TEST REPORT

Reference No.	:	GS202410056-R
Applicant	:	Zhongshan SPAR Optoelectronics Technology Co, Ltd.
Address	:	No.9 HenKang Street, GuZhenTown, ZhongShan City, GuangDong Province, China.
Manufacturer	:	Zhongshan SPAR Optoelectronics Technology Co, Ltd.
Address	:	No.9 HenKang Street, GuZhenTown, ZhongShan City, GuangDong Province, China.
Sample Name	:	LED Bulb
Model No.	:	See “General product information” on page 2-3.
Test Requested	:	In accordance with the RoHS Directive 2011/65/EU
Test Method	:	1) With Reference to EN 62321-2:2013, disassembly, disjointment and mechanical sample preparation. 2) With Reference to IEC 62321-3-1:2013, screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry 3) With reference to IEC 62321-4:2013+AMD:2017 CSV, determination of Mercury by ICP-OES 4) With reference to IEC 62321-5:2013, determination of Lead and Cadmium by ICP-OES 5) With reference to IEC 62321-7-2:2017 and IEC 62321-7-1:2015, determination of Hexavalent Chromium by UV-Vis 6) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS 7) With reference to IEC 62321-8:2017, determination of Phthalate content by GC-MS
Test Conclusion	:	Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863
Date of Receipt sample	:	2024-10-28
Date of Test	:	2024-10-28 to 2024-11-28
Date of Issue	:	2024-11-29
Test Result	:	Please refer to next page (s)

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Tested by: HOU Ho

Project Engineer

Reviewed by: Jeriten hou

Technical Manager

Model List

SPARAC-E14-2W-BX1-3 SPARAC-E14-2W-BX1-4 SPARAC-E14-2W-BX1-6	SPARAC-E14-2.5W-BX1-3 SPARAC-E14-2.5W-BX1-4 SPARAC-E14-2.5W-BX1-6	SPARAC-E14-3.5W-011-3 SPARAC-E14-3.5W-011-4 SPARAC-E14-3.5W-011-6
SPARAC-E14-2.5W-CE1-3 SPARAC-E14-2.5W-CE1-4 SPARAC-E14-2.5W-CE1-6	SPARAC-E14-3.5W-CE1-3 SPARAC-E14-3.5W-CE1-4 SPARAC-E14-3.5W-CE1-6	SPARAC-E14-3.5W-CE2-3 SPARAC-E14-3.5W-CE2-4 SPARAC-E14-3.5W-CE2-6
SPARAC-E14-4W-CE2-3 SPARAC-E14-4W-CE2-4 SPARAC-E14-4W-CE2-6	SPARAC-E14-4W-CE2-N3 SPARAC-E14-4W-CE2-N4 SPARAC-E14-4W-CE2-N6	SPARAC-E14-4.8W-CE1-3 SPARAC-E14-4.8W-CE1-4 SPARAC-E14-4.8W-CE1-6
SPARAC-E14-4.8W-CE4-3 SPARAC-E14-4.8W-CE4-4 SPARAC-E14-4.8W-CE4-6	SPARAC-E14-6W-CE1-3 SPARAC-E14-6W-CE1-4 SPARAC-E14-6W-CE1-6	SPARAC-E14-6W-CE2-3 SPARAC-E14-6W-CE2-4 SPARAC-E14-6W-CE2-6
SPARAC-E14-7W-CE2-3 SPARAC-E14-7W-CE2-4 SPARAC-E14-7W-CE2-6	SPARAC-E14-8W-CE1-3 SPARAC-E14-8W-CE1-4 SPARAC-E14-8W-CE1-6	SPARAC-E14-8W-CE2-3 SPARAC-E14-8W-CE2-4 SPARAC-E14-8W-CE2-6
SPARAC-R7S-4.8W-001-3 SPARAC-R7S-4.8W-001-4 SPARAC-R7S-4.8W-001-6	SPARAC-R7S-7W-002-3 SPARAC-R7S-7W-002-4 SPARAC-R7S-7W-002-6	SPARAC-R7S-10W-001-3 SPARAC-R7S-10W-001-4 SPARAC-R7S-10W-001-6
SPARAC-R7S-8.5W-001-3 SPARAC-R7S-8.5W-001-4 SPARAC-R7S-8.5W-001-6	SPARAC-R7S-12W-001-3 SPARAC-R7S-12W-001-4 SPARAC-R7S-12W-001-6	SPARAC-R7S-12W-002-3 SPARAC-R7S-12W-002-4 SPARAC-R7S-12W-002-6
SPARAC-R7S-18W-001-3 SPARAC-R7S-18W-001-4 SPARAC-R7S-18W-001-6	SPARAC-R7S-19W-001-3 SPARAC-R7S-19W-001-4 SPARAC-R7S-19W-001-6	

