Applicant	:	Mid Ocean Brands B.V.
Address	:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Sample Name	:	CHARGING CABLE
Tested Model	:	MO9888
Sample Receiving date	:	2023-07-31
Test period	:	2023-07-31 – 2023-08-08
Test Requirement	:	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, RoHS Directive 2011/65/EU and its amendment Directive (EU) 2015/863.
Test Method	:	Please refer to next page(s).
Test result	:	Please refer to next page(s).
Conclusion	:	Based on the verification results of the submitted sample(s), the results of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(CrVI), Polybrominated biphenyls(PBBs), Polybrominated diphenyl ethers(PBDEs), Dibutyl phthalate(DBP), Butyl benzyl phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP) and Di-iso-butyl phthalate(DIBP) content comply with the requirements as set by RoHS Directive 2011/65/EU and its amendment Directive (EU) 2015/863.
Note	:	The test results are related only to the tested items.

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Lab Manager: Gavin Zhou

NINGBO GIG TESTING CO.,LTD. GIG

2023-08-25

A. Pb, Cd, Cr(VI), Hg, PBBs&PBDEs

Test Method:

(1) Screening – Lead, mercury, cadmium, total chromium and total bromine

－Ref. to IEC 62321-3-1:2013, Screening for Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry.

(2) Wet chemical test method

a. Total Lead, Cadmium, Chromium and Mercury content

－Ref. to IEC 62321-4:2013+A1:2017, determination of Mercury in polymers, metals and electronics by ICP-OES.

－Ref. to IEC 62321-5:2013, determination of Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by ICP-OES.

b. Chromium (VI) content

－For Colourless and coloured corrosion-protected coatings on metals, Ref. to IEC 62321-7-1:2015, determination of presence of hexavalent chromium (Cr(VI)) in colourless and coloured corrosion-protected coatings on metals by the colorimetric method.

－For polymers and electronics, Ref. to IEC 62321-7-2:2017, determination of hexavalent chromium (Cr(VI)) in polymers and electronics by the colorimetric method.

c. PBBs, PBDEs

－Ref. to IEC 62321-6:2015, determination of polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatograhy -mass spectrometry (GC-MS).

Test result(s):

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	Silvery metal ring	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
2	Silvery metal	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
3	Metal (screw)	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
4	Bamboo board (shell)	BL	BL	BL	BL	BL	---	Pass
5	Heat shrink tubing	BL	BL	BL	BL	BL	---	Pass
6	White plastic	BL	BL	BL	BL	BL	---	Pass
7	Soldering tin	125 (BL)	BL	BL	BL	---	---	Pass
8	Silvery metal (USB)	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
9-1	White plastic support	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
9-2	Metal (pins)	BL	BL	BL	BL	---	---	Pass
10	Soldering tin	141 (BL)	BL	BL	BL	---	---	Pass
11	White plastic frame	BL	BL	BL	BL	BL	---	Pass
12	White plastic casing	BL	BL	BL	BL	BL	---	Pass
13	Golden varnished wire	BL	BL	BL	BL	---	---	Pass
14	Red varnished wire	BL	BL	BL	BL	---	---	Pass
15	White textile wire	BL	BL	BL	BL	BL	---	Pass
16	White plastic frame	BL	BL	BL	BL	BL	---	Pass
17	Silvery metal	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
18	Beige plastic	BL	BL	BL	BL	BL	---	Pass
19	Silvery metal pins	BL	BL	BL	BL	---	---	Pass
20	Black plastic	BL	BL	BL	BL	BL	---	Pass
21	Soldering tin (SMD)	156 (BL)	BL	BL	BL	---	---	Pass
22	Soldering tin (wiring)	115 (BL)	BL	BL	BL	---	---	Pass
23	PCB	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
24-1	Silvery metal	BL	BL	BL	BL	---	---	Pass
24-2	Beige plastic support	BL	BL	BL	BL	BL	---	Pass
25	SMD resistor	BL	BL	BL	BL	BL	---	Pass

