Test Report

Applicant	:	SUNFLX NEW ENERGY CO.,LTD
Address	:	307-08, 3rd Floor, No. 15 Xinning 1st Lane, Nanhua Community Shunde District,Foshan City , Guangdong
Manufacturer	:	SUNFLX NEW ENERGY CO.,LTD
Address	:	307-08, 3rd Floor, No. 15 Xinning 1st Lane, Nanhua Community Shunde District,Foshan City , Guangdong

The following sample(s) was /were submitted and identified on behalf of the clients as：

Trade Marks	:	SUNFLX
Sample Name	:	Solar charge controller
Sample Model	:	DKTD1205, DKTD1210, DKTD1220, DKTD1230, DCK1210, DCK1220, DCK1230, DCK1240, DCK1250, DCK1260, DCK4820, DCK4830, DCK4840, DCK4850, DCK4860
Sample Received Date	:	Nov 01, 2023
Testing Period	:	Nov 01, 2023 To Nov 05, 2023
Test Requested	:	Selected test (s) in the selected parts as requested by client with the RoHS 2 Directive 2011/65/EU Annex II (EU) 2015/863 as last amended by Directive (EU) 2017/2102.
Test Method	:	1. As specified by client, to screen Lead(Pb), Cadmium(Cd), Mercury(Hg), Chromium(Cr) and Bromine(Br) in the submitted sample(s) by XRF. 2. As specified by client, when screening results exceed the XRF screening limit in IEC 62321-3-1: 2013, further use of wet chemical methods are required to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs), Bis(2-ethylhexyl) phthalate (DEHP) ,Butyl benzyl phthalate (BBP), Dibutylphthalate (DBP) ,and Diisobutyl phthalate (DIBP)in the submitted sample(s).
Test Result	:	Please refer to next page(s).
Conclusion	:	**PASS** (Based on test results)

Signed for and on behalf of

Tony Qian/Approved Signatory

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Guangdong KEYS Testing Technology Co., Ltd.
Address: Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China
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Summary of Test Results:

TEST REQUEST	CONCLUSION
RoHS Directive 2011/65/EU and its subsequent amendments Directive (EU) 2015/863	
(1)To determine Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)),Polybrominated Biphenyls (PBBs) and Polybrominated DiphenylEthers (PBDEs)content by screening test and chemical test	**PASS**
(2) To determine Phthalates (DBP, BBP, DEHP, DIBP) content by chemical test	**PASS**

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Sample Description:

No.	Name
1	Black Plastic Shell
2	Black Plastic Cover
3	Yellow Plastic Parts
4	Black Plastic Parts
5	Screws
6	Nut
7	Metal Washer
8	White Line Skin
9	Gray Line Skin
10	Wire Core
11	Black Plastic Terminal
12	White Plastic Terminal
13	PCB
14	IC
15	Electrolytic Capacitance
16	Chip Capacitance
17	Patch Resistance
18	Chip Inductance
19	Diode
20	Triode

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No.	Name
21	Bridge Stacks
22	Led
23	Socket Black Plastic Shell
24	Metal Pin
25	White Plastic Terminal
26	Metal Needle
27	Display Board
28	Plug Black Plastic
29	Dc Plug
30	Solder

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1. XRF Test Result:

No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
1	BL	BL	BL	BL	BL	--	Pass
2	BL	BL	BL	BL	BL	--	Pass
3	BL	BL	BL	BL	BL	--	Pass
4	BL	BL	BL	BL	BL	--	Pass
5	BL	BL	BL	BL	--	--	Pass
6	BL	BL	BL	BL	--	--	Pass
7	BL	BL	BL	BL	--	--	Pass
8	BL	BL	BL	BL	BL	--	Pass
9	BL	BL	BL	BL	BL	--	Pass
10	BL	BL	BL	BL	--	--	Pass
11	BL	BL	BL	BL	BL	--	Pass
12	BL	BL	BL	BL	BL	--	Pass
13	BL	BL	BL	BL	BL	--	Pass
14	BL	BL	BL	BL	--	--	Pass
15	BL	BL	BL	BL	--	--	Pass
16	BL	BL	BL	BL	--	--	Pass
17	BL	BL	BL	BL	--	--	Pass
18	BL	BL	BL	BL	--	--	Pass
19	BL	BL	BL	BL	--	--	Pass

