

Test Report No.: **1160033721b 001**

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Client: Cixi Yuanhui Lighting Electric Co., Ltd.
Industrial Zone, Sanbei Town
Cixi City, Zhejiang Province, P.R. China

Test item(s): LED Waterproof Luminaire

Test Model No(s): YL08-54W-1560

Reference Model No(s): Refer to page 15

Sample Receiving date: 2017-04-21

Delivery condition: **Apparent good, Samples tested as received**

Test period: 2017-04-25 – 2017-05-09

Test specification:

Customer's requirement:

1. According to RoHS (recast):Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU

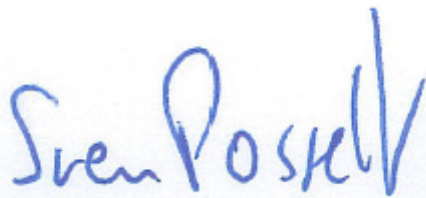
Test result:

PASS

Other Information:

Remark: As per client's requirement, the results of M001-M069 referred to the report 1160033721a 001 issued on June. 23, 2017.

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



2017-06-23 Sven Posselt Department Manager

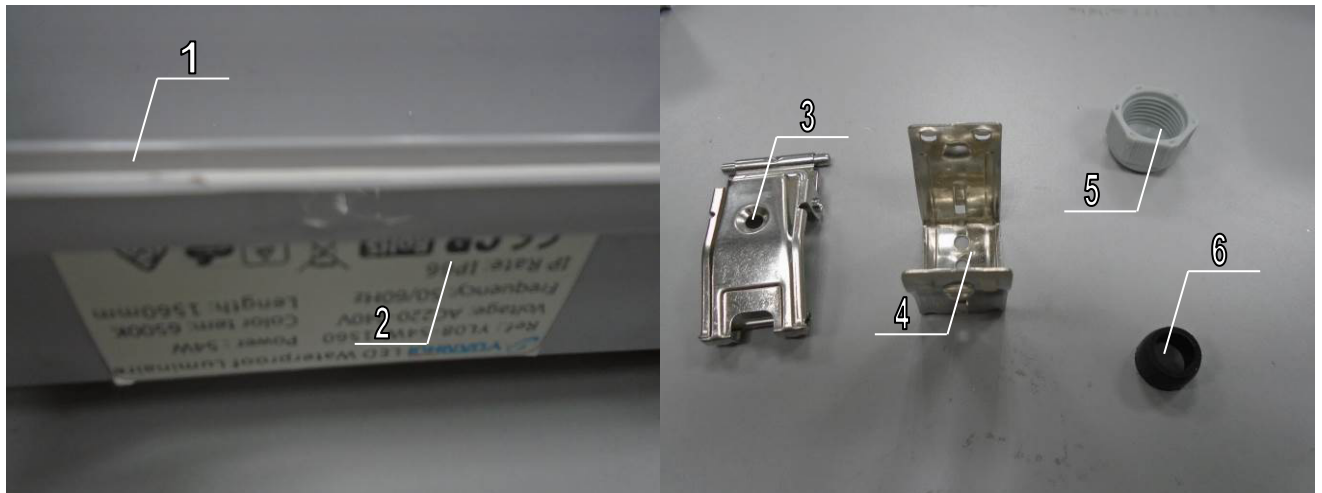
Date Name/Position

*Test result is drawn according to the kind and extent of tests performed.
This test report relates to the a. m. 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.*

