

# Verification Report

No. TAOEC2307203003

Date: 26 Oct 2023

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Client Name : Shenzhen Aiko Digital Energy Technology Co., Ltd.

Client Address : Room 607, Building B, Tengfei Industrial Building, No.6 Taohua Road, Fubao Community, Fubao Street, Futian District, Shenzhen 518045 Guangdong, P.R.China

Sample Name : Photovoltaic modules  
 Tested Basic Model No. : AIKO-A460-MAH54Mw  
 Tested Extended Model : AIKO-A450-MAH54Mb  
 No. :  
 Client Ref. Information : AIKO-Axxx-MAH54Mw (xxx=415-465, in steps of 5, 108 cells)  
 AIKO-Axxx-MAH54Mb (xxx=415-465, in steps of 5, 108 cells)  
 AIKO-Axxx-MAH72Mw (xxx=550-625, in steps of 5, 144 cells)  
 The only difference between AIKO-Axxx-MAH54Mw and AIKO-Axxx-MAH72Mw is the module size

The above sample(s) and information were provided by the client.

SGS Job No. : SHP23-014192 - QD  
 Date of Sample Received : 07 Oct 2023  
 Verification Period : 07 Oct 2023 - 26 Oct 2023  
 Verification Requested : Select test(s) as requested by the client.  
 Verification Method(s) : Please refer to next page(s).  
 Verification Result(s) : Please refer to next page(s).

### Test Result Summary

Test Items	Conclusion
Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	PASS



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Signed for and on behalf of  
SGS-CSTC Standards Technical Services (Qingdao) Co., Ltd.

Justin

Zhang Bo, Justin  
Approved Signatory



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### Photo of Submitted Sample



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**Verification Method(s) :**

1. With reference to IEC 62321-2:2021, disassembly and disjointment were performed for the submitted samples.
2. With reference to IEC 62321-1:2013, tests were performed for the samples indicated by the photos in this report
  - (1) With reference to IEC 62321-3-1:2013, screening by EDXRF spectroscopy.
  - (2) Wet chemical test method: With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC 62321-7-1:2015, IEC 62321-7-2:2017, ISO 17075-1:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, AAS,UV-Vis and GC-MS.

**Verification Part Description :**

SN ID	Sample No	SGS Sample ID	Description
SN1	A1	TAO23-072030.001	Silvery plastic(label)
SN2	A2	TAO23-072030.002	Silvery plastic(label)
SN3	A3	TAO23-072030.003	Silvery metal
SN4	A4	TAO23-072030.004	Transparent plastic
SN5	A5	TAO23-072030.005	Black plastic
SN6	A6	TAO23-072030.006	White plastic
SN7	A8	TAO23-072030.008	Black plastic
SN8	A9	TAO23-072030.009	Black plastic
SN9	A10	TAO23-072030.010	White adhesive
SN10	A11	TAO23-072030.011	Black plastic
SN11	A12	TAO23-072030.012	White adhesive
SN12	A13	TAO23-072030.013	Black body
SN13	A15	TAO23-072030.015	Black plastic
SN14	A16	TAO23-072030.016	Black plastic
SN15	A17	TAO23-072030.017	Black plastic
SN16	A18	TAO23-072030.018	Black plastic
SN17	A19	TAO23-072030.019	Black plastic
SN18	A20	TAO23-072030.020	Black plastic
SN19	A21	TAO23-072030.021	White rubber
SN20	A22	TAO23-072030.022	Black plastic(jacket)
SN21	A23	TAO23-072030.023	Silvery metal(inner core)
SN22	A24	TAO23-072030.024	Black plastic
SN23	A25	TAO23-072030.025	Silvery metal



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SN ID	Sample No	SGS Sample ID	Description
SN24	B1	TAO23-072030.026	Silvery plastic(label)
SN25	B2	TAO23-072030.027	Black/white plastic(label)
SN26	B3	TAO23-072030.028	Transparent plastic
SN27	B4	TAO23-072030.029	Black plastic
SN28	B5	TAO23-072030.030	Black plastic
SN29	B6	TAO23-072030.031	Black surfaced metal



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Verification Results :

In accordance with the result of material risk assessment, the following disjointed parts in the submitted sample have been verified. (Unless otherwise specified, the unit is mg/kg).

