



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No. : WTF19F10071699A1R1C

Applicant : Mid Ocean Brands B.V.

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

Manufacturer : 114746

Sample Name : Polyester lanyard with 3 in 1 cable QA in charge

Model No. : MO9889

Sample Receiving Date : 2019-10-18 & 2019-11-26 & 2019-12-02

Testing Period..... : 2019-10-18 to 2019-11-28 & 2019-12-02 to 2019-12-05

Date of Issue : 2019-12-06

Test Result : Please refer to next page (s)

Note..... : As per client's requirement, the results from No.1 to No.37 were quoted from Report No. WTF19F10071699A1C

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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- Test Requested**..... : In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.
- Test Method**..... :
 - 1) With Reference to IEC 62321-2:2013, disassembly, disjunction 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+AMD1:2017 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 Phthalates content by GC-MS.
- Test Conclusion**..... : **Pass** (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)



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**Test Results:****1. Lead, Mercury, Cadmium, Hexavalent Chromium, PBBs and PBDEs**

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
1	White plastic shell	BL	BL	BL	BL	BL	NA
2	Slivery metal buckle	BL	BL	BL	BL	BL	NA
3	Slivery metal spring	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
4	Black fibrous tape	BL	BL	BL	BL	BL	NA
5	White fibrous tape	BL	BL	BL	BL	BL	NA
6	Slivery metal screw	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
7	White plastic cap	BL	BL	BL	BL	BL	NA
8	White plastic shell	BL	BL	BL	BL	BL	NA
9	White plastic sheet	BL	BL	BL	BL	BL	NA
10	Golden metal pin	BL	BL	BL	BL	BL	NA
11	Slivery metal shell	BL	BL	BL	BL	BL	NA
12	Golden metal cap	BL	BL	BL	BL	BL	NA
13	Golden metal base	BL	BL	BL	BL	BL	NA
14	Golden metal spring	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
15	Solder	BL	IN	BL	BL	BL	Pb :140
16	Slivery metal shell	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
17	Grey plastic shell	BL	BL	BL	BL	BL	NA
18	Slivery metal pin	BL	BL	BL	BL	BL	NA
19	Chip audion	BL	BL	BL	BL	BL	NA
20	Chip IC	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
21	Chip resistor	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND
22	Semi-transparent plastic shell	BL	BL	BL	BL	BL	NA
23	Chip capacitor	BL	BL	BL	BL	BL	NA
24	Blue PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
25	Solder	BL	BL	BL	BL	BL	NA
26	Blue metal wire	BL	BL	BL	BL	BL	NA
27	Solder	BL	BL	BL	BL	BL	NA
28	White plastic sheet	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
29	Green metal wire	BL	BL	BL	BL	BL	NA
30	Golden-silvery metal pin	BL	BL	BL	BL	BL	NA
31	Solder	BL	BL	BL	BL	BL	NA
32	White PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
33	Silvery metal buckle	BL	BL	BL	BL	BL	NA
34	Black plastic shell	BL	BL	BL	BL	BL	NA
35	Black plastic shell	BL	BL	BL	BL	BL	NA
36	Black plastic sheet	BL	BL	BL	BL	BL	NA
37	Black plastic cap	BL	BL	BL	BL	BL	NA
38	Black plastic shell	BL	BL	BL	BL	BL	NA
39	White plastic shell	BL	BL	BL	BL	BL	NA
40	Slivery metal shell of plug	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
41	Slivery metal pin of plug	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
42	Grey plastic core of plug	BL	BL	BL	BL	BL	NA
43	Solder	BL	BL	BL	BL	BL	NA
44	Solder	BL	BL	BL	BL	BL	NA
45	Green PCB of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
46	Solder	BL	BL	BL	BL	BL	NA
47	Solder	BL	BL	BL	BL	BL	NA
48	Grey plastic core of plug	BL	BL	BL	BL	BL	NA
49	Slivery metal shell of plug	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
50	Slivery metal pin of plug	BL	BL	BL	BL	BL	NA
51	Blue PCB of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
52	Chip resistor	BL	BL	BL	BL	BL	NA

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**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 IEC 62321-3-1: 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, μg/cm²= Micrograms per square centimetre.
- (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 or as the XRF screening directly determine that test result was over 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	μg/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 Cr⁶⁺ for polymer and composite sample is 2mg/kg and MDL of Cr⁶⁺ for metal sample is 0.1μg/cm².

- (8) RoHS Requirement

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)

- (9) According to IEC 62321-7-1:2015, determined of Cr⁶⁺ on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.

Boiling water extraction:

Negative = Absence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is less than 0.10ug/cm².

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/cm².

Information on storage conditions and production date of the tested sample is unavailable and thus Cr⁶⁺ results represent status of the sample at the time of testing.

