TEST REPORT

Report No.: LCS200107001AR Date: 2020.01.04

Applicant : **NEKO LIGHTING AG**

Address : **Kreuzstrasse 2, CH-8008 Zürich, Switzerland**

Report on the submitted samples said to be:

Sample Name : **LED Ceiling Light & LED Pendant Light**

Trade Mark : NEKO

Test Model No : **GAME 900-U-90W**

Reference Model : **GAME 350-12W, GAME 350-18W, GAME 350-24W, GAME 450-18W, GAME 450-25W, GAME 450-36W, GAME 600-25W, GAME 600-38W, GAME 600-50W, GAME 600-70W, GAME 900-65W, GAME-XS 350-12W, GAME-XS 350-18W, GAME-XS 450-18W, GAME-XS 450-25W, GAME-XS 600-25W, GAME-XS 600-38W, GAME-XS 600-50W, GAME-XS 900-65W, SUGAR 350-12W, SUGAR 350-18W, SUGAR 350-24W, SUGAR 450-18W, SUGAR 450-25W, SUGAR 450-36W, SUGAR 600-25W, SUGAR 600-38W, SUGAR 600-50W, SUGAR 600-70W, SUGAR 900-65W, SUGAR-XS 350-12W, SUGAR-XS 350-18W, SUGAR-XS 450-18W, SUGAR-XS 450-25W, SUGAR-XS 600-25W, SUGAR-XS 600-38W, SUGAR-XS 600-50W, SUGAR-XS 900-65W, GAME 350-U-20W, GAME 350-U-26W, GAME 350-U-32W, GAME 450-U-29W, GAME 450-U-36W, GAME 450-U-47W, GAME 600-U-43W, GAME 600-U-56W, GAME 600-U-68W, GAME 600-U-88W, GAME 900-U-90W, GAME-XS 350-U-20W, GAME-XS 350-U-26W, GAME-XS 450-U-29W, GAME-XS 450-U-36W, GAME-XS 600-U-43W, GAME-XS 600-U-56W, GAME-XS 600-U-68W, GAME-XS 900-U-90W, SUGAR 350-U-20W, SUGAR 350-U-26W, SUGAR 350-U-32W, SUGAR 450-U-29W, SUGAR 450-U-36W, SUGAR 450-U-47W, SUGAR 600-U-43W, SUGAR 600-U-56W, SUGAR 600-U-68W, SUGAR 600-U-88W, SUGAR 900-U-90W, SUGAR-XS 350-U-20W, SUGAR-XS 350-U-26W, SUGAR-XS 450-U-29W, SUGAR-XS 450-U-36W, SUGAR-XS 600-U-43W, SUGAR-XS 600-U-56W, SUGAR-XS 600-U-68W, SUGAR-XS 900-U-90W**

Testing Period : **December 26, 2019 ~ January 04, 2020**

Results : **Please refer to next page(s).**

TEST REQUEST	CONCLUSION
According to the customer's request, based on the performed tests on submitted sample, the result of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, Dibuyl Phthalate(DBP), Benzylbutyl Phthalate(BBP), Bis(2-ethylhexyl) Phthalate(DEHP), Diispbutyl phthalate(DIBP) content comply with the limit requirement as set of RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.	Pass

Signed for and on behalf of LCS

Daniel

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Results:

A.EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results						Date of sample submission/resubmission
		Cd	Pb	Hg	Cr▼	Br▼		
						PBBs	PBDEs	
1	Light white plastic lampshade	BL	BL	BL	BL	BL	BL	2019-12-26
2	White metal frame	BL	BL	BL	BL	/	/	2019-12-26
3	White sheet metal	BL	BL	BL	BL	/	/	2019-12-26
4	White sheet metal	BL	BL	BL	BL	/	/	2019-12-26
5	Silver gray metal	BL	BL	BL	BL	/	/	2019-12-26
6	Yellow LED light bead	BL	BL	BL	BL	BL	BL	2019-12-26
7	Milky white plastic lampshade	BL	BL	BL	BL	BL	BL	2019-12-26
8	Black plastic socket	BL	BL	BL	BL	BL	BL	2019-12-26
9	White plastic terminal	BL	BL	BL	BL	BL	BL	2019-12-26
10	Silver grey metal ring	BL	X	BL	X	/	/	2019-12-26
11	Black plastic wire card	BL	BL	BL	BL	BL	BL	2019-12-26
12	White plastic line card	BL	BL	BL	BL	BL	BL	2019-12-26
13	Silver metal sheet	OL	OL	BL	X	/	/	2019-12-26
14	Black plastic wire	BL	BL	BL	BL	BL	BL	2019-12-26
15	Red plastic wire	BL	BL	BL	BL	BL	BL	2019-12-26
16	Black plastic wire	BL	BL	BL	BL	BL	BL	2019-12-26
17	Light white plastic line card	BL	BL	BL	BL	BL	BL	2019-12-26
18	Blue plastic wire	BL	BL	BL	BL	BL	BL	2019-12-26
19	Brown plastic wire	BL	BL	BL	BL	BL	BL	2019-12-26
20	Copper wire	BL	BL	BL	BL	/	/	2019-12-26
21	Yellow green two color liner	BL	BL	BL	BL	BL	BL	2019-12-26
22	White plastic wire	BL	BL	BL	BL	BL	BL	2019-12-26
23	Silver grey wire rope	BL	X	BL	X	/	/	2019-12-26
24	White plastic plug	BL	BL	BL	BL	BL	BL	2019-12-26
25	Silver gray metal screw	BL	BL	BL	X	/	/	2019-12-26

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Seq. No.	Tested Part(s)	Results						Date of sample submission/resubmission
		Cd	Pb	Hg	Cr▼	Br▼		
						PBBs	PBDEs	
26	Silver gray metal screw	BL	BL	BL	BL	/	/	2019-12-26
27	Silver metal screw	BL	BL	BL	BL	/	/	2019-12-26
28	Black metal screw	X	BL	BL	BL	/	/	2019-12-26

Note:

(1) Results were obtained by XRF for primary screening, 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 below warning value according to IEC 62321-3-1:2013.

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

Note:

BL = Below Limit
OL = Over Limit
X = Inconclusive

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

(3) The maximum permissible limit is quoted from the document 2015/863/EC amending RoHS directive 2011/65/EU:

(4) ▼=For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr(VI), and the results showed the total Cr content

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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
Dibuyl Phthalate(DBP)	1000
Benzylbutyl Phthalate(BBP)	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	1000
Diispbutyl phthalate(DIBP)	1000

Disclaimers:

This XRF Screening 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 screening 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. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

Test method:

Lead(Pb) & Cadmium(Cd) Content:
With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Mercury(Hg) Content:
With reference to IEC 62321-4:2013+AMD1:2017 CSV*, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Hexavalent Chromium(Cr(VI)) Content:
With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:
With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Lead (Pb) and Cadmium (Cd)

Item	Unit	MDL	Results			Limit
			(10)	(13)	(23)	
Lead Content (Pb)	mg/kg	5	35	11	23	1000

Item	Unit	MDL	Results		Limit
			(13)	(28)	
Cadmium Content (Cd)	mg/kg	5	N.D.	N.D.	100

2) The test results of Hexavalent Chromium (Cr(VI))(metal)

Item	Unit	MDL	Results				Limit
			(10)	(13)	(23)	(25)	
Hexavalent Chromium(Cr(VI))▼	ug/cm^2	0.10	N.D.	N.D.	N.D.	N.D.	-

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Note:

- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm^2
- ▼ = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13ug/cm^2. The sample coating is considered to contain Cr(VI)
  b. The sample is negative for Cr(VI) if Cr(VI) is N.D.(concentration less than 0.10ug/cm^2). The sample coating is considered a non- Cr(VI) based coating
  c. The result between 0.10μg/cm^2 and 0.13μg/cm^2 is considered to be inconclusive, unavoidable coating variations may influence the determination
- Information on storage conditions and production date of the tested samples is unavailable and thus Cr(VI) results represent status of the sample at the time of testing
- mg/kg = ppm=parts per million
- N.D.=Not Detected(<MDL or LOQ)

#1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.

#2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).

#3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.

#4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).

#5 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.

#6 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact is exempted.

#7 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its Amendments，Lead is exempted in steel for machining purposes and in galvanised steel containing up to 0.35% (3500ppm) by weight.