Test Item(s)	A1	A2	A3	A4	A5	A6	A8	A9
Pb	BL	BL	BL	BL	BL	BL	BL	BL
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	BL	BL
PBBs	BL	BL	---	BL	BL	BL	BL	BL
PBDEs	BL	BL	---	BL	BL	BL	BL	BL
DBP	BL	BL	---	BL	BL	BL	BL	BL
BBP	BL	BL	---	BL	BL	BL	BL	BL
DEHP	BL	BL	---	BL	BL	BL	BL	BL
DIBP	BL	BL	---	BL	BL	BL	BL	BL
Conclusion	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test Item(s)	A10	A11	A12	A15	A16	A17	A18	A19
Pb	BL	BL	BL	BL	BL	BL	BL	BL
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	BL	BL
PBBs	BL	BL	BL	BL	BL	BL	BL	BL
PBDEs	BL	BL	BL	BL	BL	BL	BL	BL
DBP	BL	BL	BL	BL	BL	BL	BL	BL
BBP	BL	BL	BL	BL	BL	BL	BL	BL
DEHP	BL	BL	BL	BL	BL	BL	BL	BL
DIBP	BL	BL	BL	BL	BL	BL	BL	BL
Conclusion	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test Item(s)	A20	A21	A22	A23	A24	A25	B1	B2
Pb	BL	BL	BL	BL	BL	BL	BL	BL
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	BL	BL
PBBs	BL	BL	BL	---	BL	---	BL	BL



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Test Item(s)	A20	A21	A22	A23	A24	A25	B1	B2
PBDEs	BL	BL	BL	---	BL	---	BL	BL
DBP	BL	BL	BL	---	BL	---	BL	BL
BBP	BL	BL	BL	---	BL	---	BL	BL
DEHP	BL	BL	BL	---	BL	---	BL	BL
DIBP	BL	BL	BL	---	BL	---	BL	BL
<b>Conclusion</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>

Test Item(s)	B3	B4	B5	B6
Pb	BL	BL	BL	BL
Cd	BL	BL	BL	BL
Hg	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL
PBBs	BL	BL	BL	---
PBDEs	BL	BL	BL	---
DBP	BL	BL	BL	---
BBP	BL	BL	BL	---
DEHP	BL	BL	BL	---
DIBP	BL	BL	BL	---
<b>Conclusion</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>

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**Notes:**

- (1) Interpretation of screening results by X-ray fluorescence spectrometry (XRF):  
 (a) Screening limits in mg/kg for regulated elements in various matrices according to IEC 62321-1:2013 Annex A as below table.

Element	Polymer	Metal	Composite Materials
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	Not applicable	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

- (b) If the maximum allowed level restricts PBB/PBDE and Cr(VI) rather than Br and Cr, the exceptions are the XRF determinations of Br and Cr. If the quantitative results for the elements Br and/or are higher than the limit (for Br calculated based on the stoichiometry of Br in the most common congeners of PBB/PBDE), the sample is “inconclusive”.
- (c) Results are obtained by EDXRF for primary screening, LOD = Limit of Detection, BL = Below Limit, OL = Over Limit, IN (The symbol X marks the region)= Inconclusive, where further investigation is necessary, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs/PBDEs) are recommended to be performed.
- (d) The EDXRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

- (2) Screening results of Phthalates (PHTH) are for primary screening, and further chemical testing by GC-MS (for DBP, BBP, DEHP and DIBP) are recommended to be performed if the concentration exceeds the below warning value (unit: mg/kg)

Test Items	CAS No.	Polymer/ Composite Materials
Dibutyl Phthalate (DBP)	84-74-2	$BL \leq 600 < X$
Benzylbutyl Phthalate (BBP)	85-68-7	$BL \leq 600 < X$
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	$BL \leq 600 < X$
Diisobutyl Phthalate (DIBP)	84-69-5	$BL \leq 600 < X$

- (3) Interpretation of results by chemical tests:

- (a) mg/kg = 0.0001%, MDL=Method detection Limit, ND = Not Detected (<MDL), --- = Not Applicable  
 (b) Unit and MDL in wet chemical test

Test Items	Pb	Cd	Hg	DBP	BBP	DEHP	DIBP
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	10	10	10	100	100	100	100

The MDL for single compound of PBBs and PBDEs is 100 mg/kg.  
 MDL of Cr(VI) for polymer, composite and leather sample is 10 mg/kg.  
 MDL of Cr(VI) for metal sample is 0.10µg/cm<sup>2</sup>.



