

Appendix

1. Reliability Test

Test Category	Test Items	Standard /Value
Optical Test	Spectrum Analysis	IES LM 79 (CCT, lumen, CRI, SDCM, XY, wavelength)
	Photometric Distribution	IES LM 79 (lumen intensity distribution & Lux diagram)
	Lumen Maintenance& Lifetime	IES LM84 & IES TM 28
Temperature Test	Normal Temperature Test - 25°C	UL1598 & UL2388 & IEC60598-1 & IEC60598-2-21
	Abnormal Operation Test - 70°C	UL1598 & UL2388 & IEC60598-1 & IEC60598-2-21
Physics Test	Bending Test	Manufacturer-defined, 1000 cycles
	Swing Test	UL2388, > 750 cycles
	Tensile Test	Manufacturer-defined, > the weight of light in max. running length by double ends feed
	Twist Test	Manufacturer-defined, 200 cycles
	IK08	IEC62262
	Ball Impact	UL1598 & UL2388 & IEC60598-1 & IEC60598-2-21
Weathering Test	Swimming Pool Water Immersion Test	GB9667, PH6.8-7.6, free chlorine 0.3-0.6mg/L
	Sea Water Immersion Test	IEC 60598-1, Salinity 4%
	Salt Spray Test	IEC68-2-11
	Outdoor Exposure	Manufacturer-defined
	Flame Resistant Test	UL94
Environment Test	UV Exposure Test	ASTMG154, UVA@340nm
	IPX5 IPX6 IPX7 IPX8	IEC60529
	Temperature Shock Test	Manufacturer-defined, -40°C-60°C (typical temperature range)
	Constant Temperature Test	Manufacturer-defined, 70°C (typical temperature range)

2. Certificate

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Test Quality Assured

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listed model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized to Apply Mark.

Applicant: Senbe Lighting CO., LTD Address: Building B6, Huachuang Industrial Park, Shiji Town, Panyu District, GUANGZHOU Guangdong 510000 Country: China Contact: Lisa Xi Phone: 020-39137589 FAX: 020-39137589 Email: senbe02@senbelighting.com	Manufacturer: Senbe Lighting CO., LTD Address: Building B6, Huachuang Industrial Park, Shiji Town, Panyu District, GUANGZHOU Guangdong 510000 Country: China Contact: Lisa Xi Phone: 020-39137589 FAX: 020-39137589 Email: senbe02@senbelighting.com
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Party Authorized to Apply Mark: Same as Manufacturer
Report Issuing Office: Intertek Testing Services Shenzhen Ltd. Guangzhou Branch

Control Number: 5010972 Authorized by:

Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

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Standard(s): Low Voltage Lighting Systems (UL 2108:2015 Ed.2-RC30MAY2017) General Requirements For Luminaires (R2016) (CSA C22.2.088 Ed.1-1996 Ed.1-1991)

Product: Low Voltage Lightings

Models: SL, followed by P or S, followed by M or C, followed by 24, followed by 08 or 12, followed by A, B, C, D, E or F, followed by 50, 70, 72, 84, 108 or 216, followed by F, T, D or H, followed by V, N, I or K, followed by -01, -02 or -03.

ATM for Report 190318042020-001 Page 1 of 1 ATM Issued: 2-JUL-2019 © IESL (194)173 Item(s)

C E R T I F I C A T E
of Conformity
EC Council Directive 2014/30/EU
Electromagnetic Compatibility

Registration No.: AE 50385422 0001
Report No.: 16077901 001

Holder: Guangzhou Senbe Lighting Co., LTD
Building B6, Huachuang Industry Park, Shiji Town, Panyu District, Guangzhou 511442 P. R. China

Product: LED Lamp (Neon Flexible Led)

Identification: S-PR-P09 S-PR-P10 S-PR-P11 S-PR-P15 S-PR-P21
S-PR-P22 S-PR-P23 S-PR-P26

Tested acc. to: EN 55015:2013
EN 55015:2013/A1
EN 61547:2009

Date: 10.11.2017

TÜV Rheinland LGA Products GmbH · Tillystraße 2 · 90431 Nürnberg

© The CE marking may only be used if all relevant and effective CE Directives are complied with. ©

