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**Client:** YUYAO AOGUANG LIGHTING ELECTRICAL APPLIANCE CO.,LTD

**Contact Information:** XIASHAFAN MAZHU TOWN, YUYAO CITY, Zhejiang, P.R. China

**Identification/** solar light  
**Model No(s):** AG-SW5-500

**Condition at delivery:** Test item complete and undamaged.

**Sample Receiving date:** 2023-09-13, 2023-10-07

**Testing Period:** 2023-09-13 to 2023-10-08

**Place of testing:** Chemical laboratory Ningbo

**Test Specification:**

**Test result:**

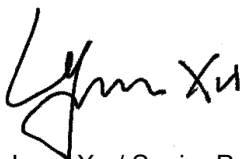
Customer's requirement:

- |  |      |
|--|------|
| 1. According to RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU Annex II and its amendment. | PASS |
|--|------|

**Other information:**

Reference Model No.: AG-SW1-1000, AG-SW3-1000, AG-SW3-1600

For and on behalf of  
TÜV Rheinland/CCIC (Ningbo) Co., Ltd.



2023-10-11

Lynn Xu / Senior Project Manager

*Date*

*Name/Position*

Sample information is provided by customer. Test result is drawn according to the kind and extent of tests performed.  
This test report relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.  
"Decision Rule" document announced in our website (<https://www.tuv.com/landingpage/en/qm-gcn/>) describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report.

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**Material List:**
Item: solar light  
AG-SW5-500

Material No.	Material	Color	Location
B001	Plastic	black	refer to photo
B002	Plastic	black	refer to photo
B003	Plastic	black	refer to photo
B004	Plastic	white	refer to photo
B005	Metal + coating	white	refer to photo
B006	Solder	silver	refer to photo
B007	Plastic	black	refer to photo
B008	Plastic	dark grey	refer to photo
B009	Plastic	black	refer to photo
B010	Rubber	black	refer to photo
B011	Metal	silver	refer to photo
B012	Metal	silver	refer to photo
B013	Rubber	black	refer to photo
B014	Plastic	blue	refer to photo
B015	Metal	silver	refer to photo
B016	Plastic	yellow	refer to photo
B017	Plastic	black	refer to photo
B018	Plastic	red	refer to photo
B019	Plastic	brown	refer to photo
B020	Plastic	black	refer to photo
B021	Metal	silver	refer to photo
B022	Solder	silver	refer to photo
B023	PCB board	green-cyan	refer to photo
B024	Electronic components	silver	refer to photo
B025	Solder	silver	refer to photo
B026	Metal	silver	refer to photo
B027	Metal	silver	refer to photo
B028	Metal	silver	refer to photo

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B029	Glue	black	refer to photo
B030	Electronic components	black	refer to photo
B031	Plastic	black	refer to photo
B032-1	Solder	silver	retest sample refer to photo
B033	PCB board	black	refer to photo
C001	Plastic	white	refer to photo
C002	Plastic	white	refer to photo

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**1.Screening Test by XRF spectroscopy**

 Test Method: Cadmium, Lead, Mercury, Chromium, Bromine  
 -- With reference to IEC 62321-3-1:2013

**Test Result:**

Material No.	Cd	Cr	Pb	Hg	Br
B001	BL	BL	BL	BL	BL
B002	BL	BL	BL	BL	d.(*1)
B003	BL	BL	BL	BL	d.(*1)
B004	BL	BL	BL	BL	BL
B005	BL	BL	BL	BL	n.a.
B006	BL	BL	BL	BL	n.a.
B007	BL	BL	BL	BL	d.(*1)
B008	BL	BL	BL	BL	d.(*1)
B009	BL	BL	BL	BL	BL
B010	BL	BL	BL	BL	BL
B011	BL	d.(*1)	BL	BL	n.a.
B012	BL	BL	BL	BL	n.a.
B013	BL	BL	BL	BL	BL
B014	BL	BL	BL	BL	BL
B015	BL	BL	BL	BL	n.a.
B016	BL	BL	BL	BL	BL
B017	BL	BL	BL	BL	BL
B018	BL	BL	BL	BL	BL
B019	BL	BL	BL	BL	BL
B020	BL	BL	BL	BL	BL
B021	BL	BL	BL	BL	n.a.
B022	BL	BL	BL	BL	n.a.
B023	BL	BL	BL	BL	d.(*1)
B024	BL	BL	d.(*1)	BL	BL
B025	BL	BL	BL	BL	n.a.
B026	BL	BL	BL	BL	n.a.
B027	BL	BL	BL	BL	n.a.
B028	BL	BL	BL	BL	n.a.
B029	BL	BL	BL	BL	BL
B030	BL	BL	BL	BL	BL
B031	BL	BL	BL	BL	d.(*1)
B033	BL	BL	BL	BL	d.(*1)
C001	BL	BL	BL	BL	BL
C002	BL	BL	BL	BL	BL
B032-1	BL	BL	BL	BL	n.a.

