Verification Report

Applicant	:	**SRNE Solar Co., Ltd**
Address	:	**4-5F, Building13A,Taihua Wutong Industrial Park, Gushu Devetopment Zone, Hangcheng Street, Baoan, Shenzhen, China PR**

Report on the submitted samples said to be:

Sample Name(s)	:	**Solar Charge Controller**
Trade Mark	:	SRNE
Part No.	:	**MA4830N15, MA2430N15, MA2440N15, MA2460N15**
Sample Received Date	:	**May 26, 2022**
Testing Period	:	**May 26, 2022 ~ July 08, 2022**
Date of Report	:	**July 08, 2022**
Results	:	**Please refer to next page(s).**

TEST REQUEST	CONCLUSION
As specified by client, based on the performed tests on submitted sample, the result of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, Dibutyl Phthalate(DBP), Butylbenzyl Phthalate(BBP), Di-2-ethylhexyl Phthalate(DEHP) and Diisobutyl phthalate(DIBP) content comply with the limits set by RoHS Directive 2011/65/EU with amendment (EU) 2015/863.	**PASS**

Signed for and on behalf of LCS

Young/Laboratory Manager

Results:

A. EU RoHS Directive 2011/65/EU and its amendment directives

Test method: With reference to IEC 62321-1:2013&IEC 62321-2:2021&IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Sample No.	Sample Description	Results						Date of sample submission/ Resubmission
		Cd	Pb	Hg	Cr▼	Br▼		
						PBBs	PBDEs	
1	Orange plastic board	BL	BL	BL	BL	BL	BL	2022-05-26
2	Black plastic shell	BL	BL	BL	BL	BL	BL	2022-05-26
3	Gold metal nut	BL	BL	BL	BL	/	/	2022-05-26/ 2022-06-20
4	Black and white label	BL	BL	BL	BL	BL	BL	2022-05-26
5	White plastic shell	BL	BL	BL	BL	BL	BL	2022-05-26
6	Ferrous metal shell	BL	BL	BL	BL	/	/	2022-05-26
7	Gold metal column	BL	BL	BL	BL	/	/	2022-05-26/ 2022-06-20/ 2022-07-06
8	Transparent plastic plate	BL	BL	BL	BL	BL	BL	2022-05-26
9	Black plastic key	BL	BL	BL	BL	BL	BL	2022-05-26
10	Grey cloth	BL	BL	BL	BL	BL	BL	2022-05-26
11	White plastic nail	BL	BL	BL	BL	BL	BL	2022-05-26
12	Silver metal screw	BL	BL	BL	BL	/	/	2022-05-26
13	Black metal screw	BL	BL	BL	BL	/	/	2022-05-26
14	Red colloid	BL	BL	BL	BL	BL	BL	2022-05-26
15	Silver metal washer	BL	BL	BL	X	/	/	2022-05-26
16	Silver metal screw	BL	BL	BL	X	/	/	2022-05-26
17	Silver metal gasket	BL	BL	BL	X	/	/	2022-05-26
18	Silver metal gasket	BL	BL	BL	BL	/	/	2022-05-26
19	Silver metal screw	X	BL	BL	BL	/	/	2022-05-26
20	Silver metal washer	BL	BL	BL	BL	/	/	2022-05-26
21	Black plastic thread leather	BL	BL	BL	BL	BL	BL	2022-05-26
22	Silver wire core	X	BL	BL	BL	/	/	2022-05-26
23	White plastic terminal	BL	BL	BL	BL	BL	BL	2022-05-26
24	Silver metal contact	OL	BL	BL	BL	/	/	2022-05-26
25	Black hard colloid	BL	BL	BL	BL	BL	BL	2022-05-26
26	Silver metal terminal	BL	OL	BL	BL	/	/	2022-05-26
27	Black tape	BL	BL	BL	BL	BL	BL	2022-05-26

