

Test Report

Report No.: AGC03507190311-002

Date: Mar.26, 2019

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Applicant: MID OCEAN BRANDS B.V

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

Report on the submitted sample(s) said to be:

Sample Name: Laser pointer touch pen

Sample Model: MO8097

Supplier: 107978

Sample Received Date: Mar.15, 2019

Testing Period: Mar.15, 2019 to Mar.26, 2019

Test site: 1,6/F.,Building 2,No. 1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Baoan District, Shenzhen, Guangdong, China

Test Requested: Please refer to following page(s).

Test Method: Please refer to following page(s).

Test Result: Please refer to following page(s).

Approved by: 

Liulinwen, Lewis
Technical Director



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Test Requested:

- As specified by client, to determine the Pb, Cd, Hg, Cr⁶⁺, PBBs, PBDEs content in the submitted sample in accordance with EU RoHS Directive 2011/65/EU(RoHS) and its amendment directives on XRF and Chemical Method.
- As specified by client, to determine the DBP, BBP, DEHP, DIBP content in the submitted sample in accordance with Directive 2011/65/EU (RoHS) and its amendment directive (EU) 2015/863.

Conclusion
Pass
Pass
Test Methods:

A: Screening by X-ray Fluorescence Spectrometry (XRF) :With reference to IEC 62321-3-1:2013 Ed 1.0 Screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry

B: Chemical test:

Test Item	Test Method	Measuring Instrument	MDL
Cadmium (Cd)	IEC 62321-5:2013 Ed 1.0	ICP-OES	2 mg/kg
Lead (Pb)	IEC 62321-5:2013 Ed 1.0	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321-4: 2013+A1:2017 Ed 1.1	ICP-OES	2 mg/kg
Non-metal Hexavalent Chromium (Cr ⁶⁺)	IEC 62321-7-2:2017 Ed 1.0	UV-Vis	1 mg/kg
Metal Hexavalent Chromium (Cr ⁶⁺)	IEC 62321-7-1:2015 Ed 1.0	UV-Vis	/
PBBs/PBDEs	IEC 62321-6:2015 Ed 1.0	GC-MS	5 mg/kg

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Test Results:
A、EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
1	Copper pen shell(pen shell)	BL	BL	BL	BL	-
2	Silver metal screw thread ring(pen shell)	X*	OL*	BL	X*	-
3	Black coating(pen shell)	BL	BL	BL	BL	BL
4	Silver plastic(pen shell)	BL	BL	BL	BL	BL
5	Black rubber map(pen shell)	BL	BL	BL	BL	BL
6	Silver metal buckle(pen shell)	BL	OL*	BL	BL	-
7	Metal pen head(pen core)	BL	OL*	BL	BL	-
8	Ink(pen core)	BL	BL	BL	BL	BL
9	Transparent plastic tube(pen core)	BL	BL	BL	BL	BL
10	White plastic seat(pen core)	BL	BL	BL	BL	BL
11	Silver metal button	BL	OL*	BL	BL	-
12	Metal spring	BL	BL	BL	BL	-
13	Tin solder	BL	BL	BL	BL	-
14	PCB board	BL	BL	BL	BL	X*
15	Led lamp body(LED lamp)	BL	BL	BL	BL	X*
16	Pin(LED lamp)	BL	BL	BL	BL	-
17	Transparent sleeving(LED lamp)	BL	BL	BL	BL	BL
18	Pink plastic button	BL	BL	BL	BL	BL
19	Silver metal shell(touch switch)	BL	BL	BL	BL	-
20	Black plastic seat(touch switch)	BL	BL	BL	BL	BL
21	Pin(touch switch)	BL	BL	BL	BL	-
22	Metal shrapnel(touch switch)	BL	BL	BL	BL	-
23	Copper shell(laser head)	BL	BL	BL	BL	-
24	PCB board(laser head)	BL	BL	BL	BL	X*

