Verification Report

Applicant	:	**Pine Store Sdn Bhd**
Address	:	**18-2-15, Gembira Parade, Lorong Delima 1, Island Glades, 11700 Penang, Malaysia.**

Report on the submitted samples said to be:

Sample Name(s)	:	**PINECIL**
Trade Mark	:	PINE64
Part No.	:	**PINECIL, PINECIL-V2**
Sample Received Date	:	**July 08, 2022**
Testing Period	:	**July 08, 2022 ~ July 15, 2022**
Date of Report	:	**July 15, 2022**
Results	:	**Please refer to next page(s).**

TEST REQUEST	CONCLUSION
As specified by client, based on the performed tests on submitted sample, the result of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, Dibutyl Phthalate(DBP), Butylbenzyl Phthalate(BBP), Di-2-ethylhexyl Phthalate(DEHP) and Diisobutyl phthalate(DIBP) content comply with the limits set by RoHS Directive 2011/65/EU with amendment (EU) 2015/863.	**PASS**

Signed for and on behalf of LCS

LCS TESTING LABORATORY APPROVED

Young/Laboratory Manager

Results:

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

Test method: With reference to IEC 62321-1:2013&IEC 62321-2:2021&IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Sample No.	Sample Description	Results						Date of sample submission/ Resubmission
		Cd	Pb	Hg	Cr▼	Br▼		
						PBBs	PBDEs	
1	Silver metal stand	BL	BL	BL	BL	/	/	2022-07-08
2	Silver metal steel ring	BL	BL	BL	BL	/	/	2022-07-08
3	Beige plastic skin	BL	BL	BL	BL	BL	BL	2022-07-08
4	Black plastic housing	BL	BL	BL	BL	BL	BL	2022-07-08
5	Silver metal casing	BL	BL	BL	BL	/	/	2022-07-08
6	Black plastic housing	BL	BL	BL	BL	BL	BL	2022-07-08
7	Green plastic skin	BL	BL	BL	BL	BL	BL	2022-07-08
8	Black plastic open key	BL	BL	BL	BL	BL	BL	2022-07-08
9	Copper-colored metal border	BL	BL	BL	BL	/	/	2022-07-08
10	Silver metal screws	BL	BL	BL	BL	/	/	2022-07-08
11	Silver metal screws	BL	BL	BL	BL	/	/	2022-07-08
12	Blue PCB board	BL	BL	BL	BL	BL	BL	2022-07-08
13	Ferrous metal housing	BL	BL	BL	BL	/	/	2022-07-08
14	Copper wire	BL	BL	BL	BL	/	/	2022-07-08
15	Black plastic transistor	BL	BL	BL	BL	BL	BL	2022-07-08
16	Black body	BL	BL	BL	BL	BL	BL	2022-07-08
17	Silver metal casing	BL	BL	BL	BL	/	/	2022-07-08
18	Black plastic diode	BL	BL	BL	BL	BL	BL	2022-07-08
19	Black body IC	BL	BL	BL	BL	BL	BL	2022-07-08
20	Brown plastic diode	BL	BL	BL	BL	BL	BL	2022-07-08
21	Silver metal pins	BL	BL	BL	BL	/	/	2022-07-08
22	Beige plastic foam	BL	BL	BL	BL	BL	BL	2022-07-08
23	Copper-colored metal flakes	BL	BL	BL	BL	/	/	2022-07-08
24	Silver metal flakes	BL	BL	BL	BL	/	/	2022-07-08
25	Black plastic border	BL	BL	BL	BL	BL	BL	2022-07-08
26	Beige plastic stoppers	BL	BL	BL	BL	BL	BL	2022-07-08
27	Beige plastic grooves	BL	BL	BL	BL	BL	BL	2022-07-08
28	Black plastic sticker	BL	BL	BL	BL	BL	BL	2022-07-08

Sample No.	Sample Description	Results						Date of sample submission/ Resubmission
		Cd	Pb	Hg	Cr▼	Br▼		
						PBBs	PBDEs	
29	Transparent plastic skin	BL	BL	BL	BL	BL	BL	2022-07-08
30	Gray plastic sticker	BL	BL	BL	BL	BL	BL	2022-07-08
31	Silver metal groove	BL	BL	BL	BL	/	/	2022-07-08
32	Silver metallic skin	BL	BL	BL	BL	/	/	2022-07-08
33	Silver metal pins	BL	BL	BL	BL	/	/	2022-07-08
34	Black plastic groove	BL	BL	BL	BL	BL	BL	2022-07-08

Note:

1. 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 IEC 62321-3-1:2013(Unit: mg/kg).