- (10)Abbreviation:

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“Pb” denotes Lead, “Cd” denotes Cadmium, “Hg” denotes Mercury, “Cr” denotes Chromium, “Cr (VI)” denotes Hexavalent Chromium, “Br” denotes Bromine, “PBBs” denotes Total Polybrominated Biphenyls, “PBDEs” denotes Total Polybrominated Diphenyl Ethers.

2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1+8 [△]	<50	<50	<50	<50
T02	4	<50	<50	<50	<50
T03	5	<50	<50	<50	<50
T04	7	<50	<50	<50	<50
T05	9	<50	<50	<50	<50
T06	17	<50	<50	<50	<50
T07	19+20+21+22+24 [△]	<50	<50	<50	<50
T08	22	<50	<50	<50	<50
T09	28	<50	<50	<50	<50
T10	32	<50	<50	<50	<50
T11	34+35+36+37 [△]	58	<50	<50	<50
T12	38	<50	<50	<50	<50
T13	39	<50	<50	<50	<50
T14	42	<50	<50	<50	<50
T15	45+51+52 [△]	<50	<50	<50	<50
T16	48	<50	<50	<50	<50

Note:

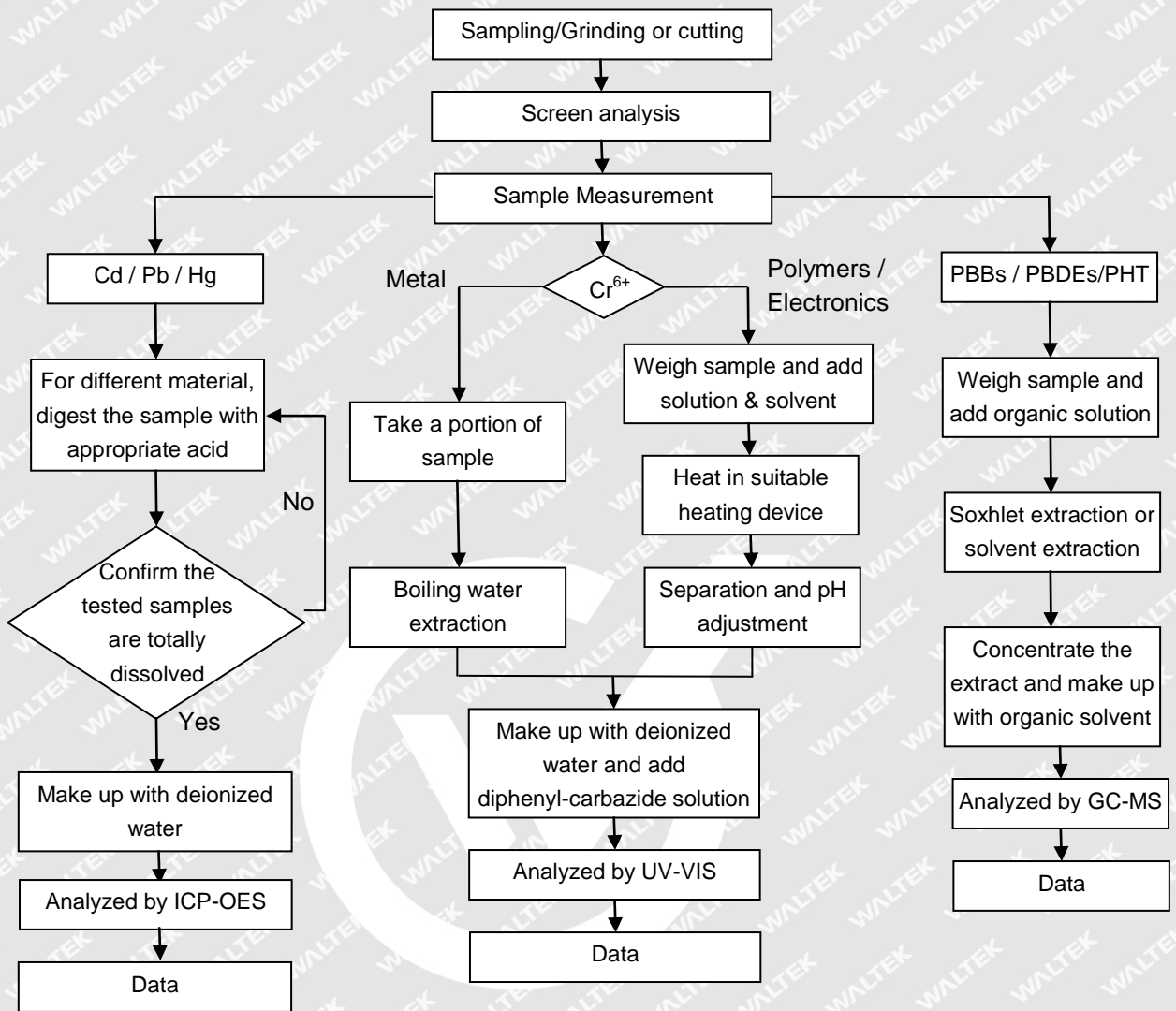
- (1) “<” = less than
- (2) mg/kg = milligram per kilogram= ppm
- (3) Abbreviation:
“DBP” denotes Dibutyl phthalate, “BBP” denotes Benzyl butyl phthalate (BBP), “DEHP” denotes Bis(2-ethylhexyl)-phthalate, “DIBP” denotes Diisobutyl phthalate, “PHT” denotes Phthalates.
- (4) RoHS requirement

Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

- (5) “△”= As client’s requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

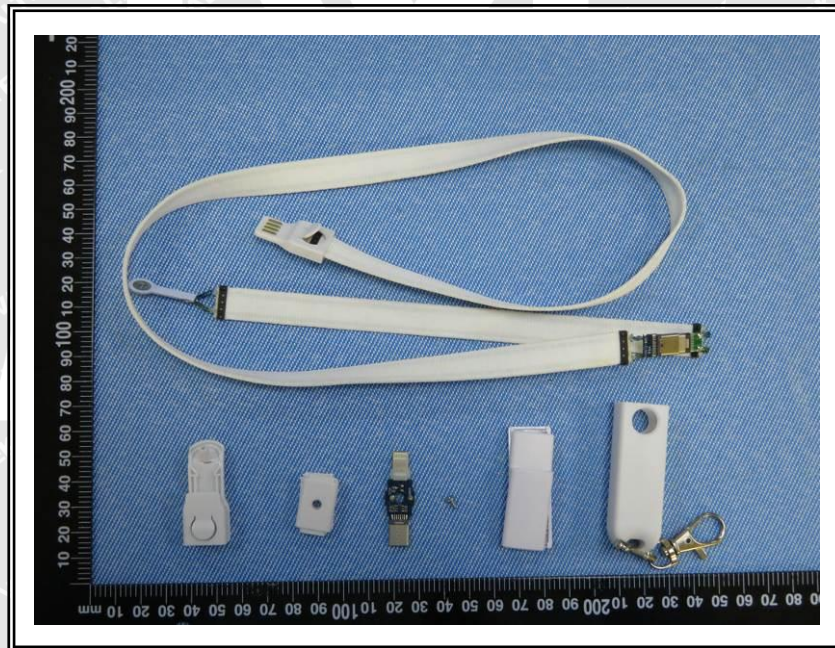


Measurement Flowchart:





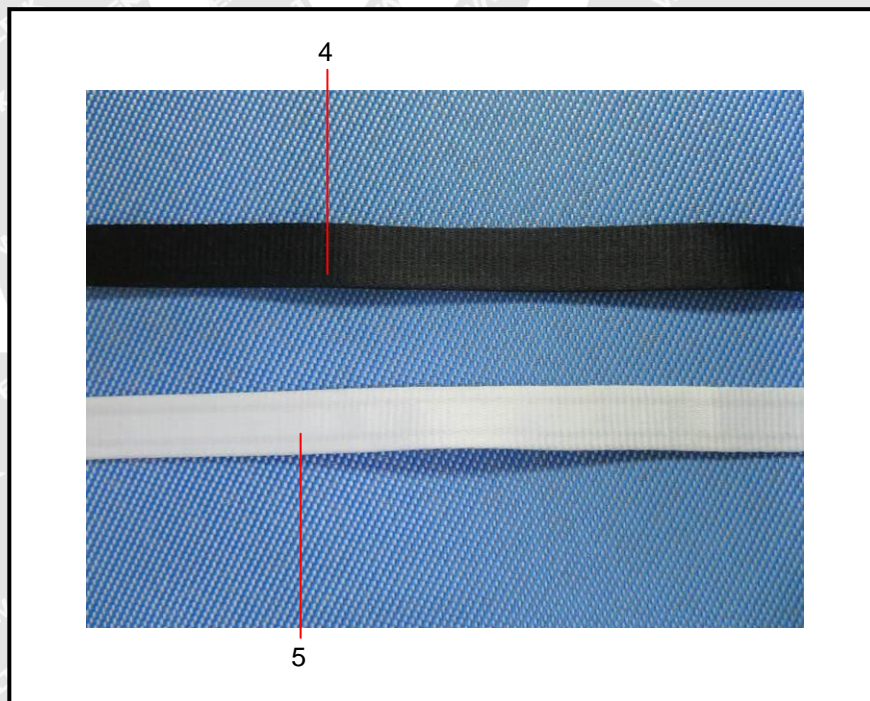
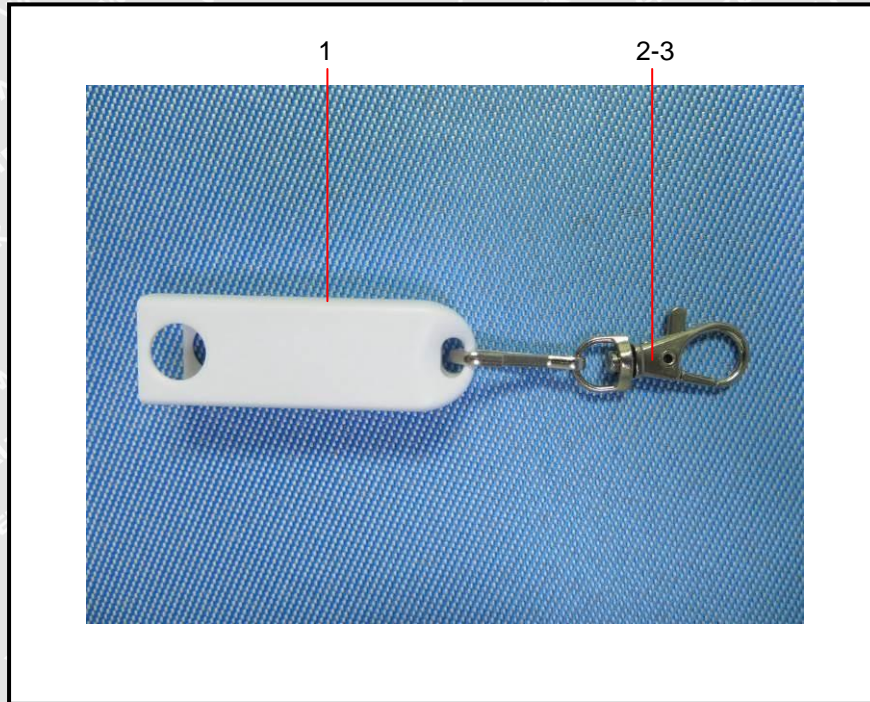
Sample Photo(s):