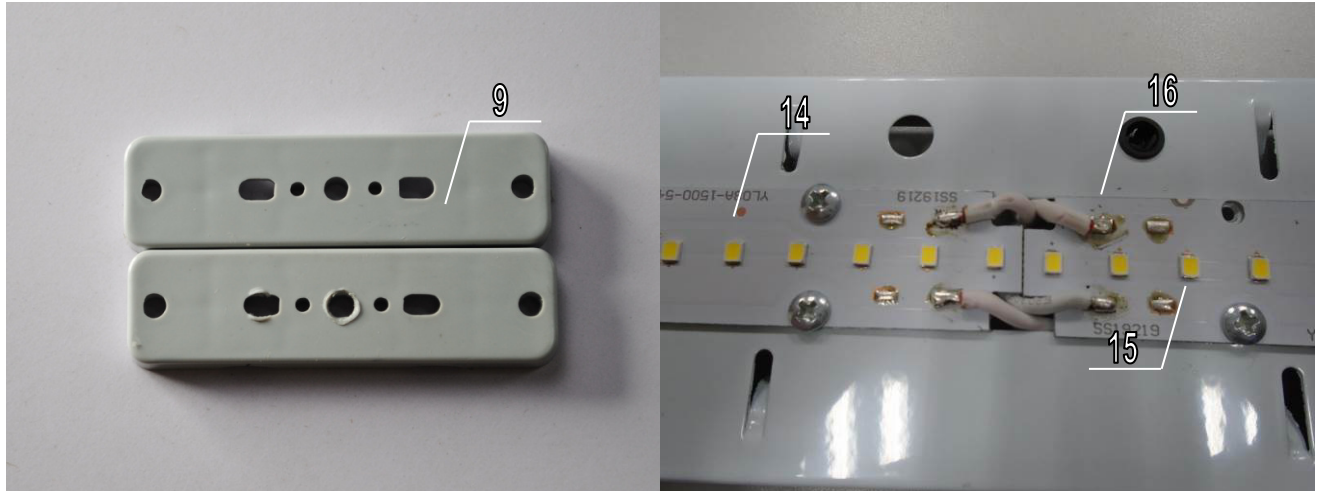
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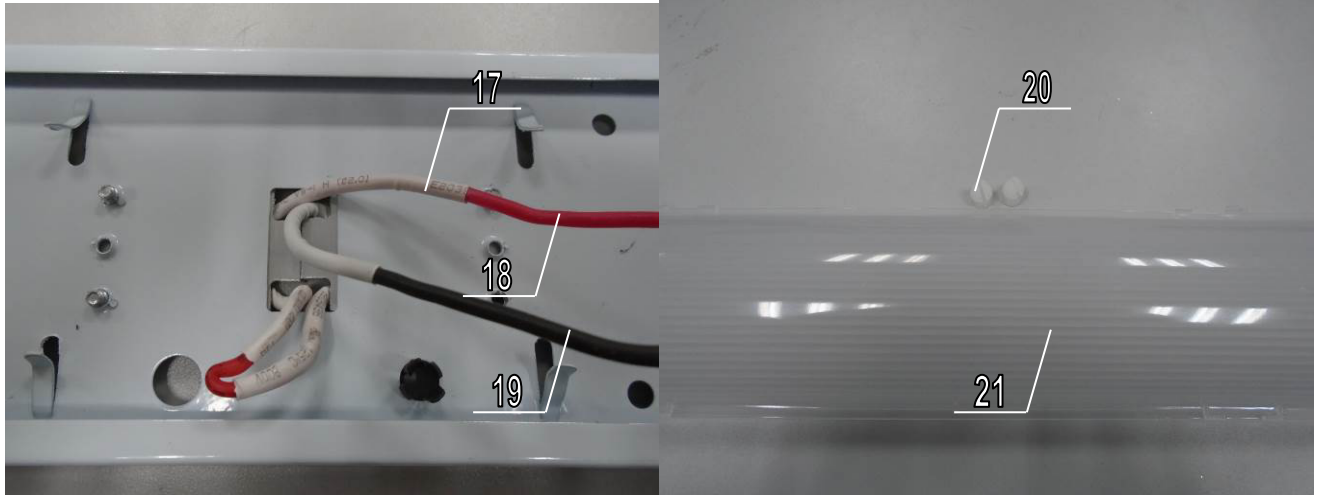
A. Screening Test by XRF Spectroscopy

