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TEST REPORT IEC 60598-2-20 Luminaires Part 2: Particular requirements Section 20: Lighting Chains	
Report Number	190425161GZU-001
Date of issue	11 Sep. 2019 Modification 1: 21 May 2020
Total number of pages	68 pages
Name of Testing Laboratory preparing the Report	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Applicant's name	Ledworks SRL
Address	Via Arcivescovo Calabiana 6, 20139 Milano - Italy
Test specification:	
Standard	IEC 60598-2-20:2014 used in conjunction with IEC 60598-1:2014, AMD1:2017
Test procedure	CE-LVD
Non-standard test method	N/A
Test Report Form No	IEC60598_2_20F
Test Report Form(s) Originator	Intertek Semko AB
Master TRF	Dated 2018-06-28
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Test item description	LED Lighting Chains
Trade Mark	—
Manufacturer	Factory 1 name: Letaron Electronic Co., Ltd. Factory 2 name: LINHAI DONGLI OPTOELECTRONIC CO., LTD.
Model/Type reference	TWS150STP-BEU; TWS150STP-BUK; TWS150STP-BUS; TWS150STP-BAU; TWS250STP-BEU; TWS250STP-BUK; TWS250STP-BUS; TWS250STP-BAU; TWS400STP-BEU; TWS400STP-BUK; TWS400STP-BUS; TWS400STP-BAU; TWS250SPP-BEU; TWS250SPP-BUK; TWS250SPP-BUS; TWS250SPP-BAU; TWS250SPP-TEU; TWS250SPP-TUK; TWS250SPP-TUS; TWS250SPP-TAU; TWS250GOP-BEU; TWS250GOP-BUK; TWS250GOP-BUS; TWS250GOP-BAU; TWI190STP-TEU; TWI190STP-TUK; TWI190STP-TUS; TWI190STP-TAU; TWI190SPP-TEU; TWI190SPP-TUK; TWI190SPP-TUS; TWI190SPP-TAU; TWI190GOP-TEU; TWI190GOP-TUK; TWI190GOP-TUS; TWI190GOP-TAU; TWF020STP-BEU; TWF020STP-BUK; TWF020STP-BUS; TWF020STP-BAU; TWF020ADP-BEU; TWF020ADP-BUS (total 42 models) Remark: the suffix of EU refers to Europe plug, UK refers to UK plug; US refers to US plug; AU refers to Australia plug.
Ratings	For drivers input: 220-240 V~ or 100-240 V~; 50/60 Hz; Class II; SELV; independent; For luminaire body input of models TWS150STP-BEU; TWS150STP-BUK; TWS150STP-BUS; TWS150STP-BAU: 24VDC; 1,0A; Class III; IP44; 150 pcs non-replaceable LEDs; For luminaire body input of models TWI190STP-TEU; TWI190STP-TUK; TWI190STP-TUS; TWI190STP-TAU; TWI190SPP-TEU; TWI190SPP-TUK; TWI190SPP-TUS; TWI190SPP-TAU; TWI190GOP-TEU; TWI190GOP-TUK; TWI190GOP-TUS; TWI190GOP-TAU: 24VDC; 1,0A; Class III; IP44; 190 pcs non-replaceable LEDs; For luminaire body input of models TWS250STP-BEU; TWS250STP- BUK; TWS250STP-BUS; TWS250STP-BAU; TWS250GOP-BEU; TWS250GOP-BUK; TWS250GOP-BUS; TWS250GOP-BAU: 24VDC; 1,0A; Class III; IP44; 250 pcs non-replaceable LEDs; For luminaire body input of models TWS250SPP-BEU; TWS250SPP-BUK; TWS250SPP-BUS; TWS250SPP-BAU; TWS250SPP-TEU; TWS250SPP-TUK; TWS250SPP-TUS; TWS250SPP-TAU: 24VDC; 1,5A; Class III; IP44; 250 pcs non-replaceable LEDs;

<p>Ratings : (continued)</p>	<p>For luminaire body input of models TWS400STP-BEU; TWS400STP- BUK; TWS400STP- BUS; TWS400STP- BAU; 24VDC; 1,5A; Class III; IP44; 400 pcs non-replaceable LEDs;</p> <p>For luminaire body input of models TWF020STP-BEU; TWF020STP-BUK; TWF020STP-BUS; TWF020STP-BAU; 24VDC; 1A; Class III; IP44; 20 pcs non-replaceable LEDs;</p> <p>For luminaire body input of models TWF020ADP-BEU; TWF020ADP-BUS: 24VDC; 1A; Class III; IP44; 20 pcs non- replaceable LEDs; Suitable for directly mounted on normal flammable surfaces.</p>
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Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Testing location/ address		Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Tested by (name, function, signature)		Lily Jiang / Engineer 
Approved by (name, function, signature) ..		Karen Xie / Technical Manager 
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address		
Tested by (name, function, signature)		--
Approved by (name, function, signature) ..		--
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		--
Witnessed by (name, function, signature) ..		--
Approved by (name, function, signature) ..		--
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
Testing location/ address		
Tested by (name, function, signature)		--
Witnessed by (name, function, signature) ..		--
Approved by (name, function, signature) ..		--
Supervised by (name, function, signature) :		--

List of Attachments (including a total number of pages in each attachment):

Total 68 pages; Page 1-53 for testing report; Page 54-68 for product photos.

Summary of testing:

The submitted samples are also fulfilled the requirements of specified standard of:

- 1) IEC 60598-2-20:2014 used in conjunction with IEC 60598-1:2014+A1:2017;
- 2) EN 60598-2-20:2015 used in conjunction with EN 60598-1: 2015+A1:2018;
- 3) Controller (flasher unit) complied with the requirements of standard IEC 61347-2-11:2001+A1:2017 used in conjunction with IEC 61347-1:2015+A1:2017 and EN 61347-2-11:2001 used in conjunction with EN 61347-1:2015;
- 4) The LED modules complied with the requirements of standard EN 62031:2008+A1:2013+A2:2015 and IEC 62031:2008+A1:2012+A2:2014.
- 5) EMF requirement according to EN 62493: 2015 has been considered.
- 6) Requirement of photobiological safety of the products has been fulfilled, the light hazard was belonging to "Exempt Group" according to standard IEC 62471:2006 (First Edition) and EN 62471:2008.

For the blue light hazard required by IEC TR 62778:2014, the products were tested and met Exempt Group, so the products don't need to mark Ethr.

Remark: Totally 42 models in this report, the main differences between models refer to below table. TWF020ADP-BEU and TWF020ADP-BUS refer to the same product, only different in TWF020ADP-BEU as interconnected chain for TWF020STP-BEU, TWF020ADP-BUS as interconnected chain for TWF020STP-BUS.

TWS400STP-BEU and TWF020STP-BEU were selected to do the full test, other models were subjected to structure check and deviation test.

Representative model	Difference
TWS150STP-BEU; TWS250STP-BEU	LED quantity
TWS250SPP-BEU; TWS250SPP-TEU; TWS400STP-BEU	Wire colour; LED driver; LED quantity; LED colour
TWI190STP-TEU; TWI190SPP-TEU; TWI190GOP-TEU	LED colour
TWS250GOP-BEU; TWS250STP-BEU	LED colour

Modification 1: Added a new factory information. No test was conducted.

Tests performed (name of test and test clause): All applicable clauses	Testing location: Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Summary of compliance with National Differences: See annex ZB and annex ZC	