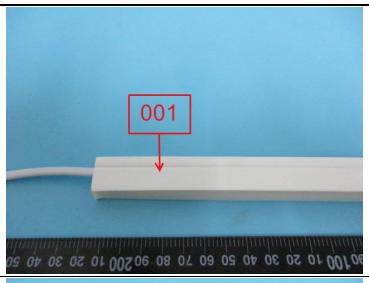
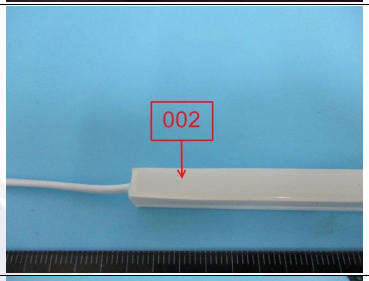
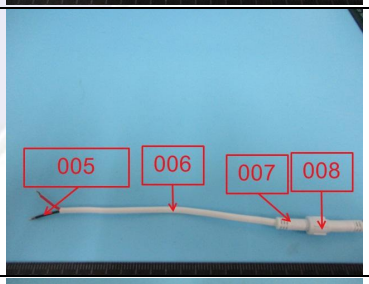
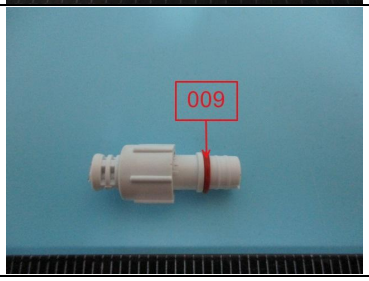
Technical Report No. 64.164.17.04772.01A
Rev. 00
Dated 2017-09-15

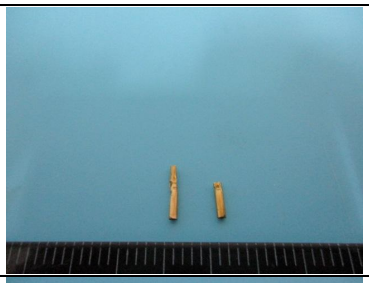
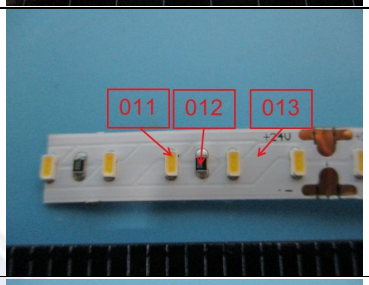
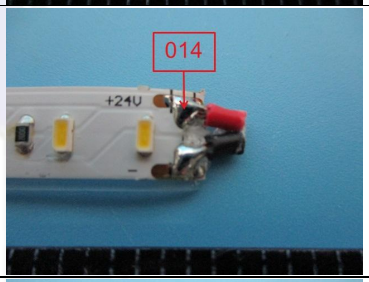
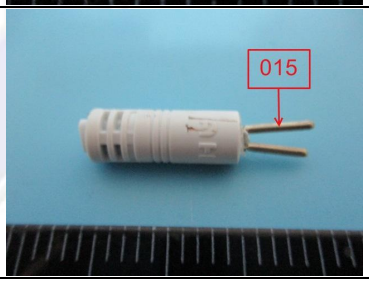
Client:	JRL International Limited No.20 JianLong Street, JianLong Village, HengGang Town, LongGang District,ShenZhen City 518115
Test Subject:	The submitted sample was identified and described by client as: Led strip
Test Requested and Conclusion:	Test according to RoHS (Restriction of Hazardous Substances) directive 2011/65/EU on submitted samples

(1)	Quantitative screening of Lead, Cadmium, Mercury, Chromium and Bromine Energy-Dispersive X-Ray Fluorescence Spectroscopy with reference to EN 62321-3-1:2014	Pass
(2)	Heavy Metals Content Test (Total Cadmium, Total Lead, Total Mercury, Hexavalent Chromium) Test method: With reference to EN 62321-4:2014, EN 62321-5:2014, EN 62321-7-1:2015 and EN 62321:2009, analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) and UV-Vis spectrophotometer	Pass
(3)	Brominated Flame Retardants (PBBs & PBDEs) Test Test Method: With reference to EN 62321-6:2015, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometry (GC-MS).	Pass

Test Result:	Refer to the following page(s)
Remark:	The results relate only to the items tested.

