

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, gary.xiao@rabweb.com

Prepared By

Deliver Co., Ltd.

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

Project Number

DLF1809113

Report Number

DLF1809113-14a

Test Date

2018/9/29

Issue Date

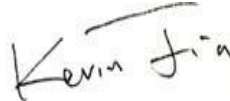
2018/9/30

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

The results contained in this report pertain only to the tested sample.

This report shall not be reproduced, except in full, without written approval of Deliver Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP.

1.0 Test Summary

DLC Technical Requirements v4.3

Indoor / Linear Ambient Direct Linear Ambient Luminaire				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Lamp Output (lm)	IES LM-79-2008	≥ 750	2676	P
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	$\geq 40\%$	56.2%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥ 130	140.1	P
Allowable CCTs* (K)	IES LM-79-2008	≤ 5000	3442	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥ 80	84	P
Power Factor	ANSI C82.77:2014	≥ 0.873	0.970	P
			0.997	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	$\leq 25\%$	6.98%	P
			5.76%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/9/29	STRP420-835U	H1
2	Goniophotometer Test	2018/9/29	STRP420-835U	H1
3	THD and PF Test	2018/9/29	STRP420-835U	H1

Remark(If any)

- 1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.
- 2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

3.0 Production Description

Luminaire Description: STRP420-835U

Electrical Specification: 120V-277V,50/60HZ, 20W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	STRP420-835U	Sample ID.	H1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.2	120.02	60	0.160	19.1	0.997

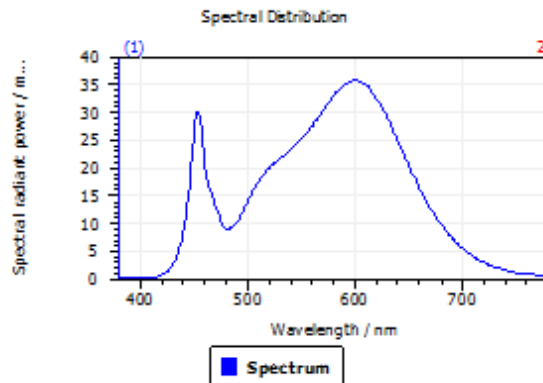
Test Result

CCT (K)	CRI (Ra)	Duv
3442	84	1.4E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	581.04 nm
Purity	0.406
PeakWavelength	599.82 nm
Radiant Power	5.865 W
Width50%:	145.58 nm

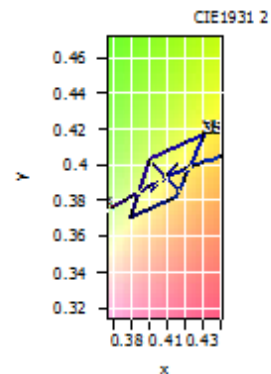
Color Coordinates

Correlated Color Temperatur 3442 K

x: 0.4088 u: 0.2371 u': 0.2371
y: 0.3927 v: 0.3417 v': 0.5126

ResultsCRICRI01	82.5	ResultsCRICRI09	14.0
ResultsCRICRI02	91.2	ResultsCRICRI10	79.1
ResultsCRICRI03	96.6	ResultsCRICRI11	81.2
ResultsCRICRI04	82.1	ResultsCRICRI12	65.5
ResultsCRICRI05	82.6	ResultsCRICRI13	84.7
ResultsCRICRI06	88.2	ResultsCRICRI14	98.6
ResultsCRICRI07	85.2	ResultsCRICRI15	76.2
ResultsCRICRI08	64.0	ResultsCRICRI16	73.5

ResultsCRI 84.1



PlankDistance 1.4E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	STRP420-835U	Sample ID.	H1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