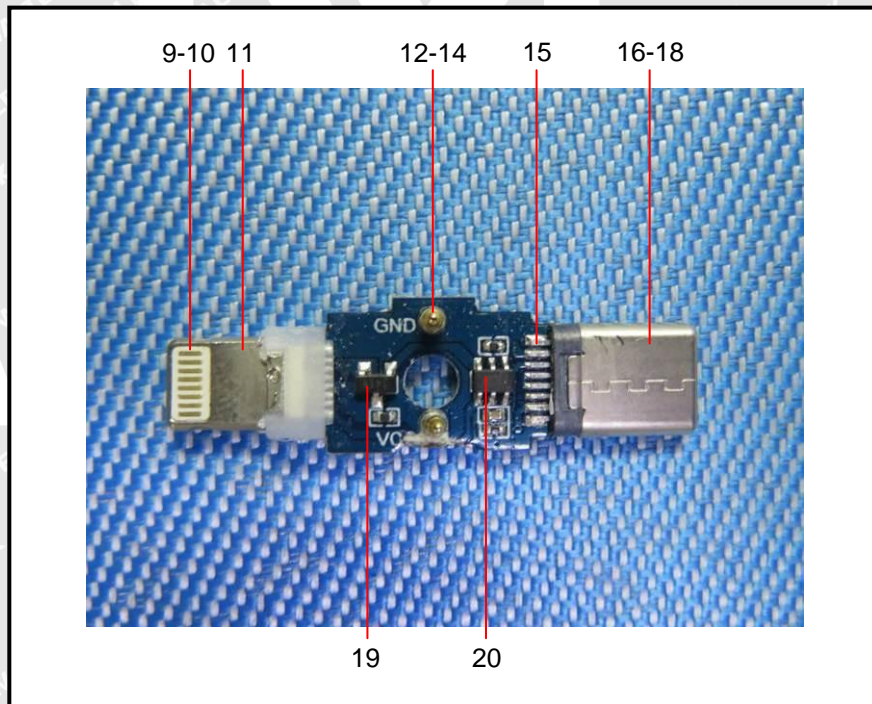
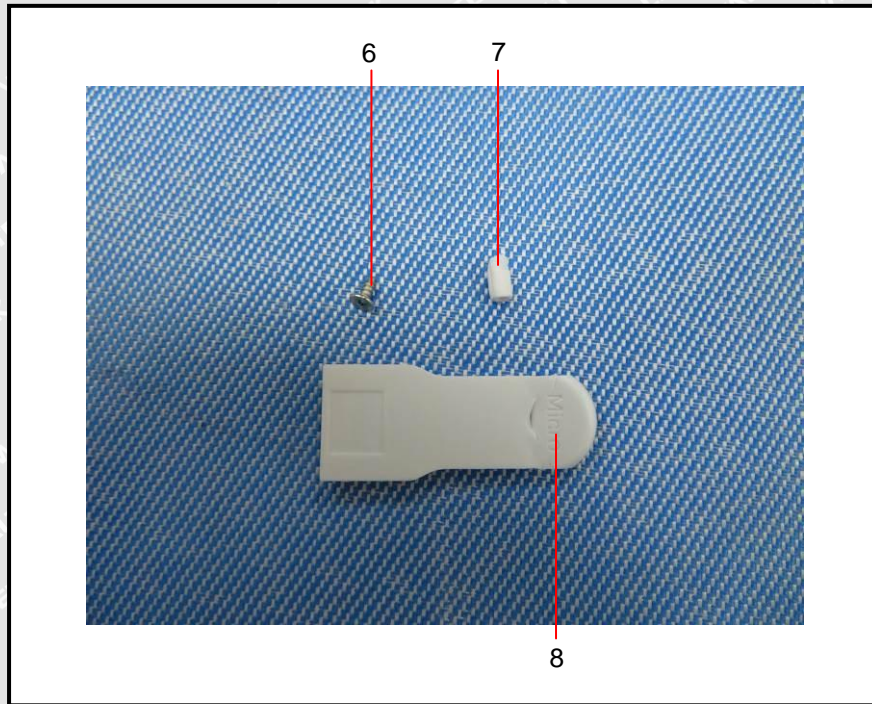


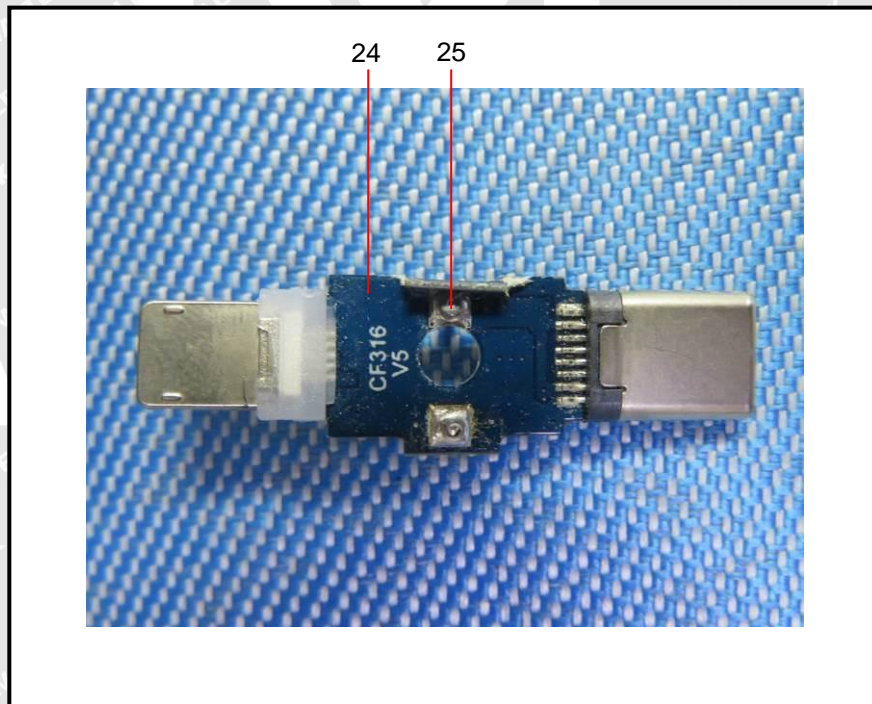
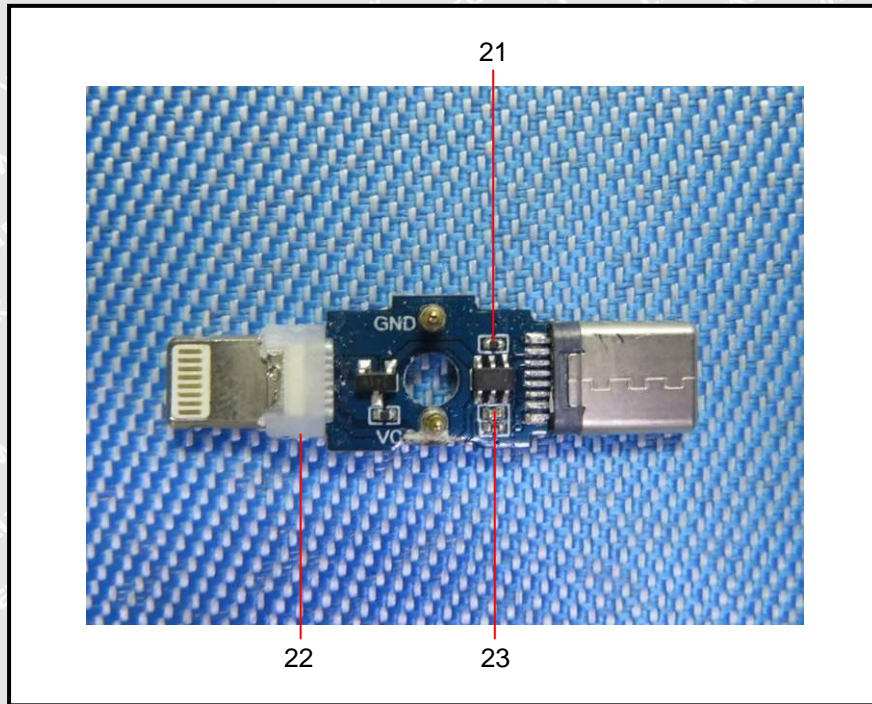