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


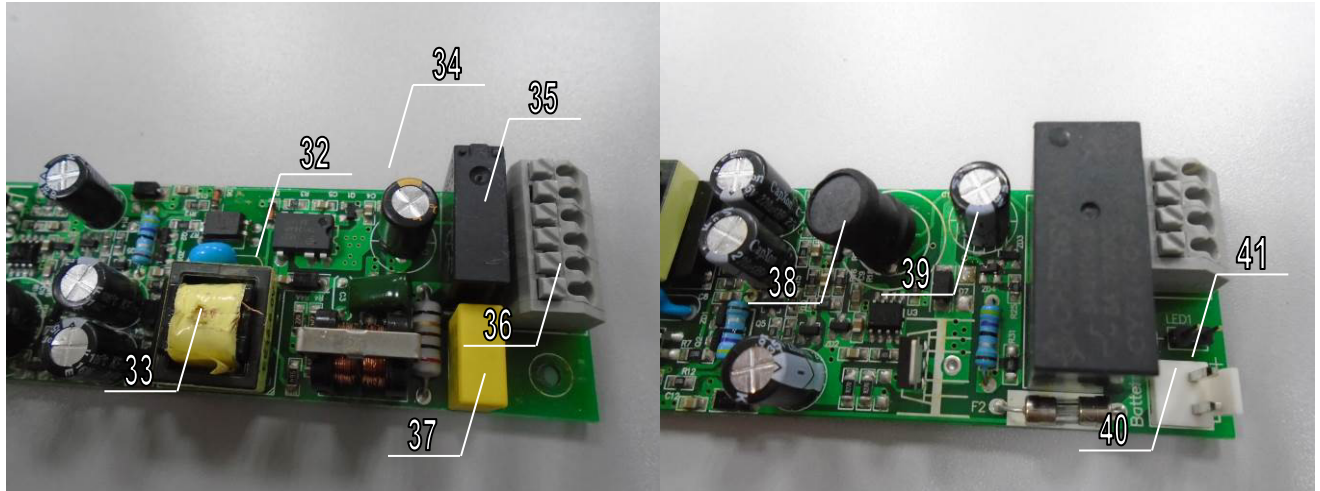
Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M001(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M002(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M003(metal)	n.d.	n.d.	d(^2)	n.d.	N.A.
M004(metal)	n.d.	n.d.	d(^2)	n.d.	N.A.
M005(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M006(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.



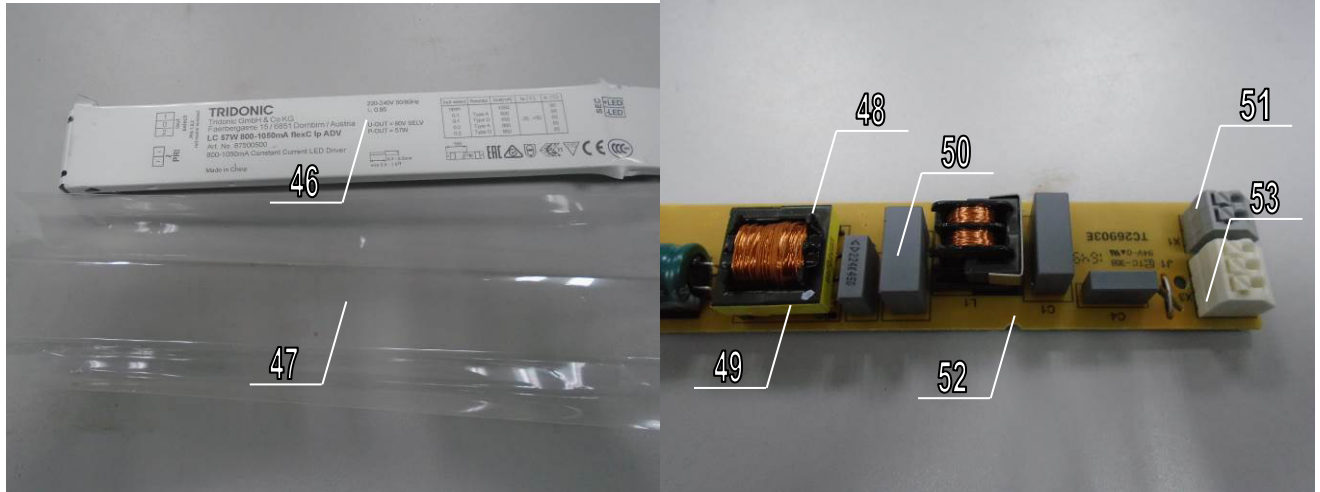
Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M009(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M014(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M015(meta)	n.d.	n.d.	n.d.	n.d.	N.A.
M016(solder)	n.d.	n.d.	n.d.	n.d.	N.A.