SPARAC-G9-2W-0S2-3 SPARAC-G9-2W-0S2-4 SPARAC-G9-2W-0S2-6	SPARAC-G9-2W-0S2-N-3 SPARAC-G9-2W-0S2-N-4 SPARAC-G9-2W-0S2-N-6	SPARAC-G9-2.5W-CE1-3 SPARAC-G9-2.5W-CE1-4 SPARAC-G9-2.5W-CE1-6
SPARAC-G9-2.5W-CE1-N3 SPARAC-G9-2.5W-CE1-N4 SPARAC-G9-2.5W-CE1-N6	SPARAC-G9-3.5W-CE1-3 SPARAC-G9-3.5W-CE1-4 SPARAC-G9-3.5W-CE1-6	SPARAC-G9-3.5W-CE2-3 SPARAC-G9-3.5W-CE2-4 SPARAC-G9-3.5W-CE2-6
SPARAC-G9-3.5W-CE3-3 SPARAC-G9-3.5W-CE3-4 SPARAC-G9-3.5W-CE3-6	SPARAC-G9-4W-CE2-3 SPARAC-G9-4W-CE2-4 SPARAC-G9-4W-CE2-6	SPARAC-G9-4W-CE3-3 SPARAC-G9-4W-CE3-4 SPARAC-G9-4W-CE3-6
SPARAC-G9-4W-CE3-N3 SPARAC-G9-4W-CE3-N4 SPARAC-G9-4W-CE3-N6	SPARAC-G9-4W-CE4-3 SPARAC-G9-4W-CE4-4 SPARAC-G9-4W-CE4-6	SPARAC-G9-4.8W-CE1-3 SPARAC-G9-4.8W-CE1-4 SPARAC-G9-4.8W-CE1-6
SPARAC-G9-4.8W-CE2-3 SPARAC-G9-4.8W-CE2-4 SPARAC-G9-4.8W-CE2-6	SPARAC-G9-4.8W-CE2-N3 SPARAC-G9-4.8W-CE2-N4 SPARAC-G9-4.8W-CE2-N6	SPARAC-G9-4.8W-CE5-3 SPARAC-G9-4.8W-CE5-4 SPARAC-G9-4.8W-CE5-6
SPARAC-G9-4.8W-CE5-N3 SPARAC-G9-4.8W-CE5-N4 SPARAC-G9-4.8W-CE5-N6	SPARAC-G9-4.8W-CE6-3 SPARAC-G9-4.8W-CE6-4 SPARAC-G9-4.8W-CE6-6	SPARAC-G9-6W-001-3 SPARAC-G9-6W-001-4 SPARAC-G9-6W-001-6
SPARAC-G9-6W-CE3-3 SPARAC-G9-6W-CE3-4 SPARAC-G9-6W-CE3-6	SPARAC-G9-6W-CE3-N3 SPARAC-G9-6W-CE3-N4 SPARAC-G9-6W-CE3-N6	SPARAC-G9-7W-CE2-3 SPARAC-G9-7W-CE2-4 SPARAC-G9-7W-CE2-6
SPARAC-G9-7W-CE2-N3 SPARAC-G9-7W-CE2-N4 SPARAC-G9-7W-CE2-N6	SPARAC-G9-8W-CE1-3 SPARAC-G9-8W-CE1-4 SPARAC-G9-8W-CE1-6	SPARAC-G9-8W-CE2-3 SPARAC-G9-8W-CE2-4 SPARAC-G9-8W-CE2-6
SPARAC-G9-8W-001-3 SPARAC-G9-8W-001-4 SPARAC-G9-8W-001-6	SPARAC-G9-2.2W-C01-3 SPARAC-G9-2.2W-C01-4 SPARAC-G9-2.2W-C01-6	SPARAC-G9-4W-C01-3 SPARAC-G9-4W-C01-4 SPARAC-G9-4W-C01-6
SPARAC-G9-3.5W-TGE1-3 SPARAC-G9-3.5W-TGE1-4 SPARAC-G9-3.5W-TGE1-6	SPARAC-G9-4W-TGE1-3 SPARAC-G9-4W-TGE1-4 SPARAC-G9-4W-TGE1-6	SPARAC-G9-5W-TGE4-3 SPARAC-G9-5W-TGE4-4 SPARAC-G9-5W-TGE4-6
SPARAC-G9-6W-TGE1-3 SPARAC-G9-6W-TGE1-4 SPARAC-G9-6W-TGE1-6		