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<b>Abbreviation:</b>	Pb	=	Lead
	Cd	=	Cadmium
	Hg	=	Mercury
	Cr	=	Chromium
	Br	=	Bromine
	n.a.	=	Not applicable
	BL	=	Below limit
	OL	=	Over limit
	d.	=	Detected

**Remark:**

- (\*1) The screening result was detected in the inconclusive region or over limits, thus the further wet chemistry tests are suggested.
- (\*2) Component(s)/ materials(s) with an area of less than 2 mm x 2 mm will not be selected for testing according to RoHS Directive 2011/65/EU due to technical reason.  
For the test sample does not have detail materials information provided by client, visually identical materials (e.g. wire insulation, solder points, etc.) will be considered as the same material.  
Solder points on a printing circuit board will be examined several times based on optical anomalies or discoloration of the solder point(s) unless the solder point(s) is obviously generated automatically during production.  
All other materials will be sampled and tested at one test point representatively.
- (\*3) The Chromium (Cr) and Bromine (Br) in the above result table indicate the total chromium and total bromine by means of XRF screening. PBBs, or PBDEs content shall be further confirmed with reference to IEC 62321-6:2015. Chromium (VI) shall be further confirmed with reference to IEC 62321-7-1:2015, IEC 62321-7-2:2017 or EN ISO 17075-1:2017.

XRF Screening limits for different matrices :

Material	Concentration (%)				
	Cd	Cr	Pb	Hg	Br
<b>Polymeric</b>	BL≤0.006<X<0.014≤ OL	BL≤0.064<X	BL≤0.067<X<0.133≤ OL	BL≤0.066<X< 0.134≤OL	BL≤0.029<X
<b>Metallic</b>	BL≤0.006<X<0.014≤ OL	BL≤0.064<X	BL≤0.067<X<0.133≤ OL	BL≤0.066<X< 0.134≤OL	n.a.
<b>Composite materials</b>	BL≤0.004<X<0.016≤ OL	BL≤0.044<X	BL≤0.047<X<0.153≤ OL	BL≤0.046<X< 0.154≤OL	BL≤0.024<X

Remark: The symbol "X" marks the region where further investigation is necessary.

	Cd	Cr(VI)	Pb	Hg	PBBs	PBDEs
<b>Maximum permissible Limit (%)</b>	0.01	0.1	0.1	0.1	0.1	0.1

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**2.Cadmium, Lead, Chromium (VI), Mercury, Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE)**

Test Method: Total Cadmium, Lead, Mercury, Chromium  
- Ref. to IEC 62321-4:2013+AMD1:2017 and IEC 62321-5:2013

Chromium (VI)  
- For Metal material - Ref. to IEC 62321-7-1:2015  
- For Polymer, Electronic material or others materials – Ref. to IEC 62321-7-2:2017

PBBs, PBDEs – Ref. to IEC 62321-6:2015

**Test Result:**

	Cd	Cr(VI)	Pb	Hg	PBBs	PBDEs
<b>Maximum Permissible Limit (%)</b>	0.01	0.1	0.1	0.1	0.1	0.1

Material No.	( <b>%</b> )					
	Cd	Cr <sup>^</sup>	Pb	Hg	PBBs	PBDEs
	RL (%)					
	0.001	0.001	0.001	0.001	0.01	0.01
B002	n.a.	n.a.	n.a.	n.a.	< RL	< RL
B003	n.a.	n.a.	n.a.	n.a.	< RL	< RL
B007	n.a.	n.a.	n.a.	n.a.	< RL	< RL
B008	n.a.	n.a.	n.a.	n.a.	< RL	< RL
B023	n.a.	n.a.	n.a.	n.a.	< RL	< RL
B024	n.a.	n.a.	0.049	n.a.	n.a.	n.a.
B031	n.a.	n.a.	n.a.	n.a.	< RL	< RL
B033	n.a.	n.a.	n.a.	n.a.	< RL	< RL

Material No.	Chromium VI content for metal materials ( $\mu\text{g}/\text{cm}^2$ ) (*1) RL: 0.10 $\mu\text{g}/\text{cm}^2$
B011	Negative

**Abbreviation:**

- Pb = Lead
- Cd = Cadmium
- Hg = Mercury
- Cr = Chromium
- Cr (VI) = Chromium (VI)
- PBBs = Total Polybrominated Biphenyls
- PBDEs = Total Polybrominated Diphenyl Ethers
- < = Less than
- RL = Reporting Limit
- n.a. = Not Applicable
- ^ = The total Chromium have been determined
- % = Percentage

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**Remark:**

(\*1) The Chromium (VI) content of metal sample in surface layer have been confirmed with reference to IEC 62321-7-1:2015 Annex.

