



REPORT NUMBER: 102316297MID-001.1
ORIGINAL ISSUE DATE: February 25, 2016

TEST REPORT

EVALUATION CENTER
Intertek Testing Services NA Inc.
8431 Murphy Drive
Middleton, WI 53562

RENDERED TO

Sonali Energiees Pvt. Ltd.
C-208 Belgium Chambers Ring Road,
Surat GJ 395003 IND

CONTACT NAME:
Nitesh Desai
nitesh@sonalisolar.com

PRODUCT EVALUATED:
Photovoltaic Module SS300

EVALUATION PROPERTY:
Type Testing (Type 2)

Report of Testing the photovoltaic modules by Sonali Energiees Pvt. Ltd. for evaluation with the applicable requirements of: UL 1703, 2002 edition (rev. Oct. 2015) Section 31.1 referencing UL 790, 2004 edition, "Standard Test Methods for Fire Tests of Roof Coverings", per section 7 and 8, for Spread of Flame and Burning Brand tests.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



1 Table of Contents

1	Table of Contents.....	2
2	Introduction	3
3	Test Samples	3
4	Testing and Evaluation Methods.....	4
5	Tests Results	4
	5.1. Results and Observations.....	4
6	Conclusion	6

2 Introduction

Intertek Testing Services NA (Intertek) Fire Testing Laboratory in Middleton, Wisconsin conducted an investigation of the external fire resistance characteristics of photovoltaic modules supplied by Sonali Energiees Pvt. Ltd. for a Type '2' application. Samples were submitted to Intertek, Middleton and received October 2015 in good condition.

The tests were conducted in accordance with the fire resistance criteria of UL 1703, 2002 edition (rev. Oct. 2015) Section 31.1 referencing UL 790 (2004) "*Standard Test Methods for Fire Tests of Roof Coverings*", per section 7 for Spread of Flame tests and section 8 for Burning Brand tests. The testing in this report was conducted to state the "Type" that the module family meets, referencing Section 16.4.1 of UL 1703, 2002 edition (rev. Oct. 2015). Model SS300 was tested.

3 Test Samples

The test decks were constructed by Intertek personnel.

1. The test material was submitted by the client.
2. The test materials were applied by Intertek personnel at Middleton location.

The samples are described in more detail in the following tables.

Deck#	Deck Type	System
1	Spread of Flames	(1) Photovoltaic Module Model: SS300 301.45 W, 8.02 A, 37.57 V Serial #: SLLGU091507067
2	Burning Brand	(1) Photovoltaic Module Model: SS300 301.45 W, 8.02 A, 37.57 V Serial #: SLLGU091507072

4 Testing and Evaluation Methods

The tests were conducted in accordance with the fire resistance criteria of UL 1703, 2002 edition (rev. Oct. 2015), Section 31.1 referencing UL 790, 2004 edition, “*Standard Test Methods for Fire Tests of Roof Coverings*”, per section 7 for Spread of Flame tests and section 8 for Burning Brand tests.

The following test equipment was used to conduct the test.

<u>Roofing Lab Equipment</u>	<u>Inventory Number</u>	<u>Measurement Uncertainty</u>	<u>Calibration Date</u>
ASTM E108 Test Apparatus (Shop)	204	NA	Daily
Davis Anemometer (A/2-4 BB)	442	±2% of max reading	03/04/15
Traceable Timer	1313	±0.001% (over 3hr. period)	12/08/15
Scale	008	±50% of minimum valid division.	1/28/16

5 Tests Results

5.1. Results and Observations

Calibration

Test Conditions (Class ‘A’)

Test Date	02/19/16
Air Velocity	1065 average fpm
Slope of Cal. Deck	5:12
Average flame temp	1404°F
Ambient air temp.	82°F

Spread of Flames Tests

Test Observations Deck 1

Test Date	02/19/16	
Slope of Test Deck	5:12	
Ambient Temperature	84°F	
Time (min:sec)	Distance (feet-inches)	Observations/Comments
00:00		Burner ignited.
03:03		Back sheet blistering.
06:25		Backsheet ignition, glass shatters.
10:00		Test stop.

Results: Class "A". No ignition topside, maximum spread of flames on back sheet was 3'7".