Prüfbericht-Nr.: 50167122 001 Test Report No.: 50167122 001	Auftrags-Nr.: 174053547 Order No.: 174053547	Seite 1 von 9 Page 1 of 9
Kunden-Referenz-Nr.: N/A Client Reference No.: N/A	Auftragsdatum: 2016-07-29 Order date: 2016-07-29	
Auftraggeber: Senbe Lighting Co., Ltd Client: Building B6, Huachuang Industrial Park, Shiji Town, Panyu District, Guangzhou		
Prüfgegenstand: LED Rope Light Test item:		
Bezeichnung / Typ-Nr.: S-PR-F15B Identification / Type No.:		
Auftragsinhalt: Type examination Order content:		
Prüfringfrage: Clause 9.2 of standard EN 60598-1:2015 and client's special requirements Test specification:		
Wareneingangdatum: 2016-06-08 Date of receipt:		
Prüfmuster-Nr.: A000746585-001, 002, 003 Test sample No.:		Detaillierte Fotodokumentation siehe Anlage zu diesem Bericht
Prüfzeitraum: 2016-06-13 to 2016-06-19 Testing period:		
Ort der Prüfung: Waitek Services (Foshan) Co., Ltd. Place of testing:		Detailed photo documentation see appendix to this report
Prüflaboratorium: TÜV Rheinland (Guangdong) Ltd. Testing laboratory:		
Prüfergebnis: Pass Test result:		
geprüft von / tested by: Dave Zhang / Project Engineer Date: 2016-06-27	kontrolliert von / reviewed by: Mark Yan / Reviewer Date: 2016-06-27	
Sonstiges / Others:		
According to client's application, this report and test result is for IP68 test only. Further tests should be evaluated if the products are required to fulfill the requirements of the whole standard EN 60598-1:2015.		
Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt Condition of the test item at delivery: Test item complete and undamaged		
*Lageplan: 1 = sehr gut 2 = gut 3 = befriedigend 4 = unzufrieden 5 = mangelhaft Positioning: 1 = very good 2 = good 3 = satisfactory 4 = unsatisfactory 5 = poor		
Dieser Prüfbericht bezieht sich nur auf das in o.g. Prüfprotokoll und auf diese Genehmigung der Prüfstelle nicht ausgearbeitete vervollständigte werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the in o.g. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.		

TÜV Rheinland (Guangdong) Ltd., No.198 Kaifu Road, Guangzhou Science City, Guangzhou 510663, Guangdong P.R. China

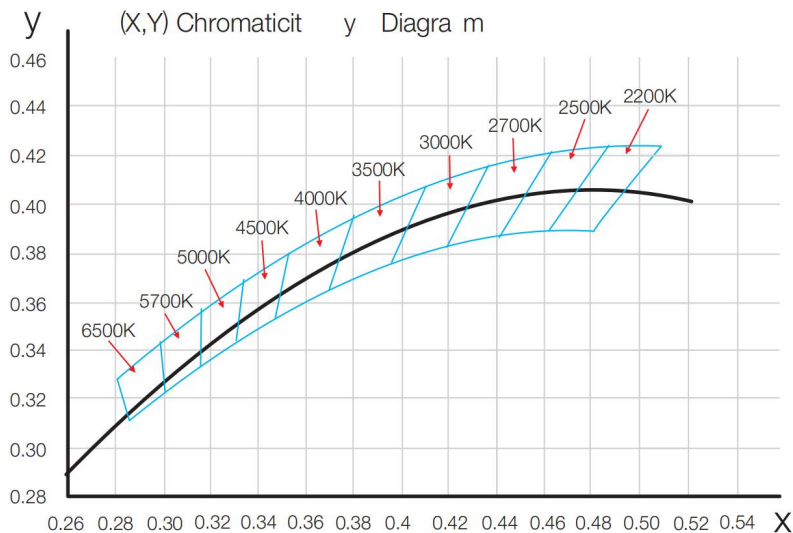
ETL

CE-EMC

IP68

Appendix

3. (X,Y) Chromaticity Diagram



4. Correlated Color Temperature

ANSI Standard

Nominal CCT Categories (2200-6500K)

Nominal CCT	Target CCT & tolerance(K)	Target D_{uv}	D_{uv} Tolerance Range
2200K	2238±102	0.0000	T_x : CCT of the source for $T_x < 2870K$
2500K	2460±120	0.0000	0.000 ± 0.0060
2700K	2725±145	0.0000	For $T_x \geq 2870K$
3000K	3045±175	0.0001	$D_{uv}(T_x) \pm 0.0060$
3500K	3465±245	0.0005	where
4000K	3985±275	0.0010	$D_{uv}(T_x) = 57700 \times (1/T_x)^2$
4500K	4503±243	0.0015	$-44.6 \times (1/T_x)$
5000K	5029±283	0.0020	$+0.00854$
5700K	5667±355	0.0025	Remark:
6500K	6532±510	0.0031	1) T_F is chosen to be at 100K steps (2300, 2400, ..., 6400K)
			2) $\Delta T = 1.1900 \times 10^8 \times T^{-3}$
			$1.5434 \times 10^4 \times T^{-2} + 0.71648 \times T - 902.55$
			3) Same as in the DUV tolerance range