	Chromium (VI) concentration	Qualitative result
Negative	$<0.1\mu\text{g}/\text{cm}^2$	The sample is negative (-ve) for Cr(VI). The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating
Inconclusive	$\geq 0.1\mu\text{g}/\text{cm}^2$ and $\leq 0.13\mu\text{g}/\text{cm}^2$	The result is considered to be inconclusive. Unavoidable coating variations may influence the determination. Recommendation: if additional samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trails for the final determination.
Positive	$>0.13\mu\text{g}/\text{cm}^2$	The sample is positive (+ve) for Cr(VI). Concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

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**3. BBP, DBP, DEHP, DIBP content**

Test Method: ref. to IEC 62321-8:2017

**Test Result:**

	<b>BBP</b>	<b>DBP</b>	<b>DEHP</b>	<b>DIBP</b>
<b>Maximum permissible Limit (%)</b>	0.1	0.1	0.1	0.1

<b>Test No.</b>	<b>Material No.</b>	<b>(%)</b>			
		<b>BBP</b>	<b>DBP</b>	<b>DEHP</b>	<b>DIBP</b>
		<b>RL (%)</b>			
		<b>0.005</b>	<b>0.005</b>	<b>0.005</b>	<b>0.005</b>
T001	B001 + B002 + B003 + B004 + B007	< RL	< RL	< RL	< RL
T002	B008 + B009 + B023 + B033 + B020	< RL	< RL	< RL	< RL
T003	B010 + B014 + B016 + B017 + B018	< RL	< RL	< RL	< RL
T004	B013 + B029	< RL	< RL	< RL	< RL
T005	B019 + B031	< RL	< RL	< RL	< RL
T006	C001 + C002	< RL	< RL	< RL	< RL

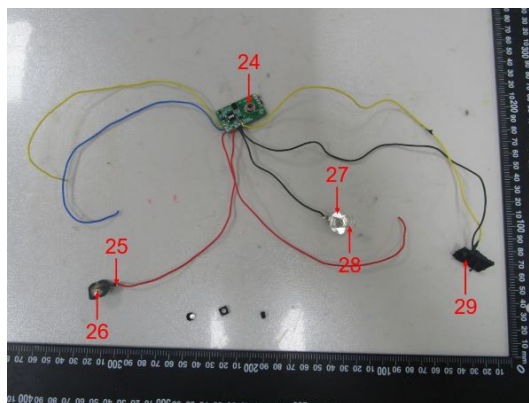
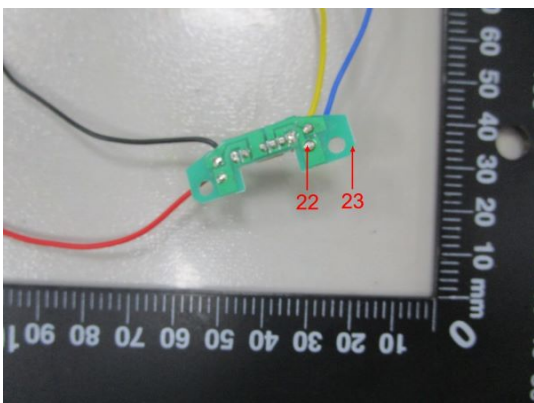
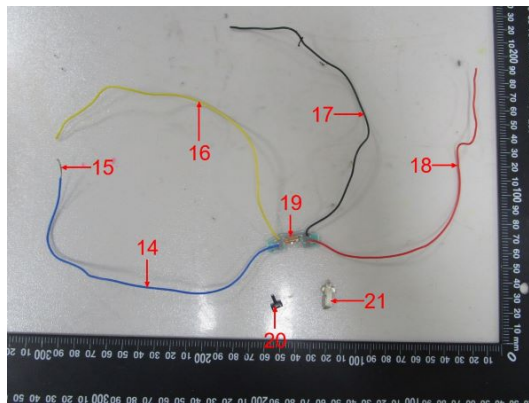
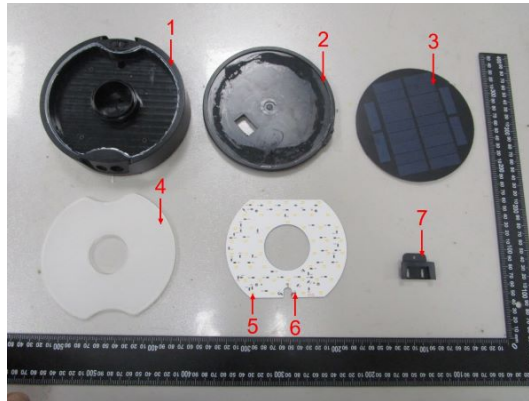
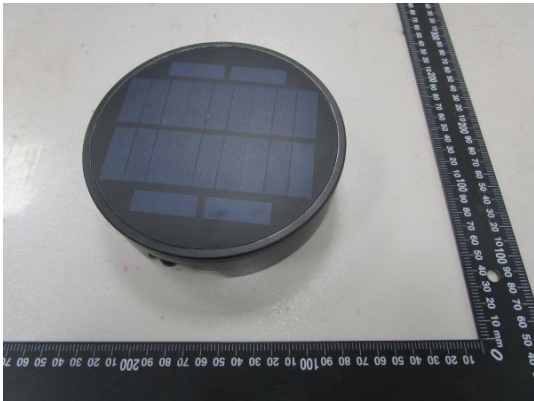
**Abbreviation:** BBP= Benzylbutyl phthalate  
 DBP= Dibutyl phthalate  
 DEHP= Bis(2-ethylhexyl) phthalate  
 DIBP= Diisobutyl phthalate  
 < = less than  
 RL = Reporting Limit  
 %= percentage