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▼ =Metal sample

- a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13µg/cm<sup>2</sup>.  
The sample coating is considered to contain Cr(VI)
- b. The sample is negative for Cr(VI) if Cr(VI) is ND (concentration less than 0.10µg/cm<sup>2</sup>).  
The coating is considered a non-Cr(VI) based coating
- c. The result between 0.10µg/cm<sup>2</sup> and 0.13µg/cm<sup>2</sup> is considered to be inconclusive  
- 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.

(4) IEC 62321 series is equivalent to EN 62321 series.

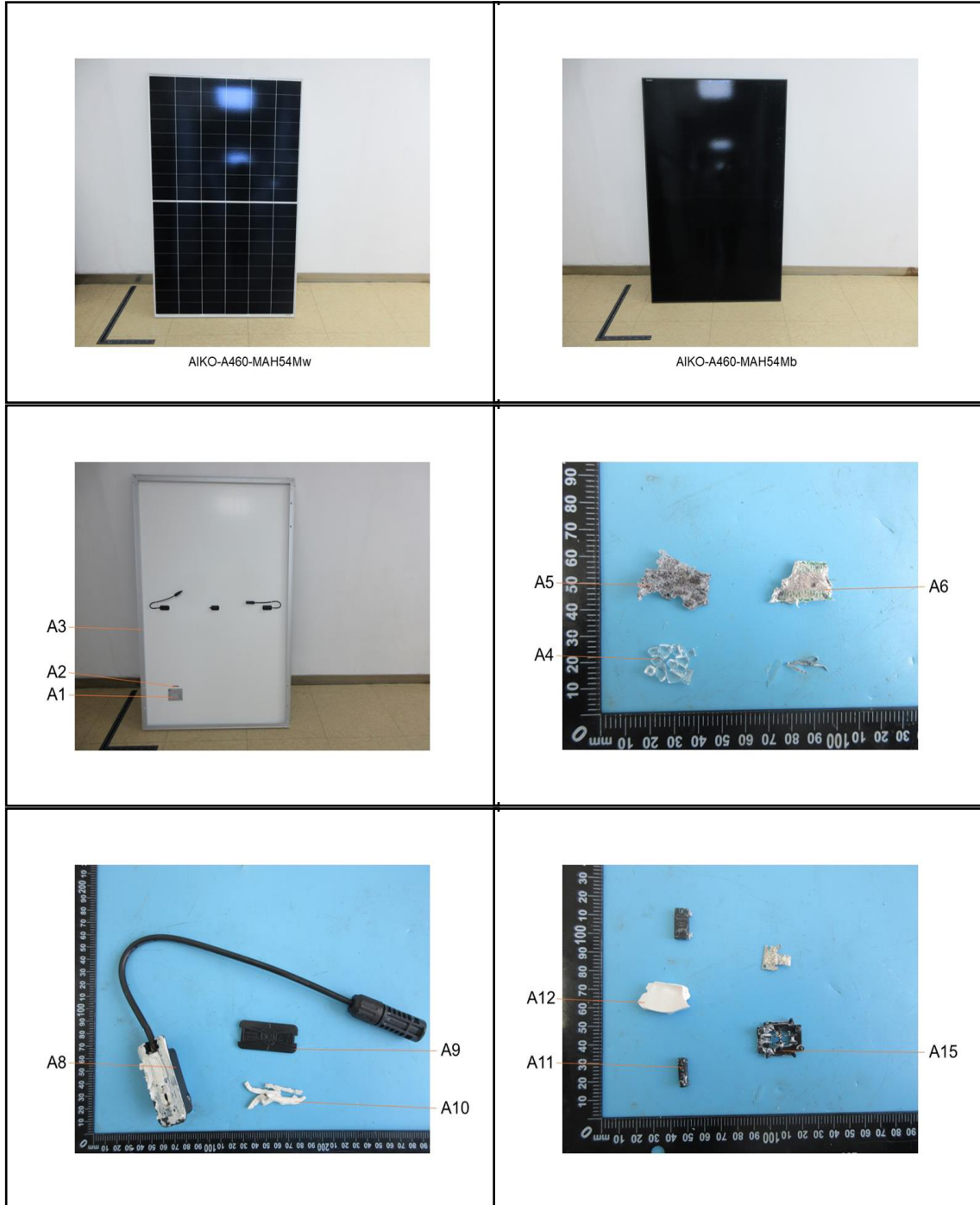
(5) The client limit of Lead, Mercury, Hexavalent chromium (no metal), Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) are 1000 mg/kg , and Cadmium is 100mg/kg.

