Test Report

Report No.: A001R20170527022-2 Date: Jun.30, 2017 Page 1 of 12

Applicant: Mid Ocean Brands B.V.

Address: 7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.

Report on the submitted sample(s) said to be:

Sample Name	:	Opener with LED torch
Model	:	See description
Item No.	:	MO8142
Manufacturers		/
Address		/
Country of origin	:	China
Country of destination	:	Europe
Sample Receiving Date	:	May 27, 2017
Testing Period	:	May 27, 2017 to Jun.30, 2017

Test Requested:	:	Please refer to next page(s).
Test Method	:	Please refer to next page(s).
Test Result	:	Please refer to next page(s).

Tested by: Huisu Luo	Reviewed by: Leon	Approved by: Jason
Luohuisu	Suhongliang, Leon	Jiangyuncheng, Jason
Test Engineer	Test Team Leader	Laboratory Manager

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Test Report

Test Requested:	**Conclusion**
1. As specified by client, to determine the Polycyclic Aromatic Hydrocarbons (PAHs) content in the submitted sample(s) with reference to entry 50, Annex XVII of the REACH Regulation (EC) No 1907/2006 and Amendment Regulation (EU) 2015/326.	**Pass**
2. As specified by client, to determine Lead(Pb), Cadmium(Cd), Mercury(Hg) content accordance with European Directive 2006/66/EC and its amendments 2013/56/EU.	**Pass**
3. As specified by client, to determine the nickel release in the submitted sample(s) with reference to entry 27, Annex XVII of the REACH Regulation (EC) No 1907/2006.	/
4. As specified by client, to determine the Pb, Cd, Hg, Cr^{6+}, PBBs, PBDEs content in the submitted sample in accordance with EU RoHS Directive 2011/65/EU(RoHS) and its amendment directives on XRF and Chemical Method.	**Pass**

Test Result(s):

1. Test result of Polycyclic Aromatic Hydrocarbons (PAHs)

Unit: mg/kg

Test Item(s)	**Test Method /Equipment**	**MDL**	**Result(s)**	**Limit**
			1-5	
Benzo[a]anthracene (BaA)	Refer to German consumer product safety regulations (ProdSG: 2014) GC-MS	0.1	N.D.	1
Chrysene (CHR)		0.1	N.D.	1
Benzo[b]fluoranthene (BbFA)		0.1	N.D.	1
Benzo[k]fluoranthene (BkFA)		0.1	N.D.	1
Benzo[j]fluoranthene (BjFA)		0.1	N.D.	1
Benzo[a]pyrene (BaP)		0.1	N.D.	1
Benzo[e]pyrene(BeP)		0.1	N.D.	1
Dibenzo[a,h]anthracene (DBAhA)		0.1	N.D.	1
Sum of 8 PAHs		—	N.D.	/
Conclusion		/	**Pass**	/

Note: 1. MDL＝Method Detection Limit
2. N.D.=Not Detected(less than method detection limit)

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2. Test result of Lead(Pb), Cadmium(Cd), Mercury(Hg)

Unit: %,w/w

Test item(s)	Test Method/ Equipment	MDL	Result(s)	Limit
			1-6	
Lead (Pb)	Refer to IEC 62321-5:2013 ICP-OES	0.0005	0.0032	—
Cadmium (Cd)		0.0005	N.D.	0.002
Mercury (Hg)	Refer to IEC 62321-4:2013, ICP-OES	0.0001	N.D.	0.0005
Conclusion	/	/	**Pass**	/

Note: 1.0.1%,w/w=1000 mg/kg

2.N.D.=Not Detected(less than method detection limit)

3.MDL = Method Detection Limit

4.Test result on specimen No.1-6 was resubmitted sample on Jun.27, 2017.