1. Description of the test subject

Sample No.	Description	Photograph
001	White soft plastic shell	
002	Transparent soft plastic part	
003	Red plasitc wire jacket	
004	Copper-colored metal wire	
005	Black plastic wire jacket	
006	White plastic cable jacket	
007	White plastic shell	
008	White plastic nut	
009	Red soft plastic ring	

Sample No.	Description	Photograph
010	Golden metal part	
011	Yellow LED	
012	Black body	
013	White PCB	
014	Silvery metal solder	
015	Silvery metal pin	

2. Order

2.1 Date of Purchase Order

2017-08-14

2.2 Receipt of Test Sample, Location

2017-08-14, Guangzhou

2.3 Date of Testing

2017-08-14 to 2017-09-15

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 Quantitative screening of Lead, Cadmium, Mercury, Chromium and Bromine

Energy-Dispersive X-Ray Fluorescence Spectroscopy with reference to EN 62321-3-1:2014

Sample No.	Total Cadmium	Total Lead	Total Mercury	Total Chromium	Total Bromine
Sample 001	BL	BL	BL	BL	BL
Sample 002	BL	BL	Inconclusive^	BL	BL
Sample 003	BL	BL	BL	BL	BL
Sample 004	BL	BL	BL	BL	N.A.
Sample 005	BL	BL	BL	BL	BL
Sample 006	BL	BL	BL	BL	BL
Sample 007	BL	BL	BL	BL	BL
Sample 008	BL	BL	BL	BL	BL
Sample 009	BL	BL	BL	BL	BL
Sample 010	BL	BL	BL	BL	N.A.
Sample 011	BL	BL	BL	BL	Inconclusive^
Sample 012	BL	BL	BL	Inconclusive^	BL
Sample 013	BL	BL	BL	BL	Inconclusive^
Sample 014	BL	BL	BL	BL	N.A.
Sample 015	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.

XRF screening limits for different materials:

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

3.2 Heavy Metals Content Test (Total Cadmium, Total Lead, Total Mercury, Hexavalent Chromium)

Test method:

a. With reference to EN 62321-4:2014, Determination of Mercury by ICP-OES
b. With reference to EN 62321-5:2014, Determination of Cadmium, lead by ICP-OES
c. With reference to EN 62321-7-1:2015 and EN 62321:2009, Determination of hexavalent chromium (Cr(VI)) by the colorimetric method and UV-Vis

Element	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Mercury [mg/kg]	Hexavalent Chromium* [ug/cm^2]	Hexavalent Chromium [mg/kg]
Reporting Limit	**2**	**10**	**10**	**0.1**	**10**
RoHS Limit	**100**	**1000**	**1000**	#	**1000**
Sample 002	/	/	N.D.	/	/
Sample 012	/	/	/	Negative	/

Note:

1. All Concentrations express in “mg/kg”(milligram per kilogram), mg/kg ~ ppm.
2. “ug/cm2” denotes microgram per square centimeter
3. “N.D.” = “Not Detected”
4. * = Boiling-water-extraction:
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 ug/cm^2. The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if the Cr(VI) concentration is less than 0.10 ug/cm^2, The coating is considered a non-Cr(VI) based coating.
   c. The result between 0.10 ug/cm^2 and 0.13 ug/cm^2 is considered to be inconclusive-unavoidable coating variations may influence the determination.
   Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
5. # = Positive indicates the presence of CrVI on the tested areas.
   Negative indicates the absence of CrVI on the tested areas.

3.3 Brominated Flame Retardants (PBBs & PBDEs) Test

Test Method: With reference to EN 62321-6:2015, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometry (GC-MS). [Reporting Limit: 5mg/kg]

Test Item		Result [mg/kg]		RoHS Limit [mg/kg]
		Sample 011	Sample 013	
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

4. Remark

Reference standard

a. EN 62321-1:2013 Determination of certain substances in electrotechnical products - Part 1: Introduction and overview

b. EN 62321-2:2014 Determination of certain substances in electrotechnical products - Part 2: Disassembly, disjointment and mechanical sample preparation

5. Documentation

APPENDIX 01: Photos of submitted products

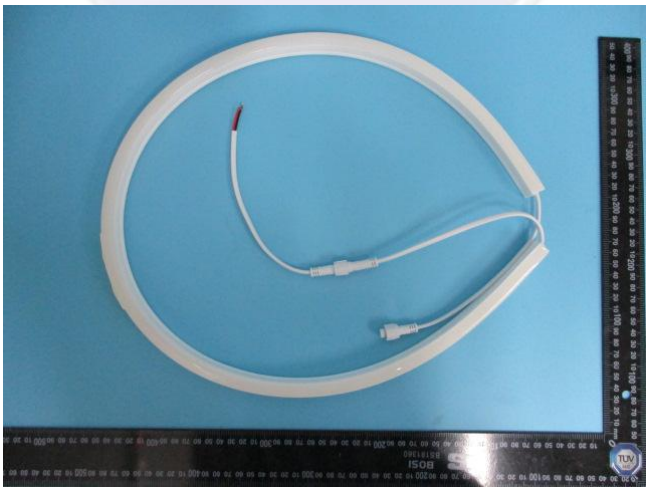
TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group

Engineer: Sam Luo **Technical Report checked:** Ben Shao

Sam Luo **Ben Shao**

APPENDIX 01:

Photos of submitted products**:**



- END OF TEST REPORT -