TEST REPORT

Report No.	:	WTF23F01000113A1C
Applicant	:	
Address	:	
Manufacturer	:	
Address	:	
Sample Name	:	LED High Bay
Sample Model	:	BT-BM240W
Reference Model No.	:	BT-BM80W, BT-BM120W, BT-BM150W, BT-BM200W
Date of Receipt sample	:	2023-01-03 & 2023-04-03
Testing period	:	2023-01-03 to 2023-02-17 & 2023-04-03 to 2023-04-04
Date of Issue	:	2023-04-06
Test Result	:	Refer to next page (s)

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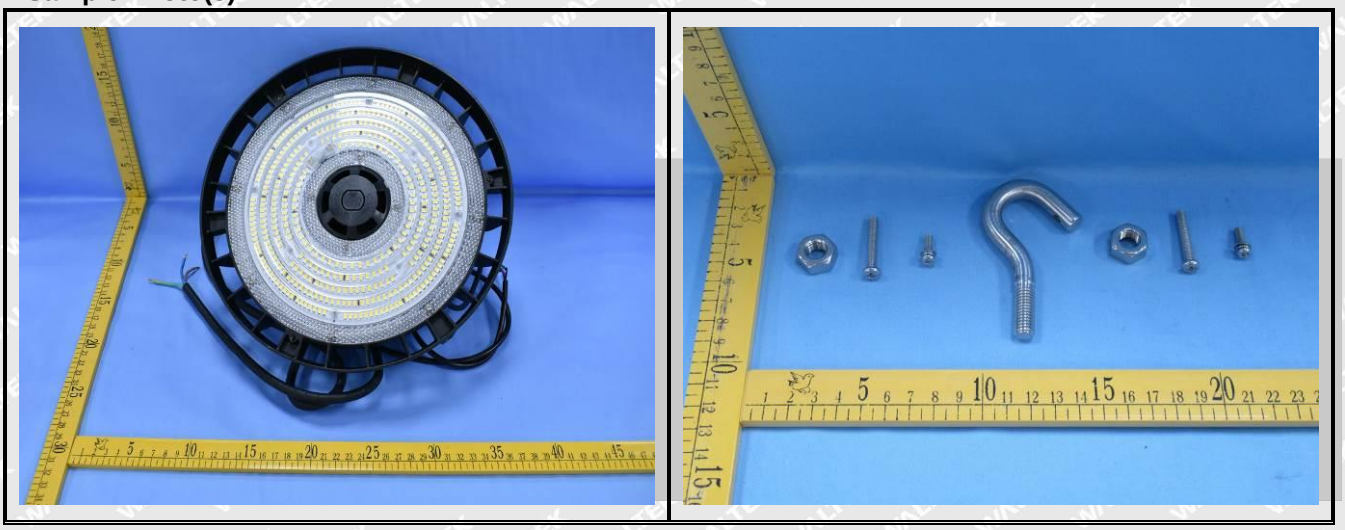
Signed for and on behalf of
Waltek Testing Group (Foshan) Co., Ltd.

Swing.Liang

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** (As per client's requirement, to test the specified components. The results of specified components comply with the requirement of EU RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863)

Sample Photo(s):