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (  $w=0$ ) stated in ILAC-G8:09/2019.

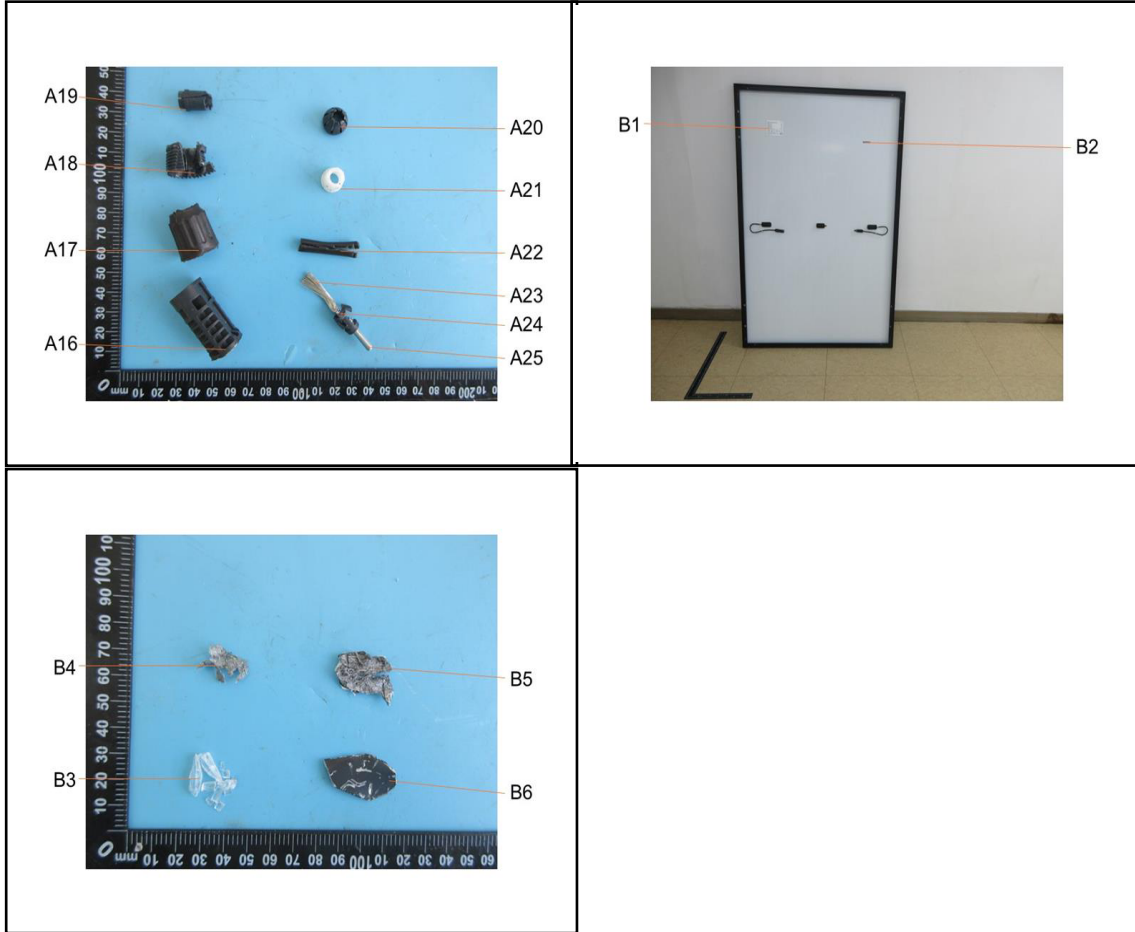


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Sample photo:



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\*\*\* End of Report \*\*\*



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