

XRF Screening and chemical confirmation test report

Number: 2310A0513SHA-001

Applicant: Jiangsu Reesun Solar Technology Co., Ltd.
No.1 Nanjing Road, Jianhu Economic Development Zone,
Yancheng City,224799 Jiangsu,P.R. China

Date: Mar. 20, 2024

Sample description:

One (1) submitted sample said to be:

Item Name : Photovoltaic (PV) Modules
Tested Model : REESUN144H-182M-10BB-545
REESUN144HB-182M-10BB-545
Brand Name : ECOREESUN
Ratings : 545W
Manufacturing : Jiangsu Reesun Solar Technology Co., Ltd.
Site / Factory : No.1 Nanjing Road, Jianhu Economic Development Zone, Yancheng City, 224799
Jiangsu,P.R. China

Tests conducted:

As requested by the applicant, for details refer to attached page(s).

Conclusion:

<u>Tested sample</u>	<u>Standard</u>	<u>Result</u>
Submitted sample	Screening by XRF spectroscopy and chemical confirmation test for RoHS Directive 2011/65/EU and (EU)2015/863	Pass

To be continued

Authorized by:
For Intertek testing services Ltd., Shanghai

Wenjia Gu
Senior Manager



Reference Model : REESUN144H-166M-9BB-XXX(XXX=425~460, in steps of 5)
REESUN120H-166M-9BB-XXX(XXX=355~380, in steps of 5)
REESUN156H-182M-10BB-XXX (XXX=580~600, in steps of 5)
REESUN144H-182M-10BB-XXX(XXX=520~555, in steps of 5)
REESUN132H-182M-10BB-XXX(XXX=480~505, in steps of 5)
REESUN120H-182M-10BB-XXX(XXX=435~460, in steps of 5)
REESUN108H-182M-10BB-XXX(XXX=395~415, in steps of 5)
REESUN144BH-182M-10BB-XXX(XXX=510~540, in steps of 5)
REESUN132BH-182M-10BB-XXX(XXX=470~495, in steps of 5)
REESUN120BH-182M-10BB-XXX(XXX=425~450, in steps of 5)
REESUN108BH-182M-10BB-XXX(XXX=385~405, in steps of 5)
REESUN156HN-182M-16BB-XXX(XXX=600~630, in steps of 5)
REESUN144HN-182M-16BB-XXX(XXX=560~595, in steps of 5)
REESUN132HN-182M-16BB-XXX(XXX=520~545, in steps of 5)
REESUN120HN-182M-16BB-XXX(XXX=465~495, in steps of 5)
REESUN108HN-182M-16BB-XXX(XXX=420~445, in steps of 5)
REESUN144BHN-182M-16BB- XXX(XXX=550~580, in steps of 5)
REESUN132BHN-182M-16BB- XXX(XXX=510~530, in steps of 5)
REESUN120BHN-182M-16BB- XXX(XXX=460~480, in steps of 5)
REESUN108BHN-182M-16BB-XXX(XXX=410~430, in steps of 5)
REESUN132H-210M-12BB-XXX(XXX=640~665, in steps of 5)
REESUN120H-210M-12BB-XXX(XXX=580~605, in steps of 5)
REESUN132HN-210M-18BB-XXX(XXX=675~710, in steps of 5)
REESUN120HN-210M-18BB-XXX(XXX=615~650, in steps of 5)
REESUN156HBN-182M-16BB-XXX(XXX=615~650, in steps of 5)
REESUN144HBN-182M-16BB-XXX(XXX=560~585, in steps of 5)
REESUN132HBN-182M-16BB-XXX(XXX=520~540, in steps of 5)
REESUN120HBN-182M-16BB-XXX(XXX=475~495, in steps of 5)
REESUN108HBN-182M-16BB-XXX(XXX=415~435, in steps of 5)
REESUN156HB-182M-10BB-XXX(XXX=580~600, in steps of 5)
REESUN144HB-182M-10BB-XXX(XXX=515~550, in steps of 5)
REESUN132HB-182M-10BB-XXX(XXX=475~505, in steps of 5)
REESUN120HB-182M-10BB-XXX(XXX=430~460, in steps of 5)
REESUN108HB-182M-10BB-XXX(XXX=390~415, in steps of 5)
REESUN132HBN-210M-18BB-XXX(XXX=675~710, in steps of 5)
REESUN120HBN-210M-18BB-XXX(XXX=615~650, in steps of 5)
REESUN132HB-210M-12BB-XXX(XXX=635~670, in steps of 5)
REESUN120HB-210M-12BB-XXX(XXX=575~610, in steps of 5)
REESUN110HB-210M-12BB-XXX(XXX=525~560, in steps of 5)
REESUN144HB-166M-9BB-XXX(XXX=435~460, in steps of 5)
REESUN120HB-166M-9BB-XXX(XXX=355~380, in steps of 5)