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Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
25	Transparent lamp shade(laser head)	BL	BL	BL	BL	BL
26	Metal spring(laser head)	BL	BL	BL	BL	-
27	Button battery	BL	BL	BL	BL	BL
28	Grey coating	BL	BL	BL	BL	BL

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70 - 3\sigma < X$ $< 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma < X$ $< 130 + 3\sigma \leq OL$	$BL \leq 50 - 3\sigma < X$ $< 150 + 3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700 - 3\sigma < X$ $< 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X$ $< 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X$ $< 1500 + 3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700 - 3\sigma < X$ $< 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X$ $< 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X$ $< 1500 + 3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	mg/kg	$BL \leq 300 - 3\sigma < X$	-	$BL \leq 250 - 3\sigma < X$

Note: BL= Below Limit

OL= Over limited

X= Inconclusive

“-“= Not regulated

*= Scanning by XRF and detected by chemical method. The test results of chemical method please refer to next pages.

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Remark:

- i Results were obtained by XRF for primary scanning, 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 above warning value according to IEC 62321-3-1:2013 Ed 1.0.
- ii The XRF scanning test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- iii The maximum permissible limit is quoted from RoHS directive 2011/65/EU:

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

Disclaimers:

This XRF Scanning 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 scanning 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.

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B、 The Test Results of Chemical Method:

1) The Test Results of Pb & Cd

Test Item(s)	Unit	Result(s)			
		2	6	7	11
Lead(Pb)	mg/kg	31911*	15478*	32255*	30132*

Test Item(s)	Unit	Result(s)
		2
Cadmium(Cd)	mg/kg	13

Note: N.D. = Not Detected or less than MDL

mg/kg = parts per million

MDL = Method Detection Limit

* = As claimed by the material declaration submitted by the client, the materials of the sample No.2, No.6, No.7, No.11 are copper alloy, according to the RoHS 2011/65 / EU, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.

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 2)The Test Results of metal Cr⁶⁺

Test Item(s)	MDL	Result(s)	Limit
		2	
Hexavalent Chromium (Cr ⁶⁺)	See note	Negative	#

Note:

- Negative = Absence of Cr(VI) on the tested areas
- MDL = Method Detection Limit
- Boiling-water-extraction:

Number	Colorimetric result (Cr(VI) concentration)	Qualitative result
1	The sample solution is < the 0,10 µg/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.
2	The sample solution is ≥ the 0,10 µg/cm ² and ≤ the 0,13 µg/cm ² equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination.
3	The sample solution is > the 0,13 µg/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).

- # = Negative indicates the absence of Cr(VI) on the tested areas concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
- Uncertainty indicates the absence of Cr(VI) on the tested areas unavoidable coating variations may influence the determination.
- Positive indicates the presence of Cr(VI) on the tested areas concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).
- Storage conditions and production date of the tested sample are unavailable and thus result of Cr(VI) represent status of the sample at the time of testing.

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3) The Test Results of PBBs & PBDEs

Unit: mg/kg

Item(s)	MDL	Result(s)			Limit
		14	15	24	
Polybrominated Biphenyls (PBBs)					
Monobromobiphenyl	5	N.D.	N.D.	N.D.	Total PBBs Content <1000
Dibromobiphenyl	5	N.D.	N.D.	N.D.	
Tribromobiphenyl	5	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	5	N.D.	N.D.	N.D.	
Pentabromobiphenyl	5	N.D.	N.D.	N.D.	
Hexabromobiphenyl	5	N.D.	N.D.	N.D.	
Heptabromobiphenyl	5	N.D.	N.D.	N.D.	
Octabromobiphenyl	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl	5	N.D.	N.D.	N.D.	
Decabromodiphenyl	5	N.D.	N.D.	N.D.	
Total content	/	N.D.	N.D.	N.D.	
Polybrominated Diphenylethers (PBDEs)					
Monobromodiphenyl ether	5	N.D.	N.D.	N.D.	Total PBDEs Content <1000
Dibromodiphenyl ether	5	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	5	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	5	N.D.	N.D.	N.D.	
Total content	/	N.D.	N.D.	N.D.	
Conclusion	/	Pass	Pass	Pass	/

