



Technical Report No. 64.164.14.000164.01

Rev. 00

Dated 2014-03-11

Client: ZhongShan LiangYi Lighting CO., LTD
BeiHai Industrial Zone, Guzhen Town, ZhongShan, GuangDong,
P.R.China

Test Subject: The submitted sample was identified and described by client as:
Lamps
Model: GU13008-3R, GU13008-4TU2, T12074(red, black, green, orange),
WL050A, WL438A

Test Method: Please refer to next page(s)


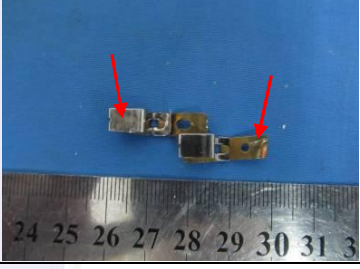

Test Result: Please refer to next page(s)

Test Requested and Conclusion: Test according to RoHS (Restriction of Hazardous Substances) directive
2011/65/EU Annex II on submitted samples

- Heavy Metal (Pb, Cd, Hg and CrVI) Content **PASS**
-
- Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs) Content **PASS**

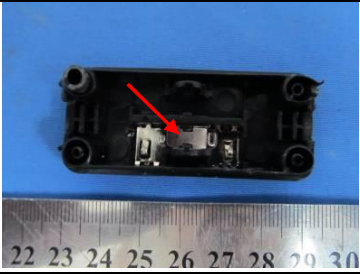
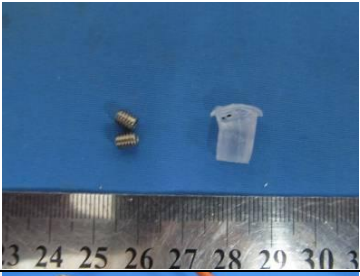

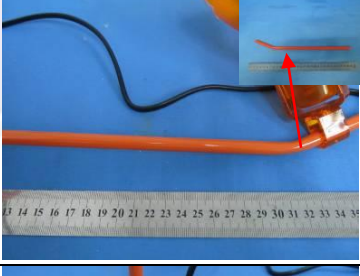

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1. Description of the test subject






Sample No.	Model No.	Description	Photograph
001	T12074 black	Transparent black plastic cover	
002		Black plastic part	
003	T12074 black	White plastic part	
004	T12074 black	Silvery metal sheet	
005		Golden metal sheet	
006	T12074 black	Black plastic heating shrinkable tube	
007		Brown plastic wire jacket	
008		Blue plastic wire jacket	
009		Copper-colored metal wire	
010		Golden metal terminal	
011	T12074 black	Black coating	
012		Silver metal tube	

Sample No.	Model No.	Description	Photograph
013	T12074 black	Black plastic base	
014	T12074 black	Silvery metal screw	
015		Grey foam	
016	T12074 black	Black foam	
017		Silvery metal sheet	
018	T12074 black	Silvery metal pin	
019		Black plastic holder	
020		Black plastic plug	
021		Black plastic cable jacket	
*022	T12074 black	Black plastic sheet	
023		Black plastic button	

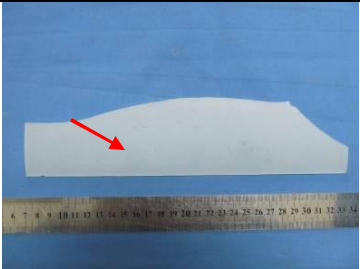
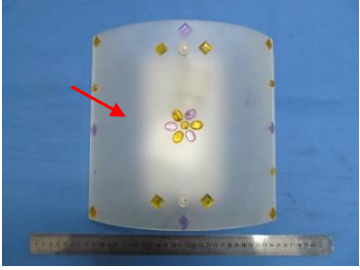
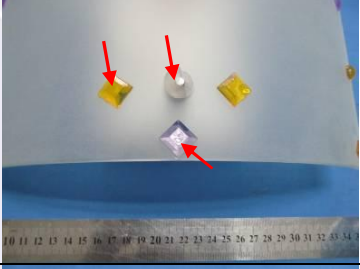


Remark: * means the retest sample was provided by client on 2014-03-03.