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
26	SMD capacitor	BL	BL	BL	BL	BL	---	Pass
27	SMD audion	BL	BL	BL	BL	BL	---	Pass
28	SMD IC	BL	BL	BL	BL	BL	---	Pass
29	Soldering tin (SMD)	184 (BL)	BL	BL	BL	---	---	Pass
30	Soldering tin (wiring)	113 (BL)	BL	BL	BL	---	---	Pass
31	White plastic frame	BL	BL	BL	BL	BL	---	Pass

Remark:

(^1) "---" = Not Applicable;

(^2) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

(b) The XRF screening test for RoHS elements-The reading may be different to the actual content in the sample be of non-uniformity composition.

(c) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warming value according to IEC 62321-3-1: 2013.

Attached table 1, XRF screening limits in mg/kg for regulated elements in various matrices:

Element	Polymer Materials	Metallic Materials	Electronics
Cd	BL≤(70-3σ)< X < (130+3σ) ≤OL	BL≤(70-3σ)< X < (130+3σ) ≤OL	LOD< X < (250+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
Br	BL≤(300-3σ)< X	N.A.	BL≤(250-3σ)< X
Cr	BL≤(700-3σ)< X	BL≤(700-3σ)< X	BL≤(500-3σ)< X

Note: ① BL "below limit" = the result less than the limit.

② OL "over limit" = the result greater than the limit.

③ IN = inconclusive, the region where need further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs).

④ 3σ = Repeability of the analyser at the action level.

⑤ LOD = Limit of detection.

(^3) (a) mg/kg = ppm = 0.0001%; (b) N.D. = Not detected (lower than RL);

(c) Reporting Limit (RL) and Limit of Directive 2011/65/EU.

Parameter	Unit	Limit	Reporting Limit (RL)
Lead (Pb)	mg/kg	1000	10
Cadmium (Cd)	mg/kg	100	10
Mercury (Hg)	mg/kg	1000	10
Chromium VI (Cr VI)	mg/kg	1000	R1
Group PBBs	mg/kg	1000	R2
Group PBDEs	mg/kg	1000	R2

R1: Cr(VI) for metal sample, the reporting limit (RL) = Method Detection Limit (MDL) = 0.10 ug/cm^2.
The reporting limit (RL) of Cr(VI) for polymers and electronics is 10mg/kg.

R2: The reporting limit (RL) for single compound of PBBs & PBDEs is 50mg/kg.

(d) According to IEC 62321-7-1:2015, result on Cr(VI) for metal sample is shown as Negative, Inconclusive or Positive: Negative = Absence of Cr(VI), Inconclusive = Maybe exist Cr(VI), Positive = Presence of Cr(VI).

Colorimetric result (Cr(VI) concentration)	Qualitative result
The sample solution is < the 0.10 ug/cm^2 equivalent comparison standard solution	The sample is negative for Cr(VI)–The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
The sample solution is ≥ the 0.10 ug/cm^2 and ≤ the 0.13 ug/cm^2 equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination. Recommendation: if addition samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trials for the final determination.
The sample solution is > the 0.13 ug/cm^2 equivalent comparison standard solution	The sample is positive for Cr(VI)–The Cr(VI) concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

B. Phthalates—DBP, BBP, DEHP & DIBP

Test Method: Ref. to IEC 62321-8: 2017

Determination of Phthalates in polymers by Gas Chromatography-Mass Spectrometry (GC-MS)

Test result:

Test item	DBP	BBP	DEHP	DIBP
Maximum Permissible Limit (mg/kg)	1000	1000	1000	1000

