TEST REPORT

REPORT No.: R2DG2002102418E Date: February 25, 2020

BAREBONES SYSTEMS, LLC.
1215 East Wilmington Avenue-Ste. 140 Salt Lake City, UT 84106

Report on the submitted samples said to be:

Sample Name	:	VINTAGE FLASHLIGHT
Style/Item No.	:	LIV-257
Country of Origin	:	China
Sample Receiving Date	:	February 10, 2020
Testing Period	:	From February 10, 2020 to February 25, 2020
Results	:	Please refer to next page(s).

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Summary of Test Results:

TEST REQUEST		CONCLUSION
A	RoHS Directive 2011/65/EU and its amendment directives	
	XRF screening test and Wet Chemical Testing (Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs & PBDEs content)	**Pass**
	Phthalates(DBP、BBP、DEHP、DIBP)content	**Pass**

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Signed for and on behalf of BACL

Checked by: _____ Farhan Yang

Approved by: _____ Bensen Huang

Results:

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

XRF screening test

Test method: With reference to IEC62321-3-1:2013 screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
1	Transparent plastic(lamp cover)	BL	BL	BL	BL	BL
2	Black soft plastic(switch button)	BL	BL	BL	BL	BL
3	Black soft plastic(gasket)	BL	BL	BL	BL	BL
4	Black plastic(battery bunker)	BL	BL	BL	BL	BL
5	Black plastic(hook holder)	BL	BL	BL	BL	BL
6*	Silvery metal(hook)	BL	BL	BL	IN	---
7	Pewter plated silvery metal(lid of battery bunker)	BL	BL	BL	BL	---
8	Silvery metal with black coating(logo)	BL	BL	BL	BL	---
9	Penny metal(stud of logo)	BL	BL	BL	BL	---
10	Silvery metal without coating(handle)	BL	BL	BL	BL	---
11	Pewter plated silvery metal(head of lamp)	BL	BL	BL	BL	---
12	Pewter plated silvery metal(base of protector)	BL	BL	BL	BL	---
13	Penny metal(ring of protector)	BL	BL	BL	BL	---
14	Penny metal(holder of ring)	BL	BL	BL	BL	---
15	Grey coating(handle)	BL	BL	BL	BL	BL
16	Transparent plastic(pilot lamp cover)	BL	BL	BL	BL	BL
17	Silvery metal(inner shell of lamp)	BL	BL	BL	BL	---
18	Silvery metal(bezel of lamp)	BL	BL	BL	BL	---
19*	Silvery metal(separation blade of lamp)	BL	BL	BL	IN	---
20*	Black plastic(gasket, lamp)	BL	BL	BL	BL	IN
21	White plastic(ring, lamp)	BL	BL	BL	BL	BL
22	Black soft plastic(wire jacket, lamp)	BL	BL	BL	BL	BL
23	Red soft plastic(wire jacket, lamp)	BL	BL	BL	BL	BL

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
24	Silvery metal(conductor, wire, lamp)	BL	BL	BL	BL	---
25	Silvery metal with white coating(lamp board)	BL	BL	BL	BL	---
26	Silvery solder(lamp board)	BL	BL	BL	BL	---
27	Yellow body(LED, lamp board)	BL	BL	BL	BL	BL
28	White material(Conductive mud, lamp board)	BL	BL	BL	BL	BL
29	Black soft plastic(searing, flashlight)	BL	BL	BL	BL	BL
30	Black plastic(base of switch button, flashlight)	BL	BL	BL	BL	BL
31	Black plastic(shell of PCB, flashlight)	BL	BL	BL	BL	BL
32	Transparent plastic(shell of contact point, flashlight)	BL	BL	BL	BL	BL
33*[1]	Golden metal(contact point, flashlight)	OL	BL	BL	BL	---
34	Golden metal(spring of contact point, flashlight)	BL	BL	BL	BL	---
35*[1]	Golden metal(base of contact point, flashlight)	OL	BL	BL	BL	---
36*	Green PCB(PCB“89700A c V10” ,flashlight)	BL	BL	BL	BL	IN
37	Silvery solder(PCB“89700A c V10” ,flashlight)	BL	BL	BL	BL	---
38*	Green PCB(PCB“89700A b V10” ,flashlight)	BL	BL	BL	BL	IN
39	Silvery solder(PCB“89700A b V10” ,flashlight)	BL	BL	BL	BL	---
40*	Silvery metal(shell of socket ,PCB“89700A b V10” ,flashlight)	BL	BL	BL	IN	---
41	Silvery metal(pin of socket ,PCB“89700A b V10” ,flashlight)	BL	BL	BL	BL	---
42	Black plastic(pin holder ,PCB“89700A b V10” ,flashlight)	BL	BL	BL	BL	BL
43*	Green PCB(PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	IN
44	Silvery solder(PCB“89700A a V10” ,flashlight)	BL	BL	BL	BL	---
45	Black soft plastic(base,capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
46	Black soft Rubber(base,capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
47	Silvery metal(shell, capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
48	Silvery metal(foil, capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
49	Dull silvery metal(foil, capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
50	Brown paper with liquid(film,capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
51	transparent adhesive plastic(tape,capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
52	Silvery metal(connector, capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
53	Silvery metal(pin, capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
54*	Silvery metal(shell, switch,PCB“89700A aV10” ,flashlight)	BL	BL	BL	IN	---
55*	Golden metal(button,switch,PCB“89700A aV10” ,flashlight)	BL	BL	BL	IN	---
56	silvery metal(foil,switch,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
57	Black plastic(base, switch,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
58	silvery metal(connector,switch,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	---
59	yellow transparent plastic(film,switch,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
60	Black body(IC,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
61	Black body(diode,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
62	Black body with black coating(resistor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
63	Brown body(capacitor,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL
64	Transparent body(diode,PCB“89700A aV10” ,flashlight)	BL	BL	BL	BL	BL