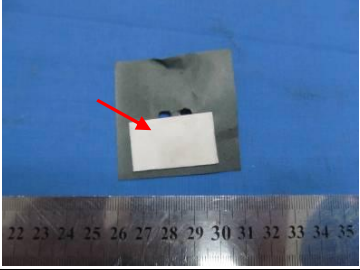



Sample No.	Model No.	Description	Photograph
024	T12074 black	Silvery metal sheet	
025	T12074 black	Silvery metal screw	
026		Transparent plastic tube	
027	T12074 Orange	Transparent orange plastic cover	
028		Transparent orange plastic part	
*029	T12074 Orange	Orange coating	
030	T12074 Orange	Orange plastic base	


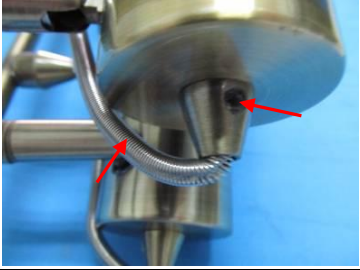
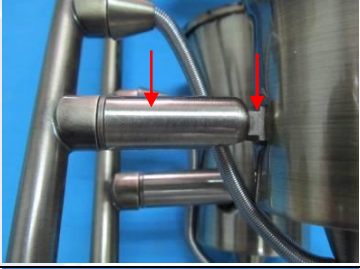


Remark: * means the retest sample was provided by client on 2014-02-24.


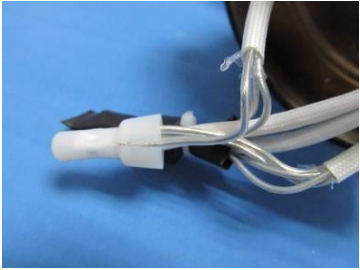
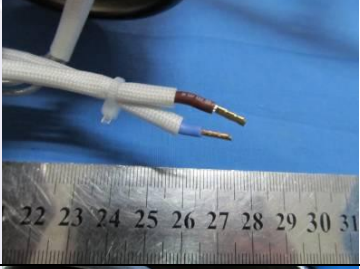


Sample No.	Model No.	Description	Photograph
031	T12074 red	Transparent red plastic cover	
032		Transparent red plastic part	
033	T12074 red	Red coating	
034	T12074 red	Red plastic base	
035	T12074 red	Transparent green plastic cover	
036		Transparent green plastic part	
037	T12074 red	Green coating	

Sample No.	Model No.	Description	Photograph
038	T12074 red	Green plastic part	
039	WL438A	Silvery metal part	
040	WL438A	Silvery metal sheet	
041		Beige plastic part	
042		Beige plastic part	
043	WL438A	White coating	
044		Silvery metal part	
045	WL438A	Silvery metal washer	
046		Silvery metal nut	
047		Silvery metal ring	
048		Silvery metal screw	
049		Silvery metal part	

Sample No.	Model No.	Description	Photograph
050	WL438A	Translucent glass	
051	WL050A	Translucent glass	
052	WL050A	Transparent yellow plastic part	
053		Transparent plastic part	
054		Transparent purple plastic part	
055	WL050A	White plastic part	
056		Silvery metal screw	
057		Silvery metal axle	
058		Translucent plastic tie	
059	WL050A	Translucent plastic part	
060		Blue surfaced metal screw	
061		Blue surfaced metal block	

Sample No.	Model No.	Description	Photograph
062	WL050A	Silvery plastic label	
063		Grey paper board with transparent film	
064	WL050A	White adhesive foam	
065	WL050A	Silvery metal screw	
066	GU13008-4TU2	Copper-colored metal cover	
067	GU13008-4TU2	Beige ceramic	

Sample No.	Model No.	Description	Photograph
068	GU13008-4TU2	Silvery metal sheet	
069		Silvery metal rivet	
070	GU13008-4TU2	Transparent plastic screw	
071		Silvery metal spring	
072	GU13008-4TU2	Copper-colored metal axle	
073		Copper-colored metal joint	
074	GU13008-4TU2	Silvery metal spring	
075	GU13008-4TU2	Copper-colored metal tube	
076		Silvery plated plastic	
077		Copper-colored metal base	