Element	Polymers	Metals	Composite material
Cd	BL≤(70-3σ)<X<(130+3σ)≤OL	BL≤(70-3σ)<X<(130+3σ)≤OL	LOD<X<(150+3σ)≤OL
Pb	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(500-3σ)<X<(1500+3σ)≤OL
Hg	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(700-3σ)<X<(1300+3σ)≤OL	BL≤(500-3σ)<X<(1500+3σ)≤OL
Cr	BL≤(700-3σ)<X	BL≤(700-3σ)<X	BL≤(500-3σ)<X
Br	BL≤(300-3σ)<X	N/A	BL≤(250-3σ)<X

Remark:

- BL= Below Limit
- OL= Over Limit
- X= The range of needing to do further testing
- 3σ= The reproducibility of analytical instruments
- N/A= Not applicable
- LOD= Detection limit

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 the document RoHS Directive 2011/65/EU with amendment (EU) 2015/863.
4. ▼=For restricted substances PBBs and PBDEs, the results show the total Br content, the restricted substance was Cr(VI), and the results showed the total Cr content.

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
Dibutyl Phthalate(DBP)	1000
Butylbenzyl Phthalate(BBP)	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	1000
Diisobutyl phthalate(DIBP)	1000

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.

B. EU RoHS Directive 2011/65/EU with amendment (EU) 2015/863 on Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, DBP, BBP, DEHP & DIBP content

Test method:

Lead(Pb) & Cadmium(Cd) Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES) or Atomic absorption spectrometer (AAS).

Mercury(Hg) Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES).

Hexavalent Chromium(Cr(VI)) Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, 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).

Phthalates(DBP, BBP, DEHP &DIBP) Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS).

1) The test results of Phthalates(DBP, BBP, DEHP &DIBP)

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		34	
Dibutyl Phthalate(DBP) Content	100	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	100	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	100	N.D.	1000
Diisobutyl phthalate(DIBP) Content	100	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		3+4+6+7+8+12	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		15+16+18+19+20+22	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

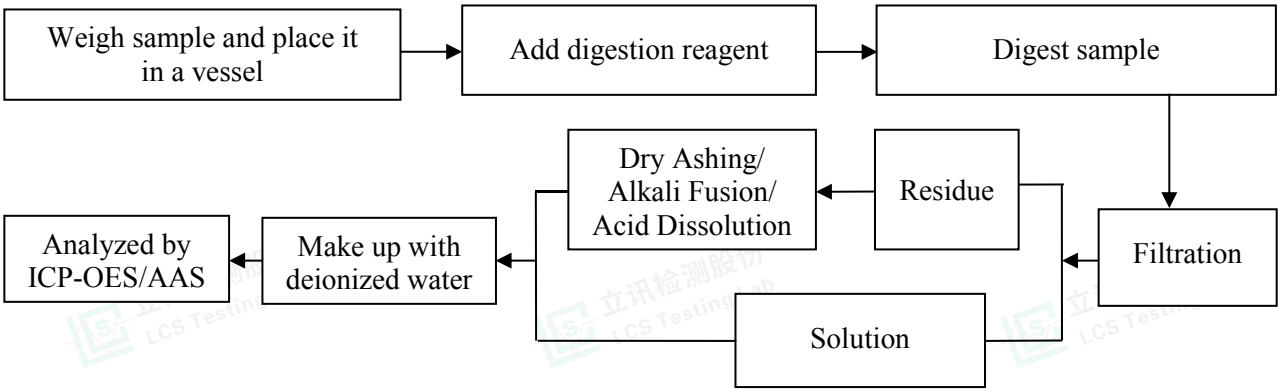
Tested Items	MDL (mg/kg)	Results (mg/kg)	Limit (mg/kg)
		25+26+27+28+29+30	
Dibutyl Phthalate(DBP) Content	600	N.D.	1000
Butylbenzyl Phthalate(BBP) Content	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP) Content	600	N.D.	1000
Diisobutyl phthalate(DIBP) Content	600	N.D.	1000

