Applicant	:	Mid Ocean Brands B.V. / Vendor code: 109979
Address	:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, HongKong
Sample Name	:	USB HUB &SPINNER
Tested Model	:	MO9318
Sample Receiving date	:	2019-11-20
Test period	:	2019-11-20 – 2019-11-27
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 in the tested part(s) 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

2019-12-05

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

Test Method:

1. Disassembly, disjointment and mechanical sample preparation
   －Ref. to IEC 62321-2:2013, Disassembly, disjointment and mechanical sample preparation.
2. With reference to IEC 62321-1:2013, tests were performed for the samples indicated by the photos in this report.

(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	Black plastic	BL	BL	BL	BL	BL	---	Pass
2	Black plastic	BL	BL	BL	BL	BL	---	Pass
3	Slivery metal (steel ring)	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
4	Silvery metal (steel ball)	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
5	Brown plastic	BL	BL	BL	BL	BL	---	Pass
6	SMD resistor	BL	BL	BL	BL	BL	---	Pass
7	SMD capacitor	BL	BL	BL	BL	BL	---	Pass
8	SMD chip (IC)	BL	BL	BL	BL	BL	---	Pass
9	Soldering tin (SMD)	189 (BL)	BL	BL	BL	---	---	Pass
10	Soldering tin (wiring)	239 (BL)	BL	BL	BL	---	---	Pass
11-1	Silvery metal	BL	BL	BL	BL	---	---	Pass
11-2	Black plastic support	BL	BL	BL	BL	BL	---	Pass
11-3	Metal (pins)	BL	BL	BL	BL	---	---	Pass
12-1	Silvery metal (USB)	BL	BL	BL	BL	---	---	Pass
12-2	White plastic support	BL	BL	BL	BL	BL	---	Pass
12-3	Metal (pins)	BL	BL	BL	BL	---	---	Pass
13	PCB board	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
14	PCB board	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
15	Black wire sheath	BL	BL	BL	BL	BL	---	Pass
16	Copper wire	BL	BL	BL	BL	---	---	Pass
17	White wire sheath	BL	BL	BL	BL	BL	---	Pass
18	Blue wire sheath	BL	BL	BL	BL	BL	---	Pass
19	Red wire sheath	BL	BL	BL	BL	BL	---	Pass
20	White plastic	BL	BL	BL	BL	BL	---	Pass
21	Metal (pins)	BL	BL	BL	BL	---	---	Pass
22	Soldering tin (wiring)	162 (BL)	BL	BL	BL	---	---	Pass
23	White plastic	BL	BL	BL	BL	BL	---	Pass

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
24	Black plastic casing	BL	BL	BL	BL	BL	---	Pass
25	Silvery metal	BL	BL	BL	BL	---	---	Pass
26	Black plastic	BL	BL	BL	BL	BL	---	Pass
27	Soldering tin (wiring)	198 (BL)	BL	BL	BL	---	---	Pass
28	White wire sheath	BL	BL	BL	BL	BL	---	Pass
29	White wire sheath	BL	BL	BL	BL	BL	---	Pass
30	Blue wire sheath	BL	BL	BL	BL	BL	---	Pass
31	Silvery coating	BL	BL	BL	BL	BL	---	Pass
32	Blue plastic (substrate)(shell)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
33	White plastic	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	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)

