No.：P2020092702

Test report

Product(Sample)	eArc module
Application Dept.	Production department
Applicant	Xiaowen Liu
Test Company	SUNMAN(ZHENJIANG) CO.,LTD.
Test Date	2021-11-12
Tester	
Auditor	
Approved by	
Date of issue	2021-12-24

上迈(镇江)新能源科技有限公司 测试中心 Testing Center SUNMAN (ZHENJIANG) CO., LTD.

1. **Purpose of the testing:**

To confirm the effect of eArc module's upper film creases on aging and long-term reliable performance.

2. Test definitions

2.1 Damp & heat aging test: to test the thermal stress while the modules are exposed to high humidity and the ability to resist the long-term penetration of moisture, thus reproduce the damage caused by the environment.

2.2 Wet Leakage: to evaluate the insulation of the modules under humid operating conditions and confirm that moisture from rain, fog, frost or snowmelt will not enter the moving parts of the module circuit.

3. Testing instrument

3.1Damp & heat aging test instrument:

Instrument Name: Damp & Heat Testing Chambers
Instrument manufacturer: Shanghai Houyao
Model：HY-BRS-DH-9

3.2 Wet Leakage test instrument:

Instrument Name: Electrical Safety Tester
Instrument manufacturer: Good Will Instrument Co., Ltd
Model：GEO925909

4. Test standard:

4.1 Damp & heat aging standard

4.1.1 Test conditions: with the temperature 85±2℃, relative humidity: 85±5%

testing time: 1000H

4.1.2 Judging criteria: no serious appearance defects, the maximum output power degradation does not exceed 5% of the test value before the experiment.

4.2 Wet leakage standard:

4.2.1 Test conditions: Soak in the solution with a resistivity of less than 3500Ω·CM for 48hours

4.2.2 Judging criteria: For modules with an area greater than 0.1m², the test insulation resistance multiplied by the module area should not be less than 40MΩ·m².

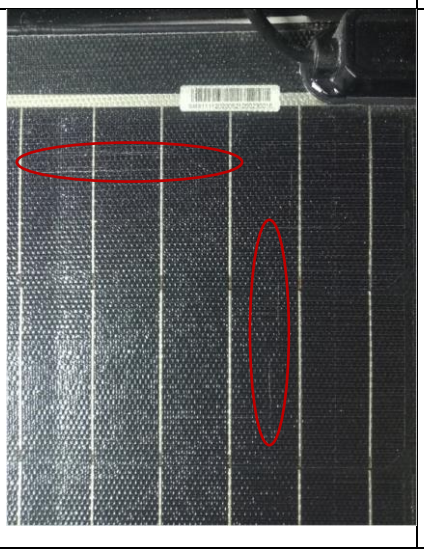
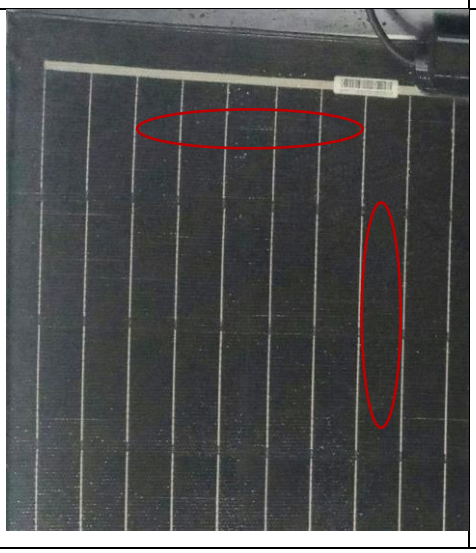
Remarks: The test standard refers to IEC 61215;GB/T 7122-1996 standard.