- Flow chart appendix is included.
- Photo appendix is included.
- *=The test items were not accredited by CNAS.
- This report test data reference report LCS191203069AR test data

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3) The test results of DBP, BBP, DEHP & DIBP

Item	Unit	MDL	Results	Limit
			1+6+7+8+9+11	
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000

Item	Unit	MDL	Results	Limit
			17+24	
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000

Item	Unit	MDL	Results				Limit
			12	14	15	16	
Dibuyl Phthalate(DBP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000

Item	Unit	MDL	Results				Limit
			18	19	21	22	
Dibuyl Phthalate(DBP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	100	N.D.	N.D.	N.D.	N.D.	1000

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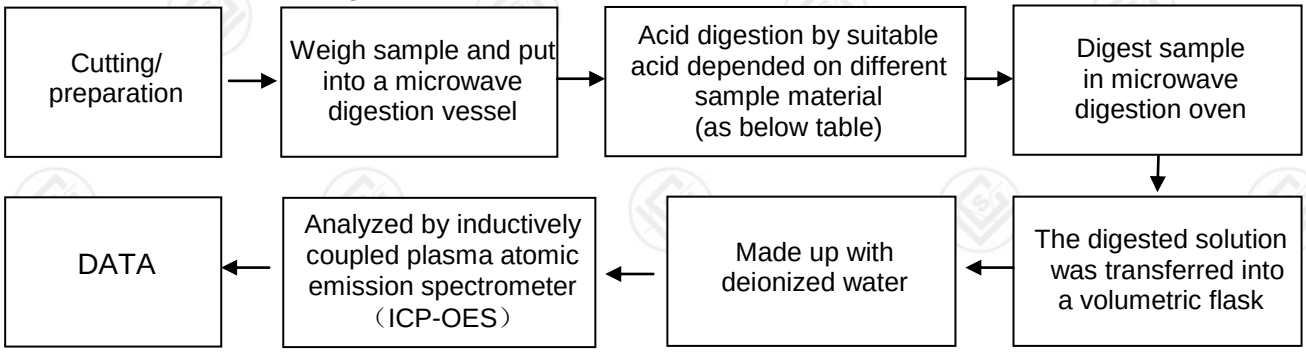
Remark:

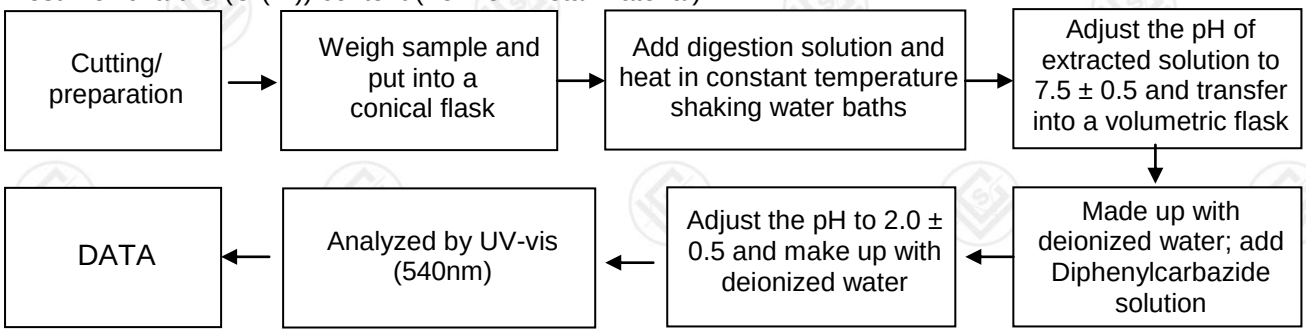
- mg/kg = ppm
- N.D. = Not detected
- MDL=Method detected limited
- Flow chart appendix is included
- Photo appendix is included.