Note:

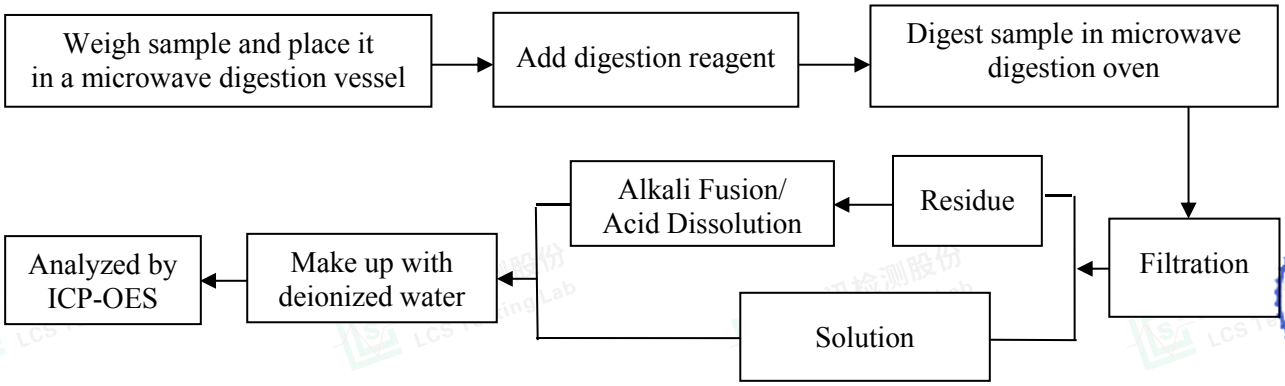
- MDL = Method Detection Limit
- N.D. = Not Detected (<MDL)
- mg/kg = milligrams per kilogram
- According to customer's requirement, only the appointed materials have been tested.