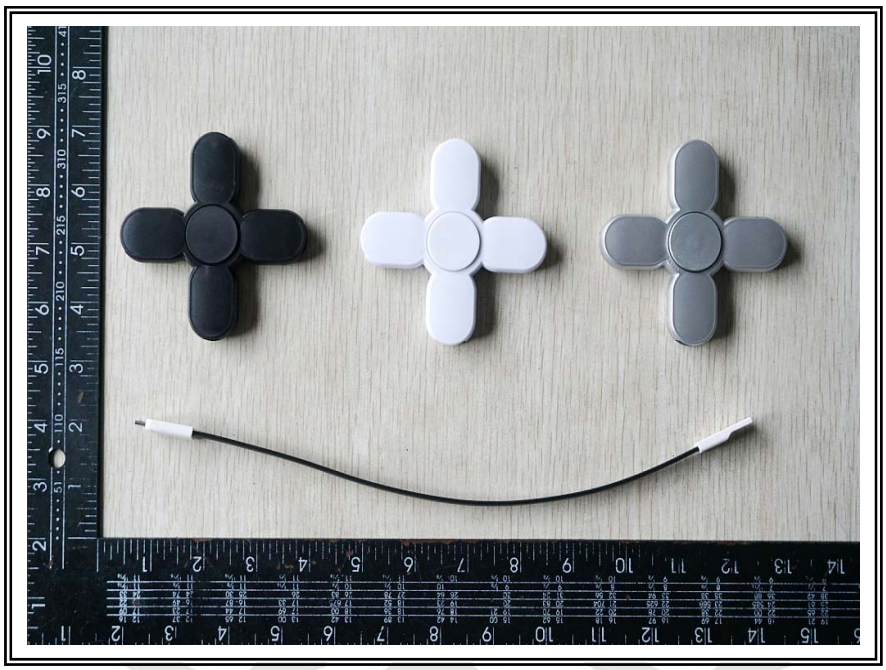
Test result:

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	
1+2	N.D.	N.D.	N.D.	N.D.	Pass
5	N.D.	N.D.	N.D.	N.D.	Pass
11-2+12-2	N.D.	N.D.	N.D.	N.D.	Pass
13+14	N.D.	N.D.	N.D.	N.D.	Pass
15+17	N.D.	N.D.	N.D.	N.D.	Pass
18+19	N.D.	N.D.	N.D.	N.D.	Pass
20+23+26	N.D.	N.D.	N.D.	N.D.	Pass
24	N.D.	N.D.	N.D.	110	Pass
28+29+30	N.D.	N.D.	N.D.	N.D.	Pass
31	N.D.	N.D.	N.D.	N.D.	Pass
32+33	N.D.	N.D.	N.D.	N.D.	Pass

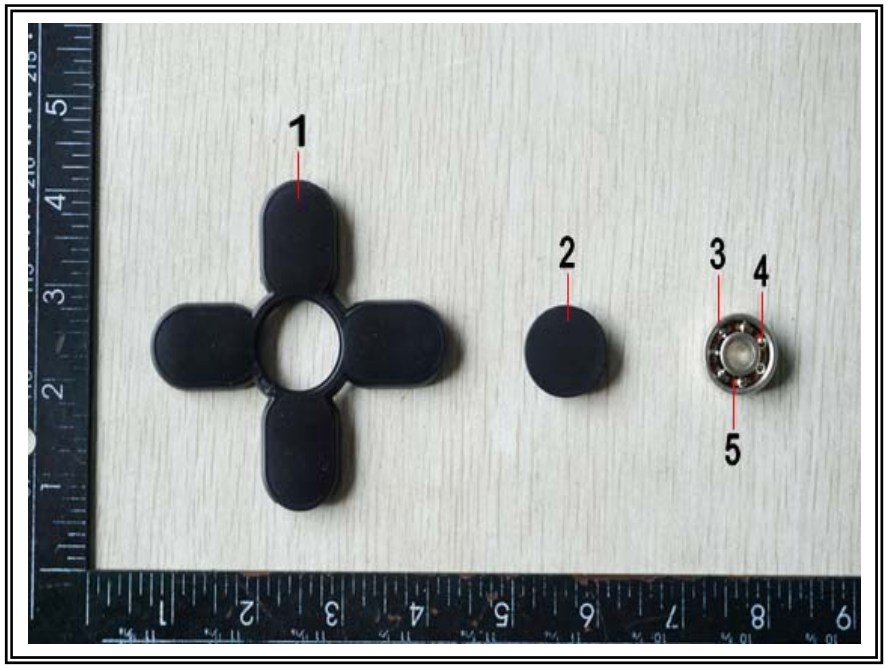
Remark: 1. Reporting Limit (RL) for DBP, BBP, DEHP, DIBP = 50mg/kg.
2. N.D. = Not Detected (<RL).