Appendix

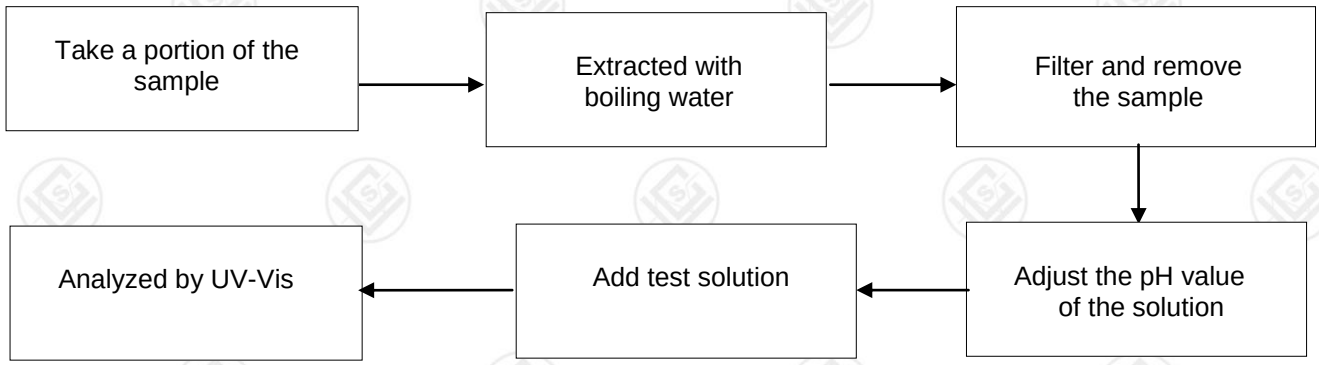
1. Test Flow chart for Cd/Pb /Hg content



2. Test Flowchart for(Cr(VI)) content (For non-metal material)



Test Flowchart for (Cr(VI)) content (For metal material)



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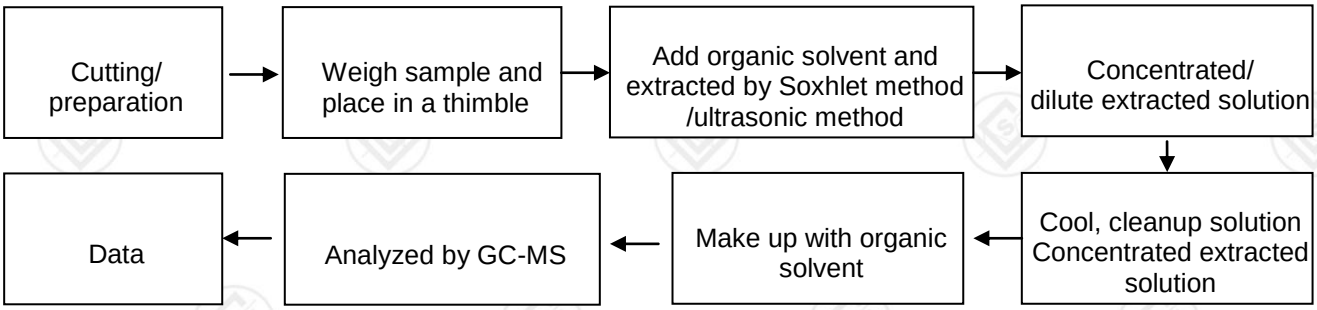
3. Test Flow chart for PBBs & PBDEs & DBP & BBP & DEHP & DIBP content