3. Test result of Nickel (Ni) release

Unit: $\mu g/cm^2$/week

Test Item(s)	Test Method/equipment	MDL	Result(s)		
			1-1-A	1-1-B	1-1-C
Nickel (Ni) release	Refer to EN 1811:2011+A1:2015 ICP-OES	0.05	N.D.	N.D.	N.D.
Conclusion		/	**Pass**	**Pass**	**Pass**

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Unit: μg/cm^2/week

Test Item(s)	Test Method/equipment	MDL	Result(s)		
			(1-2+1-3+1-4)-A*	(1-2+1-3+1-4)-B*	(1-2+1-3+1-4)-C*
Nickel (Ni) release	Refer to EN 1811:2011+A1:2015 ICP-OES	0.05	N.D.	0.08	N.D.

Type of sample	Nickel release (μg/cm^2/week)	
	Pass	Fail
Article with Nickel release limit of 0.5μg/cm^2/week (Non-body piercing)	＜0.88	≥0.88
Article with Nickel release limit of 0.2μg/cm^2/week (Body piercing)	＜0.35	≥0.35

Note:

1. N.D.=not detected (<MDL)
2. MDL=Method Detection Limit
3. μg/cm^2/week = microgram per square centimeter per week
4. Results shown above are testing data of three groups
5.*= As specified by client, the submitted samples were mixed to test.

Sample Description

No.	Sample name	Model No.
1	Opener with LED torch	MO8142
1-1	Black aluminum shell	/
1-2	Metal ring	/
1-3	Metal chain	/
1-4	Metal key ring	/
1-5	Black rubber button	/
1-6	Battery	CR2032

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4. Test Methods:

A: Screening by X-ray Fluorescence Spectrometry (XRF) :With reference to IEC 62321-3-1:2013 Ed 1.0 Screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry

B: Chemical test:

Test Item	**Test Method**	**Measuring Instrument**	**MDL**
Cadmium (Cd)	IEC 62321-5:2013 Ed 1.0 Section 7	ICP-OES	2 mg/kg
Lead (Pb)	IEC 62321-5:2013 Ed 1.0 Section 7	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321-4:2013 Ed 1.0 Section 7	ICP-OES	2 mg/kg
Non-metal Hexavalent Chromium (Cr^{6+})	IEC 62321-7-2:2017 Ed 1.0	UV-Vis	1 mg/kg
Metal Hexavalent Chromium (Cr^{6+})	IEC 62321-7-1:2015 Ed 1.0	UV-Vis	/
PBBs/PBDEs	IEC 62321-6:2015 Ed 1.0	GC-MS	5 mg/kg

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Test Results:

A、EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
1	Black aluminum shell	BL	BL	BL	BL	-
2	Metal ring(Suspend)	BL	BL	BL	BL	-
3	Metal chain(Suspend)	BL	BL	BL	BL	-
4	Metal key ring(Suspend)	BL	BL	BL	BL	-
5	Black rubber button	BL	BL	BL	BL	BL
6	Transparent battery cover	BL	BL	BL	BL	BL
7	Sheet metal	BL	BL	BL	BL	-
8	Spring	BL	BL	BL	BL	-
9	Metal circlip	BL	BL	BL	BL	-
10	White plastic seat	BL	BL	BL	BL	BL
11	Reflective bowl	BL	BL	BL	BL	X*
12	Tin solder	BL	BL	BL	BL	-
13	PCB board	BL	BL	BL	BL	X*
14	Spring	BL	BL	BL	BL	-
15	LED lamp	BL	BL	BL	BL	X*
Difference						
16	Green aluminum shell	BL	BL	BL	BL	-
17	Red aluminum shell	BL	BL	BL	BL	-
18	Orange aluminum shell	BL	BL	BL	BL	-
19	Blue aluminum shell	BL	BL	BL	BL	-
20	Yellow aluminum shell	BL	BL	BL	BL	-
21	Silver aluminum shell	BL	BL	BL	BL	-