Sample No.	Model No.	Description	Photograph
078	GU13008-4TU2	Silvery metal sheet	
079		Silvery metal screw	
080	GU13008-4TU2	Translucent plastic cover	
081		Silvery metal joint inner	
082		Transparent plastic wire jacket	
083		Silvery metal wire	
084		Silvery metal tube	
085	GU13008-4TU2	White fiber glass tube	
086		Brown plastic wire jacket	
087		Blue plastic wire jacket	
088	GU13008-4TU2	Silvery metal part	
089	GU13008-3R	Silvery metal nut	



2. Order

2.1 Date of Purchase Order

2014-01-21

2.2 Receipt of Test Sample, Location

2014-01-21, 2014-02-24, 2014-03-03, Guangzhou

2.3 Date of Testing

2014-01-21 to 2014-03-11

2.4 Location of Testing

The chemical testing was performed in TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch. Chemical lab and the XRF testing was performed at TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch. The test results were reviewed at TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch.





3. Test Results

3.1 Screening test for the specified hazardous substances of RoHS for the selected materials of the submitted sample:

- Heavy Metal (Cadmium, Chromium, Mercury, Lead) Content Test
- Bromine Content Test

According to EN 62321: 2009, and Quantification analyzed with Energy Dispersive X-ray Fluorescence Spectrometers.

Sample No.	Total Cadmium	Total Lead	Total Mercury	Total Chromium	Total Bromine
Sample 001	BL	BL	BL	BL	BL
Sample 002	BL	BL	BL	BL	BL
Sample 003	BL	BL	BL	BL	Inconclusive ^
Sample 004	BL	BL	BL	Inconclusive ^	N.A.
Sample 005	BL	BL	BL	BL	N.A.
Sample 006	BL	BL	BL	BL	BL
Sample 007	BL	BL	BL	BL	BL
Sample 008	BL	BL	BL	BL	BL
Sample 009	BL	Inconclusive ^	BL	BL	N.A.
Sample 010	BL	BL	BL	BL	N.A.
Sample 011	BL	BL	BL	BL	BL
Sample 012	BL	BL	BL	Inconclusive ^	N.A.
Sample 013	BL	BL	BL	BL	BL
Sample 014	BL	OL^	BL	BL	N.A.
Sample 015	BL	BL	BL	BL	BL
Sample 016	BL	BL	BL	BL	BL
Sample 017	BL	BL	BL	Inconclusive ^	N.A.
Sample 018	BL	OL^	BL	BL	N.A.
Sample 019	BL	BL	BL	BL	Inconclusive ^
Sample 020	BL	BL	BL	BL	BL
Sample 021	BL	BL	BL	BL	BL
Sample 022σ	BL	BL	BL	BL	Inconclusive ^
Sample 023	BL	BL	BL	BL	BL
Sample 024	BL	BL	BL	BL	N.A.
Sample 025	BL	BL	BL	BL	N.A.
Sample 026	BL	BL	BL	BL	BL
Sample 027	BL	BL	BL	BL	BL
Sample 028	BL	BL	BL	BL	BL
Sample 029σ	BL	BL	BL	BL	BL