To be continued



Tests Conducted

Cadmium (Cd), Lead (Pb), Mercury (Hg), Chromium (Cr) and Bromine (Br) content were measured with reference to IEC 62321-3-1 Edition 1.0: 2013 by XRF spectroscopy and chemical confirmation test for RoHS restricted substances. And Phthalates content were determined by Gas Chromatographic-Mass Spectrometric (GC-MS).

(A) Results:

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
1	GLUE (CLEAR NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	
2	GLASS (CLEAR NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	
3	EDGING (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA		/	
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
			DIBP	NA	NA	/	

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
4	SOLDERING TIN (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA	/		
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
5	SOLDERING TIN (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA	/		
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
6	SHELL (WHITE NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
DIBP	NA	BL	/				

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
7	TAG (SILVER NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
8	TAG (SILVER NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
9	COVER (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
DIBP	NA	BL	/				

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
10	GLUE (WHITE NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
11	SUPPORT (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
12	SHEATH (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
DIBP	NA	BL	/				

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
13	PLUG (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
14	GASKET (RED NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
15	CONTACT PIECE (COPPER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA	/		
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
DIBP	NA	NA	/				

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
16	SOLDERING TIN (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA	/		
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
17	CONTACT PIN (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA	/		
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
18	DIODE	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
DIBP	NA	BL	/				

 To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
19	WIRE LEATHER (BLACK NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
20	WIRE CORE (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA	/		
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
21	CLASP (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P	/		
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
DIBP	NA	BL	/				

 To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
22	GASKET (GREY NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	
23	SHEATH (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	
24	SHEATH (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA		/	
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
			DIBP	NA	NA	/	

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
25	PLUG PIN						
25-1	SUPPORT (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA		/	
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
			DIBP	NA	NA	/	
25-2	CONNECTING PLUG (SILVER METAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	NA		/	
			DEHP	NA	NA	/	
			BBP	NA	NA	/	
			DBP	NA	NA	/	
			DIBP	NA	NA	/	
26	SOCKET (BLACK PLASTIC)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	

To be continued



Tests Conducted

Part No.	Tested Components	Refer information	Restricted Substance	XRF Result	Screened Results (BLphthalates)	Chemical Confirmation Result	Conclusion on RoHS
DIFFERENT PARTS							
D1	GLASS (CLEAR NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	
D2	GLASS (CLEAR NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	
D3	STICKER (SILVER NONMETAL)	/	Cd	P	NA	/	PASS
			Pb	P		/	
			Hg	P		/	
			Cr	P		/	
			Br	P		/	
			DEHP	NA	BL	/	
			BBP	NA	BL	/	
			DBP	NA	BL	/	
			DIBP	NA	BL	/	

To be continued



Tests Conducted

Remark: P = pass (Below the lower screening limit of table (B))
 X = inconclusive result (Further chemical test was suggested (see table (B).)
 NA = not applicable
 ND = not detected
 ppm = Parts per million = mg/kg

Negative = A negative test result indicated the absorbance value of testing sample solution for Cr(VI) testing is less than the absorbance value of the 0.10µg/cm² equivalent comparison standard solution, the Cr(VI) concentration is below the limit of quantification, then the sample is considered to be negative for Cr(VI).

(B)
 (B1) XRF Screening Limits in mg/kg for Regulated Elements in Various Matrices.