Note: N.D. = Not Detected or less than MDL
 mg/kg = parts per million
 MDL = Method Detection Limit

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2.Test result of DBP, BBP, DEHP, DIBP content

Unit: mg/kg

Test Item(s)	Test Method/ Equipment	MDL	Result(s)				Limit
			3	4	5	8	
Di-(2-ethylhexyl) Phthalate (DEHP)	Refer to IEC 62321-8:2017 GC-MS	50	N.D.	N.D.	N.D.	N.D.	1000
Dibutyl phthalate (DBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Butylbenzyl phthalate (BBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Di-iso-butyl phthalate (DIBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Conclusion		/	Pass	Pass	Pass	Pass	/

Unit: mg/kg

Test Item(s)	Test Method/ Equipment	MDL	Result(s)				Limit
			9	10	14	15	
Di-(2-ethylhexyl) Phthalate (DEHP)	Refer to IEC 62321-8:2017 GC-MS	50	N.D.	N.D.	N.D.	N.D.	1000
Dibutyl phthalate (DBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Butylbenzyl phthalate (BBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Di-iso-butyl phthalate (DIBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Conclusion		/	Pass	Pass	Pass	Pass	/

Unit: mg/kg

Test Item(s)	Test Method/ Equipment	MDL	Result(s)				Limit
			17	18	20	24	
Di-(2-ethylhexyl) Phthalate (DEHP)	Refer to IEC 62321-8:2017 GC-MS	50	N.D.	N.D.	N.D.	N.D.	1000
Dibutyl phthalate (DBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Butylbenzyl phthalate (BBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Di-iso-butyl phthalate (DIBP)		50	N.D.	N.D.	N.D.	N.D.	1000
Conclusion		/	Pass	Pass	Pass	Pass	/

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Unit: mg/kg

Test Item(s)	Test Method/ Equipment	MDL	Result(s)			Limit
			25	27	28	
Di-(2-ethylhexyl) Phthalate (DEHP)	Refer to IEC 62321-8:2017 GC-MS	50	N.D.	N.D.	N.D.	1000
Dibutyl phthalate (DBP)		50	N.D.	N.D.	N.D.	1000
Butylbenzyl phthalate (BBP)		50	N.D.	N.D.	N.D.	1000
Di-iso-butyl phthalate (DIBP)		50	N.D.	N.D.	N.D.	1000
Conclusion		/	Pass	Pass	Pass	/

- Note:**
1. MDL=Method Detection Limit
 2. N.D.=Not Detected(less than method detection limit)

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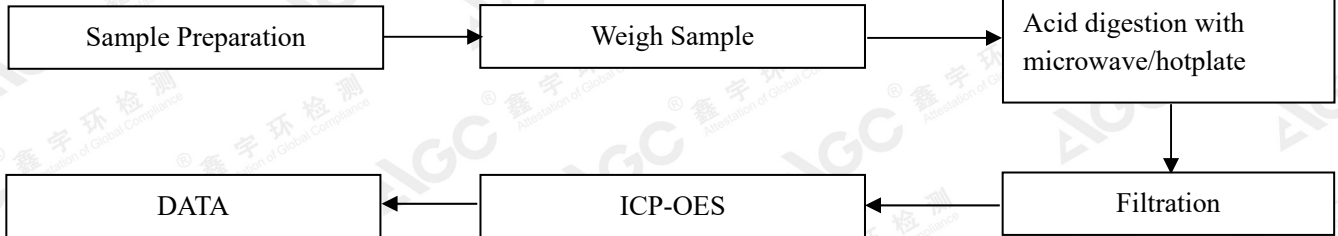
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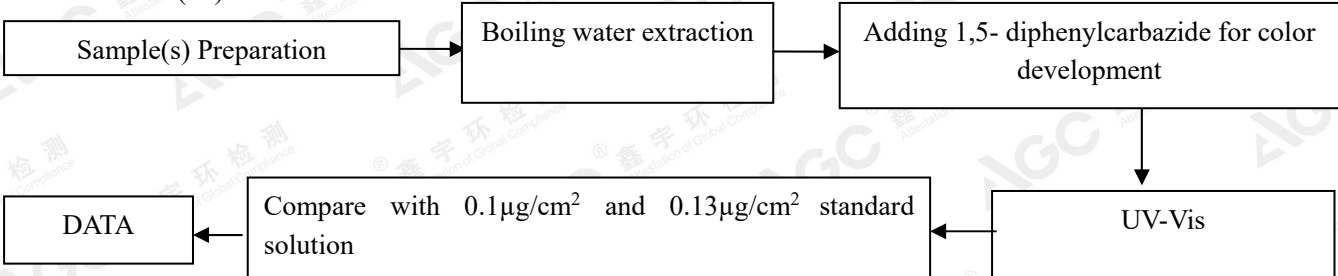
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Test Flow Chart