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Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	BL≤70-3σ<X <130+3σ≤OL	BL≤70-3σ<X <130+3σ≤OL	BL≤50-3σ<X <150+3σ≤OL
Pb	mg/kg	BL≤700-3σ<X <1300+3σ≤OL	BL≤700-3σ<X <1300+3σ≤OL	BL≤500-3σ<X <1500+3σ≤OL
Hg	mg/kg	BL≤700-3σ<X <1300+3σ≤OL	BL≤700-3σ<X <1300+3σ≤OL	BL≤500-3σ<X <1500+3σ≤OL
Cr	mg/kg	BL≤700-3σ<X	BL≤700-3σ<X	BL≤500-3σ<X
Br	mg/kg	BL≤300-3σ<X	-	BL≤250-3σ<X

Note: BL= Below Limit
OL= Over limited
X= Inconclusive
"-"= Not regulated
*= Scanning by XRF and detected by chemical method. The test results of chemical method please refer to next pages.

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Remark:

i Results were obtained by XRF for primary scanning, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(Ⅵ)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the above warning value according to IEC 62321-3-1:2013 Ed 1.0.

ii The XRF scanning test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

iii The maximum permissible limit is quoted from the document 2005/618/EC amending RoHS directive 2011/65/EU:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(Ⅵ))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000

Disclaimers:

This XRF Scanning report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF scanning report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

Test result on specimen No.12 was resubmitted sample on Jun.27, 2017.

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B、The Test Results of Chemical Method:

1）The Test Results of PBBs & PBDEs

Unit:mg/kg

Item(s)	MDL	Result(s)			Limit
		11	13	15	
Polybrominated Biphenyls (PBBs)					
Monobromobiphenyl	5	N.D.	N.D.	N.D.	Total PBBs Content <1000
Dibromobiphenyl	5	N.D.	N.D.	N.D.	
Tribromobiphenyl	5	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	5	N.D.	N.D.	N.D.	
Pentabromobiphenyl	5	N.D.	N.D.	N.D.	
Hexabromobiphenyl	5	N.D.	N.D.	N.D.	
Heptabromobiphenyl	5	N.D.	N.D.	N.D.	
Octabromobiphenyl	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl	5	N.D.	N.D.	N.D.	
Decabromodiphenyl	5	N.D.	N.D.	N.D.	
Total content	/	N.D.	N.D.	N.D.	
Polybrominated Diphenylethers (PBDEs)					
Monobromodiphenyl ether	5	N.D.	N.D.	N.D.	Total PBDEs Content <1000
Dibromodiphenyl ether	5	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	5	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	5	314	N.D.	N.D.	
Total content	/	314	N.D.	N.D.	
Conclusion	/	**Pass**	**Pass**	**Pass**	/

Note: N.D. = Not Detected or less than MDL
MDL = Method Detection Limit

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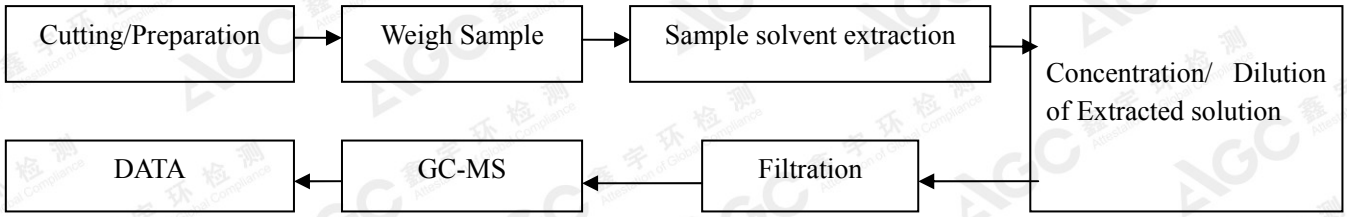
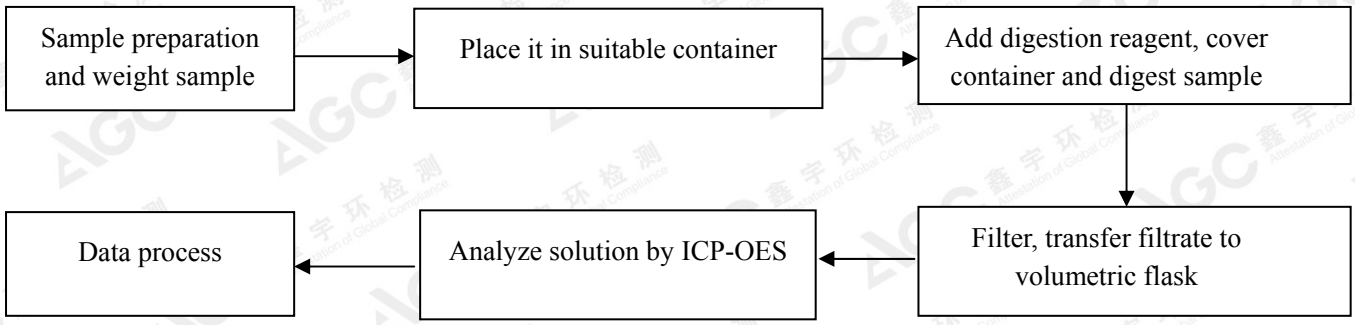
Test Flow Chart