Sample No.	Sample Description	Results						Date of sample submission/ Resubmission
		Cd	Pb	Hg	Cr▼	Br▼		
						PBBs	PBDEs	
28	White plastic leather	BL	BL	BL	BL	BL	BL	2022-05-26
29	Blue plastic sheet	BL	BL	BL	BL	X	X	2022-05-26
30	White paper	BL	BL	BL	BL	BL	BL	2022-05-26
31	Silver tape	BL	BL	BL	BL	BL	BL	2022-05-26
32	Black tape	BL	BL	BL	BL	BL	BL	2022-05-26
33	Transparent plastic plate	BL	BL	BL	BL	BL	BL	2022-05-26
34	Black glass screen	BL	BL	BL	BL	BL	BL	2022-05-26
35	Silver metal pin	BL	BL	BL	BL	/	/	2022-05-26
36	Green plastic PCB	BL	BL	BL	BL	BL	BL	2022-05-26
37	Yellow plastic patch LED lamp	BL	BL	BL	BL	BL	BL	2022-05-26
38	Silver sheet metal	BL	BL	BL	BL	/	/	2022-05-26
39	Black plastic key	BL	BL	BL	BL	BL	BL	2022-05-26
40	Silver metal shrapnel	OL	BL	BL	BL	/	/	2022-05-26
41	Black plastic base	BL	BL	BL	BL	BL	BL	2022-05-26
42	Silver metal contact	OL	X	BL	BL	/	/	2022-05-26
43	Black plastic IC	BL	BL	BL	BL	BL	BL	2022-05-26
44	White colloid	BL	BL	BL	BL	BL	BL	2022-05-26
45	Gray plastic capacitor	BL	BL	BL	BL	BL	BL	2022-05-26
46	Black plastic frame	BL	BL	BL	BL	BL	BL	2022-05-26
47	Red plastic capacitor	BL	BL	BL	BL	BL	BL	2022-05-26
48	Green plastic PCB	BL	BL	BL	BL	BL	BL	2022-05-26
49	White plastic interface	BL	BL	BL	BL	BL	BL	2022-05-26
50	Silver metal shell	BL	BL	BL	BL	/	/	2022-05-26
51	Black plastic sleeve	BL	BL	BL	BL	BL	BL	2022-05-26
52	Black colloid	BL	BL	BL	BL	BL	BL	2022-05-26

Note:

1. Results were obtained by XRF for primary screening, and further chemical testing by ICP(for Cd, Pb, Hg), UV-Vis(for Cr(VI)) and GC-MS(for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013(Unit: mg/kg).

Element	Polymers	Metals	Composite material
Cd	BL≤(70-3σ)<X<(130+3σ)≤OL	BL≤(70-3σ)<X<(130+3σ)≤OL	LOD<X<(150+3σ)≤OL
Pb	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(500-3σ)<X<(1500+3σ)≤OL
Hg	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(500-3σ)<X<(1500+3σ)≤OL
Cr	BL≤(700-3σ)<X	BL≤(700-3σ)<X	BL≤(500-3σ)<X
Br	BL≤(300-3σ)<X	N/A	BL≤(250-3σ)<X

Remark:

- BL= Below Limit
- OL= Over Limit
- X= The range of needing to do further testing
- 3σ= The reproducibility of analytical instruments
- N/A= Not applicable
- LOD= Detection limit

2. The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
3. The maximum permissible limit is quoted from the document RoHS Directive 2011/65/EU with amendment (EU) 2015/863.
4. ▼=For restricted substances PBBs and PBDEs, the results show the total Br content, the restricted substance was Cr(VI), and the results showed the total Cr content.

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium(Cd)	100
Lead(Pb)	1000
Mercury(Hg)	1000
Hexavalent Chromium(Cr(VI))	1000
Polybrominated biphenyls(PBBs)	1000
Polybrominated diphenylethers(PBDEs)	1000
Dibutyl Phthalate(DBP)	1000
Butylbenzyl Phthalate(BBP)	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	1000
Diisobutyl phthalate(DIBP)	1000

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 result 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 are required to obtain quantitative data.

B. EU RoHS Directive 2011/65/EU with amendment (EU) 2015/863 on Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, DBP, BBP, DEHP & DIBP content

Test method:

Lead(Pb) & Cadmium(Cd) Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES) or Atomic absorption spectrometer (AAS).

Mercury(Hg) Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES).

Hexavalent Chromium(Cr(VI)) Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, analysis was performed by UV-visible spectrophotometer (UV-Vis).

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS).

Phthalates(DBP, BBP, DEHP &DIBP) Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS).