Test Results:

Part No.	Part Description	Result of XRF		Result of Wet Chemical Testing (mg/kg)	Conclusion on RoHS
1	Silvery metal sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
2	Silvery metal shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
3	Silvery metal axle	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
4	White plastic gasket	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
5	Silvery metal spring	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
6	Silvery metal shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
7	Transparent glass sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
8	Silvery metal sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		

Part No.	Part Description	Result of XRF		Result of Wet Chemical Testing (mg/kg)	Conclusion on RoHS
9	White glue	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
10	Black heat-shrinkable tube	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
11	White heat-shrinkable tube	Cd	BL	PBBs :ND PBDEs :ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	IN		
12	Blue plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
13	Solder	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
14	Semi-transparent plastic shell with silvery coating	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
15	Transparent plastic shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
16	Silvery metal sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
17	Black plastic base	Cd	BL	PBBs :ND PBDEs :ND	Comply
		Pb	BL		

		Hg	BL		
		Cr	BL		
		Br	IN		
18	White plastic shell of connector	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
19	Silvery metal terminal of connector	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
20	Black plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
21	Silvery metal wire	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
22	Black heat-shrinkable tube	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
23	Silvery metal terminal	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
24	White plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
25	Silvery metal screw	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
26	Silvery metal sleeve	Cd	BL	Not tested	Comply
		Pb	BL		

		Hg	BL		
		Cr	BL		
		Br	BL		
27	Transparent plastic ring	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
28	White plastic ring	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
29	Silvery metal gasket	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
30	Silvery metal gasket	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
31	Silvery metal nut	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
32	Transparent plastic cord anchorage	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
33	Silvery metal shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
34	Black plastic sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
35	Black plastic shell	Cd	BL	Not tested	Comply
		Pb	BL		

		Hg	BL		
		Cr	BL		
		Br	BL		
36	Silvery metal sleeve	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
37	Silvery metal sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
38	White plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
39	Silvery metal wire	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
40	Red plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
41	White plastic cable tie	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
42	Black heat-shrinkable tube	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
43	Transparent plastic cover of cord anchorage	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
44	Silvery metal sheet of cord anchorage	Cd	BL	Not tested	Comply
		Pb	BL		

		Hg	BL		
		Cr	BL		
		Br	BL		
45	Silvery metal sleeve	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
46	Silvery metal shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
47	Transparent plastic sleeve	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
48	Silvery metal sleeve	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
49	White sponge adhesive sheet	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
50	Black plastic cover	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
51	Grey powder	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
52	Black plastic shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
53	Silvery metal gasket	Cd	BL	Not tested	Comply
		Pb	BL		

		Hg	BL		
		Cr	BL		
		Br	BL		
54	Transparent plastic adhesive tape	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
55	Silvery metal shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
56	Black plastic cord anchorage	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
57	Black plastic wire jacket	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
58	Brown plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
59	Coppery metal wire	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
60	Blue plastic wire covering	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		

Remark:

(1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for $Cr6^{+}$) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to EN 62321:2013 (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
Cd	BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL	BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL	LOD < IN < (150+3σ) ≤ OL
Pb	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL
Hg	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL
Cr	BL ≤ (700-3σ) < IN	BL ≤ (700-3σ) <IN	BL ≤ (500-3σ) < IN
Br	BL ≤ (300-3σ) < IN	--	BL ≤ (250-3σ) < IN

BL= Below Limit OL= Over Limit LOD = Limit of Detection -- = Not Regulated

(2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.

