



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

**Report No.**..... : WTF23F04077657A1C  
**Applicant**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Manufacturer**..... : 111033  
**Sample Name**..... : A4 portfolio  
**Sample Model**..... : KC8063  
**Date of Receipt sample**..... : 2023-04-13 & 2023-04-26  
**Testing period**..... : 2023-04-13 to 2023-04-21 & 2023-04-26 to 2023-04-28  
**Date of Issue**..... : 2023-05-05  
**Test Result**..... : Refer to next page (s)

**Prepared By:**

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Signed for and on behalf of  
Waltek Testing Group (Foshan) Co., Ltd.

Swing.Liang



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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 62321-2:2021, 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.

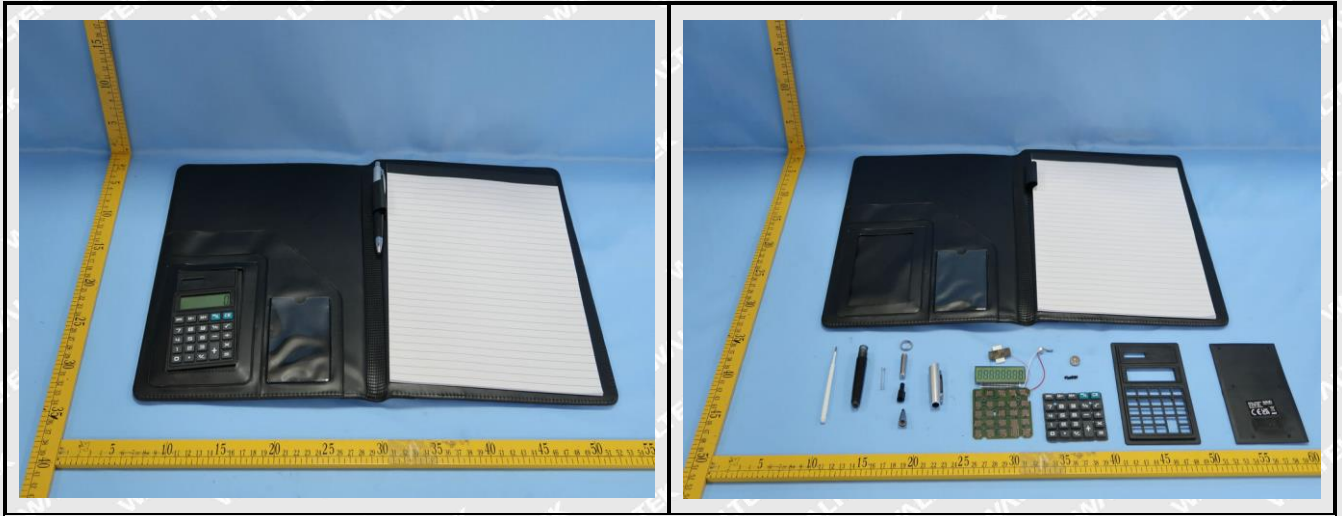
**Test Conclusion** ..... : **Pass** (Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863)