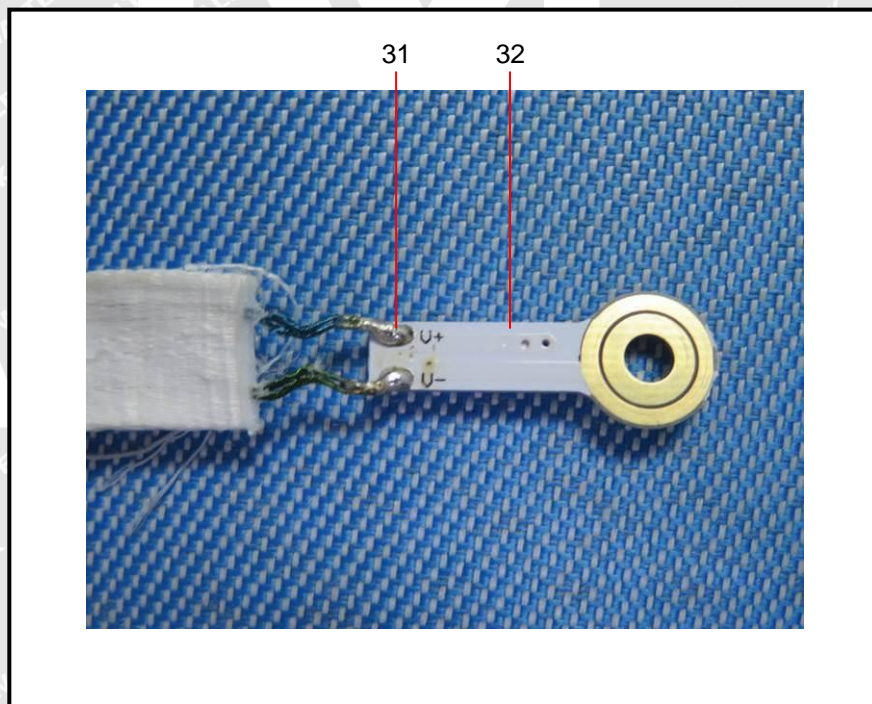
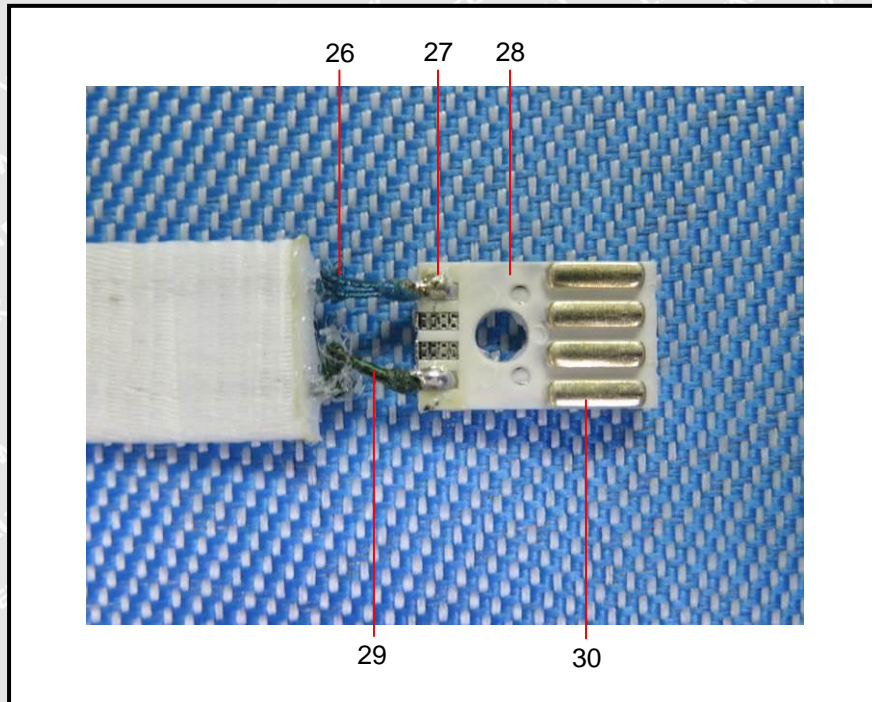