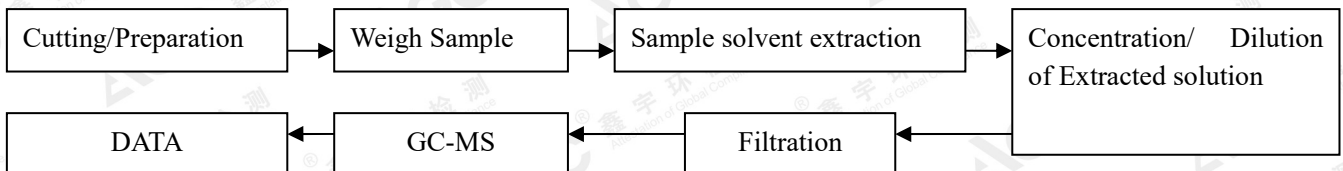
1. For Pb & Cd



2. For metal Cr(VI)



3. For PBBs, PBDEs, DBP, BBP, DEHP, DIBP



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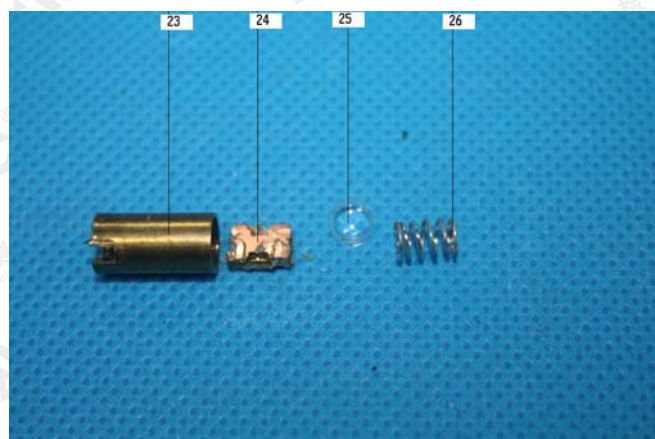
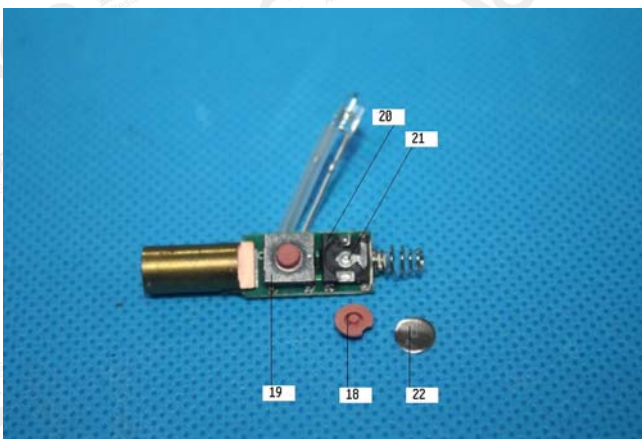
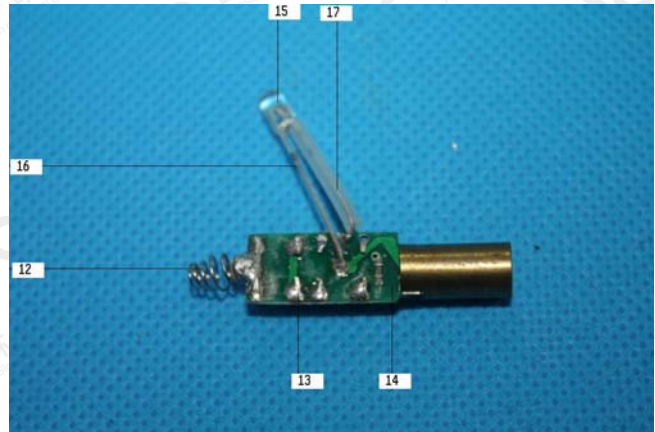