Test Process

1. Lead(Pb) & Cadmium(Cd): IEC 62321-5:2013

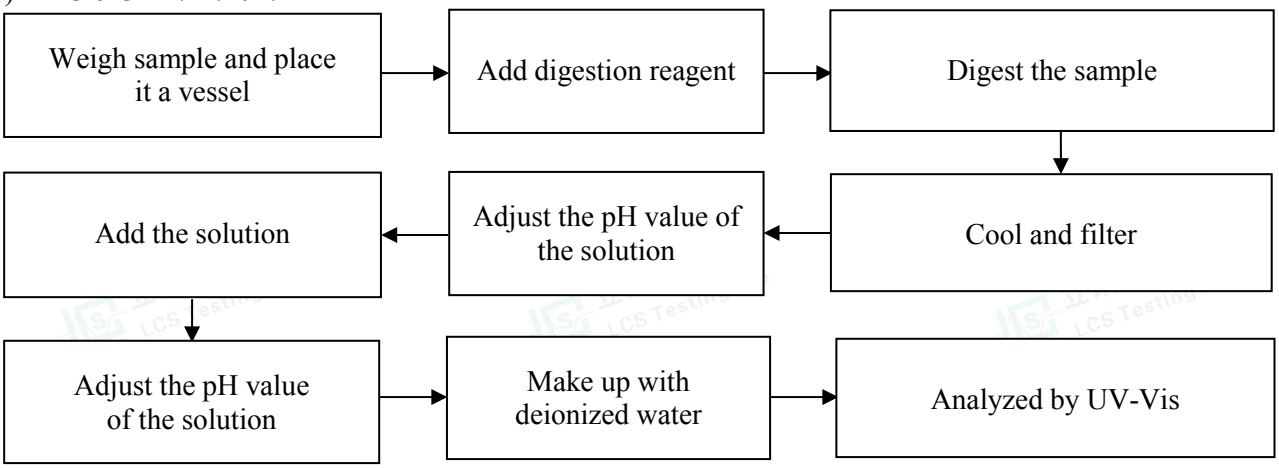


2. Mercury(Hg): IEC 62321-4:2013+AMD1:2017 CSV

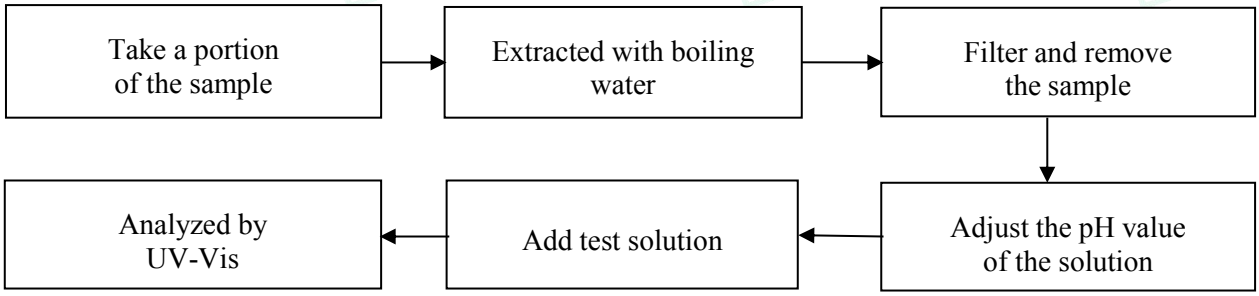


3. Hexavalent Chromium(Cr(VI))

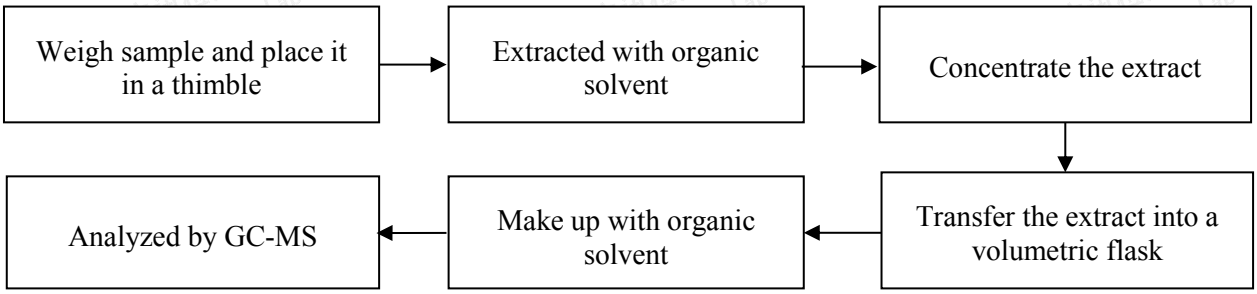