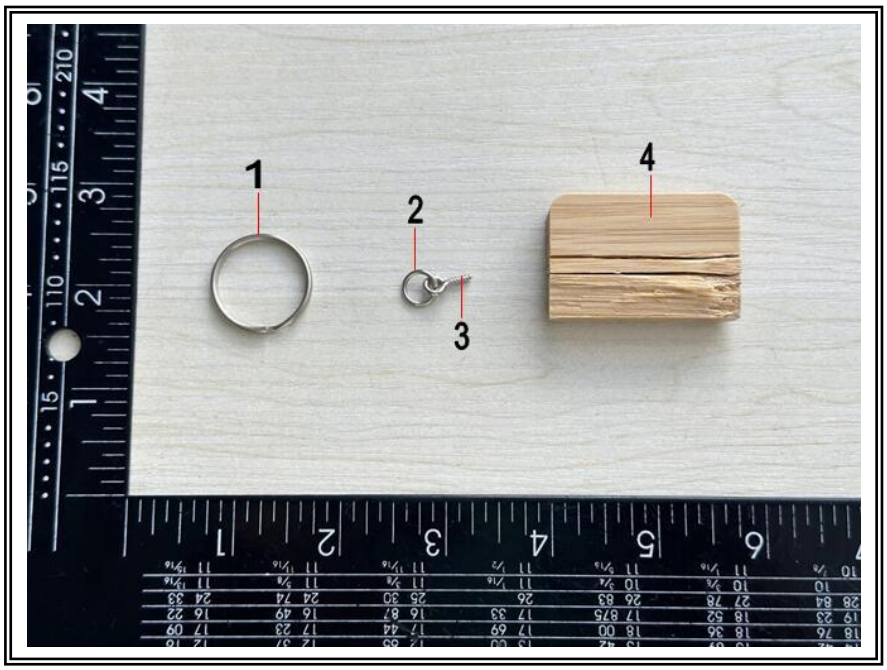
Part No.	Test item (mg/kg)				Conclusion
	DBP	BBP	DEHP	DIBP	
4	N.D.	N.D.	N.D.	N.D.	Pass
5	N.D.	N.D.	N.D.	N.D.	Pass
6	N.D.	N.D.	N.D.	N.D.	Pass
9-1+18+20	N.D.	N.D.	N.D.	N.D.	Pass
11+16+31	N.D.	N.D.	170	N.D.	Pass
12	N.D.	N.D.	N.D.	N.D.	Pass
15	N.D.	N.D.	N.D.	N.D.	Pass
23	N.D.	N.D.	N.D.	N.D.	Pass
24-2	N.D.	N.D.	N.D.	N.D.	Pass

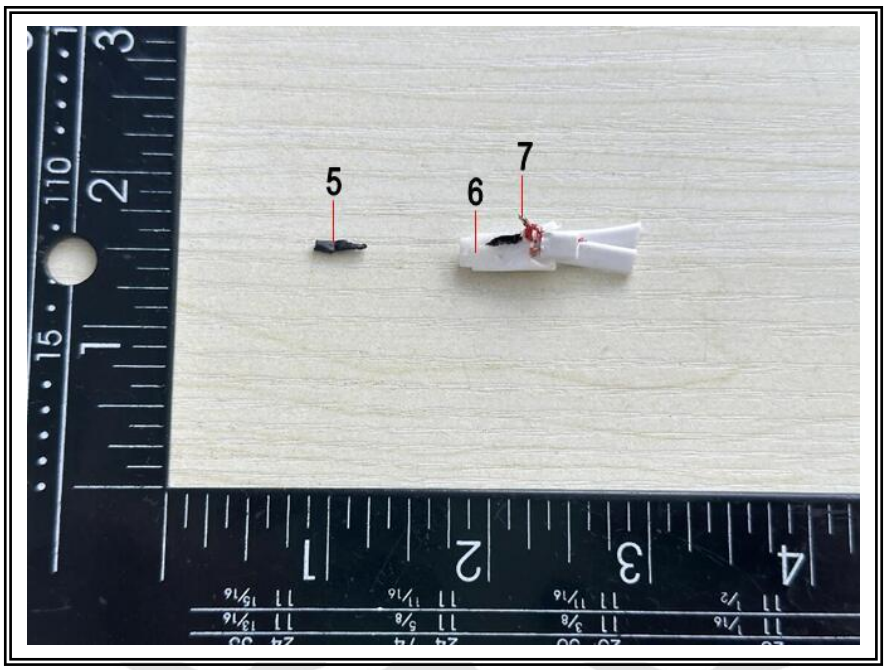
Remark: 1. Reporting Limit (RL) for DBP, BBP, DEHP, DIBP = 50mg/kg.
2. N.D. = Not Detected (<RL).

