Test Report

Novasys Greenergy Private Limited

REPORT NUMBER: 4790378634.6.1-S1

PROJECT NUMBER: 4790378634.6.1

Select the applicable test locations:

☐**LOCATION 1:**

UL India Private Limited,
Laboratory building, Kalyani Platina Campus, Sy.no.129/4, EPIP Zone, Phase II, Whitefield,
Bangalore – 560 066
P:91-80-41384400

☐**LOCATION 2:**

UL India Private Limited,
Oak building, Kalyani Platina Campus, Sy.No.129/4,
EPIP Zone, Phase II, Whitefield,
Bangalore, Karnataka – 560 066

☐**LOCATION 3:**

UL India Private Limited, 30/A, I Stage, Vishveshwarya Industrial Estate, Doddanekkundi Industrial Area, Bangalore - 560048

☒**Other:**

(#Refer Page no. 3 for Test lab location)

TEST DISCIPLINE: ELECTRONICS
PRODUCT GROUP: SOLAR PANEL

General details

Customer / Applicant	Novasys Greenergy Private Limited KHASRA NO. 185, MOUZA-MAHALGAON, TAHSIL-KAMPTEE, NAGPUR MAHARASHTRA 441202 INDIA		
Manufacturer	Novasys Greenergy Private Limited KHASRA NO. 185, MOUZA-MAHALGAON, TAHSIL-KAMPTEE, NAGPUR MAHARASHTRA 441202 INDIA		
Program	**Other**		
Item Under Test	Mono crystalline PV modules (PERC)		
Model	NOVA550MP144 (tested Model)		
Number of Samples	03 Nos.		
UL Sample Identification	Refer sample identification table	**Refer Summary of Test results for multiple samples**	
Manufacturer Serial Number (if any)	NOVABTMPVD00032, NOVABTMPVD00027, NOVABTMPVD00025		
Condition of IUT on receipt	Good		
Date of Receipt	29 April 2022		
Applicable Standard	IEC 60068-2-68 Edition 1.0, 1994-08- Environmental Testing- Part 2: Dust and Sand.		
Date of Testing (Start date)	27 June 2022	**End Date**	14 July 2022
UL general^ ambient condition	**Temperature in °C**		23 ±5°C
	Relative humidity in %		<70 %
Date of Issue	28 July 2022		
Test In-charge	Yapan Wu (China Telecommunication Technology Labs)		

Fill in the rows with information or add hyphen (-)

Supratik Ghosh Engineer Project Associate	Srimathy N Project Engineer
Reviewed by	**Authorized signatory**

General Remarks (If any)

#Test lab location (Other than UL India Private Limited)

Test Laboratory/Location	
[X] UL or Affiliate	[X] Subcontract Lab
Company Name	**China Telecommunication Technology Labs**
Location	CuiHu Cloud Center,No. 1 Gaolizhang Road,Wenquan Town, Haidian District, Beijing

Test witnessed by: Jason You(Senior Project Engineer, UL China)

Below listed models covered in this test report, on basis of having same construction, design and BOM as declared by manufacturer. No testing was considered necessary to cover below listed models. Only changes are the electrical ratings, number of cells and overall dimension from the tested model.

Models covered	156 cells module: NOVAxxxMP156, xxx stands for power range from 550~600, in step of 5 W; 144 cells module: NOVAxxxMP144, xxx stands for power range from 495~550, in step of 5 W; 132 cells module: NOVAxxxMP132, xxx stands for power range from 455~505, in step of 5 W; 120 cells module: NOVAxxxMP120, xxx stands for power range from 415~460, in step of 5 W; 108 cells module: NOVAxxxMP108, xxx stands for power range from 375~415, in step of 5 W; 96 cells module: NOVAxxxMP96, xxx stands for power range from 325~365, in step of 5 W; 72 cells module: NOVAxxxMP72, xxx stands for power range from 245~275, in step of 5 W.

Description of Item under Test (IUT)

Mono crystalline PV modules (PERC) of 540Wp was tested for Sand & dust test (Model- NOVA550MP144). Total 3 samples were tested, 1 sample was used as control sample.

Summary of Test Results

After the sand and dust test there no evidence of major visual defects as described in IEC 61730-2:2004 including also no mechanical deterioration or corrosion of module components.