Sample No.	Total Cadmium	Total Lead	Total Mercury	Total Chromium	Total Bromine
Sample 030	BL	BL	BL	BL	BL
Sample 031	BL	BL	BL	BL	BL
Sample 032	BL	BL	BL	BL	BL
Sample 033	BL	BL	BL	BL	BL
Sample 034	BL	BL	BL	BL	BL
Sample 035	BL	BL	BL	BL	BL
Sample 036	BL	BL	BL	BL	BL
Sample 037	BL	BL	BL	BL	BL
Sample 038	BL	BL	BL	BL	BL
Sample 039	BL	BL	BL	Inconclusive ^	N.A.
Sample 040	BL	BL	BL	BL	N.A.
Sample 041	BL	BL	BL	BL	Inconclusive ^
Sample 042	BL	BL	BL	BL	Inconclusive ^
Sample 043	BL	BL	BL	BL	Inconclusive ^
Sample 044	BL	BL	BL	Inconclusive ^	N.A.
Sample 045	BL	BL	BL	BL	N.A.
Sample 046	BL	BL	BL	BL	N.A.
Sample 047	BL	BL	BL	Inconclusive ^	N.A.
Sample 048	BL	BL	BL	BL	N.A.
Sample 049	BL	OL^	BL	BL	N.A.
Sample 050	BL	BL	BL	BL	BL
Sample 051	BL	BL	BL	BL	BL
Sample 052	BL	BL	BL	BL	BL
Sample 053	BL	BL	BL	BL	BL
Sample 054	BL	BL	BL	BL	BL
Sample 055	BL	BL	BL	BL	BL
Sample 056	BL	BL	BL	BL	N.A.
Sample 057	BL	BL	BL	Inconclusive ^	N.A.
Sample 058	BL	BL	BL	BL	BL
Sample 059	BL	BL	BL	BL	BL
Sample 060	BL	Inconclusive ^	BL	BL	N.A.
Sample 061	BL	BL	BL	Inconclusive ^	N.A.
Sample 062	BL	BL	BL	BL	BL
Sample 063	BL	BL	BL	BL	BL
Sample 064	BL	BL	BL	BL	BL
Sample 065	BL	BL	BL	BL	N.A.
Sample 066	BL	BL	BL	BL	N.A.
Sample 067	BL	BL	BL	BL	BL



Sample No.	Total Cadmium	Total Lead	Total Mercury	Total Chromium	Total Bromine
Sample 068	BL	BL	BL	Inconclusive ^	N.A.
Sample 069	BL	BL	BL	BL	N.A.
Sample 070	BL	BL	BL	BL	BL
Sample 071	BL	BL	BL	Inconclusive ^	N.A.
Sample 072	BL	BL	BL	BL	N.A.
Sample 073	BL	BL	BL	BL	N.A.
Sample 074	BL	BL	BL	BL	N.A.
Sample 075	BL	BL	BL	BL	N.A.
Sample 076	BL	BL	BL	BL	BL
Sample 077	BL	BL	BL	BL	N.A.
Sample 078	BL	BL	BL	BL	N.A.
Sample 079	BL	BL	BL	BL	N.A.
Sample 080	BL	BL	BL	BL	BL
Sample 081	BL	BL	BL	BL	N.A.
Sample 082	BL	BL	BL	BL	BL
Sample 083	BL	BL	BL	BL	N.A.
Sample 084	BL	BL	BL	BL	BL
Sample 085	BL	BL	BL	BL	BL
Sample 086	BL	BL	BL	BL	BL
Sample 087	BL	BL	BL	BL	BL
Sample 088	BL	BL	BL	BL	N.A.
Sample 089	BL	BL	BL	BL	N.A.

Note:

1. All Concentrations express in “mg/kg” (milligram per kilogram), mg/kg ~ ppm
2. “OL” denotes “over limit”
3. “BL” denotes “below limit”
4. “N.A.” denotes “Not Applicable”
5. “Inconclusive” denotes result is intermediate between “OL” and “BL”
6. “^”denotes the screening result was inconclusive(X) or over limit (OL), thus further confirmation test was conducted, results are listed in 3.2 and 3.3.
7. σ means the retest result.



XRF screening limits for different materials:

Materials	Concentration (mg/kg)				
	Cd	Cr	Pb	Hg	Br
Metal	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	N.A.
Polymers	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (300-3\sigma) < X$
Composite material	$BL \leq (50-3\sigma) < X < (150+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$	$BL \leq (250-3\sigma) < X$

3.2 Test for Heavy Metals

– Lead, Cadmium, Hexavalent Chromium and Mercury Tests according to EN 62321: 2009.