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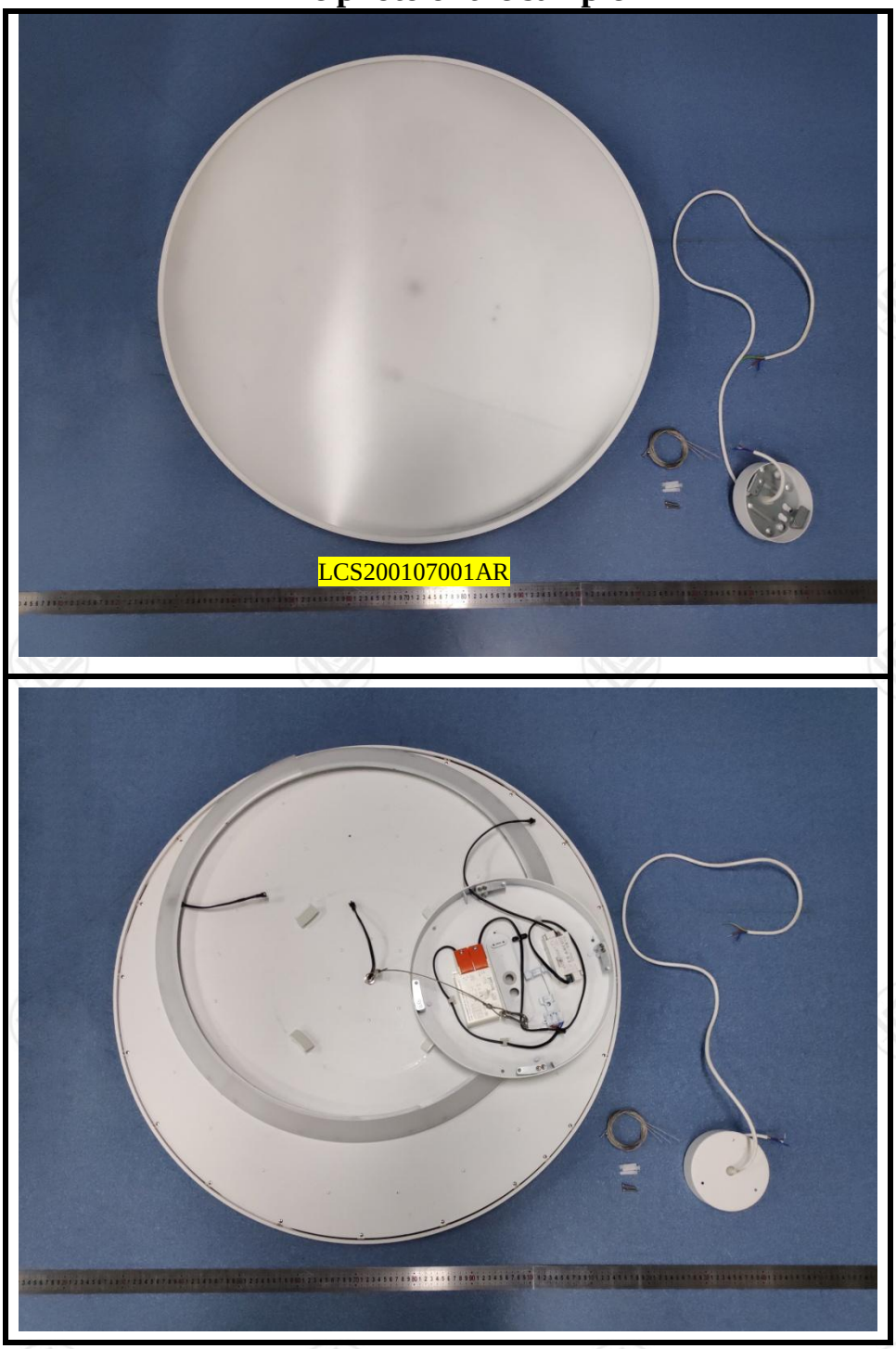
The photo of the sample



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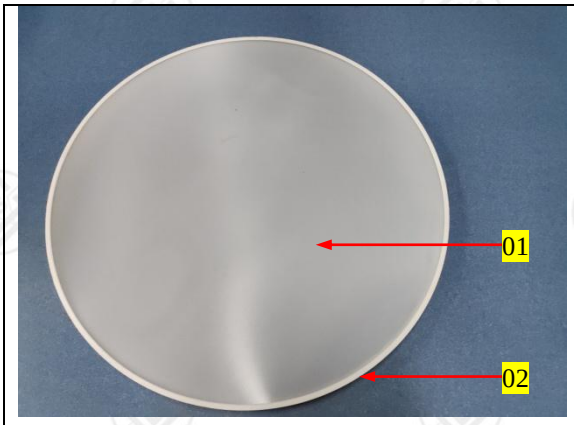