Flexible CCT	$T_F^{1)} \pm \Delta T^{2)}$	$D_{uv} T_F^{3)}$
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Appendix

5. Maximum Extension Wire Length (to stabilize voltage drop)

Watts of Light	Current	22AWG 0.34mm ²	20AWG 0.53mm ²	18AWG 0.82mm ²	17AWG 1.04mm ²	16AWG 1.38mm ²	14AWG 2.07mm ²	12AWG 3.29mm ²	10AWG 5.6mm ²
10W	0.42A	37m	62m	105m	125m	146m	245m	410m	610m
20W	0.84A	18m	30m	52m	65m	74m	125m	205m	300m
30W	1.25A	12m	20m	32m	38m	50m	85m	135m	200m
40W	1.7A	8m	15m	24m	28m	36m	60m	98m	140m
50W	2.1A	6m	12m	20m	23m	28m	50m	80m	110m
60W	2.5A	5m	10m	16m	18m	23m	36m	64m	90m
70W	3A	/	8m	12m	15m	18m	30m	53m	75m
80W	3.4A	/	6m	10m	12m	15m	25m	40m	60m
90W	3.75A	/	4m	7m	8m	10m	18m	32m	45m
100W	4.2A	/	/	6m	6m	7m	12m	24m	35m
110W	4.6A	/	/	3m	4m	5m	8m	16m	24m
120W	5A	/	/	2m	3m	3m	4.5m	8m	14m
130W	5.4A	/	/	1.7m	2.1m	2.6m	4m	7.5m	12m
140W	5.9A	/	/	1.6m	1.8m	2.2m	3.6m	6.5m	10.5m
150W	6.3A	/	/	1.5m	1.7m	2m	3.2m	6m	10m
170W	7.1A	/	/	1.2m	1.5m	1.7m	2.8m	5m	8m
180W	7.5A	/	/	/	1.3m	1.5m	2.5m	4.5m	7.5m
200W	8.4A	/	/	/	1m	1.3m	2m	4m	6.5m
210W	8.8A	/	/	/	/	1.2m	1.8m	3.4m	6.2m
220W	9.2A	/	/	/	/	1m	1.6m	3m	5.8m

Note: Aboved values do not include the 1m cable of front connector.

6. Loading Chart of Power Supply

Power Supply Light Power/m	40W	60W	80W	100W	120W	150W	185W	240W	320W	480W
6W	5m	8m	10.5m	13.3m	16m	20m	24.5m	32m	42.5m	64m
7W	4.5m	6.8m	9m	11.4m	13.5m	17m	21m	27m	36.5m	54.5m
7.8W	4m	6m	8.2m	10.2m	12.3m	15m	19m	24.5m	32.8m	49m
9W	3.5m	5.3m	7m	8.8m	10.5m	13m	16.4m	21.3m	28.4m	42m
10W	3.2m	4.8m	6.4m	8m	9.5m	12m	14.8m	19m	25.5m	38.4m
12W	2.6m	4m	5.3m	6.5m	8m	10m	12.3m	16m	21.3m	32m
13W	2.4m	3.6m	4.9m	6m	7.3m	9m	11.3m	14.5m	19.7m	29.5m
14W	2.2m	3.4m	4.5m	5.7m	6.8m	8.5m	10.5m	13.5m	18.3m	27m
15W	2m	3.2m	4.2m	5.3m	6.4m	8m	9.8m	12.8m	17m	25.5m
15.5W	2m	3.1m	4.1m	5m	6.2m	7.5m	9.5m	12.4m	16.5m	25.5m
17W	1.8m	2.8m	3.7m	4.7m	5.5m	7m	8.7m	11.3m	15m	22.5m
18W	1.7m	2.6m	3.5m	4.4m	5.3m	6.5m	8.2m	10.5m	14.2m	21m
19.5W	1.6m	2.5m	3.2m	4.1m	4.9m	6m	7.5m	9.8m	13m	19.5m
22W	1.4m	2.1m	2.9m	3.6m	4.3m	5.5m	6.7m	8.7m	11.5m	17.5m

Note

Aboved are the max running lengths based on selected power supplies (20% left as buffer), but each model should be subject to its maximum running length. For example: If max. running length of 6W/m is 20m, then it is recommended to use 150W driver for single-end run, and 320W driver for double-ends run.