1) The test results of Lead(Pb) & Cadmium(Cd)

Tested Items	MDL (mg/kg)	Results (mg/kg)			Limit (mg/kg)
		(26)	(40)	(42)	
Lead(Pb) Content	5	890	116	374	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)				Limit (mg/kg)
		(19)	(22)	(24)	(40)	
Cadmium(Cd) Content	5	N.D.	N.D.	N.D.	N.D.	100

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		(42)	
Cadmium(Cd) Content	5	8	100

2) The test results of Hexavalent Chromium(Cr(VI))(for coating on metal)

Tested Items	MDL ($\mu g/cm^2$)	Results ($\mu g/cm^2$)			Limit ($\mu g/cm^2$)
		(15)	(16)	(17)	
Hexavalent Chromium(Cr(VI)) Content★	0.10 (LOQ)	N.D.	N.D.	N.D.	1000

3) The test results of Phthalates(DBP, BBP, DEHP &DIBP)

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		1+2+4+5+8+9	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		10+11+14+23+25+27	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		28+29+30+31+32+33	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		34+36+37+39+41+43	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		44+45+46+47+48+49	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)			Limit (mg/kg)
		21	51	52	
Dibutyl Phthalate(DBP) Content	100	N.D.	N.D.	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	100	N.D.	N.D.	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	100	N.D.	N.D.	N.D.	1000
Diisobutyl phthalate(DIBP) Content	100	N.D.	N.D.	N.D.	1000

4) The test results of PBBs & PBDEs

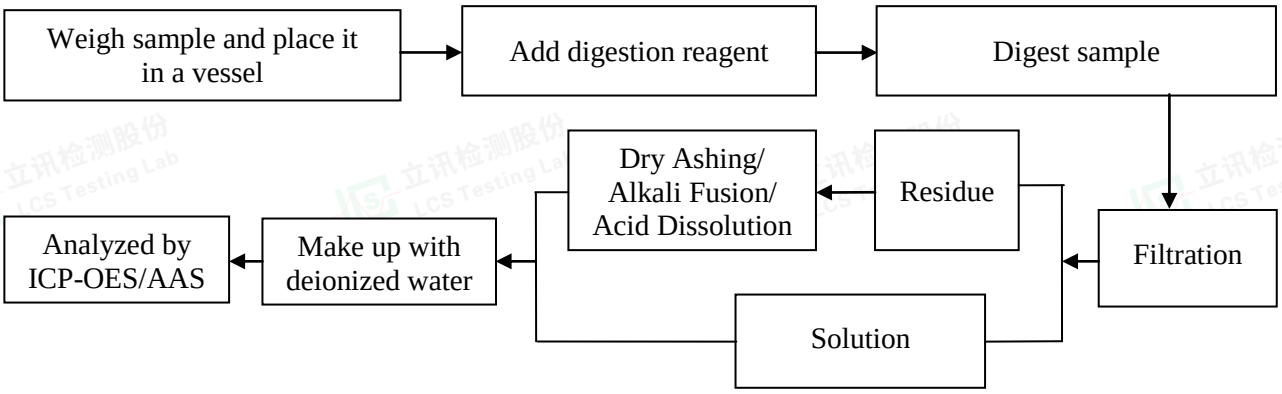
Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		(29)	
Polybrominated Biphenyls(PBBs) Content			
Monobromobiphenyl	5	N.D.	/
Dibromobiphenyl	5	N.D.	/
Tribromobiphenyl	5	N.D.	/
Tetrabromobiphenyl	5	N.D.	/
Pentabromobiphenyl	5	N.D.	/
Hexabromobiphenyl	5	N.D.	/
Heptabromobiphenyl	5	N.D.	/
Octabromobiphenyl	5	N.D.	/
Nonabromodiphenyl	5	N.D.	/
Decabromodiphenyl	5	N.D.	/
Total content	/	N.D.	1000
Polybrominated Diphenylethers(PBDEs) Content			
Monobromodiphenyl ether	5	N.D.	/
Dibromodiphenyl ether	5	N.D.	/
Tribromodiphenyl ether	5	N.D.	/
Tetrabromodiphenyl ether	5	N.D.	/
Pentabromodiphenyl ether	5	N.D.	/
Hexabromodiphenyl ether	5	N.D.	/
Heptabromodiphenyl ether	5	N.D.	/
Octabromodiphenyl ether	5	N.D.	/
Nonabromodiphenyl ether	5	N.D.	/
Decabromodiphenyl ether	5	N.D.	/
Total content	/	N.D.	1000