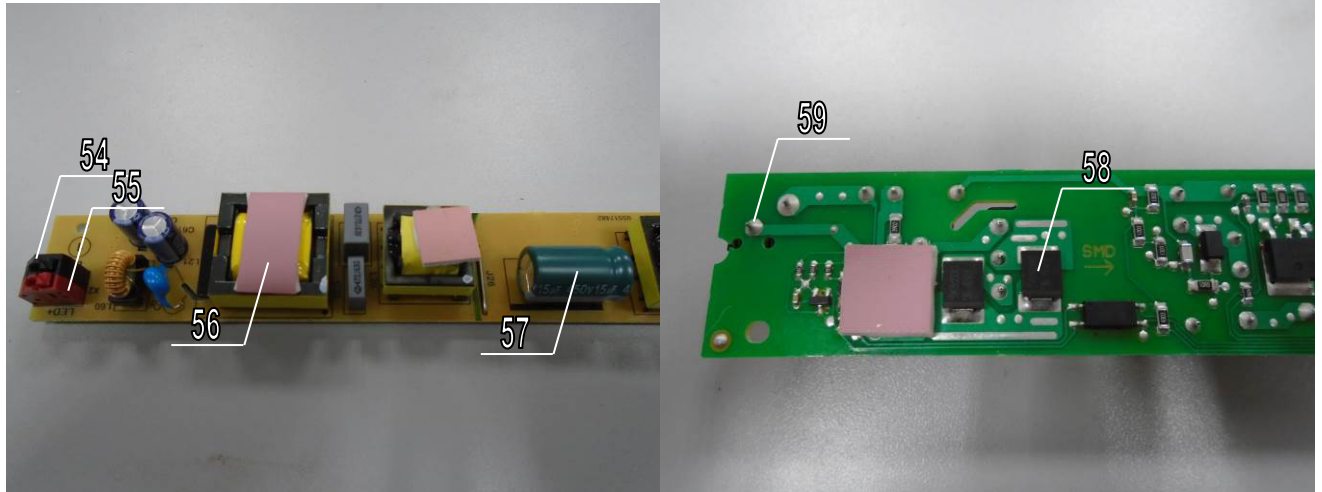
Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M017(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M018(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M019(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M020(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M021(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.



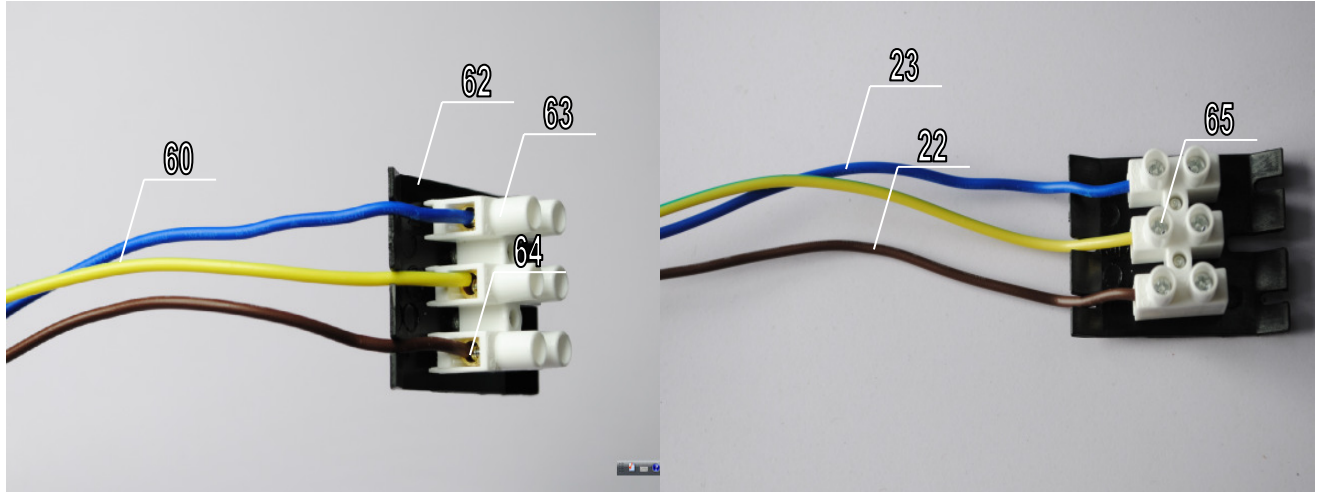
Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M032(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M033(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M034(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M035(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M036(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M037(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M038(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M039(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M040(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M041(metal)	n.d.	n.d.	n.d.	n.d.	N.A.