After the sand and dust test exposure test the maximum power was not decrease by more than 5 % of the initial value.

All the test results fulfil the requirements of standard: IEC 60068-2-68 Edition 1.0, 1994-08- Environmental Testing- Part 2: Dust and Sand.

Test No.	Test Item	Standard references, clause	Result
1	Visual inspection	IEC 61215:2005-04, Ed-2, 10.1	P
2	Maximum power determination	IEC 61215:2005-04, Ed-2, 10.2	P
3	Preconditioning	IEC 61215:2005-04, Ed-2	P
4	Visual inspection	IEC 61215:2005-04, Ed-2, 10.1	P
5	Electroluminescence test	IEC TS 60904-13, Edition 1, 2018-08	P
6	Maximum power determination	IEC 61215:2005-04, Ed-2, 10.2	P
7	Dielectric withstand test	IEC 61215:2005-04, Ed-2, 10.3	P
8	Wet leakage current test	IEC 61215:2005-04, Ed-2, 10.15	P
9	Ground continuity test	IEC 61730-2:2004-10, Ed-1, clause 10.4	P
10	Dust and sand test	IEC 60068-2-68: 1994-08, Ed-1, 6.1.4.1	P
11	Visual inspection after Dust and sand test	IEC 61215:2005-04, Ed-2, 10.1	P
12	Electroluminescence test after Dust and sand test	IEC TS 60904-13, Ed-1, 2018-08	P
13	Maximum power determination after Dust and sand test	IEC 61215:2005-04, Ed-2, 10.2	P
14	Dielectric withstand test after Dust and sand test	IEC 61215:2005-04, Ed-2, 10.3	P
15	Wet leakage current test after Dust and sand test	IEC 61215:2005-04, Ed-2, 10.15	P
16	Ground continuity test after Dust and sand test	IEC 61730-2:2004-10, Ed-1, clause 10.4	P
17	Bypass diode functionality test after Dust and sand test	IEC 62716 Ed-1.0, dated 2013-06, clause 4.2	P

P: Meets the requirements F: Does not meet the requirement NA: Not applicable

Abbreviations used in the report:

Pmax – Maximum power
Vmp – Maximum power voltage
Imp – Maximum power current
Isc – Short circuit current
Voc – Open circuit voltage
FF – Fill factor
N/A – not apply to the object

Master Equipment and Calibration details

Inst. ID No.	Instrument Type	Test Number, Test Title or Conditioning	Last Cal. Date [YYYY-MM-DD]	Next Cal. Date [YYYY-MM-DD]
CTTL-09065	Steel tape	1/4/11	2022-03-19	2023-03-18
CTTL-09579	Light Meter	1/4/11	2022-04-12	2023-04-11
CTTL-09517	Solar simulator	2/6/13/17	2021-11-16	2022-11-15
CTTL-09410	Reference PV module	2/6/13/17	2021-09-29	2022-09-28
CTTL-09068	Infrared thermometer	2/6/13/17	2021-10-12	2022-10-11
CTTL-07599	Dielectrometer	7/8/14/15	2021-12-28	2022-12-27
CTTL-07600	Withstand voltage tester	7/14	2021-12-28	2022-12-27
CTTL-08576	Current caliper	3/5/9/12/16/17	2021-08-19	2022-08-18
Support Equipment	EL camera	5/12	N/A	N/A
CTTL-02698	Conductivity meter	8/15	2022-02-05	2023-02-04
YD0004185	Power supply	5/9/12/16/17	/	/
CTTL-07777	Shunt	9/16	2021-10-14	2022-10-13
CTTL-02610	Multimeter	9/16	2022-01-04	2023-01-03
CTTL-09066	Sand dust test chamber	10	2021-09-01	2022-08-31
CTTL-02590~ CTTL-02595	Sample separation screen	10	2022-07-07	2023-07-06
CTTL-02604	balance	10	2022-05-18	2023-05-17
CTTL-08577	Temperature and humidity meter	1~17	2021-08-25	2022-08-24

Remark: during testing and measurements no equipment out of calibration.

Appendixes of this report:-

No.	Appendix Name
1	Appendix 1 – Bill of material of the test sample

Test methodology adopted

[X]Test items were conducted in subcontract lab: