / SOLAR ASCE™(0.45mm^t)

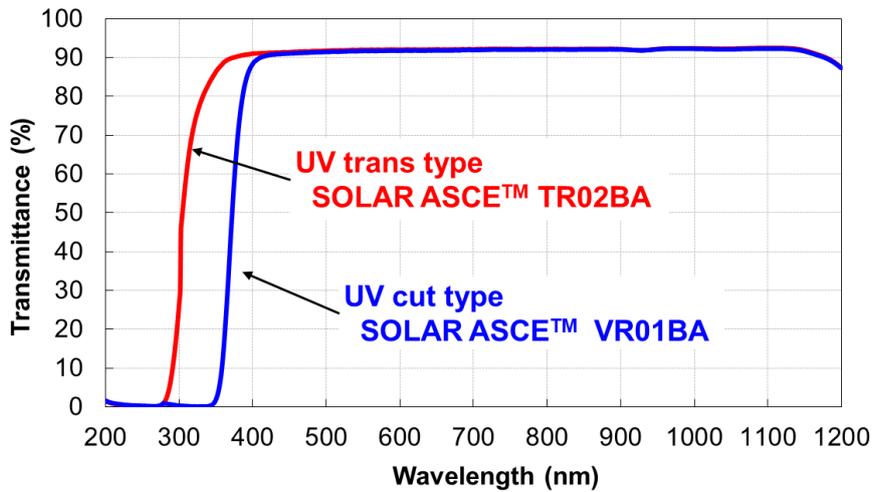


Fig.1 Optical transmittance of SOLAR ASCE™

4. Cross-linking speed of SOLAR ASCE™

Experimental conditions of cross-linking speed are following;

- Structure: Glass/PET (50µm)/SOLAR ASCE™/PET (50µm)
- Glass: 3.2mm (t) X 200mm (w) X 200mm (l)
- Laminate condition: Temperature 150,160 deg.C.
Vacuum 3min (with Pin) and Press & Hold 4-15min.
- Laminator: Hot plate size is 500mm x 500mm

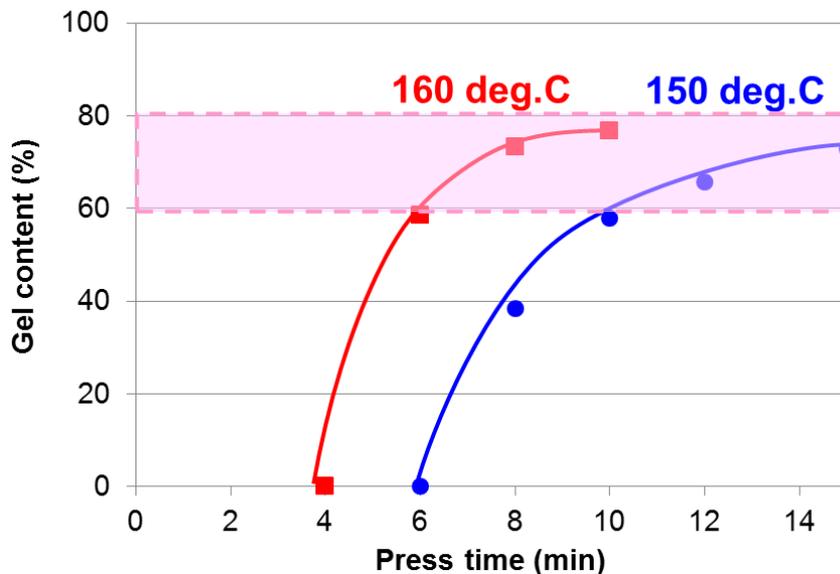


Fig.2 Cross-linking speed of SOLAR ASCE™ TR02BA

*) The necessity which adjusts gel content 60% to 80%

If gel content falls below 60%, there is a possibility that air bubbles and delamination occur.

If gel content exceeds 80%, there is a possibility that stabilizers degrade for over cure.

5. Example of laminating condition

Table2. Laminate conditions for SOALR ASCE™

Setting Temp.	150 °C	160 °C
Vacuum	3 ~ 4min	
Press & Hold	10 ~ 20 min	7 ~ 11 min
Total time	13 ~ 24 min	10 ~ 15 min

- > Conditions above are based on MCTI testing machine evaluation considering of actual module.
- > Actual condition should be determined by each customer.
- > Optimized process condition is to be settled by measuring gel content.

6. Storage and handling Cautions

- (1) SOLAR ASCE™ shall not be used for any purpose other than the photovoltaic encapsulation application.
- (2) Keep rolls of SOLAR ASCE™ sealed in their original packaging until ready for production use.
- (3) Do not handle SOLAR ASCE™ with bare hands.
- (4) Do not lay roll on side or stack additional weight on SOLAR ASCE™
- (5) Store SOLAR ASCE™ at temperature between 0 to 30 deg C with package* (wrapping by aluminum sheet including desiccant)

Do not expose to temperature of >=40 deg C for any length of time.

Do not expose to temperature of >30 deg C for more than 1hr.

* In the case with package (wrapping by aluminum sheet including desiccant), it is not necessary to consider about humidity of atmosphere because moisture cannot penetrate from outside to the inside of the package and also desiccant removes moisture inside of the package.

- (6) After the original packaging is opened, SOLAR ASCE™ is susceptible to moisture. After use, unfinished SOLAR ASCE™ rolls should be tightly rewrapped in the packaging with as much air removed as possible. Do not allow to be exposed to open air more than total 10 hours in 30 deg C and in humidity of amount of water vapor : 21.3g/m3 equal to relative humidity of 70%RH (@30 deg. C) .

(conversion of this figure to Relative Humidity at each temperature is as follows)

Temp (deg C)	Humidity (RH %)
0~24*	≤95
25	≤92
26	≤87
27	≤83
28	≤78
29	≤74
30	≤70

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* In case of the temp. 0 ~ 24 deg. C, Relative Humidity should be less than 95%RH.

- (7) Do not expose to moisture (such as dew), oil, organic solvents, chemicals, and UV light (ex. sun light, room lighting in working space, etc.)
- (8) Before the packaging is opened, the material should be allowed to stabilize at room temperature because of the compensation for the temperature difference between the storage and use areas.
- (9) Storage areas should be free of excess dust to reduce contamination.
- (10) Store the rolls in a method to facilitate FIFO usage.
- (11) Keep away SOLAR ASCE™ from fire.
- (12) Heating the product over 170 deg C during lamination work may not be recommended. Please ask for an advice if you apply temperature over 170 deg C for a trial or something.