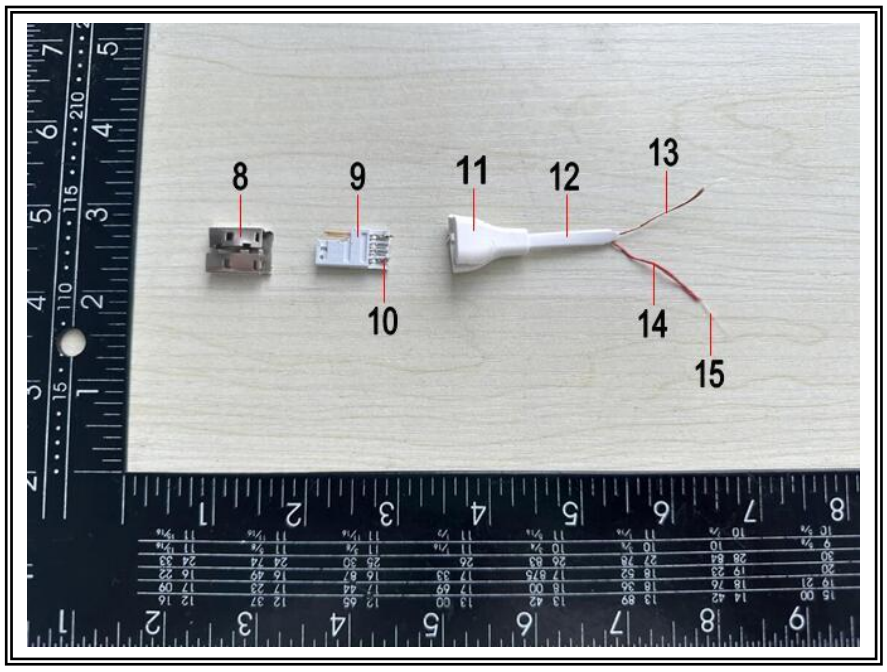
Sample photo(s):

