

## Test Report

Report No.: G150424B02-04EN

Date: 2015-05-11

Page 1 of 6

Applicant : Ningbo Shanhuang Electric Appliance Company  
Address : No.115 Xingongyi Road, Xinxing Industrial Area, Ninghai, Ningbo,  
China 315600  
Sample Name : LED Grave Light  
Tested Model : BSZD0  
Sample Receiving date: : 2015-04-27, 2015-05-08  
Test period : 2015-04-27 – 2015-05-06, 2015-05-08 – 2015-05-11  
Test Requirement : The Restriction of the Use of Certain Hazardous Substances in Electrical and  
Electronic Equipment, 2011/65/EU.  
Test Method : Please refer to next page(s).  
Test result : Please refer to next page(s).  
Conclusion : Based on the verification results of the submitted sample(s), the results of  
Lead, Cadmium, Mercury, Hexavalent chromium, Polybrominated biphenyls  
(PBBs) and Polybrominated diphenyl ethers (PBDEs) in the tested part(s)  
comply with the limits as set by RoHS Directive 2011/65/EU—The Restriction  
of the Use of Certain Hazardous Substances in Electrical and Electronic  
Equipment.

# ORIGINAL

Authorized signature



Lab Manager: Gavin Zhou



2015-05-11

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## Result Summary:

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	Golden plastic cover	BL	BL	BL	BL	BL	---	Pass
2	White plastic shell	BL	BL	BL	BL	BL	---	Pass
3	Black plastic tape	BL	BL	BL	BL	BL	---	Pass
4	White plastic	BL	BL	BL	BL	BL	---	Pass
5	White plastic	BL	BL	BL	BL	BL	---	Pass
6	Black plastic (battery housing)	BL	BL	BL	BL	BL	---	Pass
7	Transparent plastic	BL	BL	BL	BL	BL	---	Pass
8	Red plastic	BL	BL	BL	BL	BL	---	Pass
9-1	Blue wire sheath	BL	BL	BL	BL	BL	---	Pass
9-2	Copper wire	BL	BL	BL	BL	---	---	Pass
10	Red wire sheath	BL	BL	BL	BL	BL	---	Pass
11	LED light	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
12-1	Black metal shell	BL	BL	BL	BL	---	---	Pass
12-2	Black plastic shell	BL	BL	BL	BL	BL	---	Pass
12-3	Silvery metal spring	BL	BL	BL	BL	---	---	Pass
12-4	Silvery metal sheet (star contact)	BL	BL	BL	BL	---	---	Pass
12-5	Brown plastic base	BL	BL	BL	BL	BL	---	Pass
12-6	Silvery metal (pins)	BL	BL	BL	BL	---	---	Pass
13	Soldering tin	BL	BL	BL	BL	---	Pb: 48	Pass
14	PCB	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
15	Metal(conducting strip)	BL	BL	BL	BL	---	---	Pass
16	Metal (Spring)	BL	BL	BL	BL	---	---	Pass
17	Soldering tin	BL	BL	BL	BL	---	Pb: 38	Pass

### Remark:

(^1) "----"= Not Applicable;

(^2) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

(b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Pb、Cd、Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013.

Attached table 1, XRF screening limits in mg/kg for regulated elements in various matrices:

Element	Polymer Materials	Metallic Materials	Electronics
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (250+3\sigma) \leq OL$
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	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

Note:

- ① BL "below limit" = the result less than the limit.
- ② OL "over limit" = the result greater than the limit.
- ③ IN = inconclusive, the region where need further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs).
- ④  $3\sigma$  = Repeability of the analyser at the action level.
- ⑤ LOD = Limit of detection.

(c) 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) (a) mg/kg = ppm = 0.0001%;

(b) N.D. = Not detected, less than MDL;

(c) Method Detection Limit (MDL) in wet chemical test and Limit of Directive 2011/65/EU.

Parameter	Unit	Limit	Method Detection Limit (MDL)
Lead (Pb)	mg/kg	1000	2
Cadmium (Cd)	mg/kg	100	2
Mercury (Hg)	mg/kg	1000	2
Chromium VI (Cr VI)	mg/kg	1000	2
Group PBBs	mg/kg	1000	5
Group PBDEs	mg/kg	1000	5

Important: The limit values apply to each individual homogenous material.

(d) According to IEC 62321, result on Cr(VI) for metal sample is shown as Negative/Positive:

Negative = Absence of Cr(VI), Positive = Presence of Cr(VI).

(^4) Main test instruments used and test method:

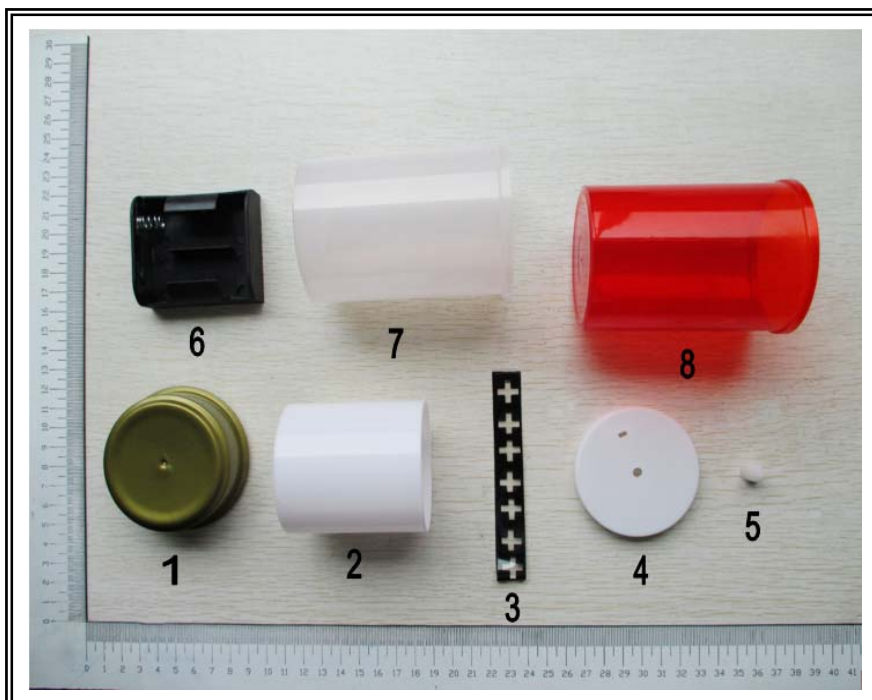
Parameter	Test Method	Instrument	Manufactory
Pb, Cd, Hg, Cr & Br	IEC 62321-3-1: 2013	EDX	Skyray Instrument
Pb, Cd & Cr	IEC 62321-5: 2013	ICP-OES	PerkinElmer
Hg	IEC 62321-4: 2013	ICP-OES	PerkinElmer
Cr(VI)	IEC 62321: 2008 Annex B and C	UV-Vis	LabTech
PBBs & PBDEs	IEC 62321: 2008 Annex A	GC-MSD	Thermo Fisher

Sample photo(s):

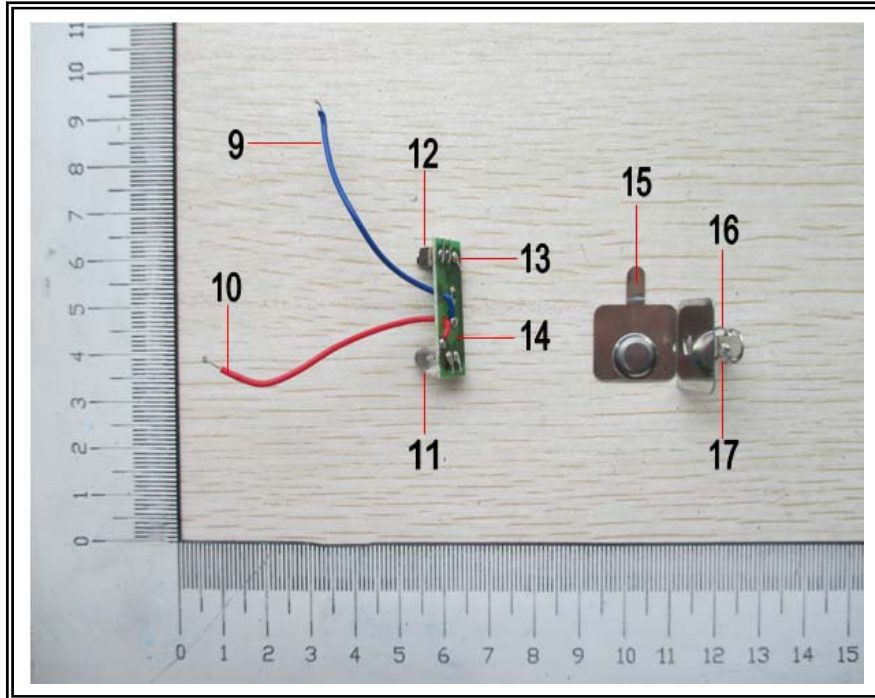


Test item: LED Grave Light

Tested Model: BSZD0



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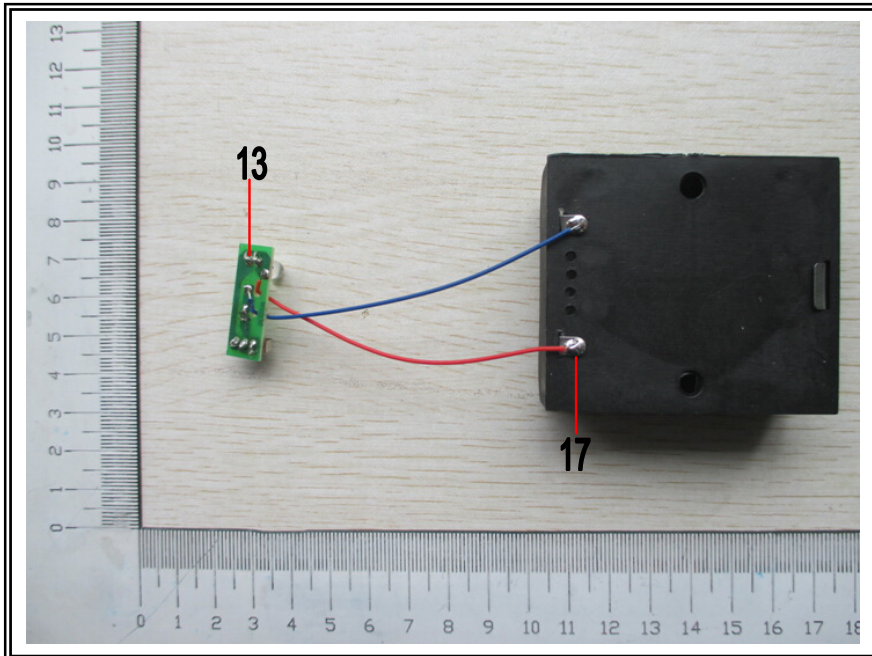


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The following sample(s) were resubmitted on May.08, 2015



GIG authenticate the photo(s) on original report only

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