Note:

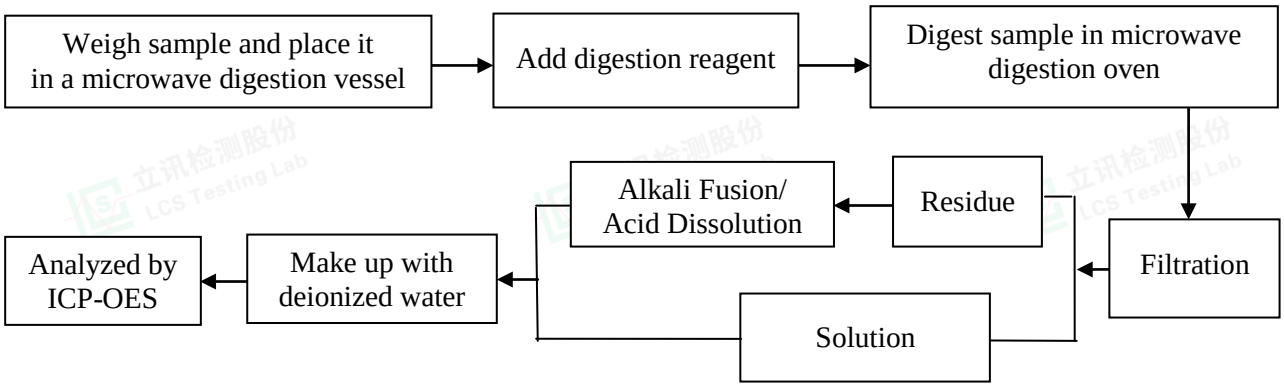
- MDL = Method Detection Limit
- N.D. = Not Detected (<MDL or LOQ)
- mg/kg = milligrams per kilogram
- LOQ = Limit Of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm^2
- ★ = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13μg/cm^2. The sample coating is considered to contain Cr(VI).
  b. The sample is negative for Cr(VI) if Cr(VI) is N.D.(concentration less than 0.10μg/cm^2). The sample coating is considered a non- Cr(VI) based coating.
  c. The result between 0.10μg/cm^2 and 0.13μg/cm^2 is considered to be inconclusive, unavoidable coating variations may influence the determination.
- Information on storage conditions and production date of the tested samples is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
- According to customer's requirement, only the appointed materials have been tested.