Element	Polymer materials	Metallic materials	Composite materials
Cd	$P \leq 70 < X < 130 \leq F$	$P \leq 70 < X < 130 \leq F$	$P \leq 70 < X < 150 \leq F$
Pb	$P \leq 700 < X < 1300 \leq F$	$P \leq 700 < X < 1300 \leq F$	$P \leq 500 < X < 1500 \leq F$
Hg	$P \leq 700 < X < 1300 \leq F$	$P \leq 700 < X < 1300 \leq F$	$P \leq 500 < X < 1500 \leq F$
Cr	$P \leq 700 < X$	$P \leq 700 < F$	$P \leq 500 < X$
Br	$P \leq 300 < X$	Not applicable	$P \leq 250 < X$

(B2) Preliminary screening test will used for phthalates, if the results exceed the warning area in the following table, further chemical methods will conduct to confirm the exact content by GC/MS.

Phthalates	Polymer
Bis(2-ethylhexyl)phthalate(DEHP)	$BL \leq 600 < X$
Butyl benzyl phthalate(BBP)	$BL \leq 600 < X$
Dibutyl phthalate(DBP)	$BL \leq 600 < X$
Diisobutyl phthalate(DIBP)	$BL \leq 600 < X$

(C) Estimated detection limits in mg/kg for regulated elements in various matrices.

Element	Polymer materials	Metallic materials	Composite materials
Cd	50	70	70
Pb	100	200	200
Hg	100	200	200
Cr	100	200	200
Br	200	Not applicable	200

 To be continued



Tests Conducted

Disclaimers:

This XRF screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The results shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis is required to obtain quantitative data.

(D) Chemical confirmation test methods:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) Content	With reference to IEC 62321-5 Edition 1.0:2013, by acid digestion until the tested sample was totally dissolved and determined by ICP - OES	2 mg/kg
Lead (Pb) Content	With reference to IEC 62321-5 Edition 1.0:2013, by acid digestion until the tested sample was totally dissolved and determined by ICP - OES	2 mg/kg
Mercury (Hg) Content	With reference to IEC 62321-4 Edition 1.1:2017, by acid digestion until the tested sample was totally dissolved and determined by ICP - OES	2 mg/kg
Chromium (VI)(Cr ⁶⁺) Content	With reference to IEC 62321-7-2 Edition 1.0:2017, by alkaline digestion and determined by UV-VIS Spectrophotometer	10 mg/kg
Chromium (VI) (Cr ⁶⁺) content (for metal)	With reference to IEC 62321-7-1 Edition 1.0: 2015, by boiling water extraction and determined by UV-VIS Spectrophotometer.	Positive(>0.13 µg/m ²)/ Negative(<0.10 µg/m ²) Inconclusive(0.10-0.13 µg/m ²)
Polybrominated Biphenyls (PBBs) & Polybrominated Diphenyl Ethers (PBDEs) Content	With reference to IEC 62321-6 edition 1.0:2015, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary	5 mg/kg
Phthalates(DEHP,BBP,DBP, DIBP) Content	With reference to IEC62321-8: 2017, by solvent extraction and determined by GC/MS	100mg/kg

To be continued



Tests Conducted

(E) RoHS requirement

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)
Phthalates (DEHP, BBP, DBP, DIBP)	0.1% (1000 mg/kg)

The above limits were quoted from 2011/65/EU and (EU) 2015/863 for homogeneous material.