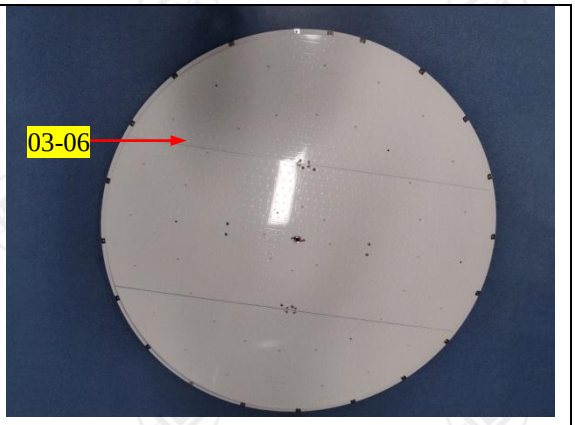

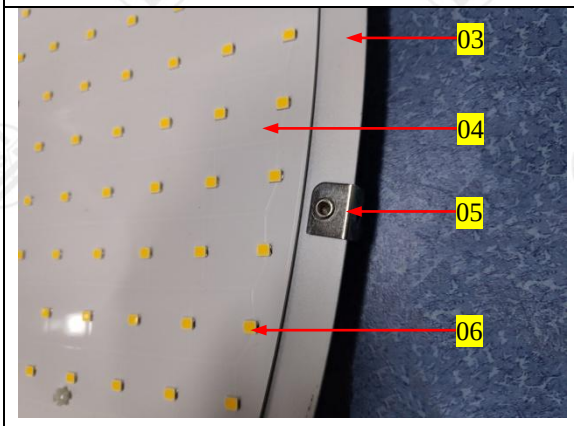

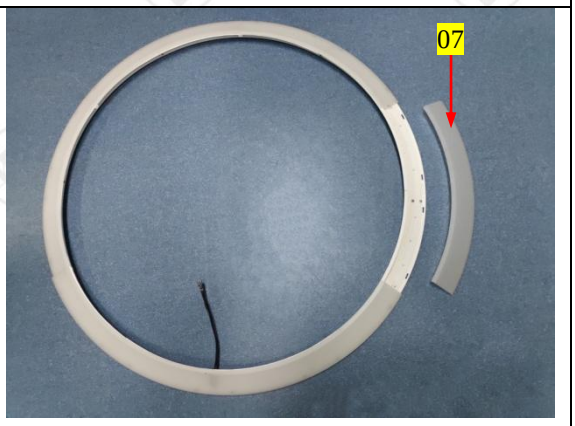

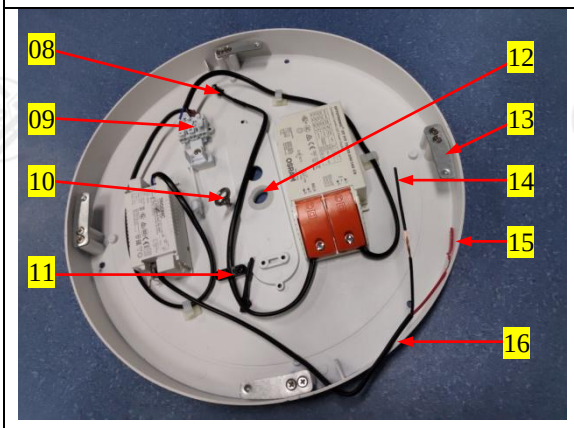

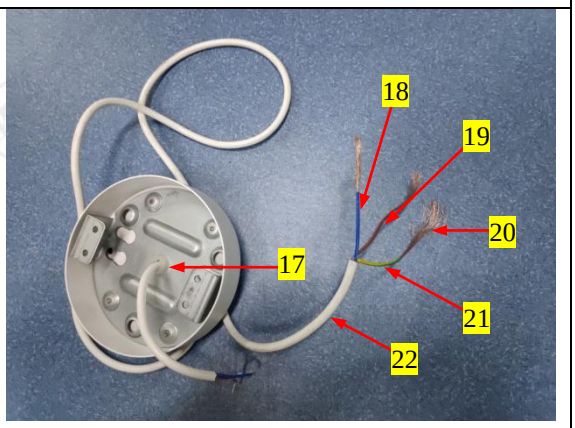

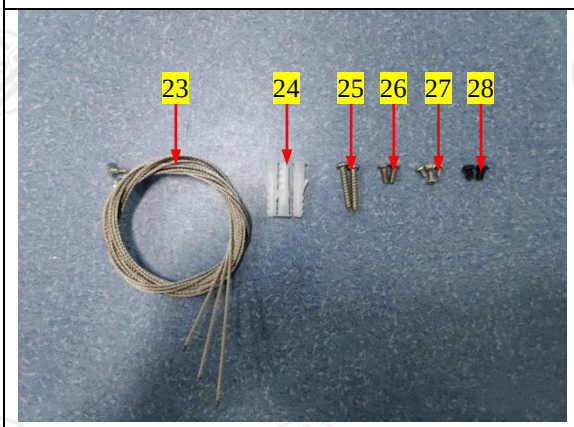

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********** End of Report **********

Statement:

1. The test report is considered invalidated without approval signature, special seal on the perforation.
2. The result(s) shown in this report refer only to the sample(s) tested.
3. Without written approval of LCS, this report can't be reproduced except in full.
4. The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which LCS hasn't verified.
5. In case of any discrepancy between the English version and Chinese version of the testing reports(if generated), the Chinese version shall prevail.