1) IEC 62321-7-2:2017



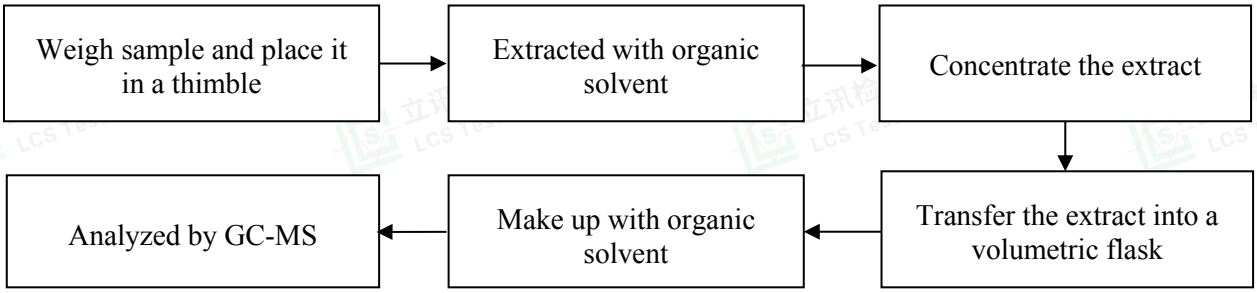
2) IEC 62321-7-1:2015



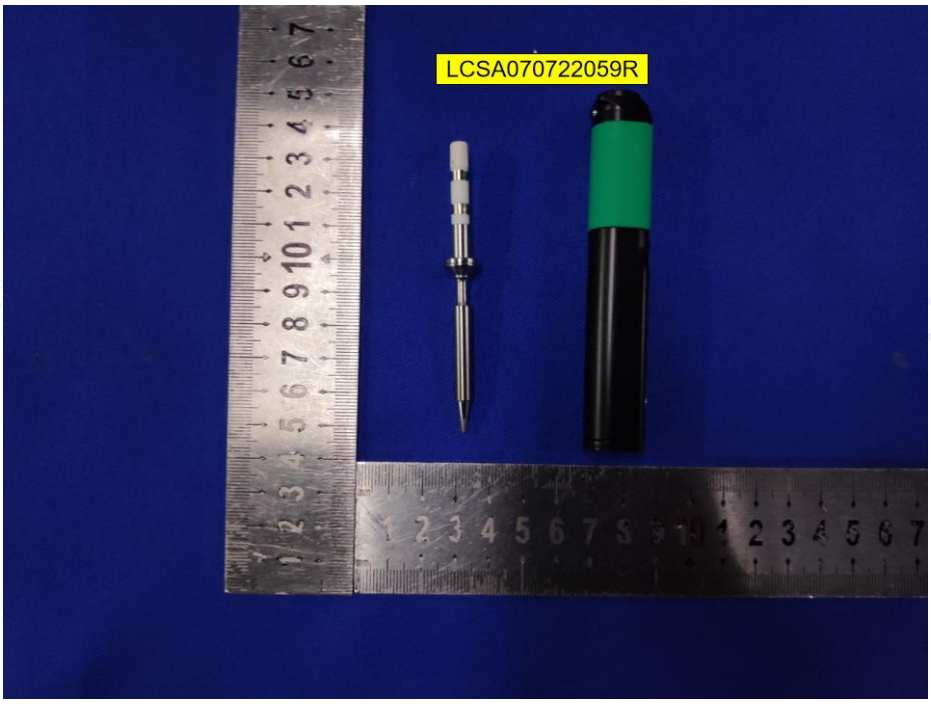
4. Polybrominated Biphenyls(PBBs) & Polybrominated Diphenyl Ethers(PBDEs) : IEC 62321-6:2015