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No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
20	BL	BL	BL	BL	--	--	Pass
21	BL	BL	BL	BL	--	--	Pass
22	BL	BL	BL	BL	BL	--	Pass
23	BL	BL	BL	BL	BL	--	Pass
24	BL	BL	BL	BL	--	--	Pass
25	BL	BL	BL	BL	BL	--	Pass
26	BL	BL	BL	BL	--	--	Pass
27	BL	BL	BL	BL	--	--	Pass
28	BL	BL	BL	BL	BL	--	Pass
29	BL	BL	BL	BL	--	--	Pass
30	BL	BL	BL	BL	--	--	Pass

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Remark:

1. It is the result on total Br while test item on restricted substances in PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).
2. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC 62321-3-1: 2013Annex A.

Element	Polymer Material	Metallic Material	Composite Material
Pb	BL≤700-3σ≤X＜1300+3σ≤OL	BL≤700-3σ≤X＜1300+3σ≤OL	BL≤500-3σ≤X＜1500+3σ≤OL
Cd	BL≤70-3σ≤X＜130+3σ≤OL	BL≤70-3σ≤X＜130+3σ≤OL	LOD＜X＜150+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	--	BL≤250-3σ＜X

XRF detection limits in mg/kg for regulated elements in various material

Element	Polymer Material	Metallic Material	Composite Material
Pb	10	50	50
Cd	10	50	50
Hg	10	50	50
Cr	10	50	50
Br	10	50	50

Note: -BL = Under the XRF screening limit

-OL = Future chemical test will be conducted while result is above the screening limit

-X =The symbol“X”marks the region where further investigation in necessary

-3σ=The reproducibility of analytical instruments

-LOD=Detection limit

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2. Wet Chemical Test

Test Item(s)	Test Method/ Test Equipment	Unit	Limit	MDL
Cadmium(Cd)	IEC 62321-5:2013, ICP-OES	mg/kg	100	2
Lead(Pb)	IEC 62321-5:2013, ICP-OES	mg/kg	1000	2
Mercury(Hg)	IEC 62321-4:2013+AMD1:2017, ICP-OES	mg/kg	1000	2
Hexavalent Chromium(CrVI) (Metal)	IEC 62321-7-1:2015, UV-Vis	$\mu g/cm^2$	0.13	0.1
Hexavalent Chromium(CrVI) (Nonmetal)	IEC 62321-7-2:2017, UV-Vis	mg/kg	1000	8
PBBs (Next form)	IEC 62321-6:2015, GC-MS	mg/kg	1000	5
PBDEs (Next form)	IEC 62321-6:2015, GC-MS	mg/kg	1000	5
Dibutyl Phthalate(DBP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30
Butyl benzyl phthalate (BBP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30
Di-(2-ethylhexyl) Phthalate(DEHP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30
Diisobutyl phthalate (DIBP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30

PBBs		PBDEs	
Monobromobiphenyl	Hexabromobiphenyl	Monobromodiphenyl ether	Hexabromodiphenyl ether
Dibromobiphenyl	Heptabromobiphenyl	Dibromodiphenyl ether	Heptabromodiphenyl ether
Tribromobiphenyl	Octabromobiphenyl	Tribromodiphenyl ether	Octabromodiphenyl ether
Tetrabromobiphenyl	Nonabromobiphenyl	Tetrabromodiphenyl ether	Nonabromodiphenyl ether
Pentabromobiphenyl	Decabromobiphenyl	Pentabromodiphenyl ether	Decabromodiphenyl ether

Note: 1. mg/kg= ppm=0.0001%

2. N.D.= Not Detected(<MDL)

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3. MDL = Method Detection Limit
4. -- = No Testing
5. When Cr (VI) in a sample is detected below the 0.10 μg/cm^2 LOQ (limit of quantification), the sample is considered to be negative for Cr (VI). Since Cr (VI) may not be uniformly distributed in the coating even within the same sample batch, a "grey zone" between 0.10 μg/cm^2 and 0.13 μg/cm^2 has been established as "inconclusive" to reduce inconsistent results due to unavoidable coating variations. In this case, additional testing may be necessary to confirm the presence of Cr (VI). When Cr (VI) is detected above 0.13 μg/cm^2, the sample is considered to be positive for the presence of Cr (VI) in the coating layer. Unavoidable coating variations may influence the determination Information on storage conditions and production date of the tested sample is unavailable and thus Cr (VI) results represent status of the sample at the time of testing.