TEST REPORT

Remark:
(1)

--- = Not Conducted

* = Results were obtained by XRF for primary screening, 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 below warning value according to IEC62321-3-1:2013.

Element	Unit	Polymers	Metal	Composite Material
Cd	mg/kg	BL≤70-3σ< X <130+3σ≤OL	BL≤70-3σ< X <130+3σ≤OL	LOD < 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

BL = Below Limit
OL = Over Limit
IN = Inconclusive
LOD = Limit of Detection

*[1] = As claimed by the material declaration submitted by the client, the materials of the sample No. 33 35 are copper alloy. And according to RoHS directive2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.

(2) 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) The maximum permissible limit is quoted from 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
Polybrominate ddiphenylethers (PBDEs)	1000

(4) As requested by applicant, only components shown in this report were screened by XRF spectroscopy for 2011/65/EU and its amendment directives, other components were not screened included in this report.

(5) Photo appendix is included.

Disclaimers:

This XRF Screening 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 screening 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.

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Wet Chemical Testing：

Test method:

Lead Content:
With reference to IEC62321-5:2013, by acid digestion and analysis was performed by Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES) or Atomic Absorption Spectrometry (AAS).

Hexavalent Chromium Content (For metal material):
With reference to IEC 62321-7-1:2015, by boiling-water-extraction and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:
With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Pb

Item	Unit	MDL	Results	
			33	35
Lead (Pb) Content	mg/kg	10	15880	16280

2) The test results of Cr (Ⅵ)

Item	Unit	MDL	Results					Limit
			6	19	40	54	55	
Hexavalent Chromium (Cr(Ⅵ))	μg/cm^2	0.10	N.D.	N.D.	N.D.	N.D.	N.D.	**
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**/**

Note:

- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- mg/kg = ppm
- ** =

  a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13μg/cm^2. The sample coating is considered to contain CrVI
  b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10μg/cm^2). The coating is considered a non-CrVI based coating
  c. The result between 0.10μg/cm^2 and 0.13μg/cm^2 is considered to be inconclusive -unavoidable coating variations may influence the determination

  For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

3) The test results of PBBs & PBDEs

Item	Unit	MDL	Results				Limit
			20	36	38	43	
Polybrominated Biphenyls							
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	N.D.	1000
Polybrominated Diphenylethers							
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	N.D.	1000
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	**Pass**	**/**

Note:

- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- The results less than MDL are not taken into account while calculating the sum contents.
- mg/kg = ppm
- Photo is included.

TEST REPORT

Phthalates(DBP、BBP、DEHP、DIBP)content

Test method: With reference to IEC 62321-8:2017, by gas chromatographic-mass spectrometer (GC-MS)

Item	Unit	MDL	Results			Limit
			1+4+5	2+3	15	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	0.005	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	/

Item	Unit	MDL	Results			Limit
			16+27+28	20+31+32	22+23	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	/

Item	Unit	MDL	Results			Limit
			29+30+31	36+38+42	43+45+46	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	/

TEST REPORT

Item	Unit	MDL	Results			Limit
			50+51+57	59+60+61	62+63+64	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	/

Note:

- The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- mg/kg = ppm
- "+"= Mixed, The admixture of specimen is tested as a whole(part) which according to the applicant's request, the result of report as average value because of the whole specimen is regarded as constituting from the homogeneous material. If the testing of specimen may have the obvious difference, and the result may exceed the number in this report. The applicant will undertake all differences and risk.
- Photo is included.

TEST REPORT

Photograph of Sample

BACL authenticate the photo on original report only

Directions:

1. This report cannot be reproduced except in full, without prior written approval of the Company.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
3. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
5. The information which provided by the applicant, such as sample description, sample name ,material component, style/item No. , P.O. No. , manufacture, age phase, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
6. The test samples were in good condition before testing.
7. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

*** End of Report ***