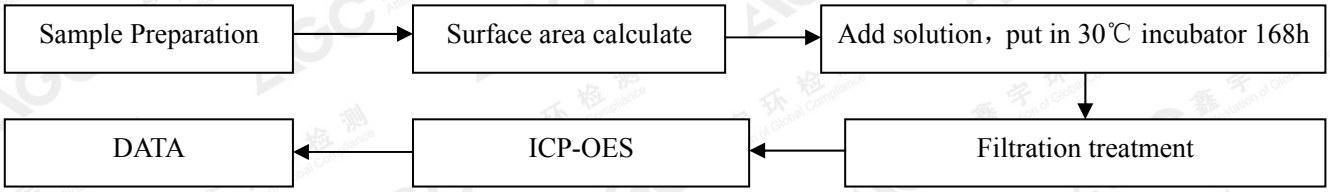
1.For PAHs



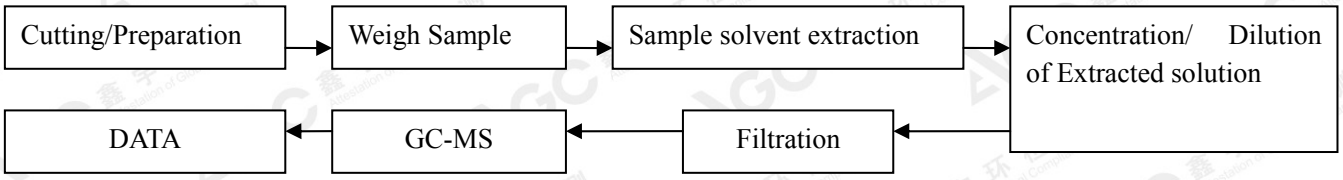
2.For Pb, Cd, Hg(Battery)



3. For Ni release



4.For PBBs & PBDEs



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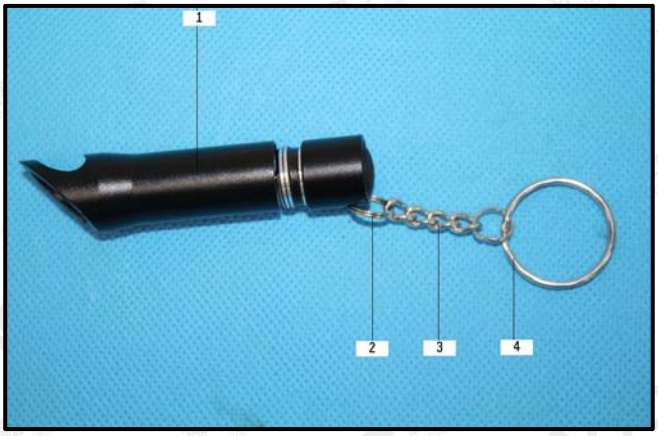
The photo of the sample