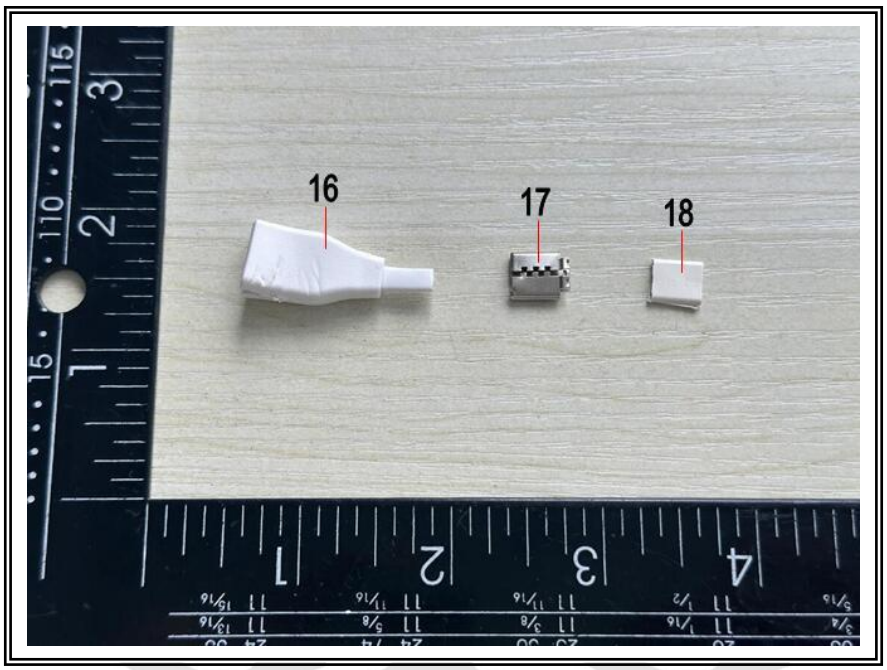
Test item: CHARGING CABLE

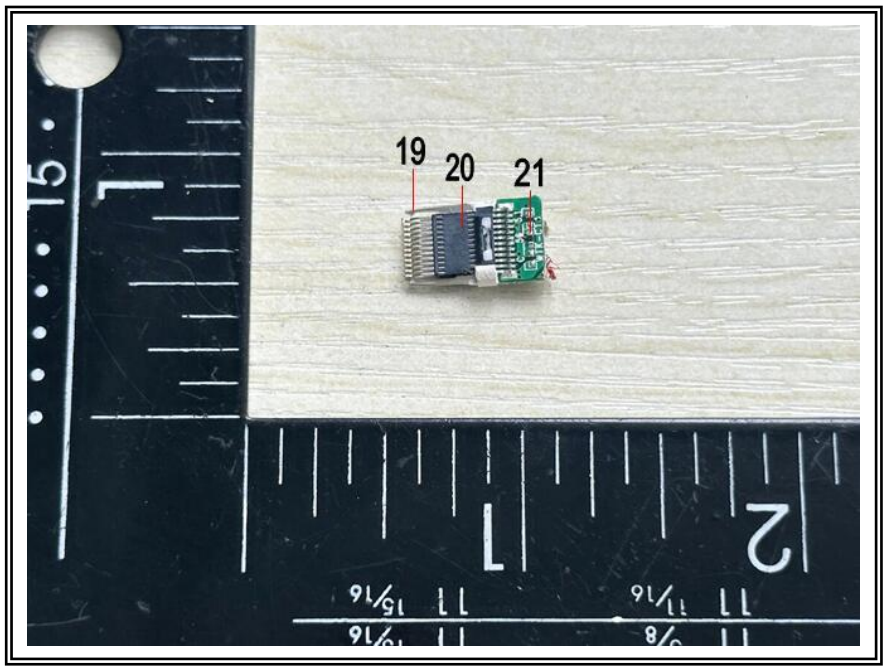
Tested Model No.: MO9888

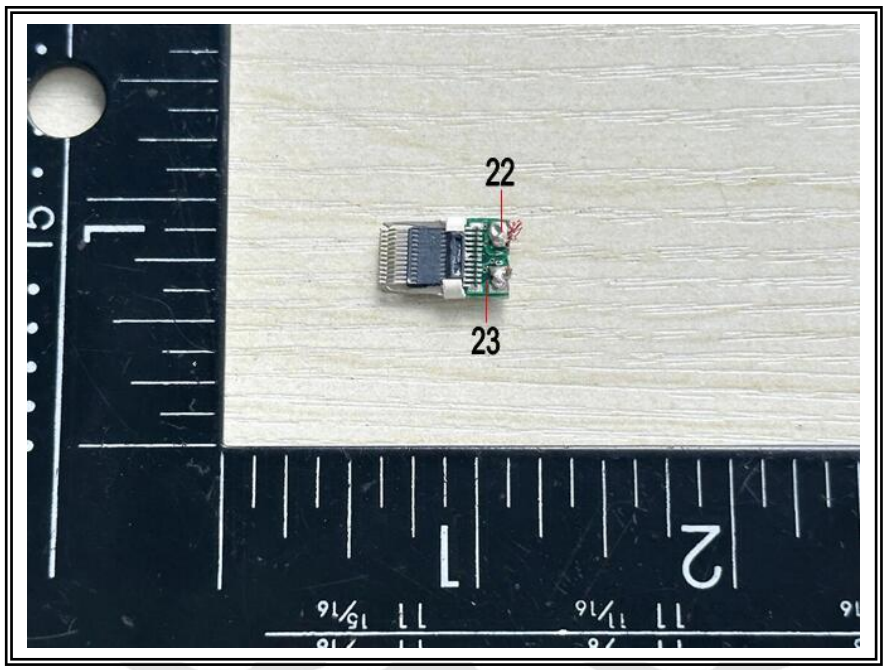