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3. Phthalate Test Result:

Test No.	Test Item(s)				Conclusion
	Dibutyl Phthalate (DBP)	Butyl benzyl phthalate (BBP)	Di-(2-ethylhexyl) Phthalate (DEHP)	Diisobutyl phthalate (DIBP)	
1	N.D.	N.D.	N.D.	N.D.	Pass
2	N.D.	N.D.	N.D.	N.D.	Pass
3	N.D.	N.D.	N.D.	N.D.	Pass
4	N.D.	N.D.	N.D.	N.D.	Pass
8	N.D.	N.D.	N.D.	N.D.	Pass
9	N.D.	N.D.	N.D.	N.D.	Pass
11	N.D.	N.D.	N.D.	N.D.	Pass
12	N.D.	N.D.	N.D.	N.D.	Pass
13	N.D.	N.D.	N.D.	N.D.	Pass
22	N.D.	N.D.	N.D.	N.D.	Pass
23	N.D.	N.D.	N.D.	N.D.	Pass
25	N.D.	N.D.	N.D.	N.D.	Pass
28	N.D.	N.D.	N.D.	N.D.	Pass

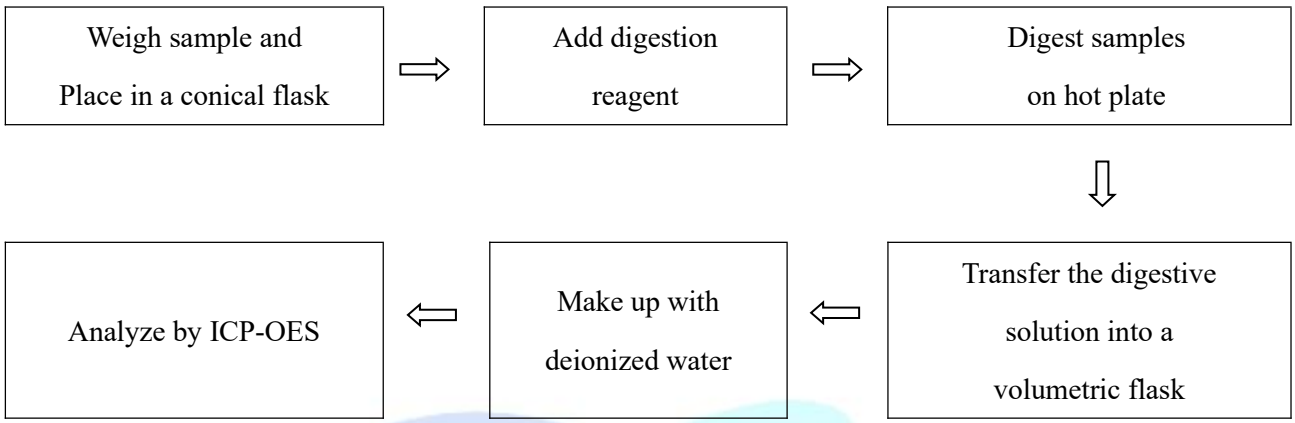
Note: 1. mg/kg= ppm=0.0001%

2. N.D.= Not Detected(<MDL)

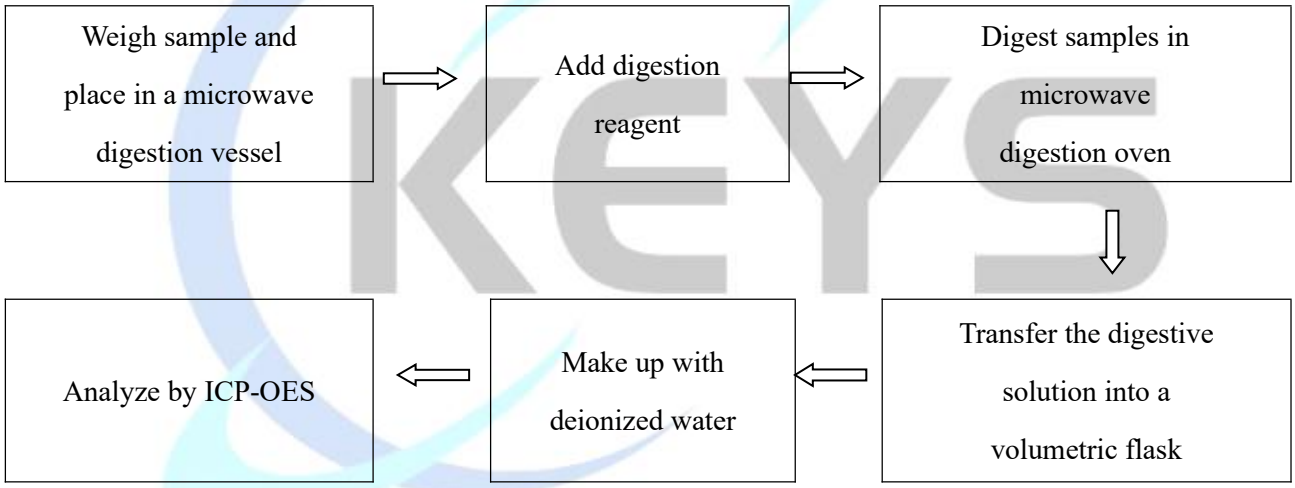
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Test Process:

1. Test for Cd/Pb Content



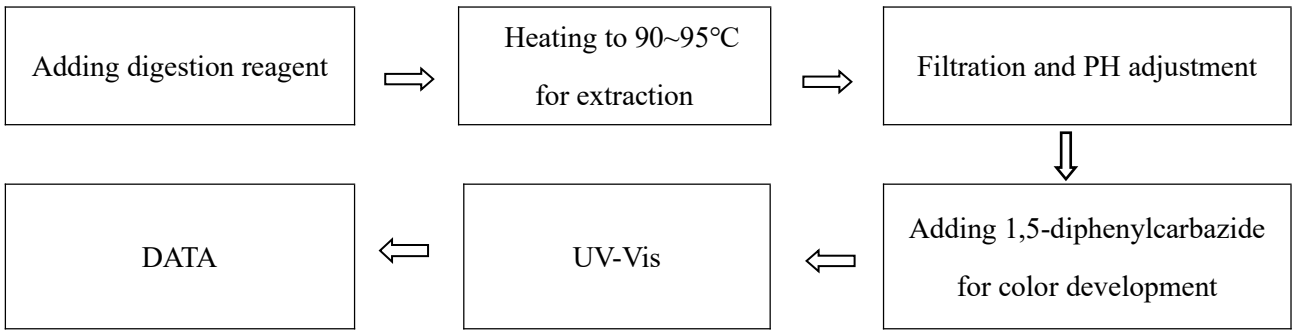
2. Test for Hg Content



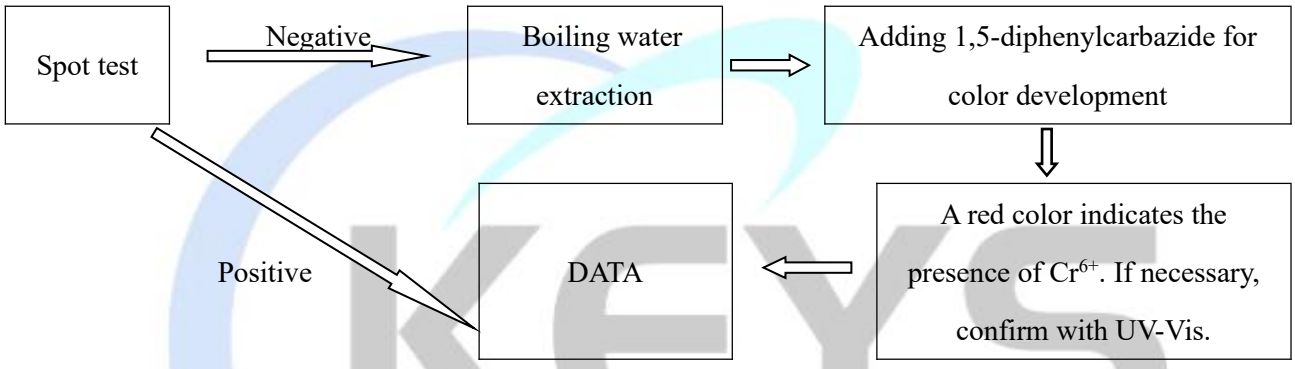
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3. Test for Chromium (VI) Content