5. Samples information：

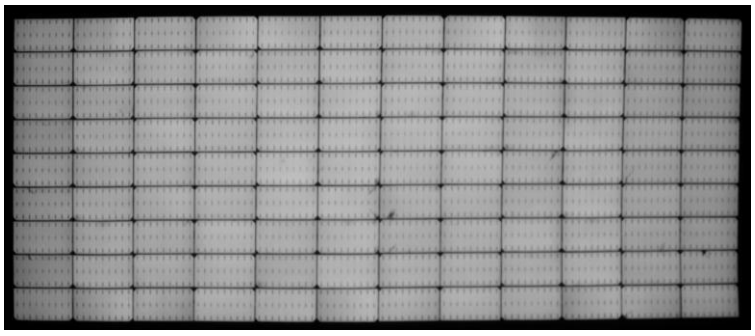
No.	Lot No.	Model	Serial Number	Structure
1	N/A	9*12 cut cell	SMS111120200521050230016	eArc

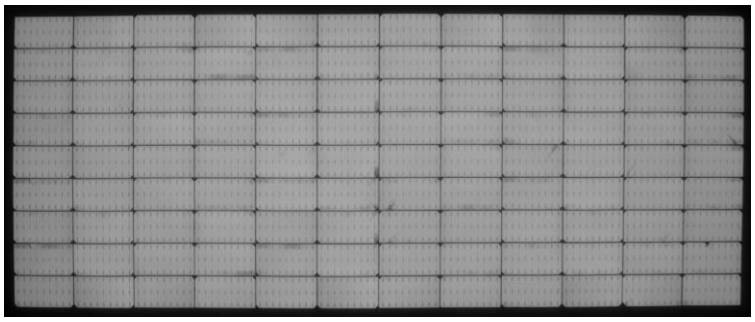
6. Test results:

6.1 Appearance:

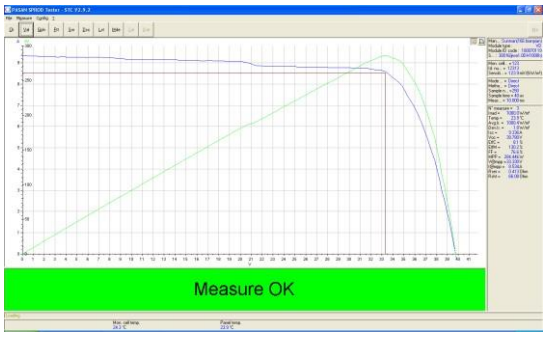
No.	Lot No.	Before aging		After aging		Analysis & Judgement
		Images	Note	Images	Note	
1	N/A		Normal		Color: Normal No obvious abnormalities on the creases area	Pass

6.2 EL test：

No.	Test period	Images	Note	Judgement
1	Before testing		Normal	Pass

	1*IEC		No abnormalities	Pass

6.3 Power：

No.	Test period	Images	Note	Judgement
1	Before testing		Power：292.568W	Pass
	1* IEC		Power：284.446W Degradation ： -2.78%	Pass

6.3.1 Power loss：

No.	Test period	VOC（V）	Vmp（V）	Isc（A）	Imp（A）	Pmp（W）	RS（Ω）	FF（%）	Degradation
1	Before testing	40.369	33.981	9.235	8.610	292.568	0.39	78.5	/
	1* IEC	39.780	33.330	9.336	8.534	284.446	0.41	76.6	2.78%

6.4 Wet leakage ：

6.4.1 Test conditions: Soak in the solution with a resistivity of less than 3500Ω·CM for 48hours after DH1000 hours

6.4.2 Test Voltage :1000V

No.	Test period	The actual resistance value of the soaking solution （Ω.CM）	Images	Insulation resistance value （MΩ）	Module area （㎡）	Resistance value*area （MΩ·㎡）	Pass criteria （MΩ·㎡）	Judgement
1	Before testing	2923		1997	1.3975	2762	≥40	Pass
	1*IEC	2765		365	1.3975	510	≥40	Pass

7. Conclusion:

After DH1000h, the power degradation is less than 5%, and no obvious abnormalities on the creases area, the power and wet leakage tests both meet the requirements;

Therefore, it is determined that the creases on the surface do not affect the performance, durability or reliability of the modules .