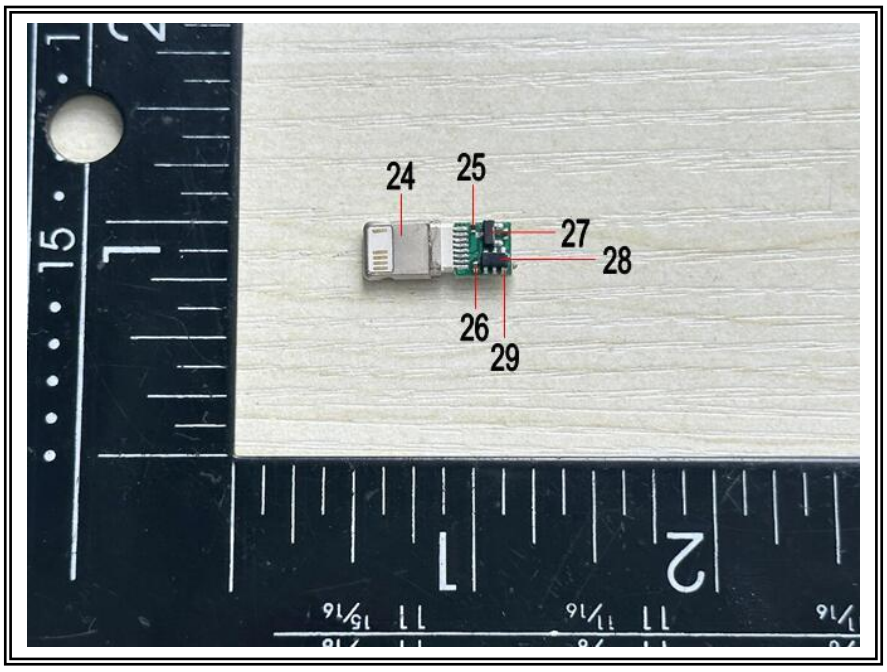


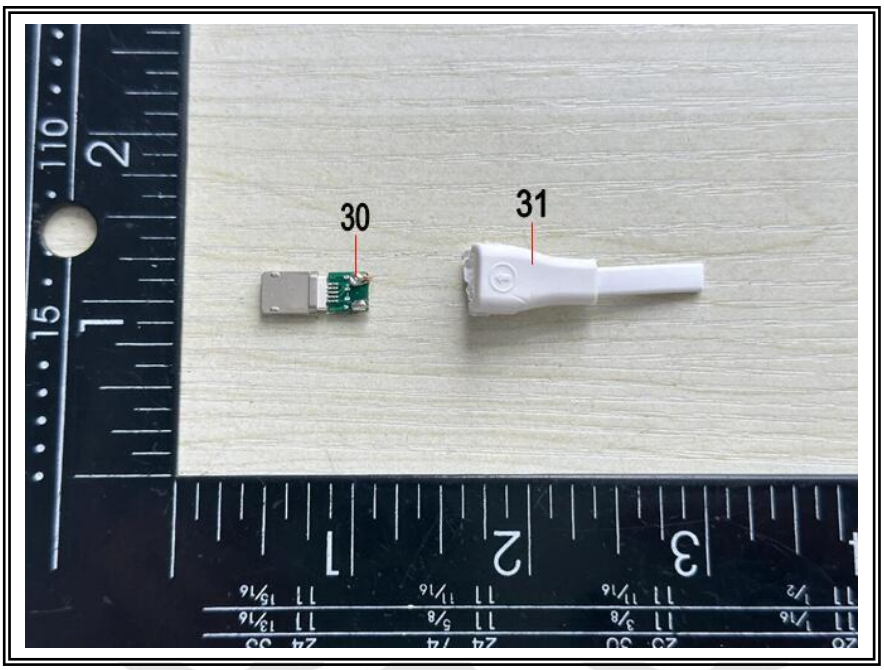












GIG authenticate the photo(s) on original report only

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