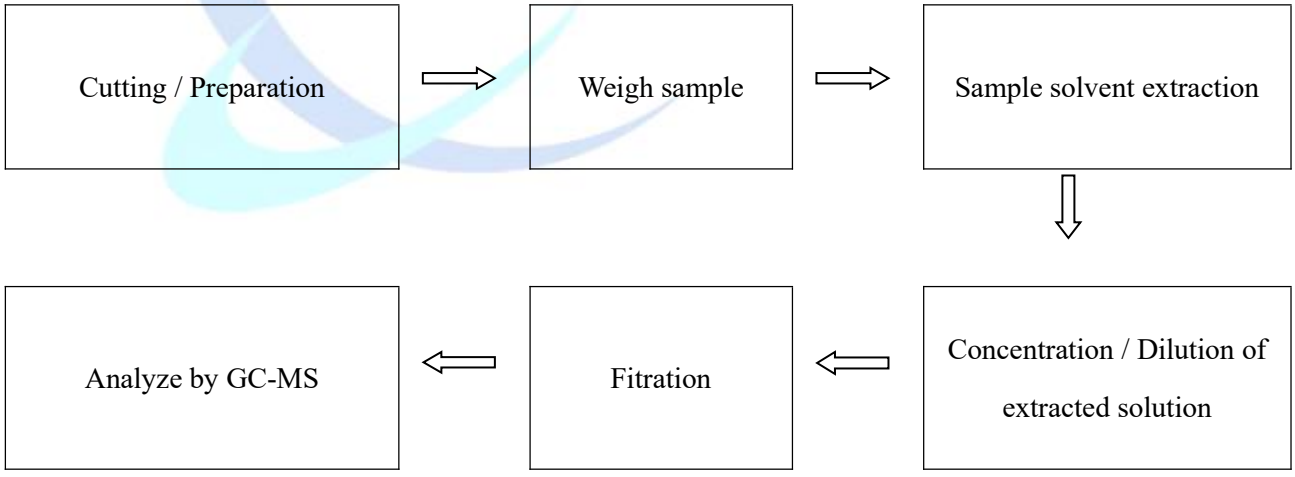
Nonmetal material



Metal material



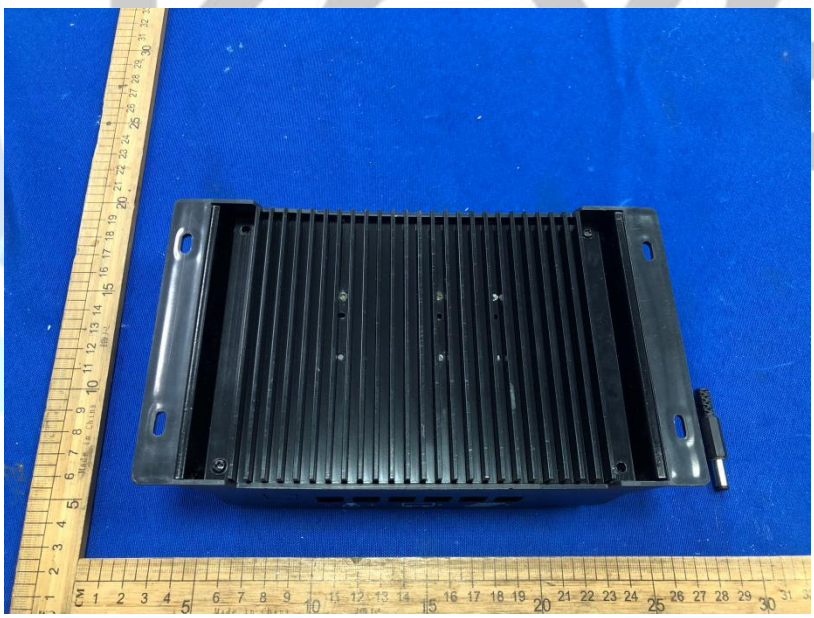
4. Test for DBP, BBP, DEHP, DIBP, PBB, PBDE Content



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Sample Photo:





*** End of Report ***

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