# WALTEK



Report No.: WTF23F04077657A1C

**Sample Photo(s):**



**WALTEK**



**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	Black synthetic leather	BL	BL	BL	BL	BL	NA
2	Black paper sheet	BL	BL	BL	BL	BL	NA
3	Transparent plastic sheet	BL	BL	BL	BL	BL	NA
4	White paper sheet	BL	BL	BL	BL	BL	NA
5	White sponge	BL	BL	BL	BL	BL	NA
6	Black synthetic leather	BL	BL	BL	BL	BL	NA
7	Black sewing thread	BL	BL	BL	BL	BL	NA
8	Grey paper sheet	BL	BL	BL	BL	BL	NA
9	Black plastic shell	BL	BL	BL	BL	BL	NA
10	Silvery metal sheet	BL	BL	BL	BL	--	NA
11	Silvery metal spring	BL	BL	BL	BL	--	NA
12	Grey plastic sleeve with silvery plating	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 31
13	Black plastic sleeve	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 30
14	White plastic sleeve	BL	BL	BL	BL	BL	NA
15	Beige plastic sleeve	BL	BL	BL	BL	BL	NA
16	Grey plastic sleeve without Silvery coating	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 49
17	Silvery coating	BL	BL	BL	BL	BL	NA
18	Grey plastic sleeve with silvery plating	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 66
19	Grey plastic ring with silvery plating	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	
20	Silvery metal refill	BL	BL	BL	BL	--	NA
21	Blue ink	BL	BL	BL	BL	BL	NA
22	Black plastic shell	BL	BL	BL	BL	BL	NA
23	White paper adhesive label with black printing	BL	BL	BL	BL	BL	NA
24	Black soft plastic keyboard with white printing	BL	BL	BL	BL	BL	NA
25	Green soft plastic keyboard with white printing	BL	BL	BL	BL	BL	NA
26	Solder	BL	BL	BL	BL	--	NA
27	Red plastic wire covering	BL	BL	BL	BL	BL	NA
28	White plastic wire covering	BL	BL	BL	BL	BL	NA
29	Silvery metal wire	BL	BL	BL	BL	--	NA
30	Silvery metal sheet	BL	BL	BL	BL	--	NA
31	Green PCB	BL	BL	BL	BL	BL	NA
32	Chip capacitor	BL	BL	BL	BL	BL	NA
33	Chip IC	BL	BL	BL	BL	BL	NA
34	White-grey plastic sheet	BL	BL	BL	BL	BL	NA
35	Transparent glass sheet	BL	BL	BL	BL	--	NA
36	White sponge adhesive sheet	BL	BL	BL	BL	BL	NA
37	Black transparent FPC	BL	BL	BL	BL	BL	NA
38	Green varnished wire	BL	BL	BL	BL	BL	NA
39	Transparent glass sheet with brown coating	BL	BL	BL	BL	--	NA





Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
40	Red varnished wire	BL	BL	BL	BL	BL	NA
41	White fibrous wire	BL	BL	BL	BL	BL	NA
42	Silvery metal screw with black plating	BL	BL	BL	IN	--	Cr <sup>6+</sup> : Negative

**Remark:**

- (1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr<sup>6+</sup>) 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/cm<sup>2</sup> = Micrograms per square centimetre.
- (5) ND = Not Detected or lower than limit of quantitation.
- (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) LOQ = Limit of quantitation.

Test Items	Pb	Cd	Hg	Cr <sup>6+</sup>		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	μg/cm <sup>2</sup>	mg/kg	mg/kg
LOQ	2	2	2	8	0.1	5	5

The LOQ for single compound of PBBs and PBDEs is 5mg/kg, LOQ of Cr<sup>6+</sup> for polymer and composite sample is 8mg/kg and LOQ of Cr<sup>6+</sup> for metal sample is 0.1μg/cm<sup>2</sup>.



## (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 <sup>6+</sup> )	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 Cr<sup>6+</sup> on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.

Boiling water extraction:

Negative = Absence of Cr<sup>6+</sup> coating, the detected concentration in boiling water extraction solution is less than 0.10ug/cm<sup>2</sup>.

Positive = Presence of Cr<sup>6+</sup> coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/cm<sup>2</sup>.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr<sup>6+</sup> results represent status of the sample at the time of testing.