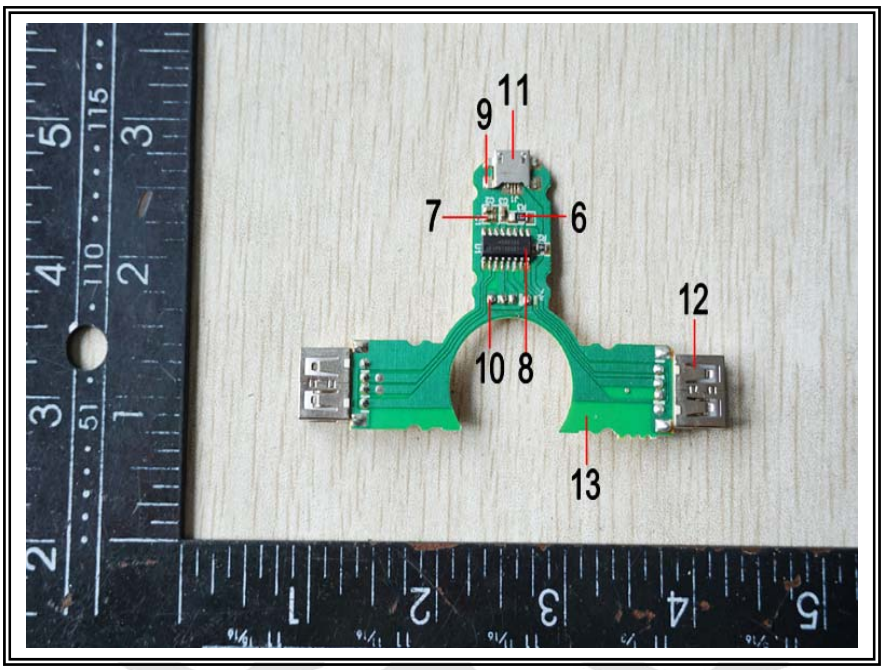
Sample photo(s):