Date sample received: Nov. 18, 2023 & Mar. 12, 2024

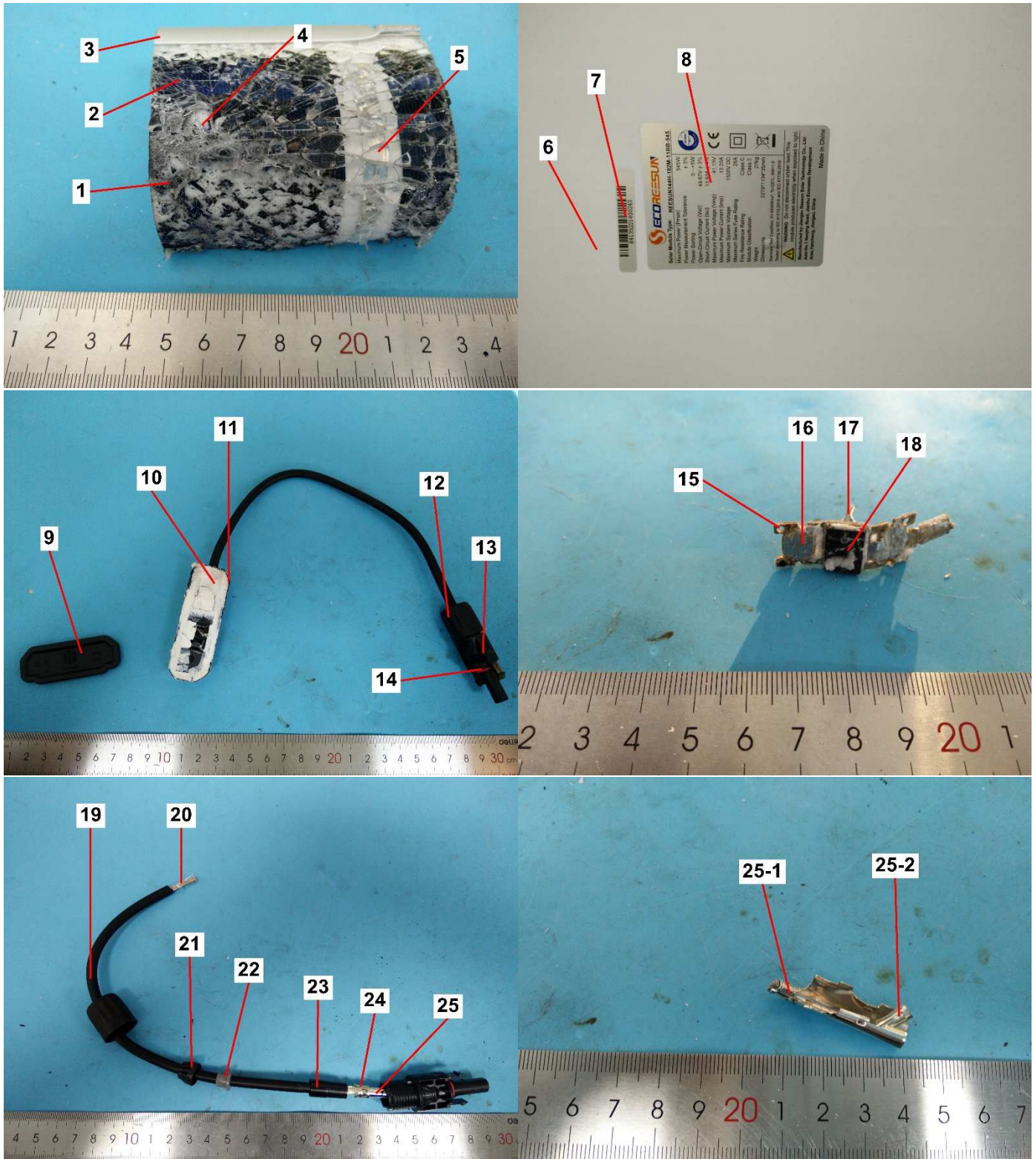
Testing period: Nov. 18, 2023 To Mar. 13, 2024