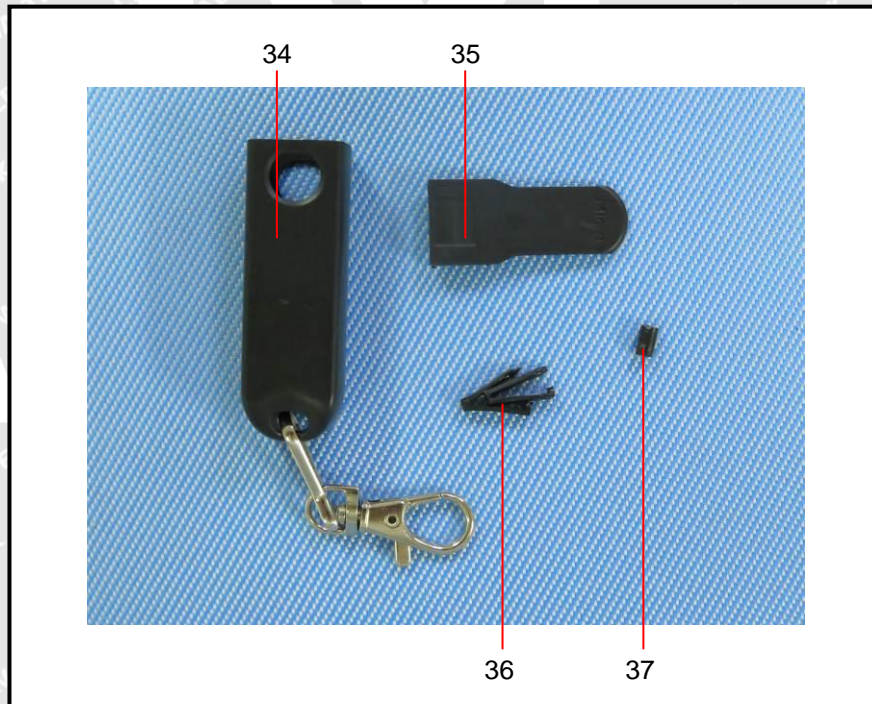
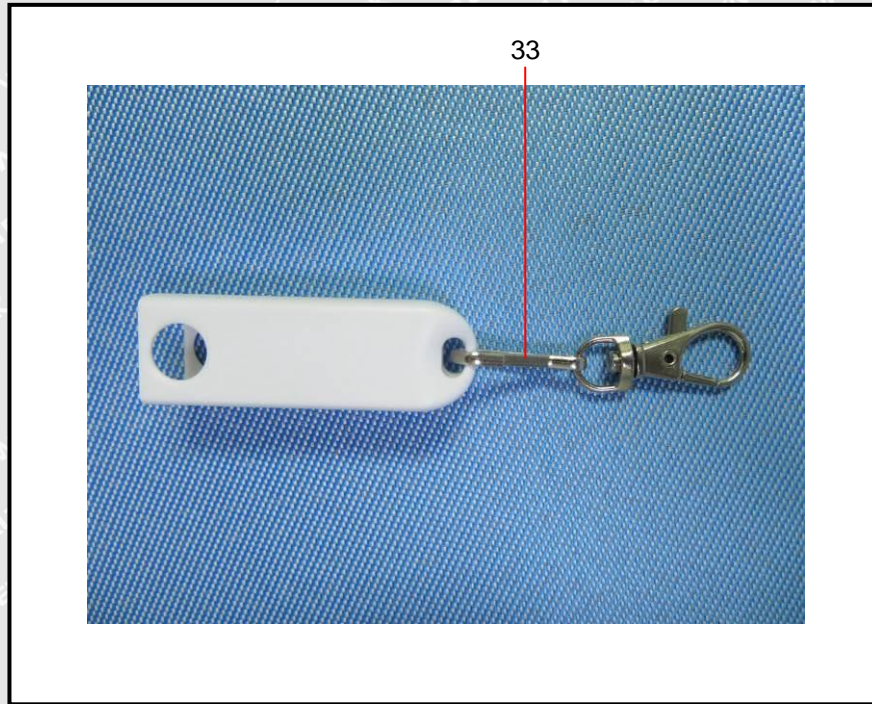
Photograph(s) of parts tested:

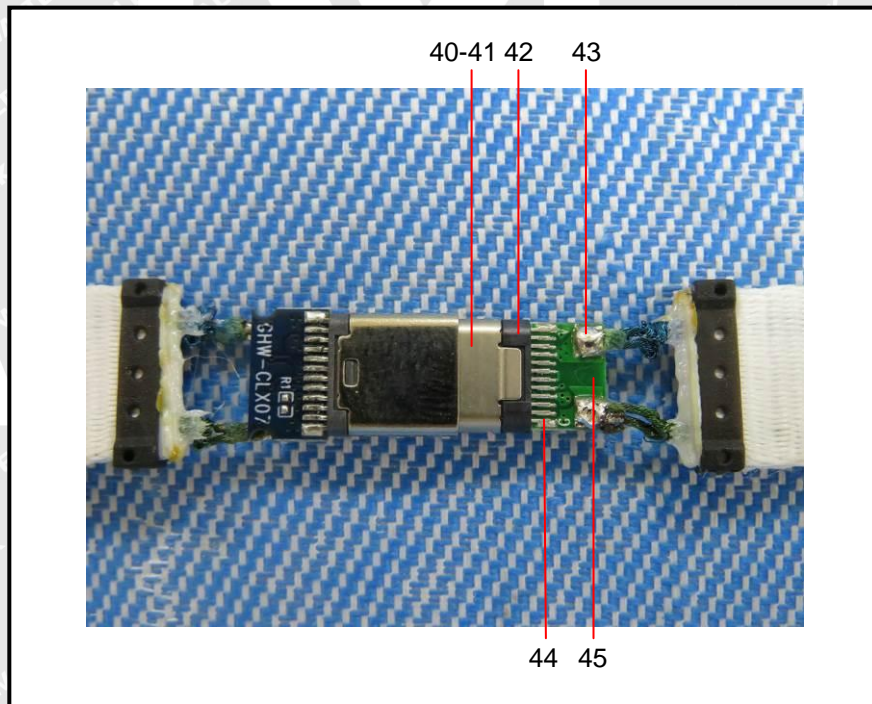
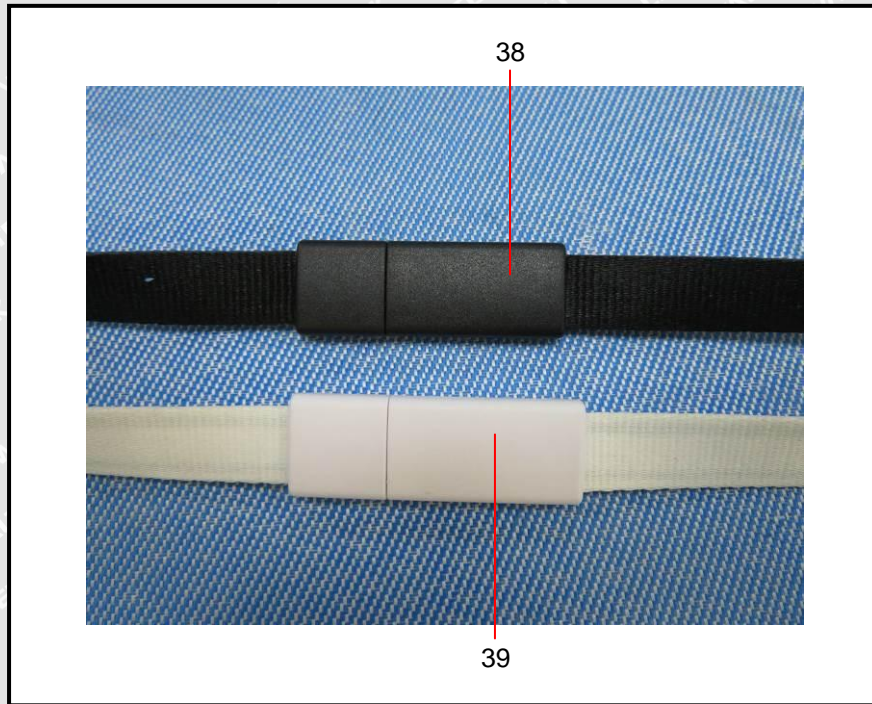


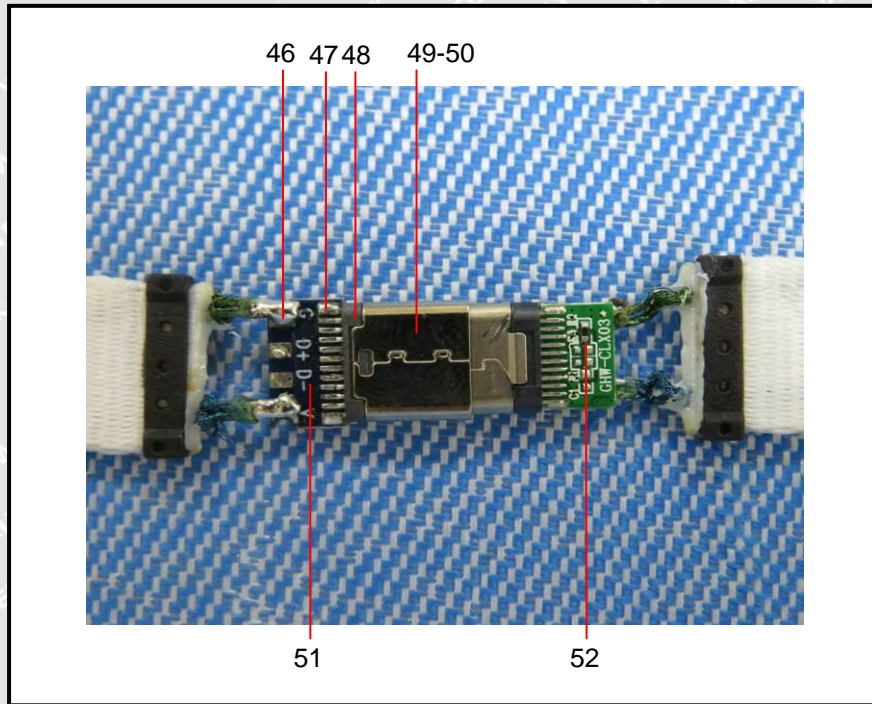












==== End of Report =====

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