Element	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Mercury [mg/kg]	Hexavalent Chromium [-]	Hexavalent Chromium [mg/kg]
Detection Limit	5	5	5	Δ	5
RoHS Requirements	100	1000	1000	#	1000
Sample 004	/	/	/	Negative	/
Sample 009	/	448	/	/	/
Sample 012	/	/	/	Negative	/
Sample 014	/	N.D.	/	/	/
Sample 017	/	/	/	Negative	/
Sample 018	/	26700 Φ	/	/	/
Sample 039	/	/	/	Negative	/
Sample 044	/	/	/	Negative	/
Sample 047	/	/	/	Negative	/
Sample 049	/	N.D.	/	/	/
Sample 057	/	/	/	Negative	/
Sample 060	/	N.D.	/	/	/
Sample 061	/	/	/	Negative	/
Sample 068	/	/	/	Negative	/
Sample 071	/	/	/	Negative	/



Note:

1. All Concentrations express in “mg/kg”(milligram per kilogram), mg/kg ~ ppm.
2. “N.D.” = “Not Detected”.
3. Δ =Spot-Test:
Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;
(The tested sample should be further verified by boiling-water-extraction method if the spot test result is negative or cannot be confirmed.)
Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02mg/kg with 50 cm² sample surface area.
Storage conditions and production date of the tested sample are unavailable and thus results of Cr(VI) represent status of the sample at the time of testing
4. # = Positive indicates the presence of CrVI on the tested areas.
Negative indicates the absence of CrVI on the tested areas.
5. “-” = Not regulated
6. Φ means as the information (the main source of lead could be copper alloy base) provided by the client, when Lead as an alloying element in copper alloy containing up to 4% Lead by weight is exempted from RoHS Directive 2011/65/EU Annex III.





3. 3. 3 Test for Flame retardants

Test Method: With reference to EN 62321:2009, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometry (GC-MS). [Reporting Limit: 5mg/kg]

Test Item		Result [mg/kg]		RoHS Requirement [mg/kg]
		Sample 003+019	Sample 022 σ	
PBBs	Monobromobiphenyl	< 5	< 5	Sum of PBBs < 1000
	Dibromobiphenyl	< 5	< 5	
	Tribromobiphenyl	< 5	< 5	
	Tetrabromobiphenyl	< 5	< 5	
	Pentabromobiphenyl	< 5	< 5	
	Hexabromobiphenyl	< 5	< 5	
	Heptabromobiphenyl	< 5	< 5	
	Octabromobiphenyl	< 5	< 5	
	Nonabromobiphenyl	< 5	< 5	
	Decabromobiphenyl	< 5	< 5	
	Sum of PBBs	< 5	< 5	
PBDEs	Monobromodiphenyl Ether	< 5	< 5	Sum of PBDEs < 1000
	Dibromodiphenyl Ether	< 5	< 5	
	Tribromodiphenyl Ether	< 5	< 5	
	Tetrabromodiphenyl Ether	< 5	< 5	
	Pentabromodiphenyl Ether	< 5	< 5	
	Hexabromodiphenyl Ether	< 5	< 5	
	Heptabromodiphenyl Ether	< 5	< 5	
	Octabromodiphenyl Ether	< 5	< 5	
	Nonabromodiphenyl Ether	< 5	< 5	
	Decabromodiphenyl Ether	16	< 5	
	Sum of PBDEs	16	< 5	

Note:

1. All Concentrations express in "mg/kg" (milligram per kilogram), mg/kg ~ ppm.
2. "<" denotes less than
3. σ means the retest result.



Test Item		Result [mg/kg]		RoHS Requirement [mg/kg]
		Sample 041	Sample 042	
PBBs	Monobromobiphenyl	< 5	< 5	Sum of PBBs < 1000
	Dibromobiphenyl	< 5	< 5	
	Tribromobiphenyl	< 5	< 5	
	Tetrabromobiphenyl	< 5	< 5	
	Pentabromobiphenyl	< 5	< 5	
	Hexabromobiphenyl	< 5	< 5	
	Heptabromobiphenyl	< 5	< 5	
	Octabromobiphenyl	< 5	< 5	
	Nonabromobiphenyl	< 5	< 5	
	Decabromobiphenyl	< 5	< 5	
	Sum of PBBs	< 5	< 5	
PBDEs	Monobromodiphenyl Ether	< 5	< 5	Sum of PBDEs < 1000
	Dibromodiphenyl Ether	< 5	< 5	
	Tribromodiphenyl Ether	< 5	< 5	
	Tetrabromodiphenyl Ether	< 5	< 5	
	Pentabromodiphenyl Ether	< 5	< 5	
	Hexabromodiphenyl Ether	< 5	< 5	
	Heptabromodiphenyl Ether	< 5	< 5	
	Octabromodiphenyl Ether	< 5	< 5	
	Nonabromodiphenyl Ether	< 5	< 5	
	Decabromodiphenyl Ether	< 5	< 5	
	Sum of PBDEs	< 5	< 5	