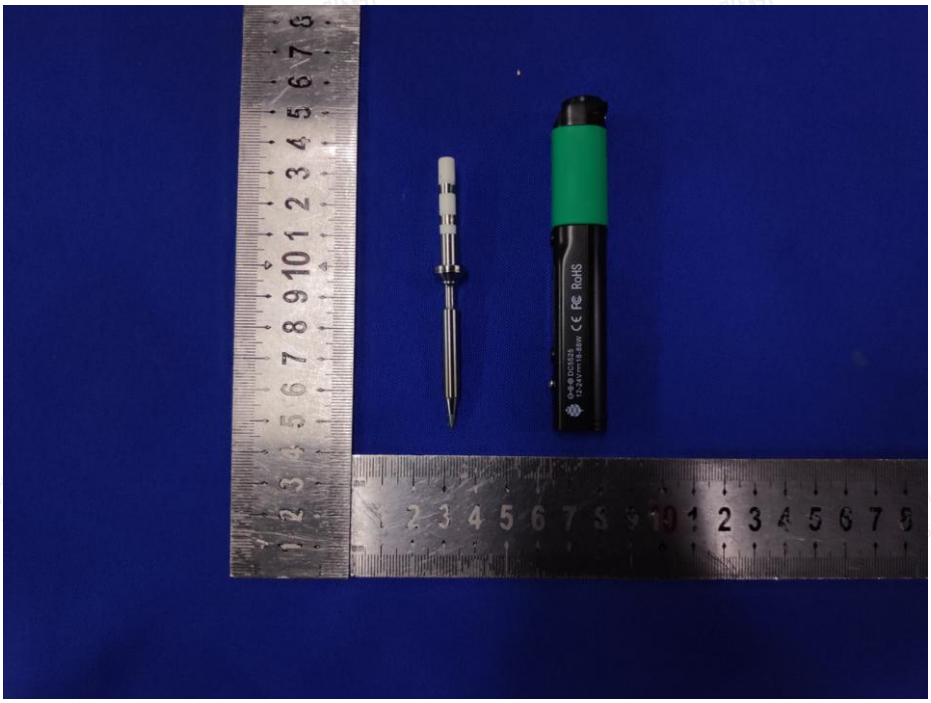


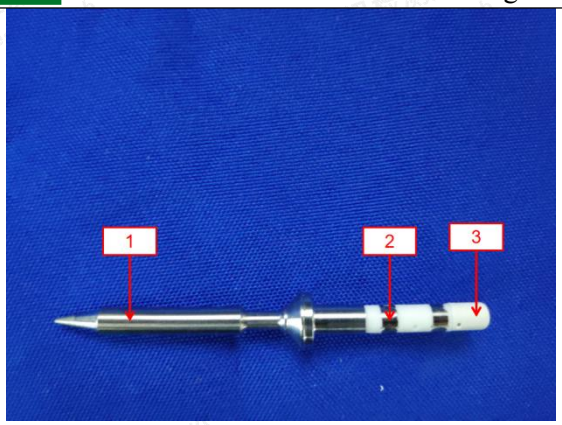
5. Phthalates(DBP, BBP, DEHP & DIBP) : IEC 62321-8:2017