Test Process

1. Lead(Pb) & Cadmium(Cd): IEC 62321-5:2013

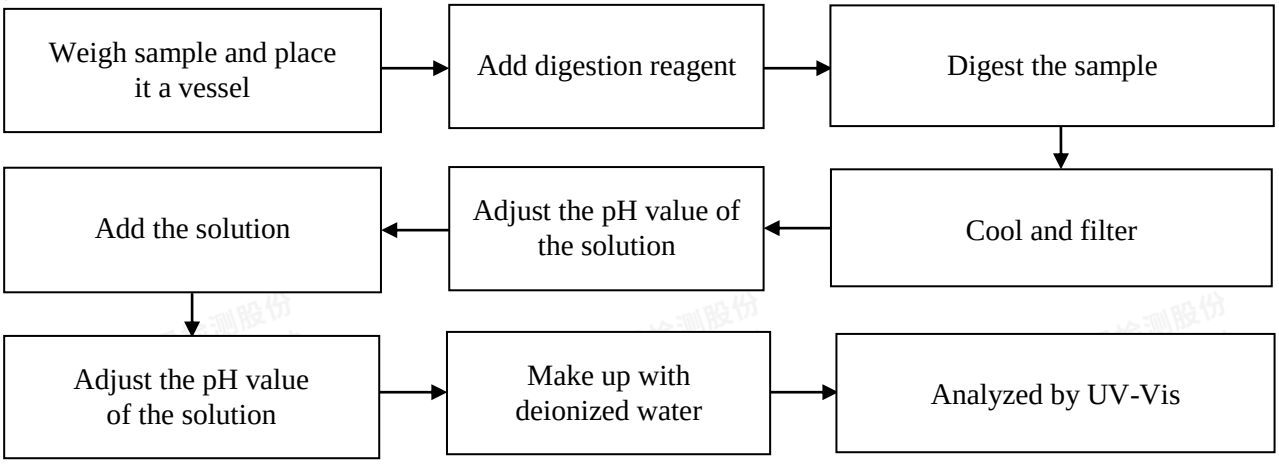


2. Mercury(Hg): IEC 62321-4:2013+AMD1:2017 CSV

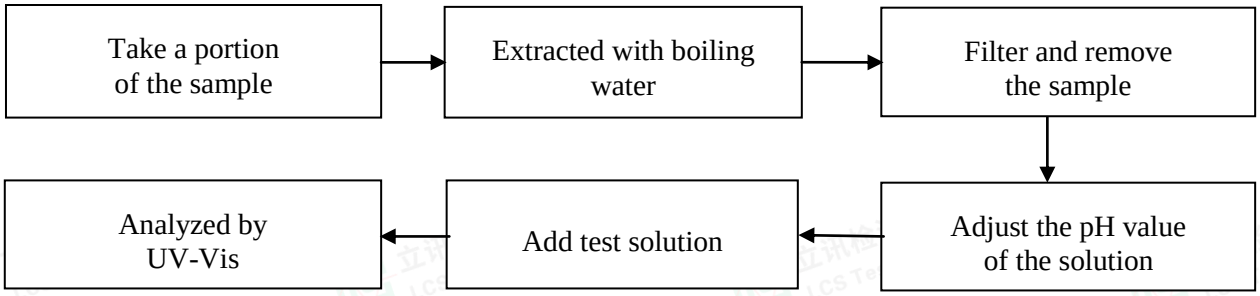


3. Hexavalent Chromium(Cr(VI))

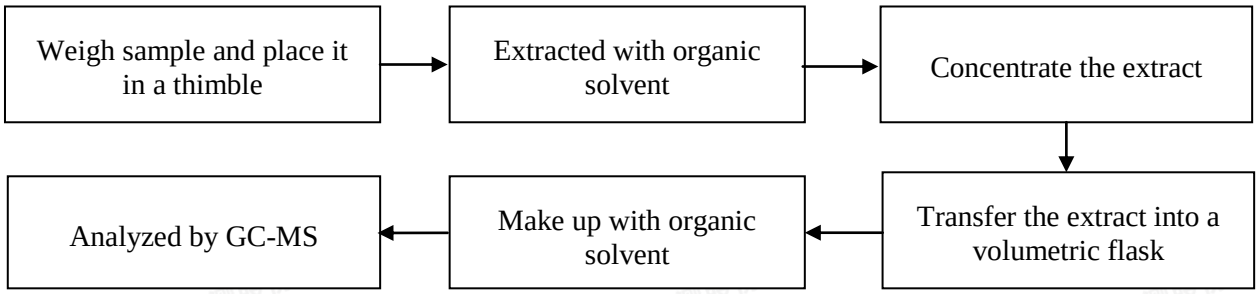
1) IEC 62321-7-2:2017



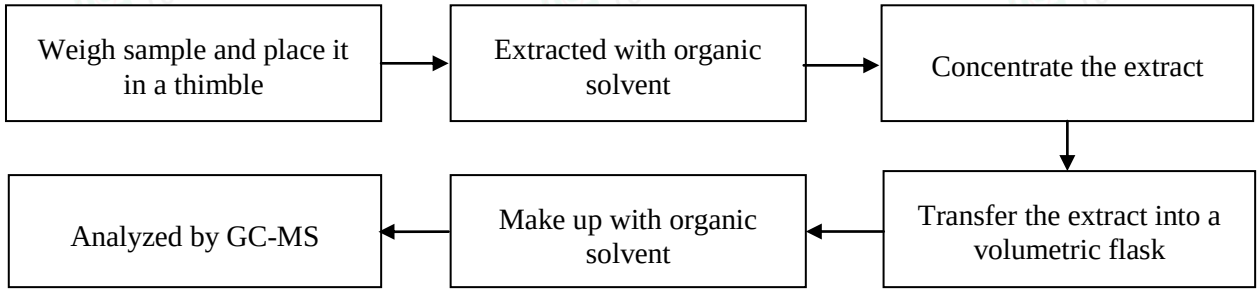
2) IEC 62321-7-1:2015



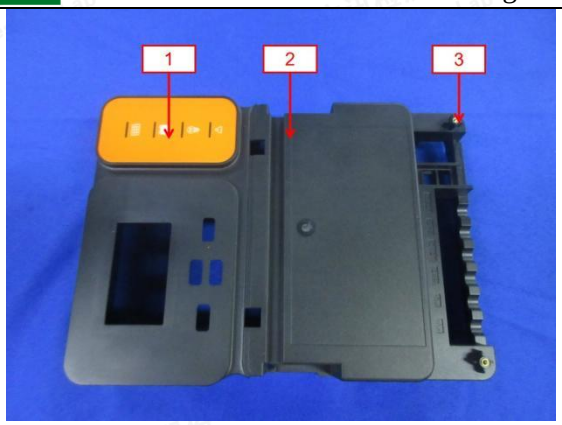
4. Polybrominated Biphenyls(PBBs) & Polybrominated Diphenyl Ethers(PBDEs) : IEC 62321-6:2015



