

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

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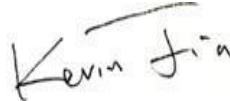
2018/9/27

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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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	2658	P
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	$\geq 40\%$	63.3%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥ 130	136.6	P
Allowable CCTs* (K)	IES LM-79-2008	≤ 5000	3936	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥ 80	83	P
Power Factor	ANSI C82.77:2014	≥ 0.873	0.970	P
			0.997	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	$\leq 25\%$	7.29%	P
			5.87%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/9/27	STRP220-840U	B1
2	Goniophotometer Test	2018/9/27	STRP220-840U	B1
3	THD and PF Test	2018/9/27	STRP220-840U	B1

Remark(If any)

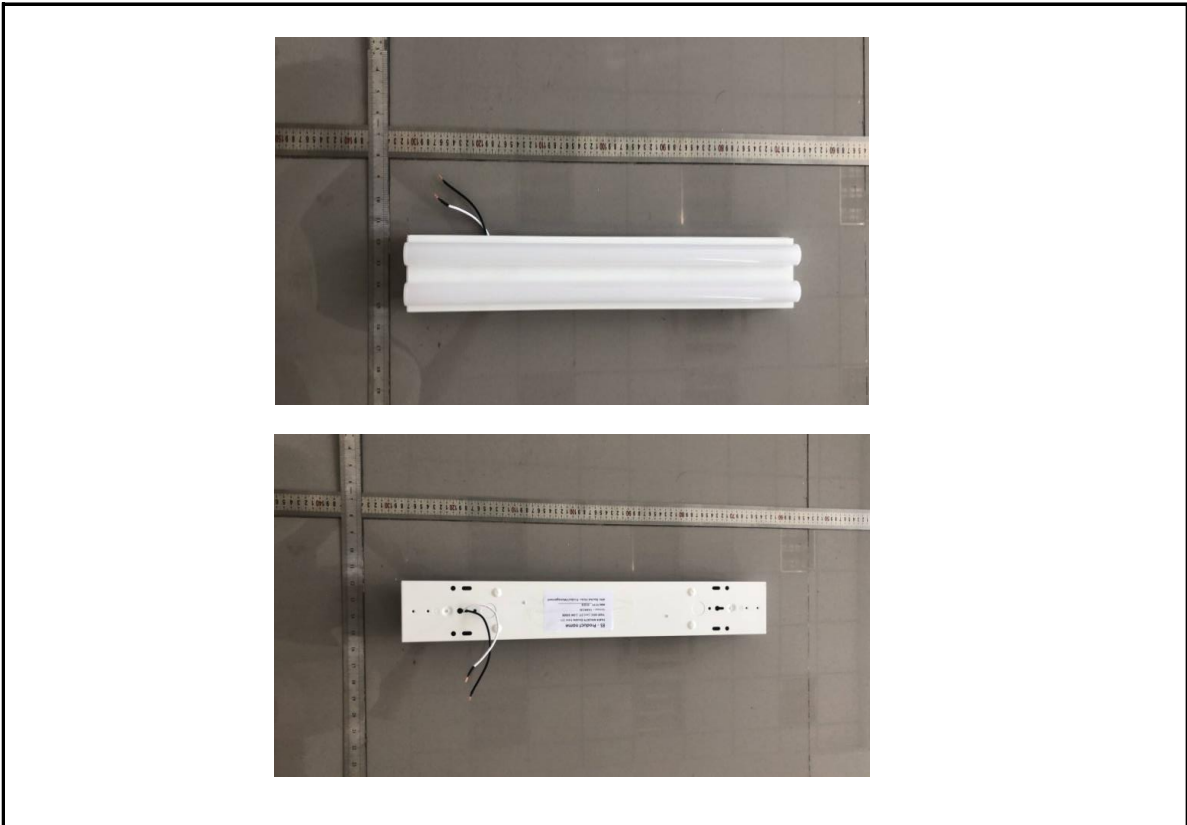
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3.0 Production Description

Luminaire Description: STRP220-840U

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.	STRP220-840U	Sample ID.	B1
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	120.01	60	0.162	19.4	0.997

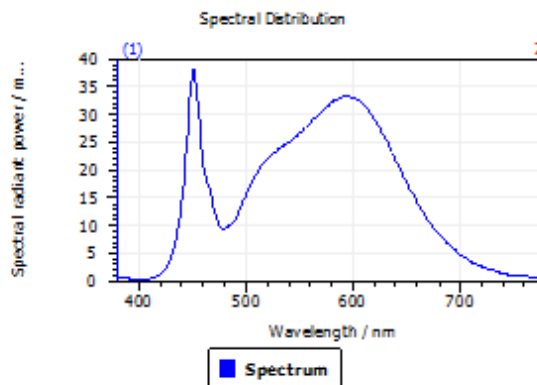
Test Result

CCT (K)	CRI (Ra)	Duv
3936	83	5.5E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