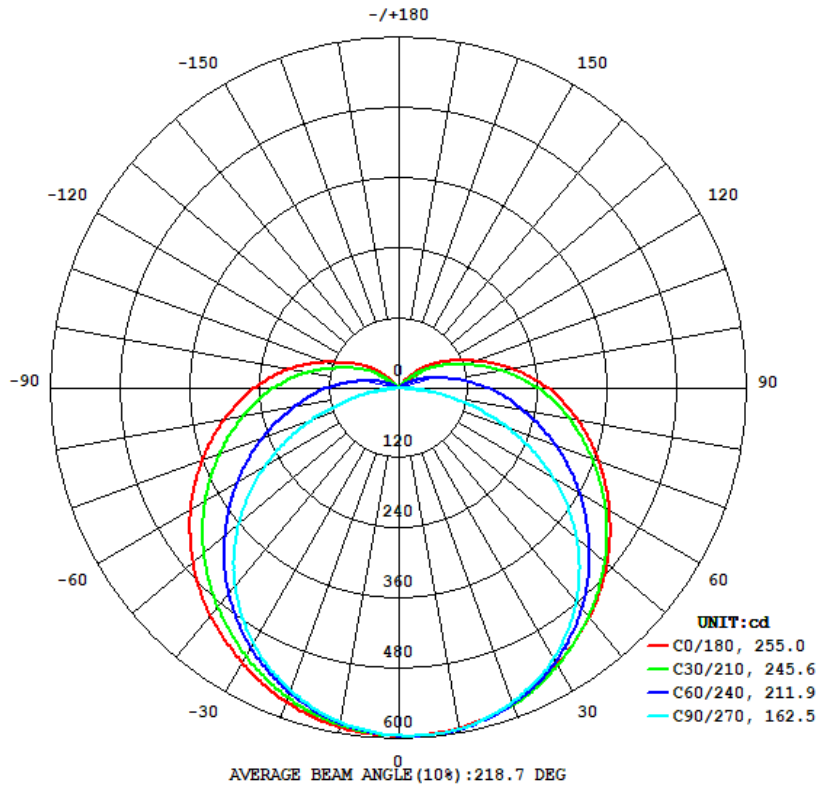
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.3	119.97	60	0.160	19.1	0.997	Light Down

Test Result

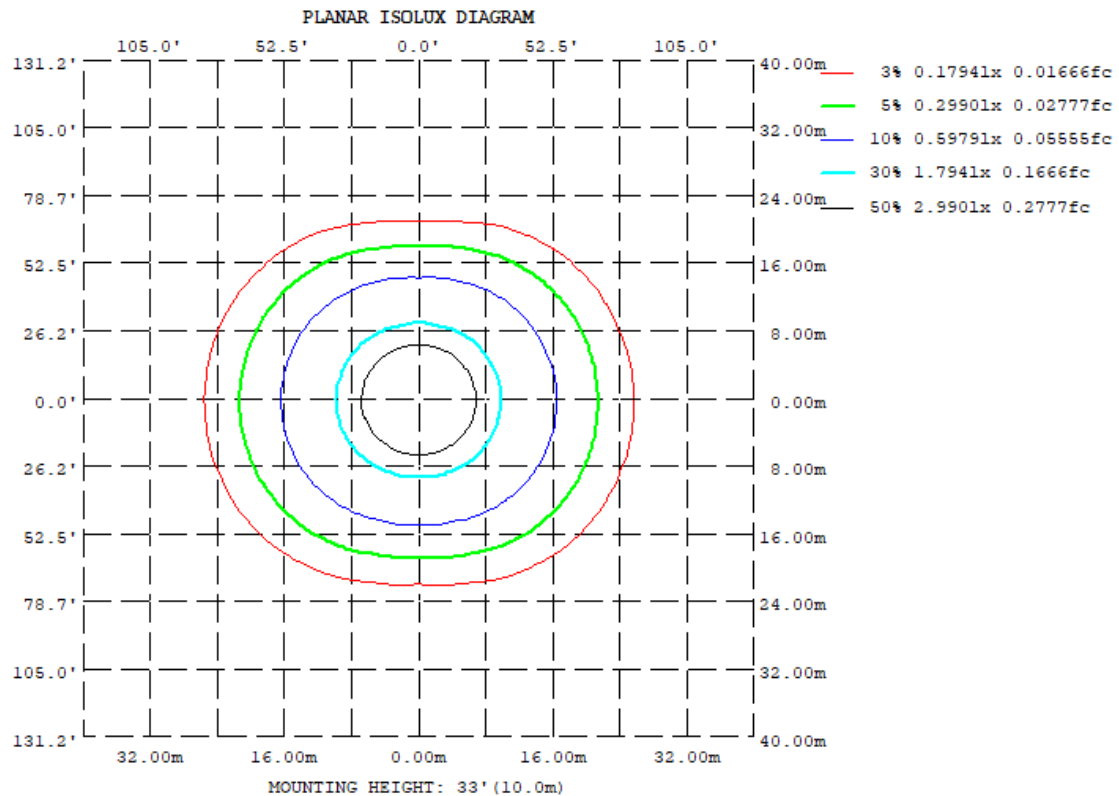
Flux(lm)	Zonal Lumen Requirement (0° - 60°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		0-180	90-270	0-180	90-270	
2676	56.2%	166.7	164.2	164.3	117.9	140.1