5. Phthalates(DBP, BBP, DEHP & DIBP) : IEC 62321-8:2017



The photo(s) of the sample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MA4830N15
CE RoHS
MPPT Solar Charge Controller
Battery Voltage: 12V / 24V / 36V / 48V Auto
Charging Current: 30A ; Load Current: 30A
Max. Voltage of PV: 150V
Max. Power of PV: 400W/12V; 800W/24V;
1200W/36V; 1600W/48V;
V020005
Date:2022.05
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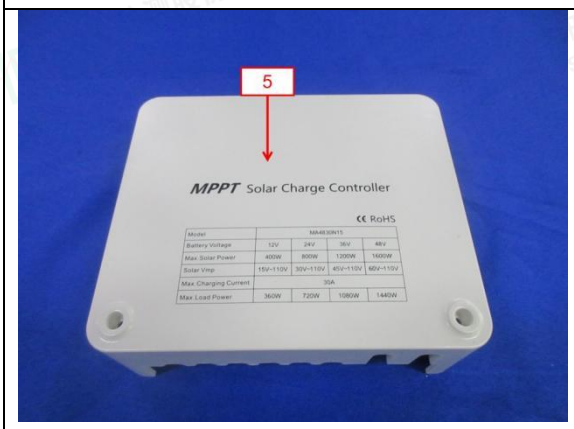
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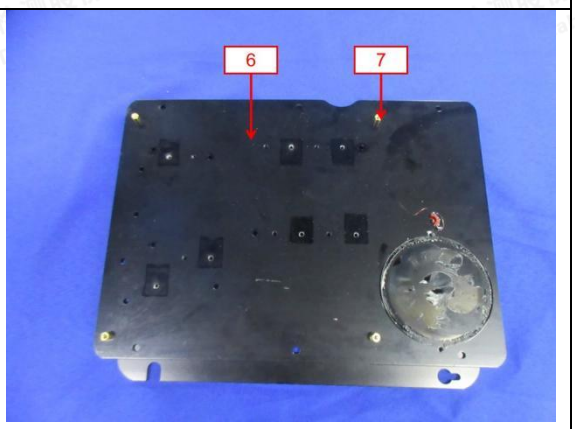
MPPT Solar Charge Controller
CE RoHS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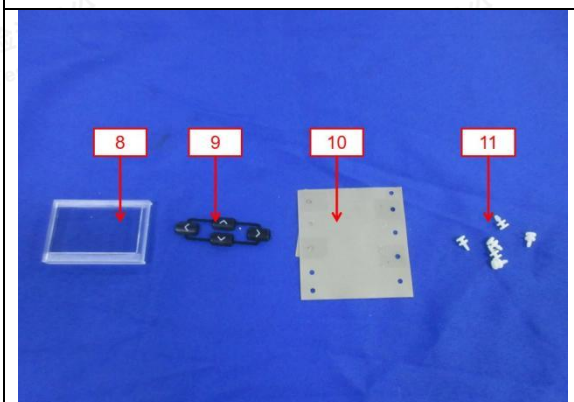
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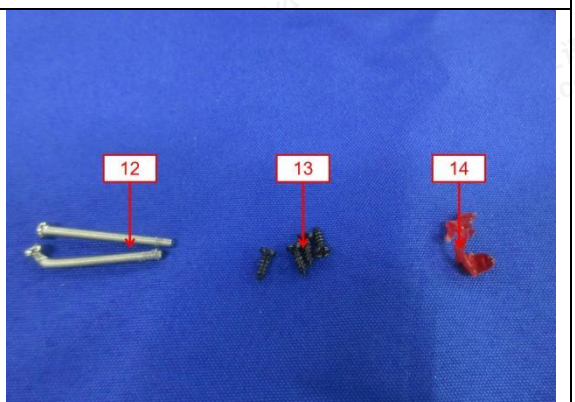