## (10) Abbreviation:

“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	ND	ND	ND	ND
T02	2+4+8 <sup>△</sup>	ND	ND	ND	ND
T03	3+9+14 <sup>△</sup>	ND	ND	ND	ND
T04	5	ND	ND	ND	ND
T05	6	ND	ND	ND	ND
T06	7	ND	ND	ND	ND
T07	10	--	--	--	--
T08	11	--	--	--	--
T09	12	ND	ND	151	ND
T10	13	ND	ND	ND	ND
T11	15+19+22 <sup>△</sup>	ND	ND	ND	ND
T12	16	ND	ND	179	ND
T13	17	ND	ND	112	ND
T14	18	ND	ND	ND	ND
T15	20	--	--	--	--
T16	21	331	ND	ND	ND





Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T17	23	ND	ND	ND	ND
T18	24	ND	ND	ND	ND
T19	25	ND	ND	ND	ND
T20	26	--	--	--	--
T21	27	ND	ND	ND	ND
T22	28	ND	ND	ND	ND
T23	29	--	--	--	--
T24	30	--	--	--	--
T25	31+32+33+37+38 <sup>△</sup>	ND	ND	ND	ND
T26	34	ND	ND	ND	ND
T27	35	--	--	--	--
T28	36	ND	ND	ND	ND
T29	39	--	--	--	--
T30	40	ND	ND	ND	ND
T31	41	ND	ND	ND	ND
T32	42	--	--	--	--

**Note:**

- (1) mg/kg = milligram per kilogram= ppm
- (2) ND = Not Detected or lower than limit of quantitation.
- (3) -- = Not Regulated.
- (4) LOQ = Limit of quantitation.

Test Items	DBP	BBP	DEHP	DIBP
Units	mg/kg	mg/kg	mg/kg	mg/kg
LOQ	50	50	50	50

- (5) Abbreviation:  
"DBP" denotes Dibutyl phthalate, "BBP" denotes Benzyl butyl phthalate (BBP), "DEHP" denotes Bis(2-ethylhexyl)-phthalate, "DIBP" denotes Diisobutyl phthalate, "PHT" denotes Phthalates.
- (6) RoHS requirement

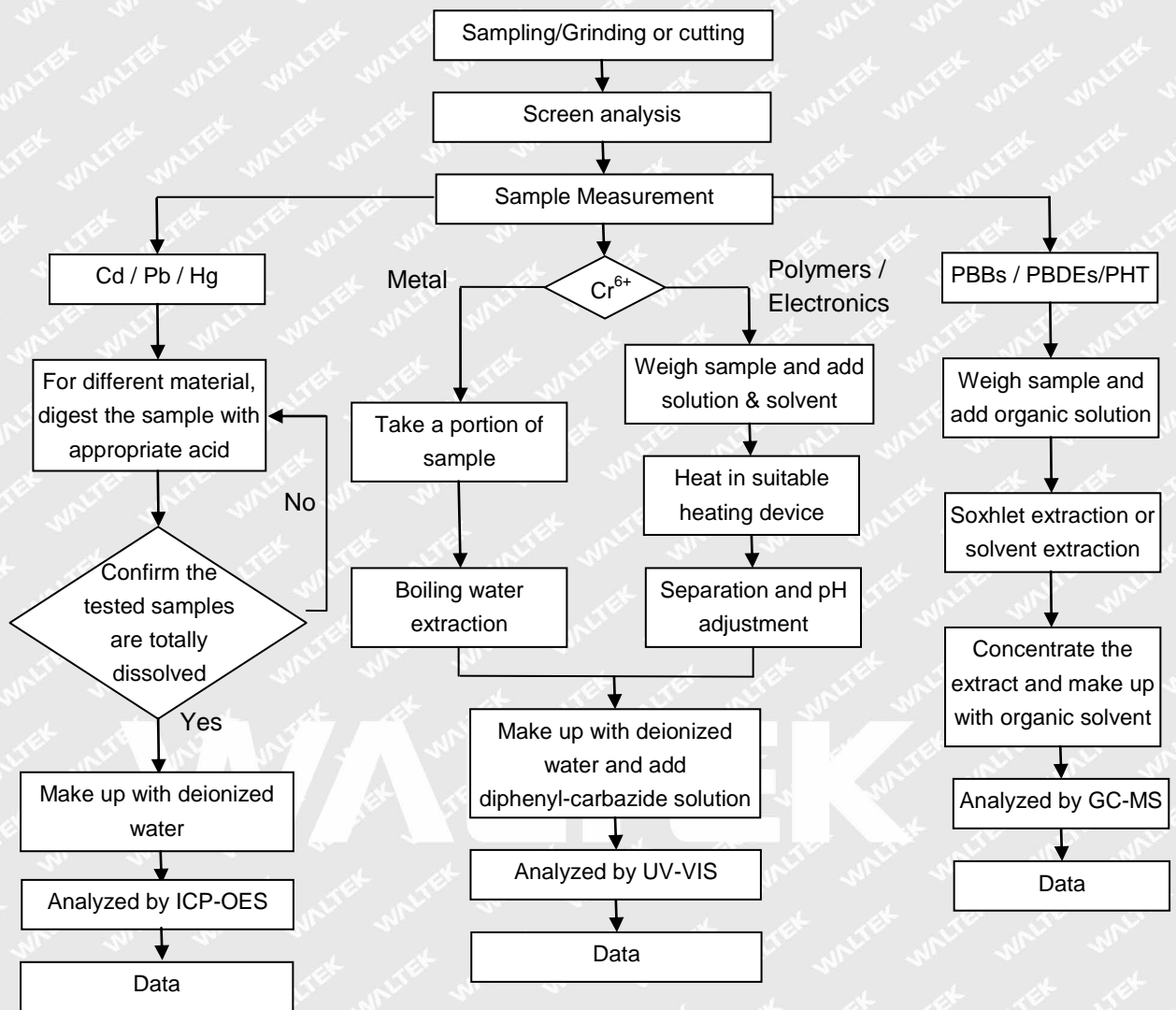
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