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	C0	C45	C90	C135	C180	C225	C270	C315
7	591.0	592.8	592.3	591.8	589.1	583.4	581.3	583.9
10	573.8	575.6	571.4	573.1	571.2	558.2	550.1	559.5
20	546.4	545.3	534.4	542.3	541.9	520.4	503.3	523.3
30	510.9	501.5	477.6	497.3	507.4	471.4	439.8	475.7
40	469.2	450.1	401.5	445.8	463.4	417.5	360.4	420.9
50	420.5	392.3	308.4	386.7	414.6	358.6	267.4	363.1
60	367.7	330.2	199.7	323.3	361.3	296.9	162.0	303.1
70	313.1	267.7	86.77	259.8	305.0	236.3	56.98	242.0
80	258.8	208.5	8.494	200.2	251.1	181.2	4.497	186.6
90	199.3	148.7	6.033	141.4	193.9	124.8	4.300	129.5
100	139.0	93.86	5.220	84.83	132.1	74.95	3.687	81.77
110	93.35	54.75	4.107	45.38	84.67	39.31	2.920	46.16
120	54.90	19.70	2.996	13.01	46.05	9.890	2.243	14.51
130	20.98	1.081	2.066	1.091	12.56	1.108	1.720	1.130
140	0.7052	0.8345	1.346	0.8377	1.096	1.076	1.346	1.088
150	0.7963	0.7930	0.8812	0.7742	1.211	1.190	1.101	1.125
160	0.9009	0.8879	0.8648	0.8863	1.155	1.201	1.129	1.124
170	1.080	1.047	1.020	1.031	1.079	1.062	1.025	1.019
180	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	56.46	0 - 10	56.46	2.11%
10-20	163.70	0 - 20	220.16	8.23%
20-30	254.32	0 - 30	474.48	17.73%
30-40	319.55	0 - 40	794.03	29.67%
40-50	354.02	0 - 50	1148.05	42.90%
50-60	355.67	0 - 60	1503.72	56.19%
60-70	326.97	0 - 70	1830.69	68.40%
70-80	275.29	0 - 80	2105.98	78.69%
80-90	213.57	0 - 90	2319.55	86.67%
90-100	155.92	0 - 100	2475.47	92.49%
100-110	101.20	0 - 110	2576.67	96.28%
110-120	58.48	0 - 120	2635.15	98.46%
120-130	28.93	0 - 130	2664.08	99.54%
130-140	9.86	0 - 140	2673.94	99.91%
140-150	1.57	0 - 150	2675.51	99.97%
150-160	0.47	0 - 160	2675.98	99.99%
160-170	0.28	0 - 170	2676.26	100.00%
170-180	0.10	0 - 180	2676.36	100.00%