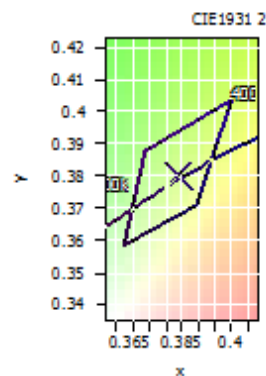
DominantWavelength	579.03 nm
Purity	0.292
PeakWavelength	450.80 nm
Radiant Power	5.868 W
Width50%	19.67 nm

Color Coordinates

Correlated Color Temperature 3936 K

x: 0.3837 u: 0.2260 u': 0.2260
y: 0.3799 v: 0.3356 v': 0.5035

ResultsCRICRI01	81.1	ResultsCRICRI09	9.8
ResultsCRICRI02	89.2	ResultsCRICRI10	74.6
ResultsCRICRI03	94.9	ResultsCRICRI11	80.5
ResultsCRICRI04	81.6	ResultsCRICRI12	62.3
ResultsCRICRI05	81.4	ResultsCRICRI13	83.1
ResultsCRICRI06	85.4	ResultsCRICRI14	97.3
ResultsCRICRI07	85.8	ResultsCRICRI15	74.8
ResultsCRICRI08	64.4	ResultsCRICRI16	72.8
ResultsCRI	83.0		



PlankDistance 5.5E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	STRP220-840U	Sample ID.	B1
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

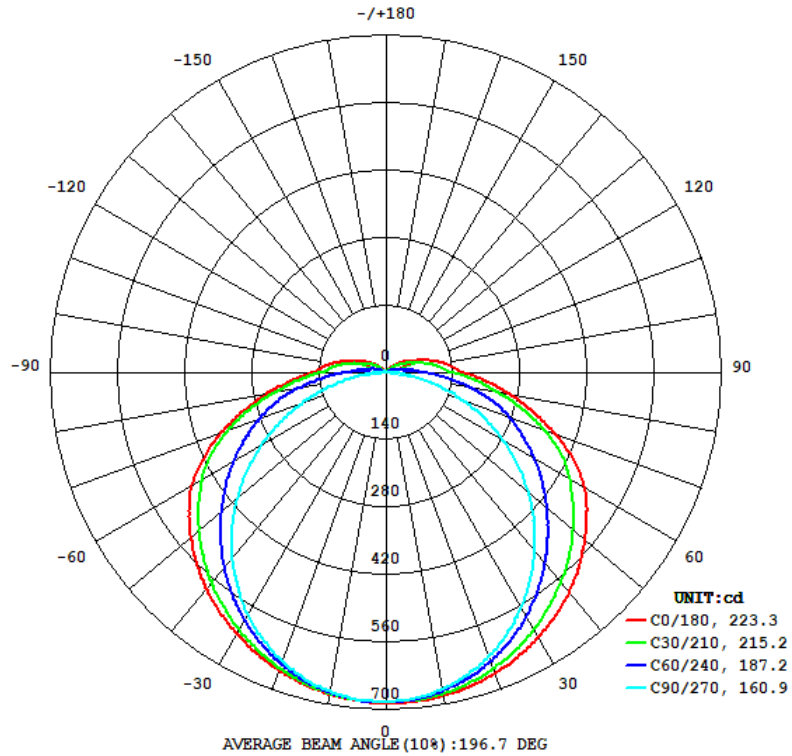
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.3	120.01	60	0.163	19.5	0.996	Light Down