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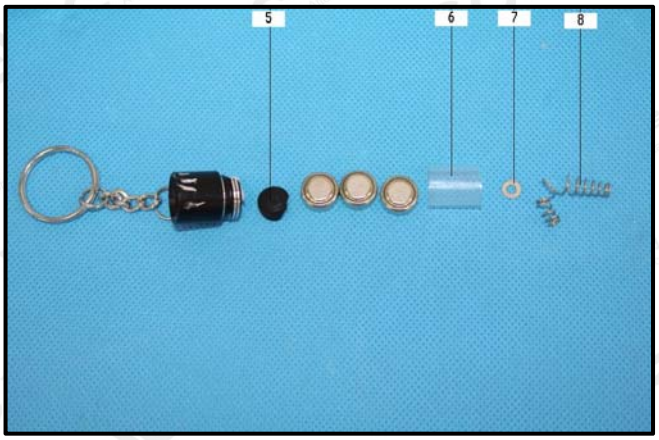

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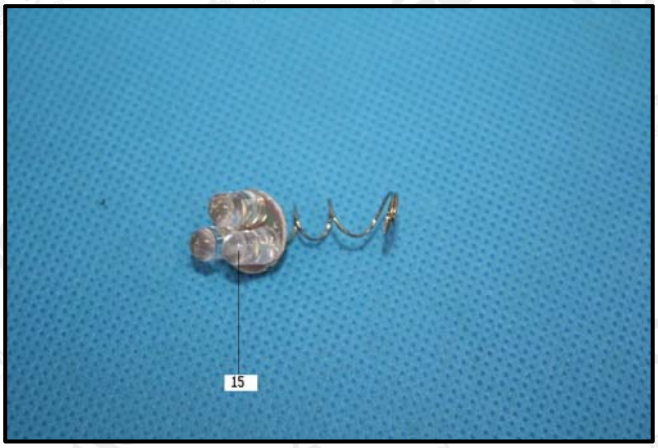

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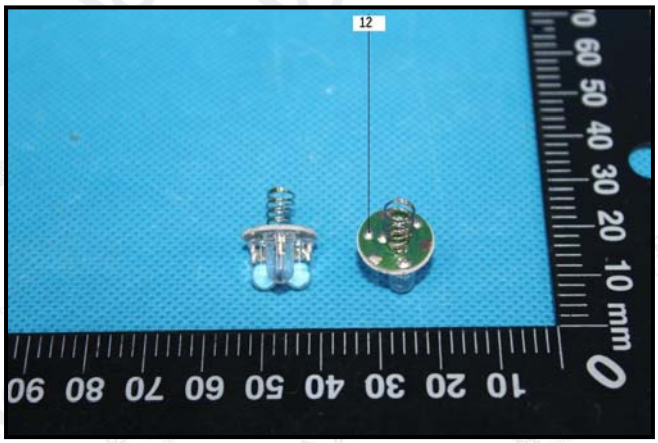

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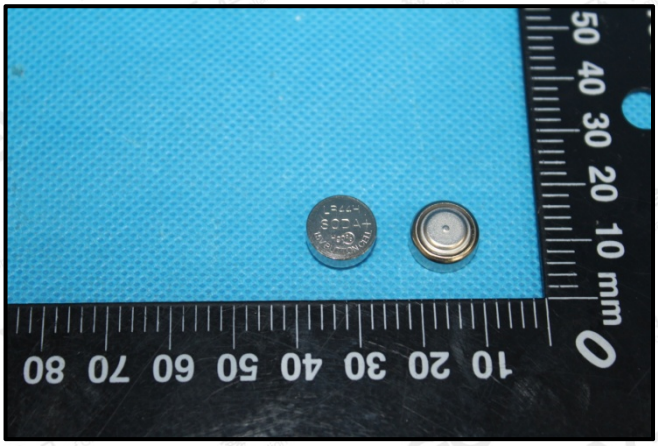

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AGC authenticate the photo only on original report

*** End of Report ***