**Remark:**

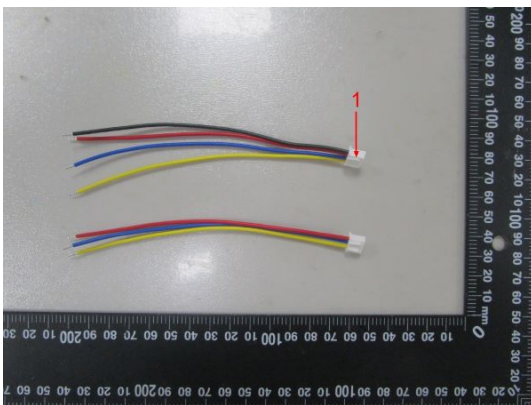
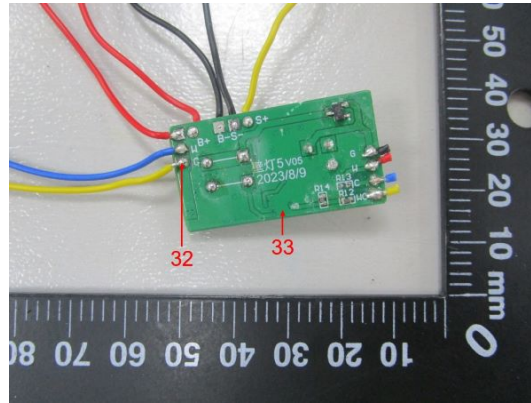
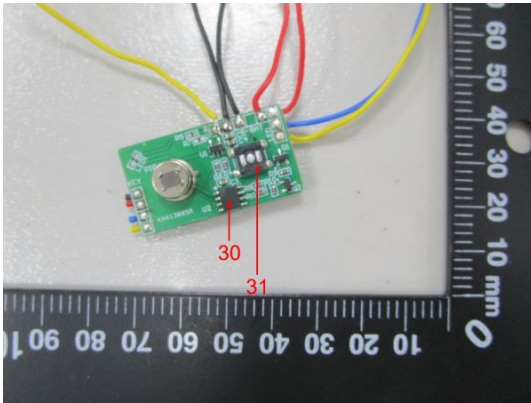
- \* The maximum permissible limit is required from the amendment (EU) 2015/863 of RoHS Directive 2011/65/EU.



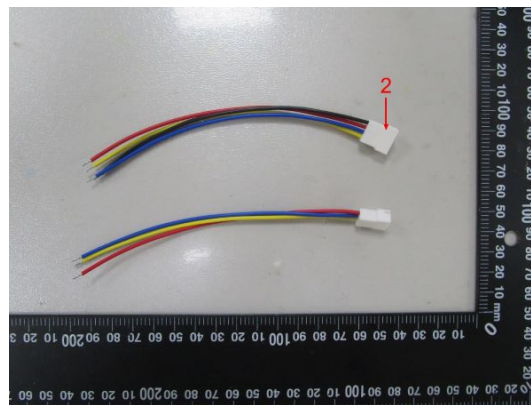
Sample Photos



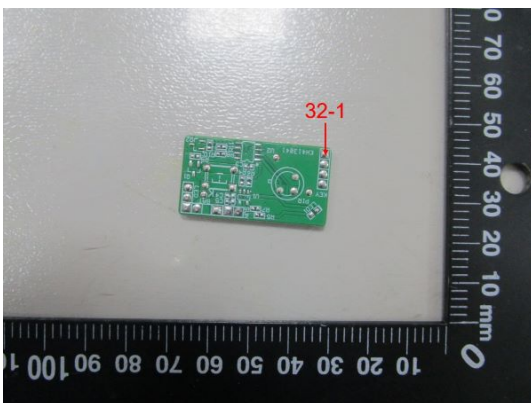
Sample Photos



C001



C002



- END -