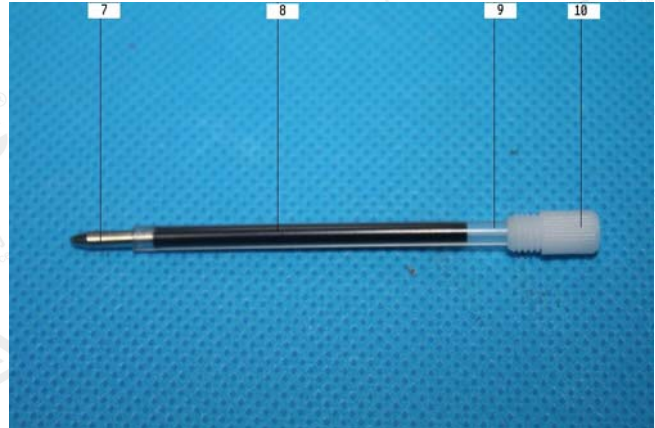
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The photo of the sample



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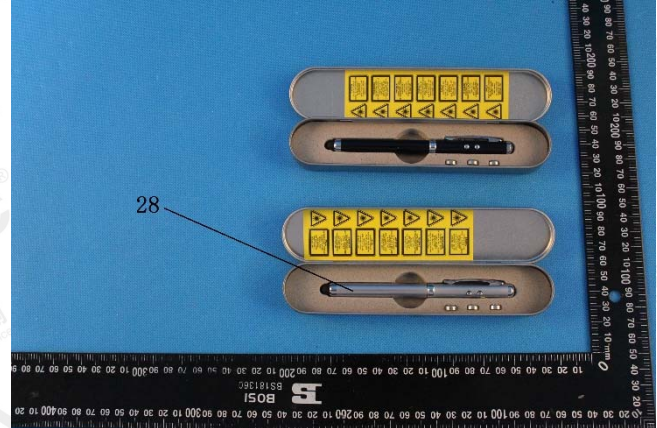
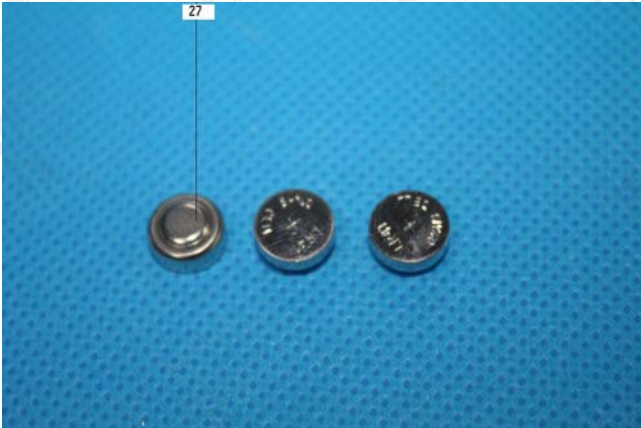


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