The photo(s) of the sample



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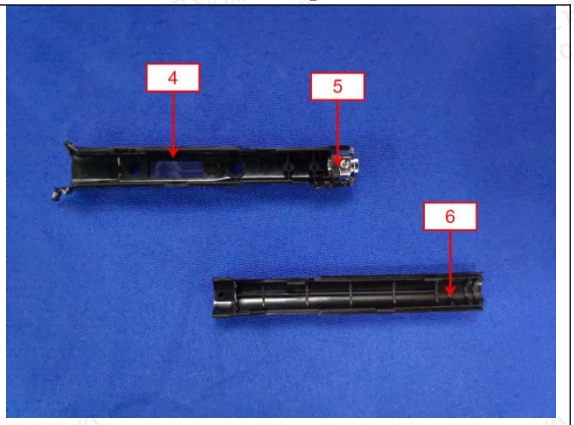
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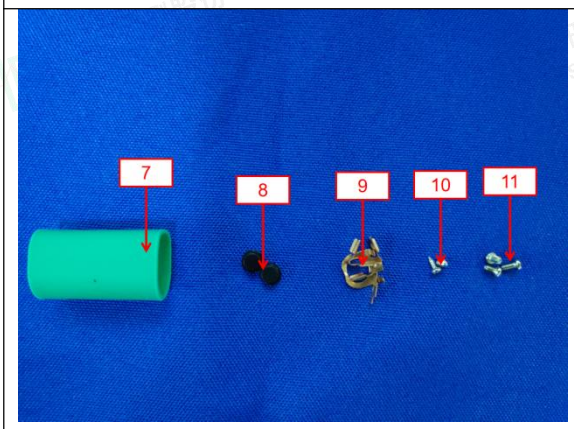
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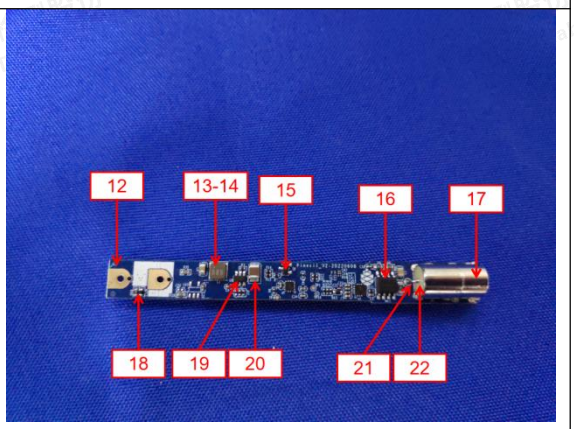
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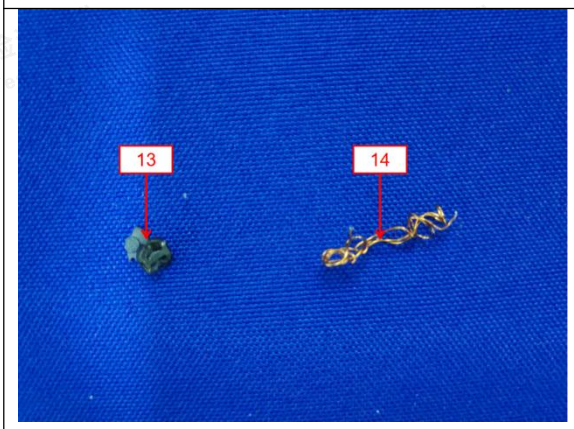
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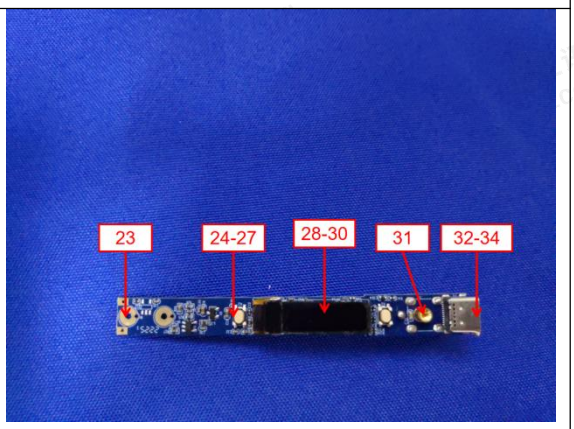
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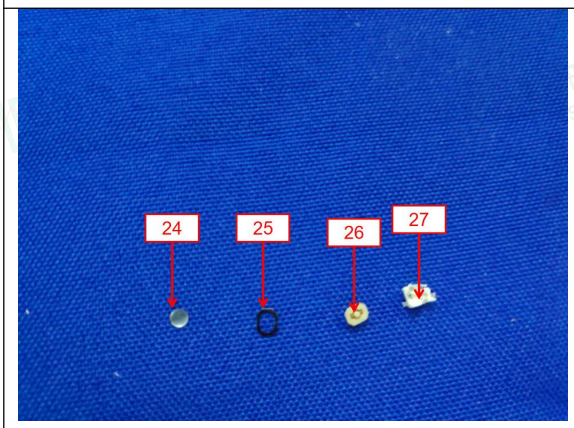
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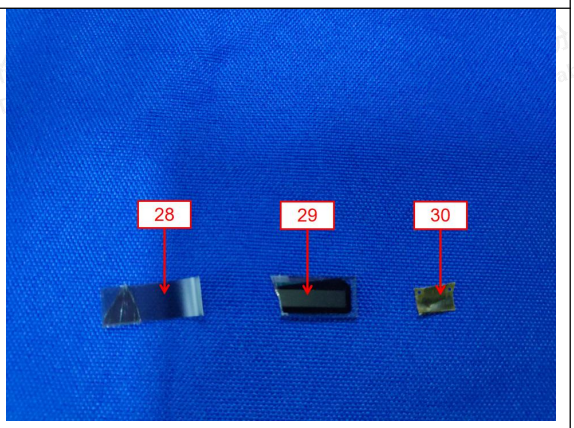
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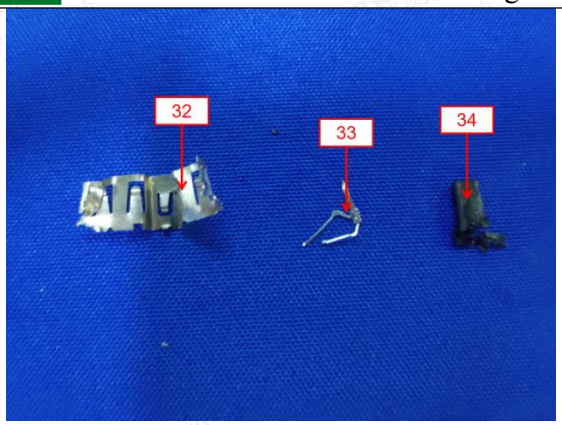	**Blank**

Statement:

1. The test report is invalid without the signature of the approver and the special seal for the company's report;
2. The company name, address and sample information shown on the report were provided by the applicant who should be responsible for the authenticity which are not verified by LCS;
3. The test results in this report are only responsible for the tested samples;
4. Without written approval of LCS, this report can't be reproduced except in full;
5. In case of any discrepancy between the corresponding Chinese and English contents in the test report, the English version shall prevail.

*** End of Report ***