Note:

1. All Concentrations express in “mg/kg” (milligram per kilogram), mg/kg ~ ppm.
2. “<” denotes less than



Test Item		Result [mg/kg]	RoHS Requirement [mg/kg]
		Sample 043	
PBBs	Monobromobiphenyl	< 5	Sum of PBBs < 1000
	Dibromobiphenyl	< 5	
	Tribromobiphenyl	< 5	
	Tetrabromobiphenyl	< 5	
	Pentabromobiphenyl	< 5	
	Hexabromobiphenyl	< 5	
	Heptabromobiphenyl	< 5	
	Octabromobiphenyl	< 5	
	Nonabromobiphenyl	< 5	
	Decabromobiphenyl	< 5	
	Sum of PBBs	< 5	
PBDEs	Monobromodiphenyl Ether	< 5	Sum of PBDEs < 1000
	Dibromodiphenyl Ether	< 5	
	Tribromodiphenyl Ether	< 5	
	Tetrabromodiphenyl Ether	< 5	
	Pentabromodiphenyl Ether	< 5	
	Hexabromodiphenyl Ether	< 5	
	Heptabromodiphenyl Ether	< 5	
	Octabromodiphenyl Ether	< 5	
	Nonabromodiphenyl Ether	< 5	
	Decabromodiphenyl Ether	< 5	
	Sum of PBDEs	< 5	

Note:

1. All Concentrations express in "mg/kg" (milligram per kilogram), mg/kg ~ ppm.
2. "<" denotes less than

4. Documentation

APPENDIX 01: Photos of submitted products

APPENDIX 02: Exploded Drawing

APPENDIX 03: Bill of Material

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group



Engineer: _____

Judy Tan

Judy Tan

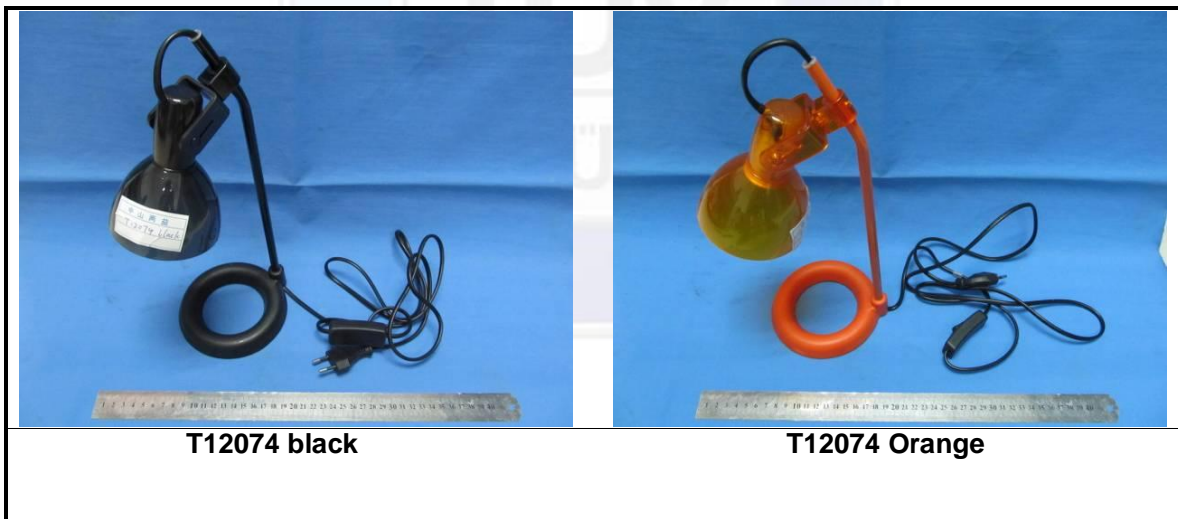
Technical Report checked: _____

Ben Shao

Ben Shao

APPENDIX 01:

Photos of submitted products:



T12074 black

T12074 Orange



APPENDIX 02: Exploded Drawing