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 coating	BL	BL	BL	BL	BL	NA
2	Silvery metal shell without black coating	BL	BL	BL	BL	--	NA
3	Black plastic sheet	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
4	White coating	BL	BL	BL	BL	BL	NA
5	Silvery metal sheet without white coating	BL	BL	BL	BL	--	NA
6	Grey glue	BL	BL	BL	BL	BL	NA
7	Chip resistor	BL	IN	BL	BL	BL	Pb :188
8	Golden metal tube	BL	BL	BL	BL	--	NA
9	Transparent plastic sheet	BL	BL	BL	BL	BL	NA
10	White soft plastic ring	BL	BL	BL	BL	BL	NA
11	Silvery metal sheet without black coating	BL	BL	BL	IN	--	Cr^{6+} : Negative
13	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
14	Black soft plastic stopper	BL	BL	BL	BL	BL	NA
15	Golden metal sheet	BL	BL	BL	BL	--	NA
16	Brown plastic wire covering	BL	BL	BL	BL	BL	NA
17	Coppery metal wire	BL	BL	BL	BL	--	NA
18	Blue plastic wire covering	BL	BL	BL	BL	BL	NA
19	Yellow-green plastic wire covering	BL	BL	BL	BL	BL	NA
20	Black plastic wire jacket	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	
21	Dark pink plastic wire covering	BL	BL	BL	BL	BL	NA
22	Silvery metal wire	BL	BL	BL	BL	--	NA
23	Black soft plastic tube	BL	BL	BL	BL	BL	NA
24	Solder	BL	BL	BL	BL	--	NA
25	Black plastic wire covering	BL	BL	BL	BL	BL	NA
26	Dark purple plastic wire covering	BL	BL	BL	BL	BL	NA
27	White fibrous wire	BL	BL	BL	BL	BL	NA
28	Black plastic tube	BL	BL	BL	BL	BL	NA
29	Black soft plastic tube	BL	BL	BL	BL	BL	NA
30	Silvery metal screw	BL	BL	BL	IN	--	Cr^{6+} : Negative
31	Silvery metal gasket	BL	BL	BL	IN	--	Cr^{6+} : Negative
32	Silvery metal gasket	BL	BL	BL	IN	--	Cr^{6+} : Negative
33	Silvery metal screw	BL	BL	BL	IN	--	Cr^{6+} : Negative
34	Silvery metal screw	BL	BL	BL	IN	--	Cr^{6+} : Negative
35	Silvery metal screw	BL	BL	BL	IN	--	Cr^{6+} : Negative
36	Silvery metal tube	BL	BL	BL	BL	--	NA
37	White fibrous tube	BL	BL	BL	BL	BL	NA

Remark:

(1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr^{6+}) 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, $\mu g/cm^2$= 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^{6+}		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	$\mu g/cm^2$	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^{6+} for polymer and composite sample is 8mg/kg and LOQ of Cr^{6+} for metal sample is 0.1$\mu g/cm^2$.

(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 Cr^{6+} on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.
Boiling water extraction:
Negative = Absence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is less than 0.10ug/cm^2.
Positive = Presence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/cm^2.
Information on storage conditions and production date of the tested sample is unavailable and thus Cr^{6+} 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.

(11) As per client's requirement, to test the specified components. The test results relate only to the components tested, and it doesn't mean that the whole product complies with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.

2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1	ND	ND	ND	ND
T02	2	--	--	--	--
T03	3	ND	ND	ND	ND
T04	4	ND	ND	ND	ND
T05	5	--	--	--	--
T06	6	ND	ND	ND	ND
T07	7	ND	ND	ND	ND
T08	8	--	--	--	--
T09	9+28△	ND	ND	ND	ND
T10	10	ND	ND	ND	ND
T11	11	--	--	--	--
T12	13	ND	ND	ND	ND
T13	14	ND	ND	ND	ND
T14	15	--	--	--	--
T15	16	ND	ND	ND	ND
T16	17	--	--	--	--
T17	18	ND	ND	ND	ND
T18	19	ND	ND	ND	ND
T19	20	ND	ND	ND	ND
T20	21	ND	ND	ND	ND
T21	22	--	--	--	--
T22	23	ND	ND	ND	ND
T23	24	--	--	--	--
T24	25	ND	ND	ND	ND
T25	26	ND	ND	ND	ND

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T26	27	ND	ND	ND	ND
T27	29	ND	ND	ND	ND
T28	30	--	--	--	--
T29	31	--	--	--	--
T30	32	--	--	--	--
T31	33	--	--	--	--
T32	34	--	--	--	--
T33	35	--	--	--	--
T34	36	--	--	--	--
T35	37	ND	ND	ND	ND

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.

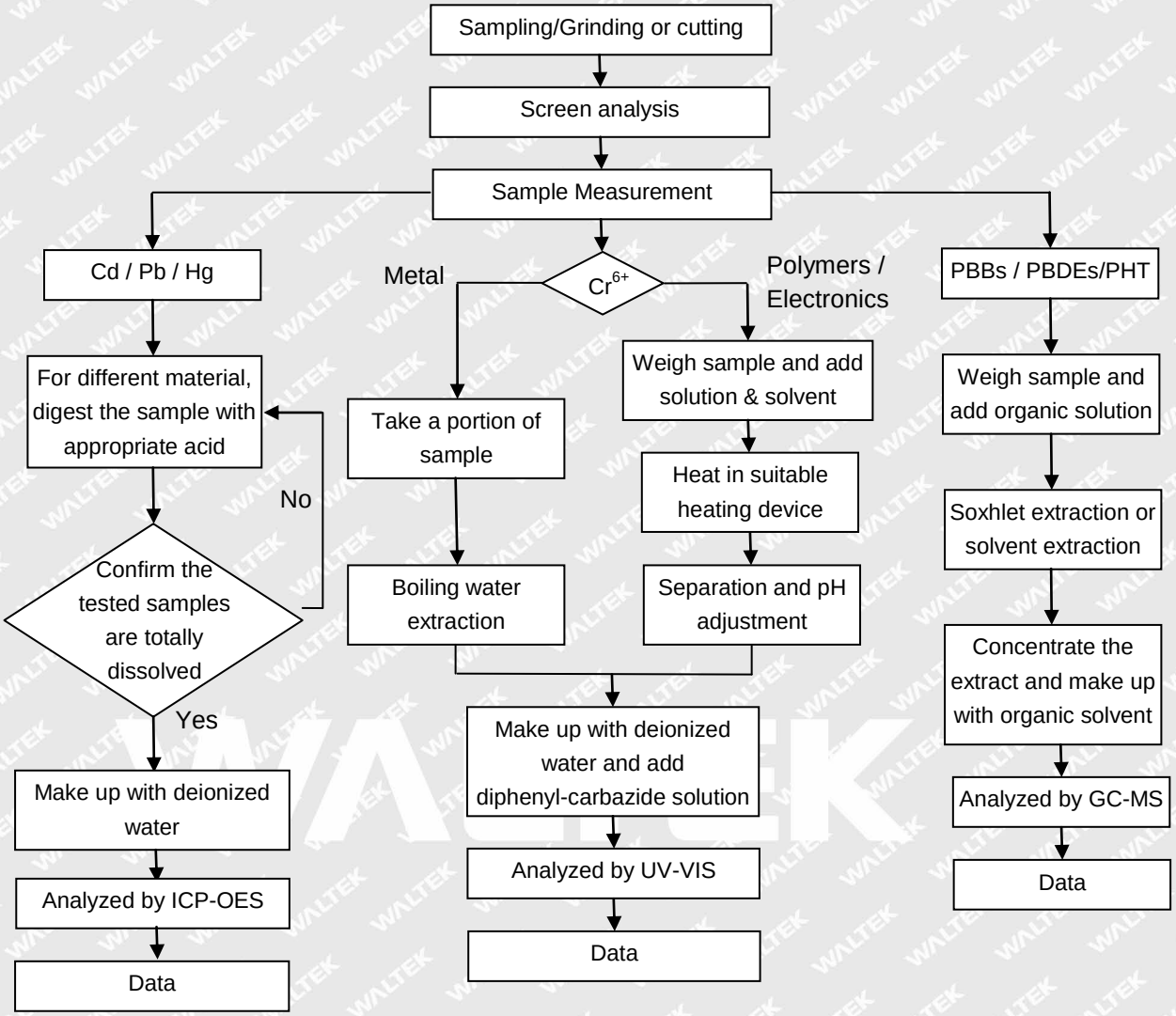
(6) RoHS requirement

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)