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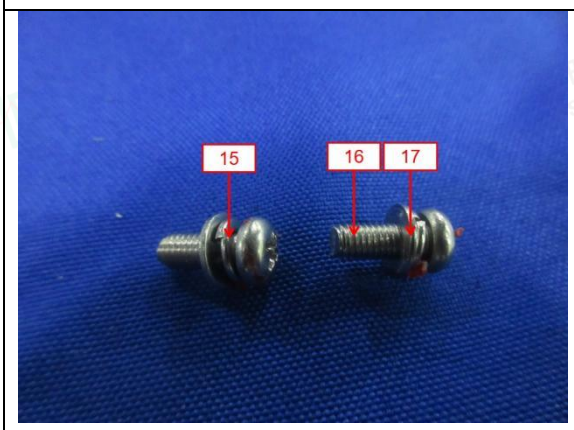
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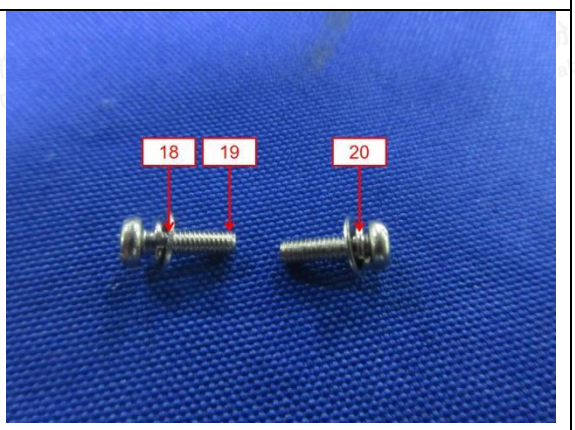
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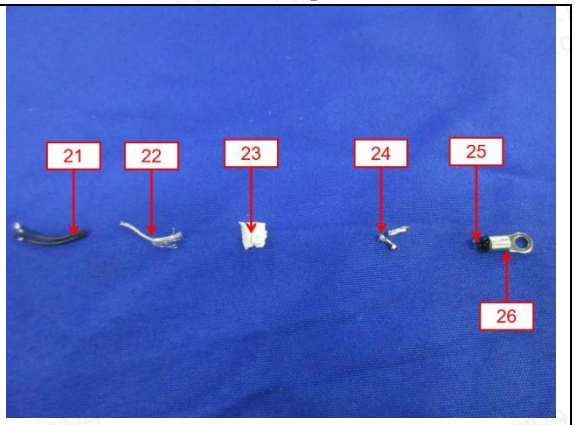
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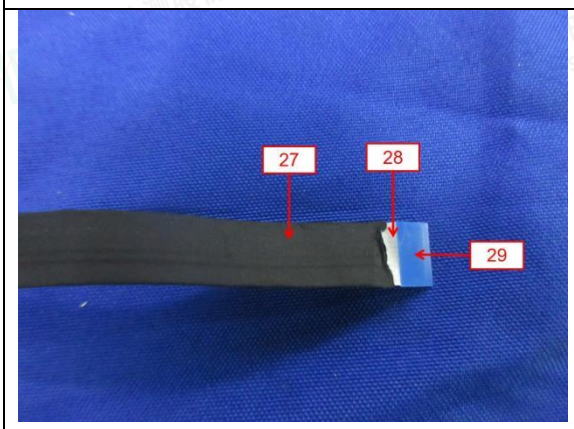
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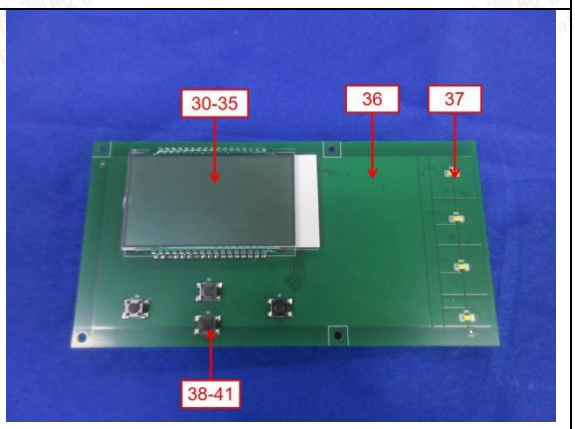
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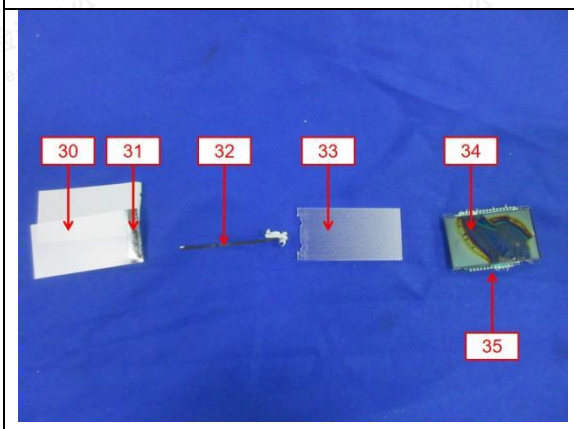
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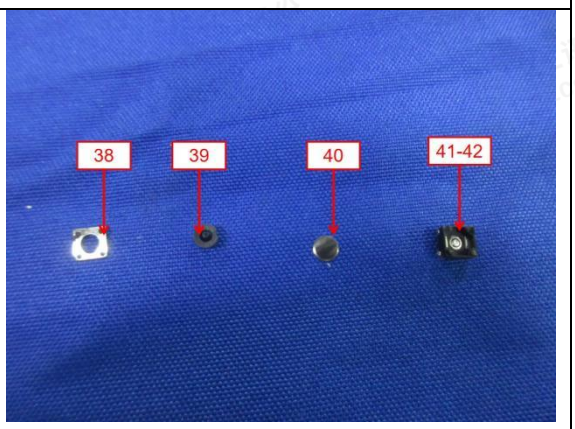
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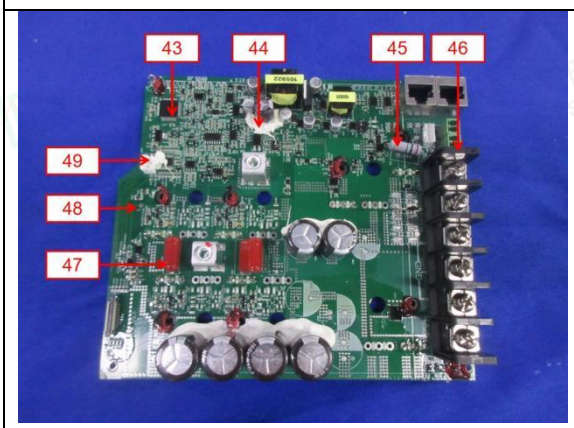