Burning Brand Test

Test Observations Deck 2

Test Date	02/19/16
Brand Type	(21) Class C Brands, 9.25g ±0.33g
Slope of Test Deck	5:12
Ambient Temperature	83°F

Brand#	Time (min:sec)	Observations	
		Flame Out	Glow Out / Blown Off Deck
1	00:00	00:00	02:37
2	01:00	01:01	03:03
3	02:01	02:01	05:03
4	03:01	03:01	04:36
5	04:00	04:55	05:28
6	05:01	06:25	07:05
7	06:00	07:28	08:03
8	07:02	07:05	08:48
9	08:01	08:01	11:33
10	09:04	09:04	11:48
11	10:01	11:01	12:12
12	11:01	11:44	13:33
13	12:02	12:50	14:40
14	13:01	13:25	17:25
15	14:00	14:35	16:13
16	15:00	15:00	18:01
17	16:00	16:00	18:33
18	17:00	17:00	19:13
19	18:01	18:01	19:50
20	19:01	19:50	23:10
21	20:00	20:40	23:27
	30:00	Test stop. Deck is cool to touch. No smoke, flame or glow.	

Results: Class "C". No flaming of the underside of the deck, No deck penetration.

6 Conclusion

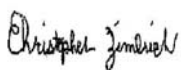
The results of the tests performed on the Photovoltaic Modules model SS300 provided by Sonali Energiees Pvt. Ltd. for a Type 2 rating, per UL 1703, 2002 edition (rev. Oct. 2015) Section 31.1 (Section 16.4.1 of UL 1703), referencing UL 790, 2004 edition “*Standard Test Methods for Fire Tests of Roof Coverings*”, section 7 for Spread of Flame tests and section 8 for Burning Brand are as follows.

Sample	Surface Material	Test	Rating
1	Photovoltaic Module SS300	Spread of Flame	Pass
2	Photovoltaic Module SS300	Burning Brand	Pass

The Sonali Energiees Pvt. Ltd. photovoltaic modules (SS300) met the requirements for a Type 2 fire application in accordance with UL 1703, 2002 edition (rev. Oct. 2015) Section 31.1 in compliance with UL 790 (2004) “*Standard Test Methods for Fire Tests of Roof Coverings*”, section 7 for Spread of Flame tests and section 8 for Burning Brand tests at a 5:12 slope.

This report does not automatically imply product certification. Products must be under a certification program and bear the Warnock Hersey registered certification mark to demonstrate compliance.

INTERTEK TESTING SERVICES NA

Reported by: 
Christopher Zimbrich
Technician II, Fire Resistance
Intertek, Building Products

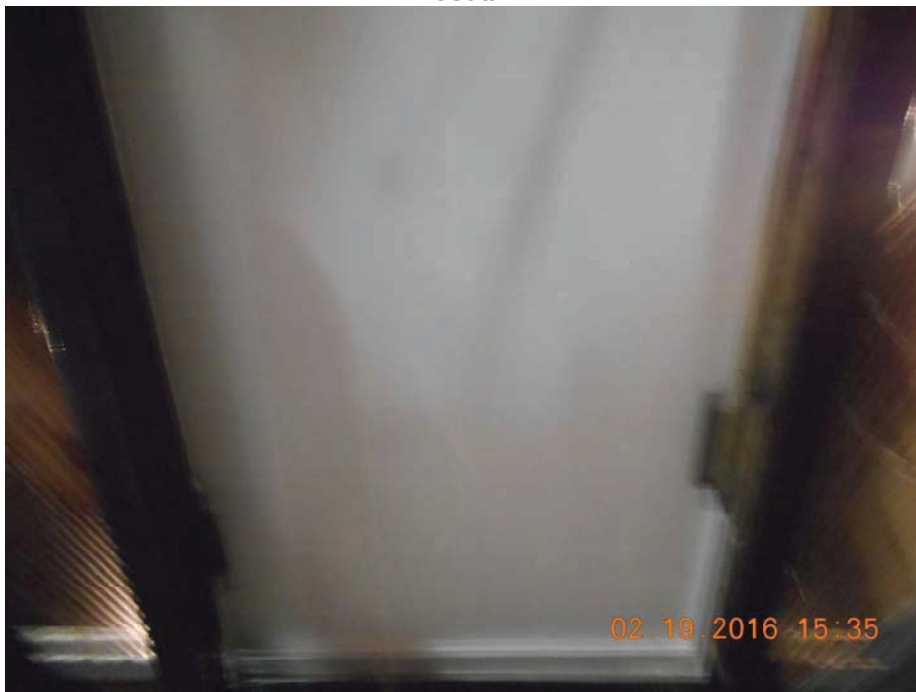
Reviewed by: 
Kent Kelsey
Lead Engineer\Fire Resistance
Intertek Building Products

Photographs

Test #1



Test #2





Sonali Energiees Pvt. Ltd.
Project No. 102316297MID-001.1

Date: February 25, 2016
Page 8 of 8

REVISION SUMMARY

DATE	SUMMARY
February 25, 2016	Initial report