- (7) "△" = As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.



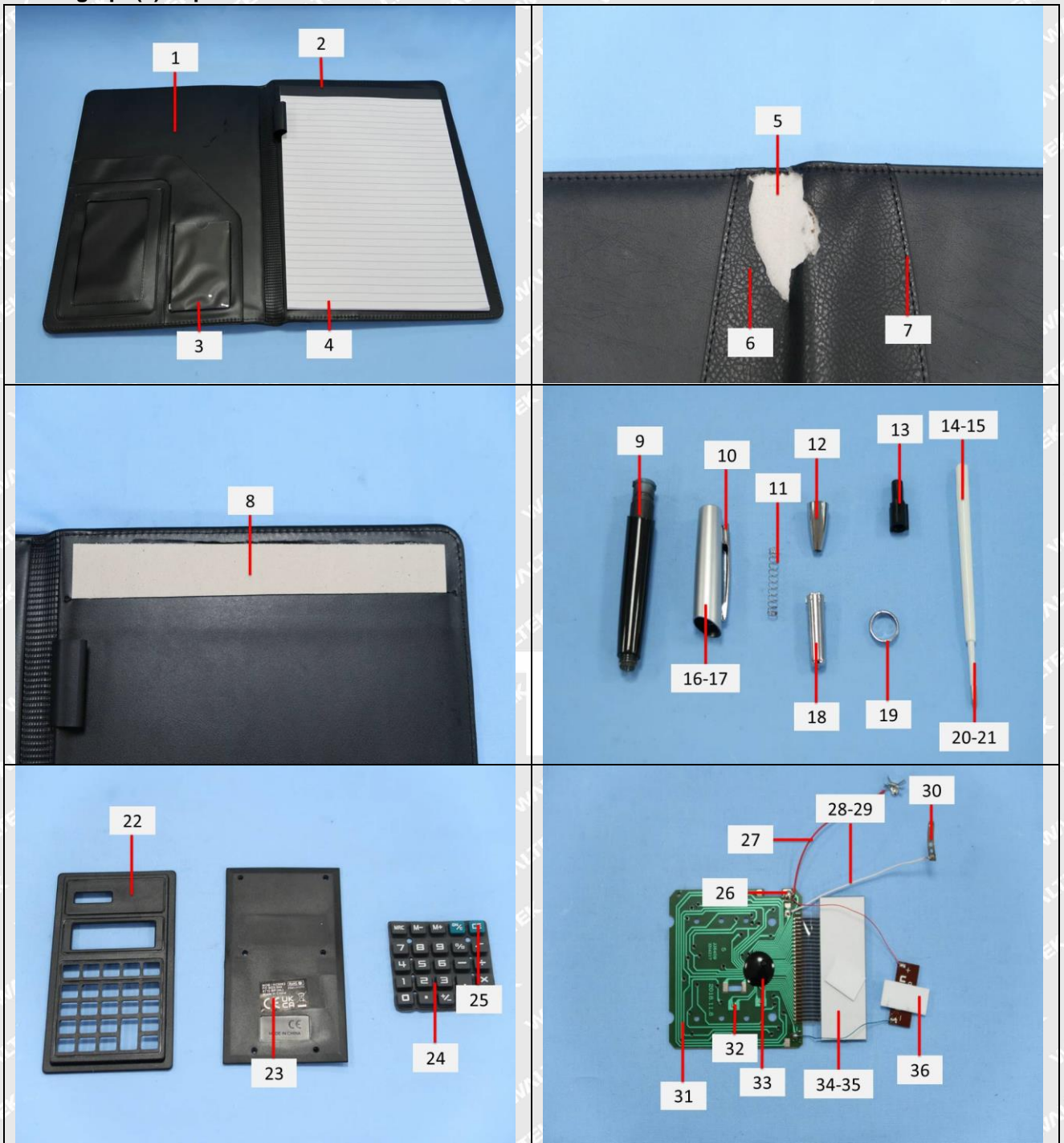


**Measurement Flowchart:**