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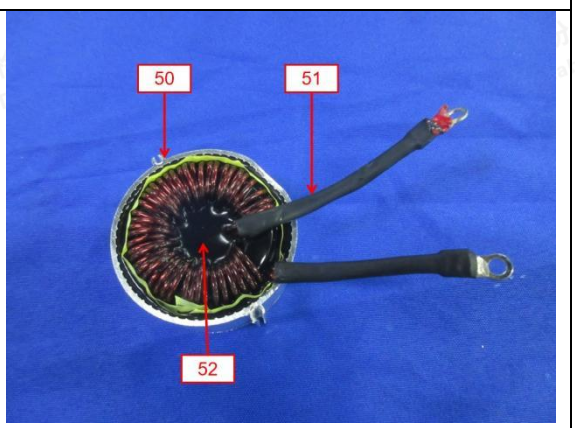
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Statement:

1. The test report is invalid without the signature of the approver and the special seal for the company's report;
2. The company name, address and sample information shown on the report were provided by the applicant who should be responsible for the authenticity which are not verified by LCS;
3. The test results in this report are only responsible for the tested samples;
4. Without written approval of LCS, this report can't be reproduced except in full;
5. In case of any discrepancy between the corresponding Chinese and English contents in the test report, the English version shall prevail.

*** End of Report ***