(3) The XRF screening test for RoHs elements – the reading may be different to the actual content in the sample be of non-uniformity composition

(4) mg / kg =milligram per kilogram=ppm, based on the dry weight of tested sample.

(5) ND = Not Detected, less than the value of Method Detection Limit.

(6) NA = Not Applicable, as the XRF screening test result was below the limit, it was not need to conduct the wet chemical testing.

(7) MDL= Method Detection Limit in wet chemical test.

Test Items	Pb	Cd	Hg	Cr^{6+}		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	$\mu g/cm^2$	mg/kg	mg/kg
MDL	2	2	2	2	0.1	5	5

The MDL for single compound of PBBs and PBDEs is 5mg/kg, MDL of Cr^{6+} for polymer and composite sample is 2mg/kg and MDL of Cr^{6+} for metal sample is 0.1μg/cm^2.

(8) According to IEC 62321-7-1:2015, determined of Cr^{6+} on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.
Boiling water extraction:
Negative = Absence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is less than 0.10ug/cm^2.
Positive = Presence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/cm^2.
Information on storage conditions and production date of the tested sample is unavailable and thus Cr^{6+}

(9) The test components were selected by the client; The test results relate only to the components tested, and it doesn't mean that the whole product complies with the RoHS Directive 2011/65/EU.

(10)* =According to the declaration from client, the source of lead in test sample could be from the glass or ceramic material of that electronic component which is exempted by Directive 2011/65/EU.

(11)# = According to the declaration from client, the source of cadmium in test sample could be from cadmium and its compounds in electrical contacts which is exempted by Directive 2011/65/EU.

(12)# = According to the declaration from client, the source of lead in test sample could be from copper alloy while lead as copper alloy containing up to 4% lead by weight is exempted by Directive 2011/65/EU.

(13) The test components were selected by the client; The test results relate only to the components tested, and it doesn't mean that the whole product complies with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863

2. Phthalates (DEHP, BBP, DBP, DIBP)

Test items	Result (mg/kg)			Limit (mg/kg)
	No.3+No.4 +No.5△	No.7	No.9	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	538	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.12	No.13+No.32+ No.61△	No.14	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.15+No.16+ No.18+No.20△	No.17+No.85△	No.19	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	144*	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.21+No.25+ No.26+No.27△	No.39△	No.40+No.51 +No.54△	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.55	No.65	No.67	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.69+No.75+ No.99△	No.71	No.76+No.80+ No.82+No.83△	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	55	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.81	No.86	No.87+No.124+ No.134 +No.135△	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.89	No.90+No.93+ No.94△	No.91	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.96+No.137+ No.146△	No.98	No.102+No.123 +No.138△	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.103	No.104+No.105 +No.106△	No.108	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	60*	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.109	No.111	No.112	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	89	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.113+No.114 +No.115△	No.116+No.118 +No.122△	No.117+No.120 +121△	
Bis(2-ethylhexyl)-phthalate (DEHP)	203*	168*	154*	1000
Dibutyl phthalate (DBP)	<50	235*	193*	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.125+No.127 +No.131△	No.132 +No.133△	No.140+No.141 +No.142△	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Test items	Result (mg/kg)			Limit (mg/kg)
	No.143+No.144 +No.145△	No.149+No.151 +No.153△	No.154 +No.155△	
Bis(2-ethylhexyl)-phthalate (DEHP)	<50	<50	<50	1000
Dibutyl phthalate (DBP)	<50	<50	<50	1000
Benzylbutyl phthalate (BBP)	<50	<50	<50	1000
Diisobutyl phthalate (DIBP)	<50	<50	<50	1000

Note:

(1) "<" = less than

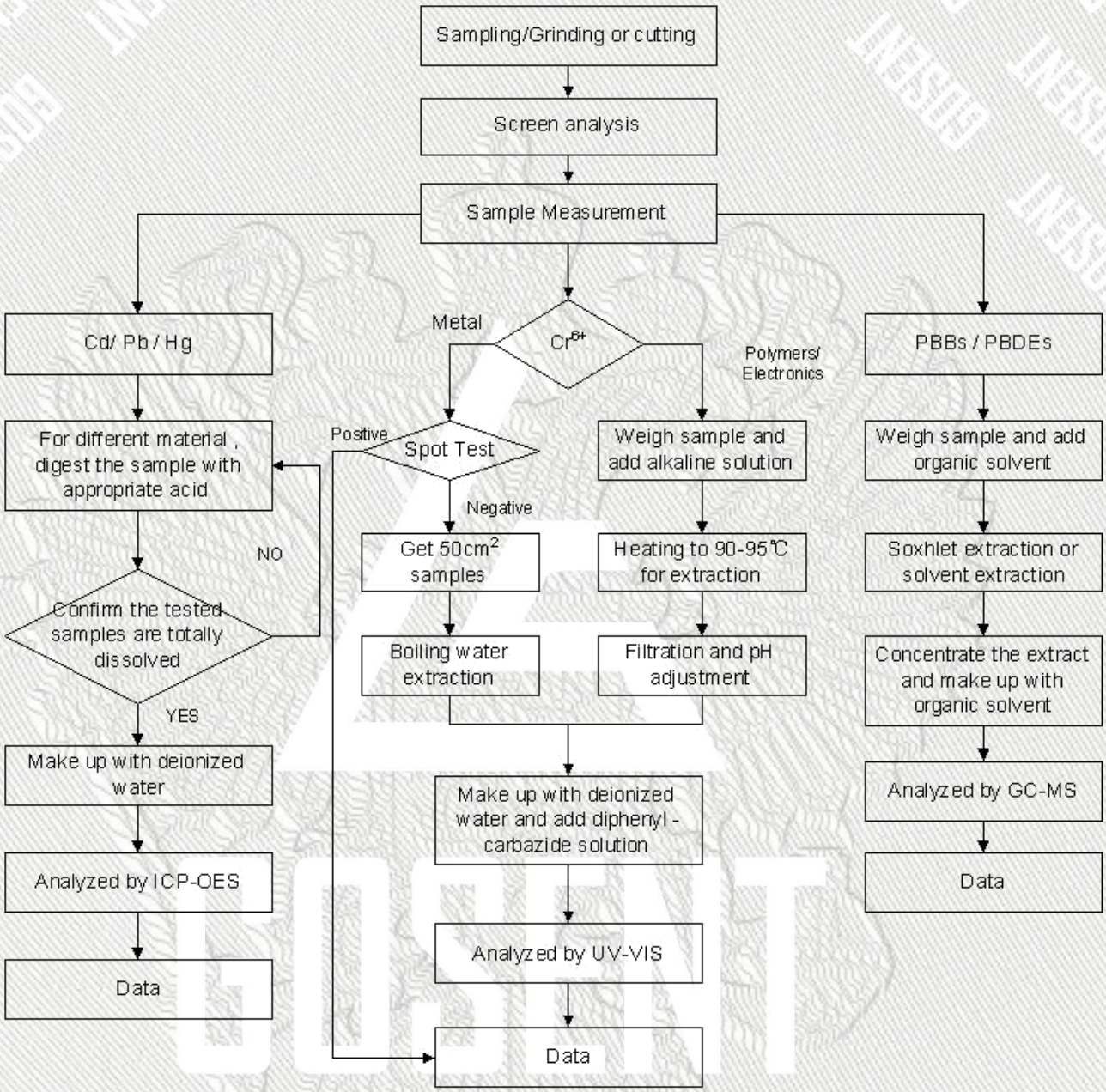
(2) mg/kg = milligram per kilogram= ppm

(3) "△"= As client's requirement, the testing was conducted based on mixed components, the test result is for reference only.

(4) "*" = The test results were based on the minimum mass conversion of the mixed samples.

(5) The test components were selected by the client; The test results relate only to the components tested, and it doesn't mean that the whole product complies with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863

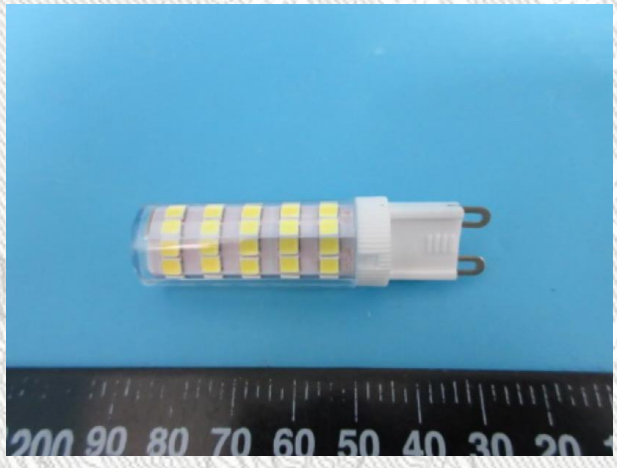
Measurement Flowchart:



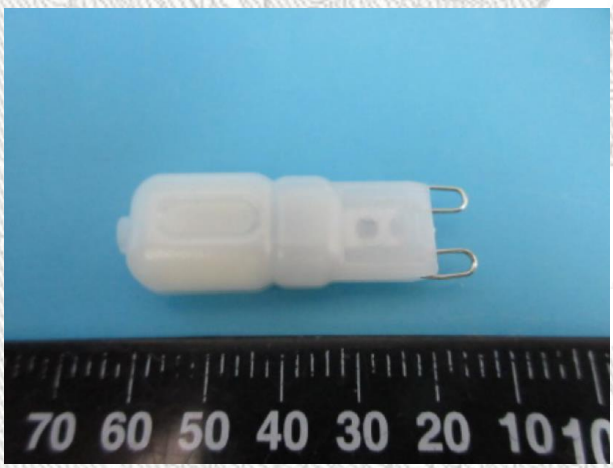
Sample Photo:



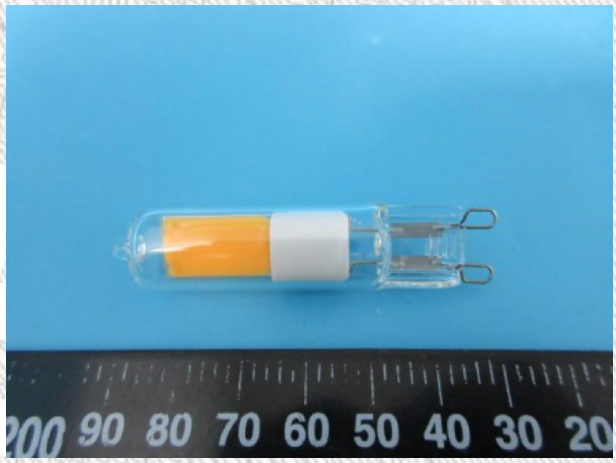
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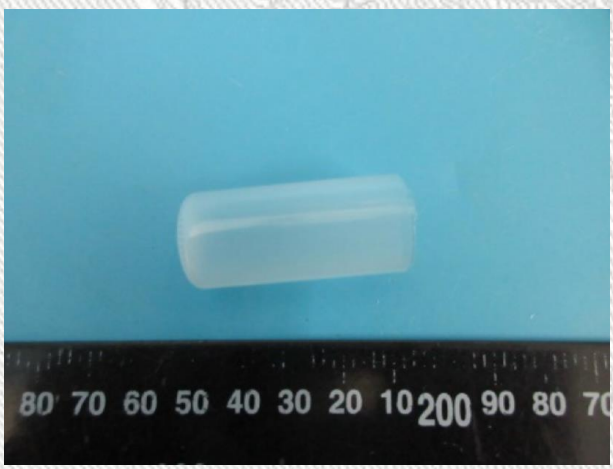
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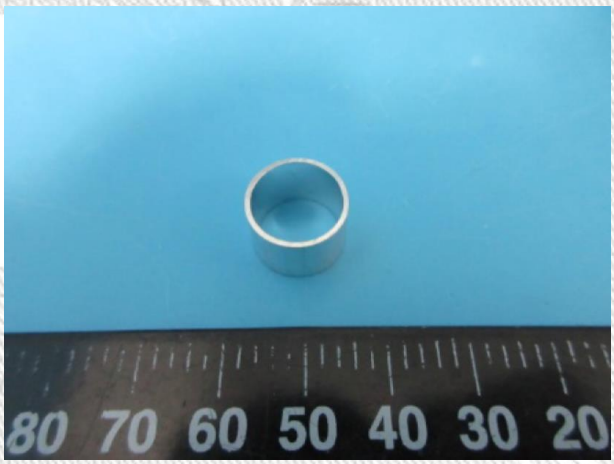
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SPARAC-G9-4W-C01-3



SPARAC-G9-7W-CE3-N3



SPARAC-G9-4W-0S2-6

====== End of Report ======