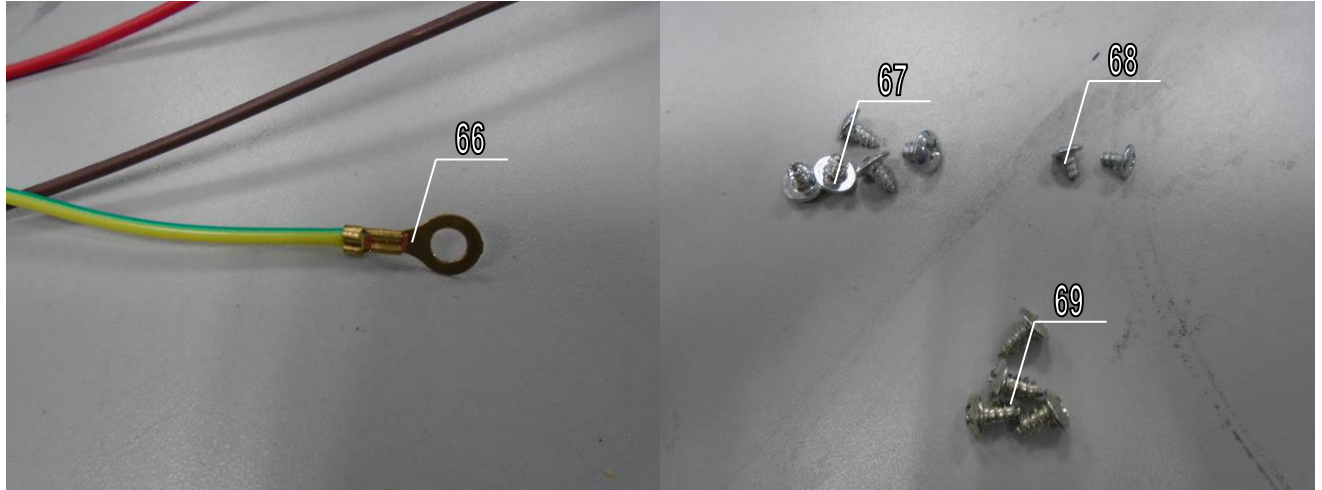
Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M046(metal)	n.d.	n.d.	n.d.	n.d.	N.A.
M047(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M048(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M049(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M050(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M051(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M052(PCB)	n.d.	n.d.	n.d.	n.d.	d(^1)
M053(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.



Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M054(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M055(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M056(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M057(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M058(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M059(solder)	n.d.	n.d.	n.d.	n.d.	N.A.



Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M022(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M023(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M060(plastic)	n.d.	n.d.	n.d.	n.d.	n.d.
M062(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M063(plastic)	n.d.	n.d.	n.d.	n.d.	d(^1)
M064(metal)	n.d.	d(^1)	n.d.	n.d.	N.A.
M065(metal)	n.d.	n.d.	n.d.	n.d.	N.A.



Material No.	Result (mg/kg)				
	Cd	Pb	Cr	Hg	Br
	Limit(mg/kg)				
	100	1000	Cr(VI): 1000	1000	PBB:1000 PBDE:1000
M066(metal)	n.d.	n.d.	n.d.	n.d.	N.A.
M067(metal)	n.d.	n.d.	n.d.	n.d.	N.A.
M068(metal)	n.d.	n.d.	d(^2)	n.d.	N.A.
M069(metal)	n.d.	n.d.	n.d.	n.d.	N.A.

Abbreviation:

Pb	denotes Lead
Cd	denotes Cadmium
Hg	denotes Mercury
Cr	denotes Chromium
Cr(VI)	denotes Chromium(VI)
Br	denotes Bromine
PBBs	denotes Total Polybrominated Biphenyls
PBDEs	denotes Total Polybrominated Diphenyl Ethers
<	denotes less than
N.A.	denotes Not Applicable
n.d.	denotes Not Detected
d	denotes Detected

Remark:

(^1) The screening result was found in the inconclusive region (X), thus the further wet chemistry tests are suggested.

(^2) For metal sample, the Chromium (VI) content have been confirmed with reference to IEC 62321-7-1:2015.

For plastic sample or electronic sample, the Chromium (VI) content have been confirmed with reference to IEC 62321:2008 Annex C.