To be continued



Tests Conducted

Photo

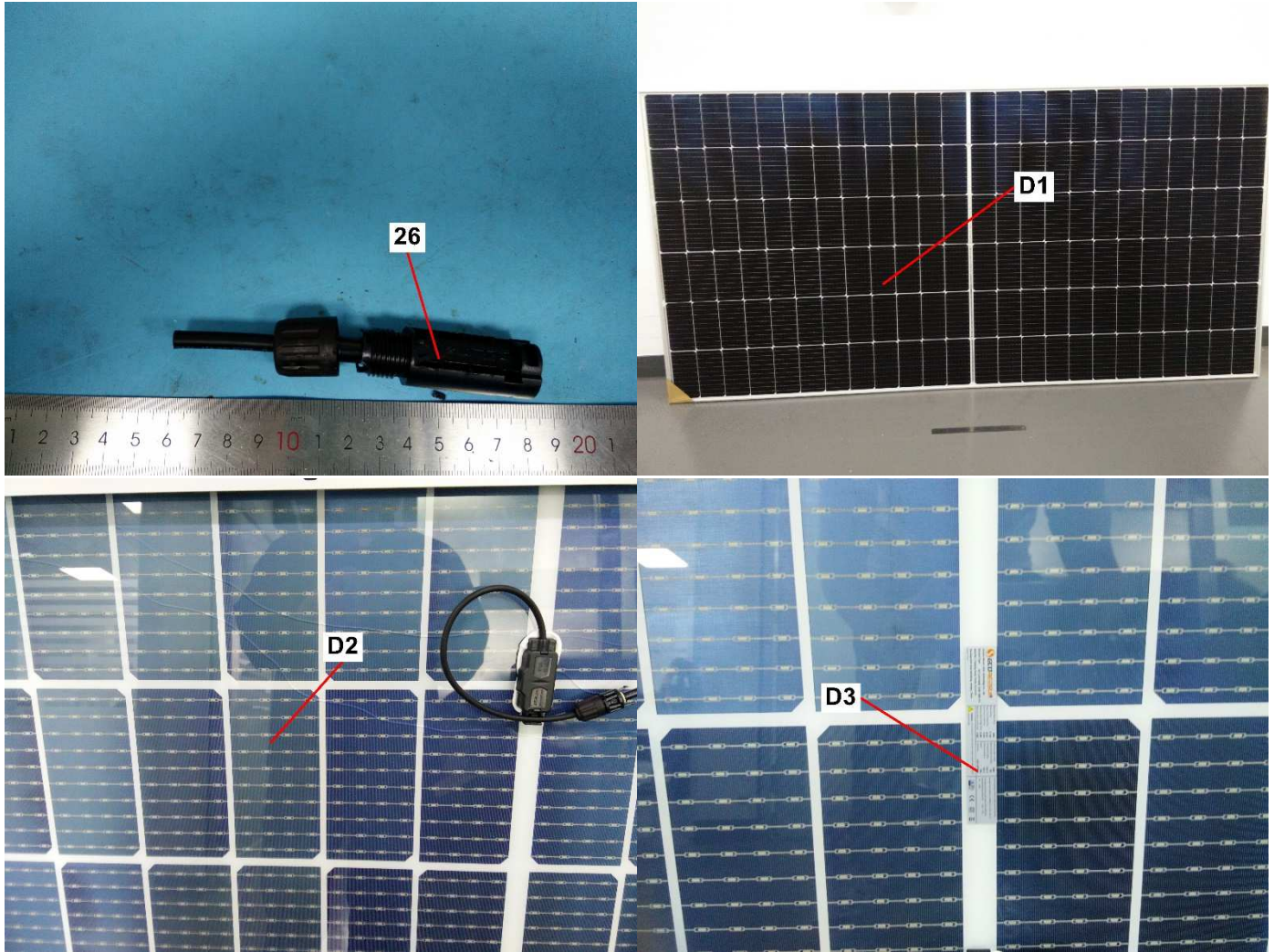


To be continued



Tests Conducted

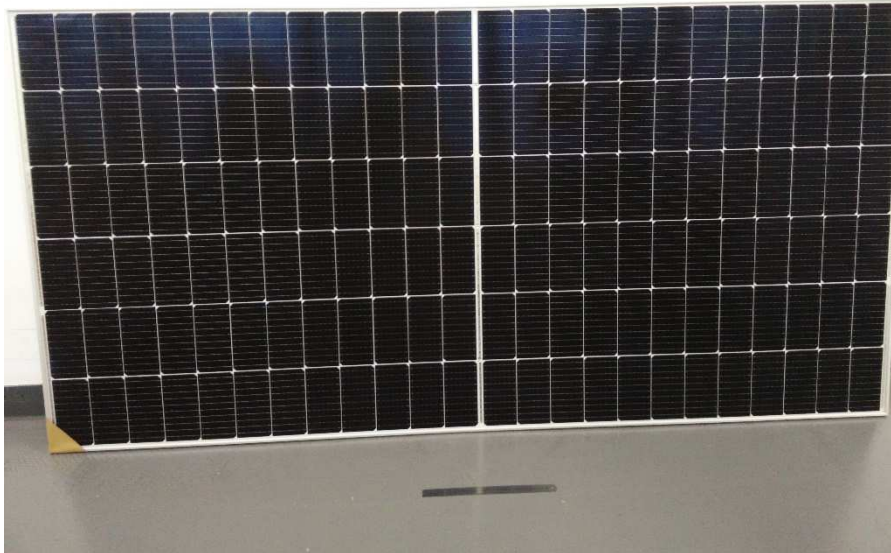
Photo



To be continued

Tests Conducted

Photo



End of report

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