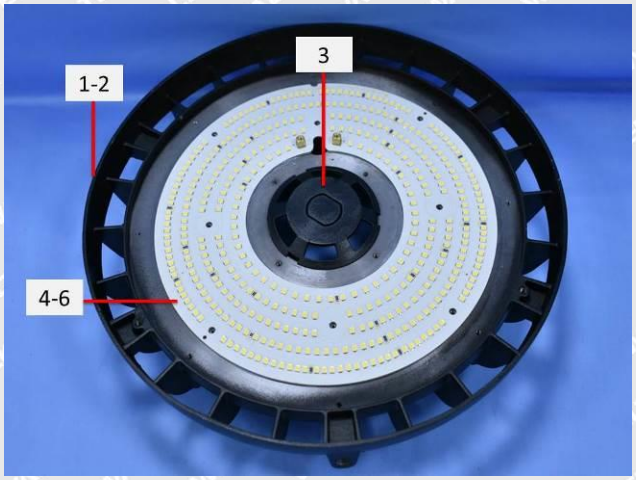
(7) "△"= As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

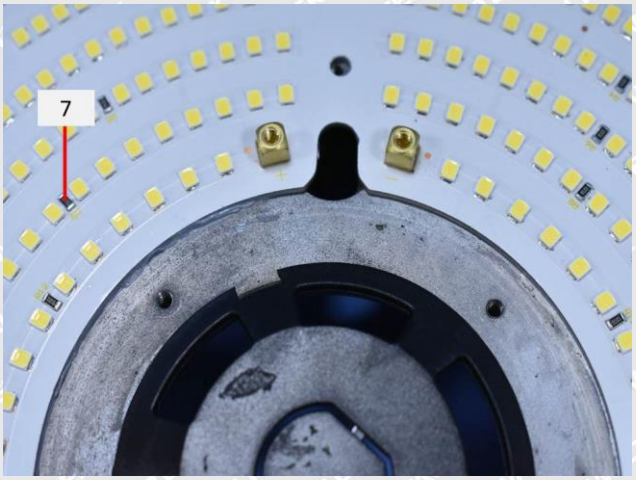
(8) As per client's requirement, to test the specified components. The test results relate only to the components tested, and it doesn't mean that the whole product complies with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.

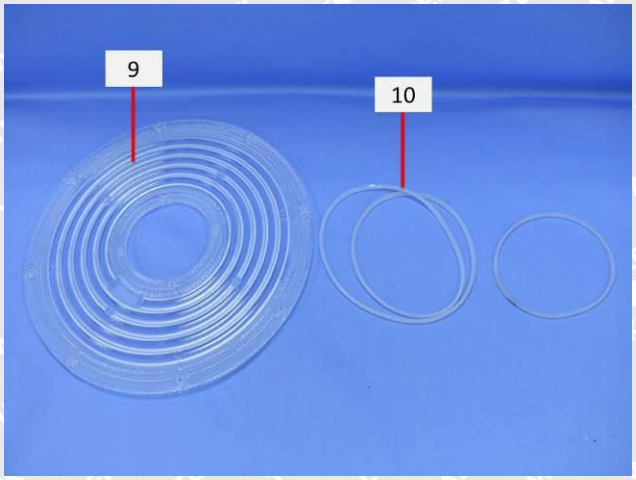
Measurement Flowchart:

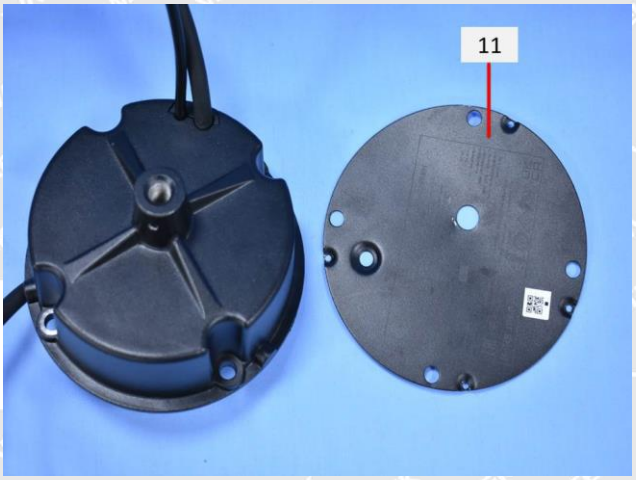


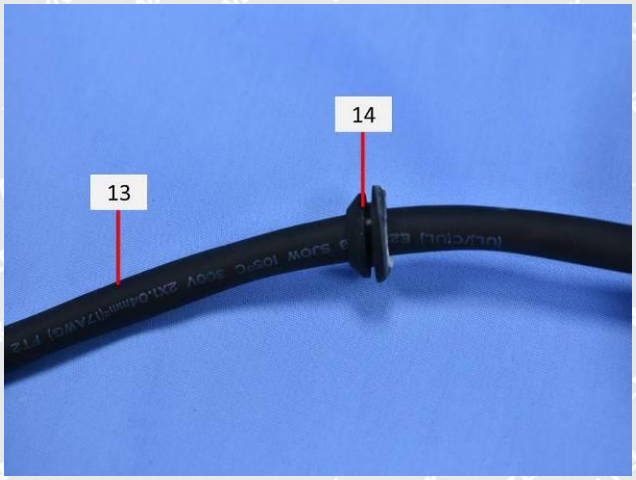
Photograph(s) of parts tested:

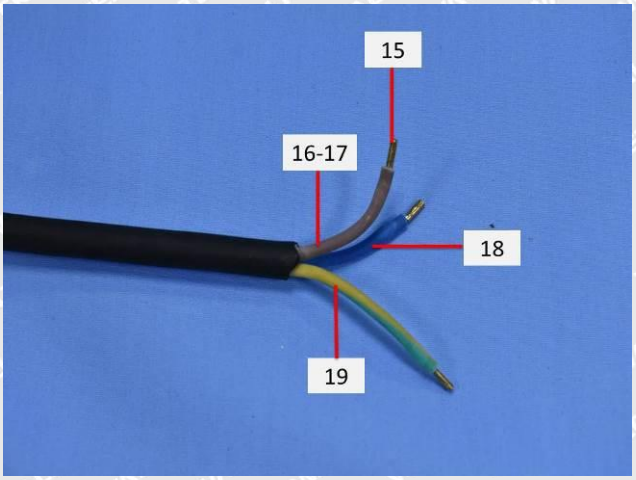


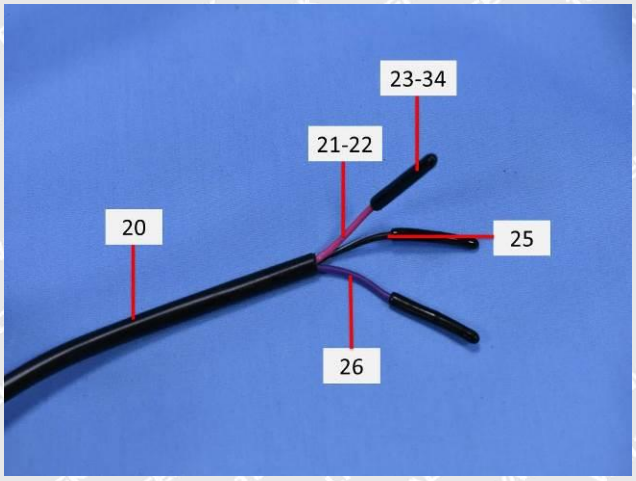


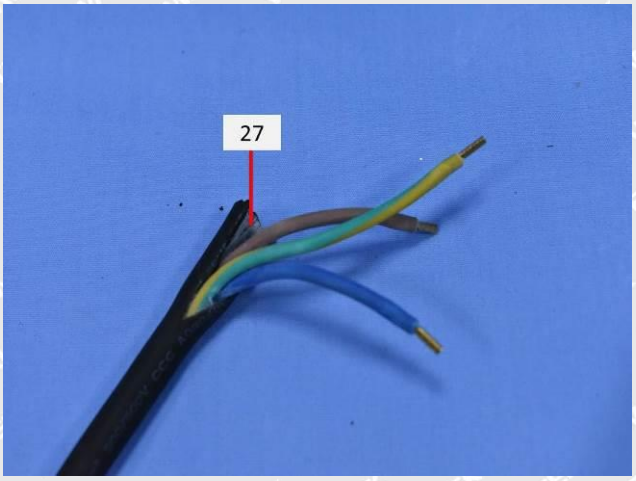


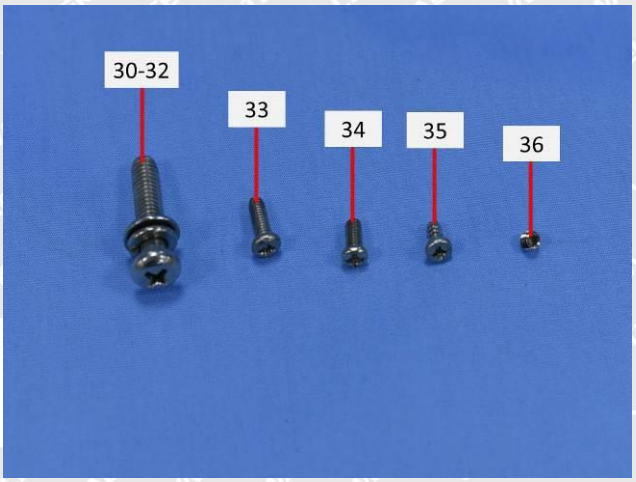


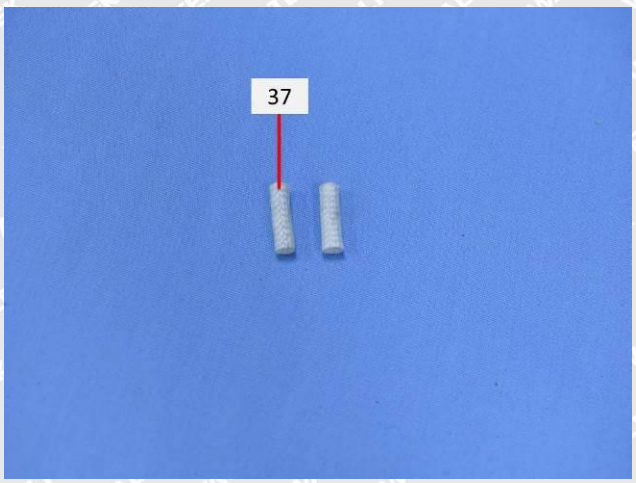


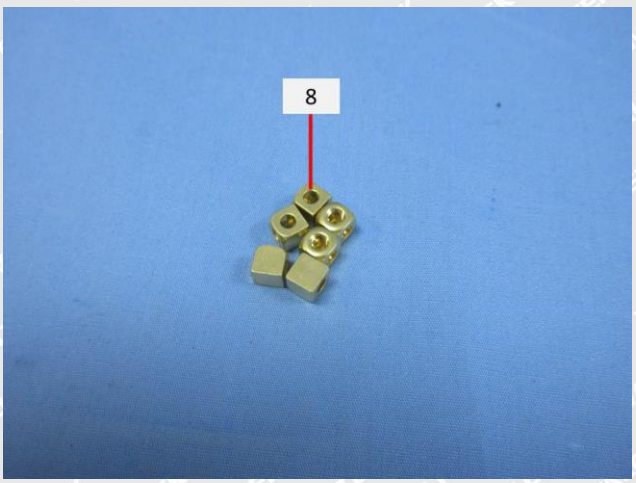












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====== End of Report ======