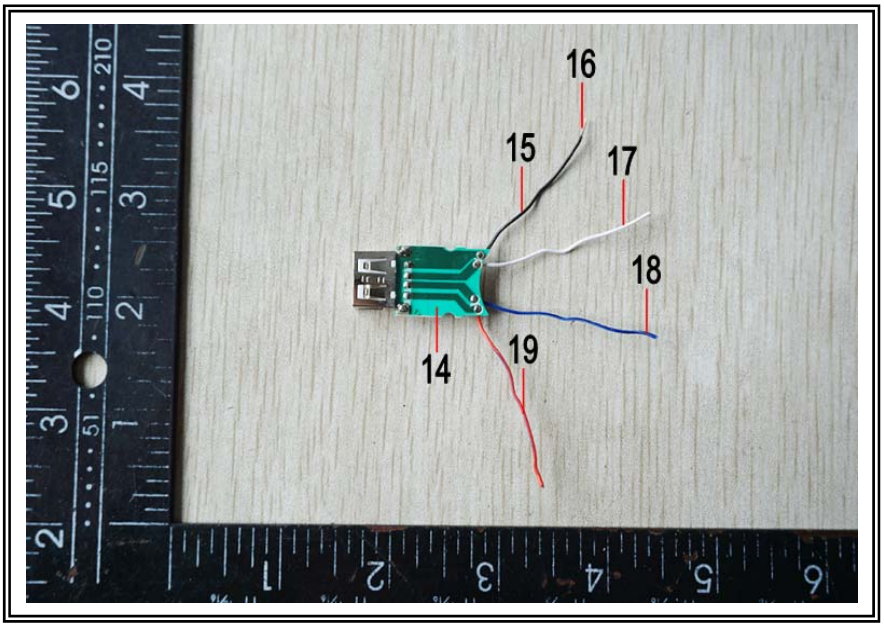


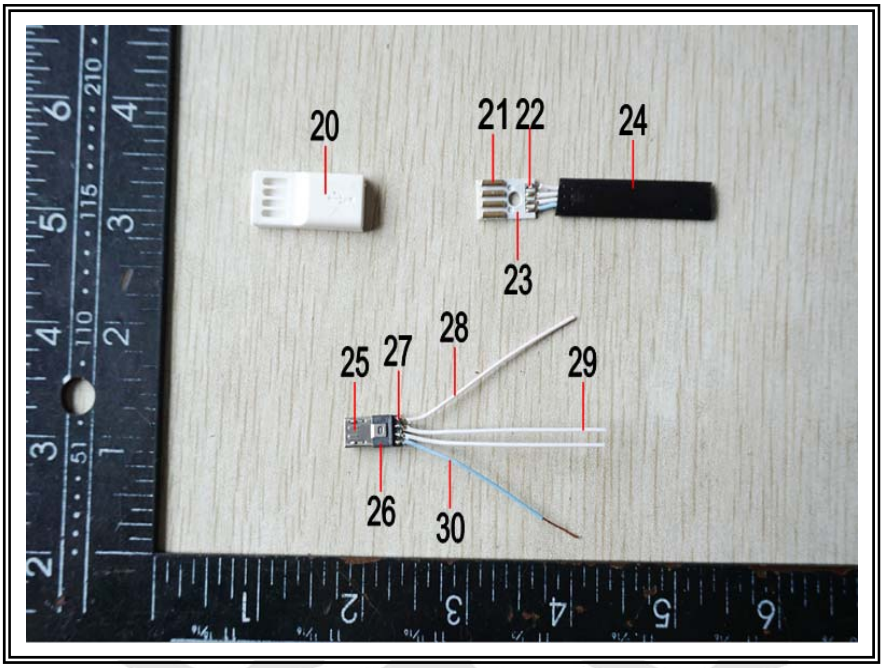
Test item: USB HUB & SPINNER

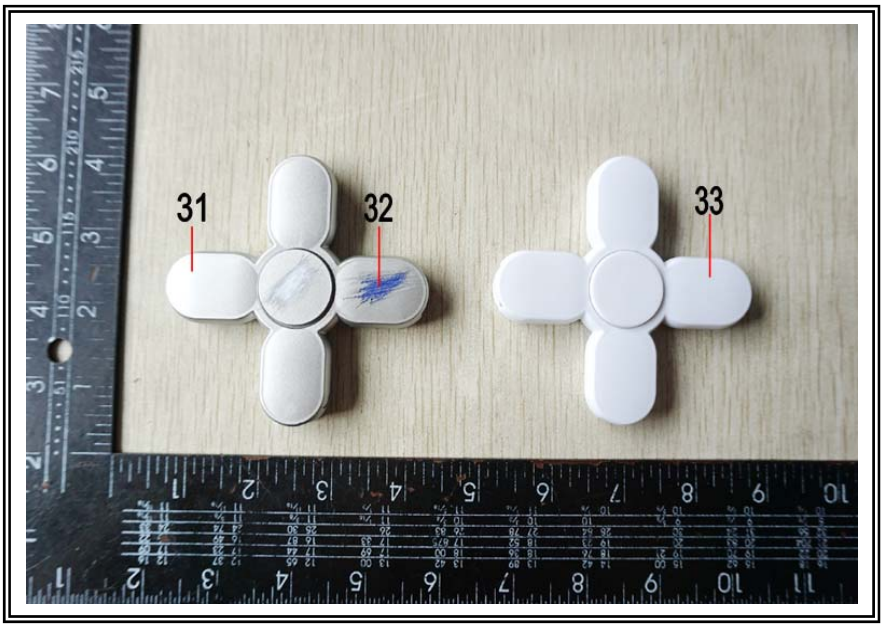
Tested Model No.: MO9318











GIG authenticate the photo(s) on original report only

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