XRF Screening limits for different materials:

Materials	Concentration (mg/kg)				
	Cd	Cr	Pb	Hg	Br
Metallic material	P≤ 50 < X ≤150 < F	P≤ 630 < X	P≤ 690 < X≤1360 < F	P≤ 520 < X≤1560 < F	NA
Polymeric material	P≤ 50 < X ≤150 < F	P≤ 630 < X	P≤ 690 < X≤1360 < F	P≤ 520 < X≤1560 < F	P≤ 300 < X
Electronic material	P≤ 50 < X ≤180 < F	P≤ 500 < X	P≤ 550 < X≤1640 < F	P≤410 < X≤1870 < F	P≤ 240 < X

* Component(s)/ materials(s) with an area of less than 2mm x2 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

B. Confirmation Test by Wet Chemistry

Test Method: Total Cadmium, Lead, Mercury, Chromium
 - Ref. to IEC 62321-4:2013 and IEC 62321-5:2013
 Chromium VI
 - For Metal material - Ref. to IEC 62321-7-1:2015
 - For Plastic or Electronic material – Ref. to IEC 62321:2008 Annex C
 PBBs, PBDEs – Ref. to IEC 62321-6:2015

Material list:

Material No.	Material	Test Plan
		A=Test HM only B=Test FR only C=Test HM+FR
M003	Metal	A
M004	Metal	A
M005	Plastic	B
M009	Plastic	B
M035	Plastic	B
M037	Plastic	B
M050	Plastic	B
M052	PCB	B
M058	Plastic	B
M062	Plastic	B
M063	Plastic	B
M064	Metal	A
M068	Metal	A

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Test result:

	Cd	Pb	Cr (VI)	Hg	PBBs (*)	PBDEs (*)
Maximum Permissible Limit ppm (mg/kg)	100	1000	1000	1000	1000	1000

Material No.	(mg/kg)					
	Cd	Pb	Cr [^]	Hg	PBBs (*)	PBDEs (*)
	RL (mg/kg)					
	10	10	10	10	5	5
M005	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M009	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M035	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M037	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M050	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M052	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M058	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M062	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M063	N.A.	N.A.	N.A.	N.A.	N.D.	N.D.
M064	N.A.	28700 ^{6(c)}	N.A.	N.A.	N.A.	N.A.

Material no.	Hexavalent Chromium Content ($\mu\text{g}/\text{cm}^2$) (*1)
	RL: 0.10 $\mu\text{g}/\text{cm}^2$
M003	Negative
M004	Negative
M068	Negative

Abbreviation:

Pb	denotes Lead
Cd	denotes Cadmium
Hg	denotes Mercury
Cr	denotes Chromium
Cr(VI)	denotes Chromium(VI)
PBBs	denotes Total Polybrominated Biphenyls
PBDEs	denotes Total Polybrominated Diphenyl Ethers
N.D.	denotes Not Detected
MDL	denotes Method Detection Limit
N.A.	denotes Not Applicable
^	The total Chromium have been determined

Remark:

6(c) denotes exemption applications 6(c) Copper alloy containing up to 4 % lead by weight.

(*1) The total chromium content in Metal sample was found to be exceeded the maximum permissible limit (1000mg/kg). Thus, the Chromium (VI) content in surface layer have been confirmed with reference to IEC 62321-7-1:2015 Annex.

	Chromium (VI) concentration	Qualitative result
Negative	<0.1µg/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	≥ 0.1µg/cm ² and ≤ 0.13 µg/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 µg/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).

(*) The reporting limit for each individual PBBs and individual PBDEs are :

Method Detection Limit in ppm (mg/kg)		
PBBs	Monbromobiphenyl	5
	Dibromobiphenyl	5
	Tribromobiphenyl	5
	Tetrabromobiphenyl	5
	Pentabromobiphenyl	5
	Hexabromobiphenyl	5
	Heptabromobiphenly	5
	Octabromobiphenyl	5
	Nonabromobiphenyl	5
	Decabromobiphenyl	5
PBDEs	Monbromodiphenyl ether	5
	Dibromodiphenyl ether	5
	Tribromodiphenyl ether	5
	Tetrabromodiphenyl ether	5
	Pentabromodiphenyl ether	5
	Hexabromodiphenyl ether	5
	Heptabromodiphenyl ether	5
	Octabromodiphenyl ether	5
	Nonabromodiphenyl ether	5
	Decabromodiphenyl ether	5

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Reference style No(s):

YL08-20W-650 YL08-20W-1220 YL08-30W-1220 YL08-36W-1220 YL08-45W-1220

YL08-36W-1560 YL08-65W-1560

Sample photo:



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