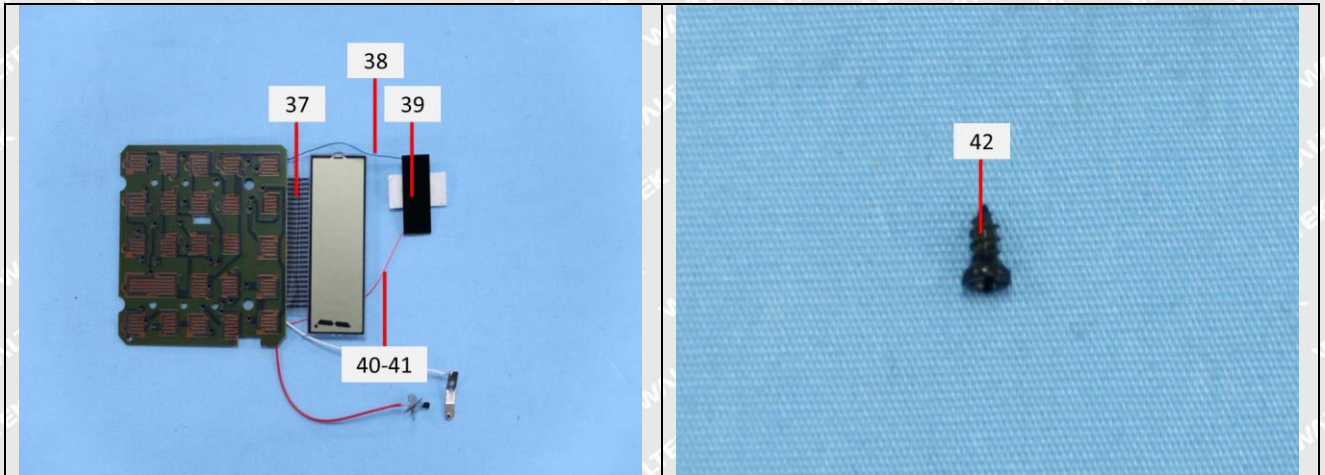




Photograph(s) of parts tested:







Remarks:

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