4.3 Goniophotometer Test

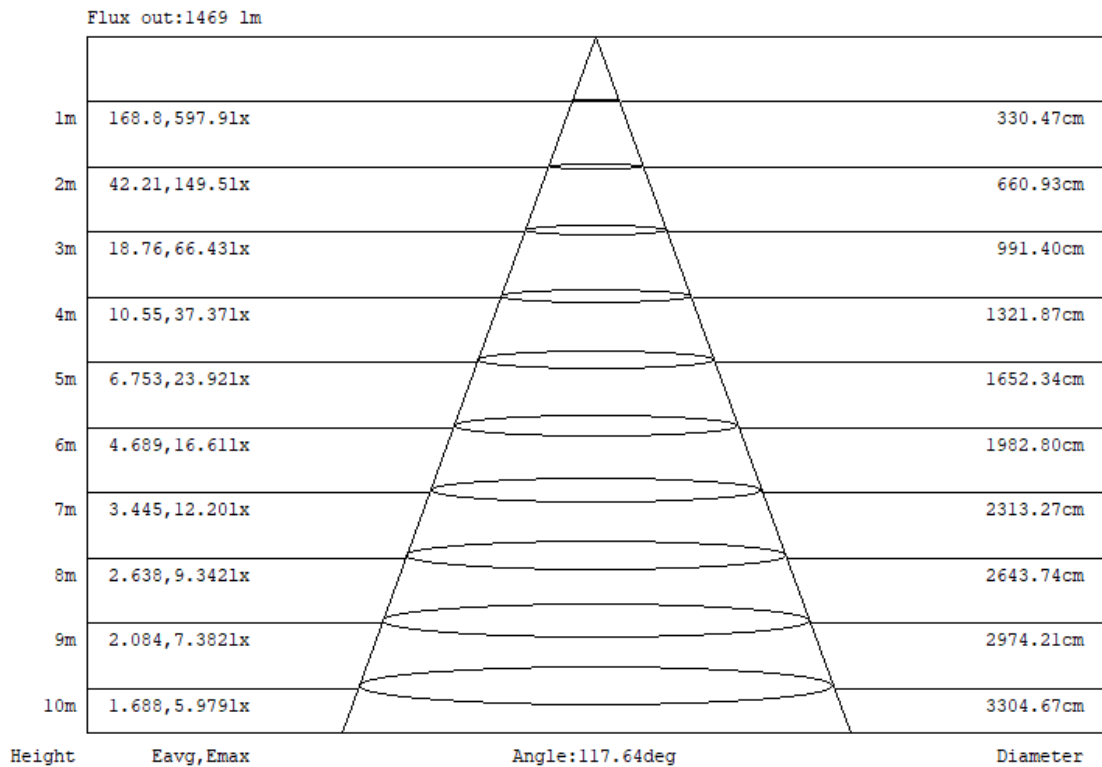
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	236	236	236	236	227	227	227	227	211	211	211	197	197	197	183	183	183	177
1	209	196	185	175	200	189	178	169	175	166	159	162	155	149	150	145	140	133
2	187	167	151	137	179	161	146	133	149	137	126	138	128	119	128	120	112	106
3	169	145	126	111	161	139	122	108	129	115	103	120	108	98	111	101	92	86
4	154	127	107	92	147	122	104	90	114	98	86	106	92	82	98	87	78	72
5	141	113	93	78	134	109	90	77	101	85	73	94	81	70	88	76	67	61
6	130	101	81	67	124	97	79	66	91	75	63	85	71	61	79	67	58	53
7	120	91	72	59	115	88	70	58	82	67	55	77	63	53	72	60	51	46
8	111	83	64	52	106	80	63	51	75	60	49	70	57	47	66	54	45	41
9	104	75	58	46	99	73	57	46	69	54	44	65	52	42	61	49	41	36
10	97	69	53	42	93	67	52	41	63	49	40	60	47	38	56	45	37	33

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	STRP420-835U	Sample ID.	H1
-----------	--------------	------------	----

Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.3	277.03	60	0.070	18.8	0.970	6.98%
25.3	119.97	60	0.160	19.1	0.997	5.76%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

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