Test Result

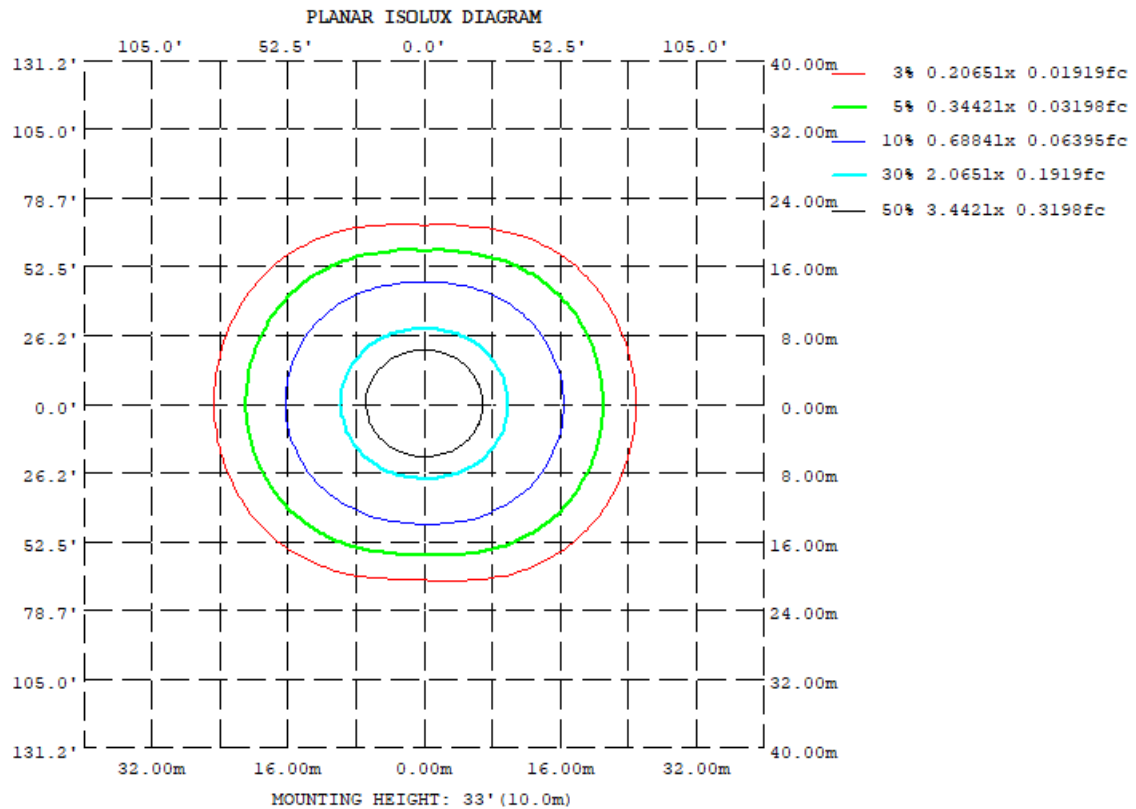
Flux(lm)	Zonal Lumen Requirement(0° - 60°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		0-180	90-270	0-180	90-270	
2658	63.3%	223.3	160.9	144.8	110.7	136.6

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	680.7	675.9	668.2	670.2	679.1	678.2	672.1	677.3
20	665.8	647.9	626.3	641.1	656.8	650.4	638.9	654.5
30	635.6	601.4	563.2	593.1	626.0	605.8	578.6	609.6
40	594.5	544.4	484.1	532.0	585.8	549.6	499.8	553.2
50	541.5	478.4	388.6	465.9	531.0	483.4	406.6	487.4
60	480.1	405.6	282.8	391.4	468.8	411.0	301.2	412.3
70	376.7	323.9	172.7	311.6	366.4	327.9	188.3	332.9
80	261.8	212.4	67.29	202.8	251.9	217.9	78.67	220.9
90	161.5	112.9	8.241	104.1	153.0	113.1	9.697	116.4
100	122.3	76.86	7.158	68.82	116.2	77.20	8.012	77.73
110	78.53	44.17	6.564	39.15	72.90	44.12	7.446	43.93
120	49.26	26.33	5.659	21.89	46.29	25.69	6.529	25.32
130	28.26	11.32	4.596	7.460	26.02	10.34	5.456	10.14
140	10.27	2.050	3.528	2.245	8.573	2.732	4.332	2.894
150	0.7212	1.474	2.488	1.613	1.191	2.097	3.239	2.310
160	0.7971	1.027	1.549	1.092	1.284	1.518	2.206	1.829
170	0.9105	0.9584	0.9942	0.9523	1.262	1.299	1.393	1.336
180	1.094	1.135	1.151	1.121	1.094	1.123	1.149	1.134
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	64.88	0 - 10	64.88	2.44%
10-20	187.34	0 - 20	252.22	9.49%
20-30	288.89	0 - 30	541.11	20.36%
30-40	359.31	0 - 40	900.42	33.88%
40-50	393.00	0 - 50	1293.42	48.66%
50-60	389.02	0 - 60	1682.44	63.30%
60-70	346.16	0 - 70	2028.60	76.32%
70-80	262.39	0 - 80	2290.99	86.20%
80-90	158.87	0 - 90	2449.86	92.17%
90-100	91.95	0 - 100	2541.81	95.63%
100-110	57.27	0 - 110	2599.08	97.79%
110-120	32.26	0 - 120	2631.34	99.00%
120-130	16.91	0 - 130	2648.25	99.64%
130-140	6.67	0 - 140	2654.92	99.89%
140-150	1.76	0 - 150	2656.68	99.95%
150-160	0.76	0 - 160	2657.44	99.98%
160-170	0.36	0 - 170	2657.80	100.00%
170-180	0.11	0 - 180	2657.91	100.00%

4.3 Goniophotometer Test

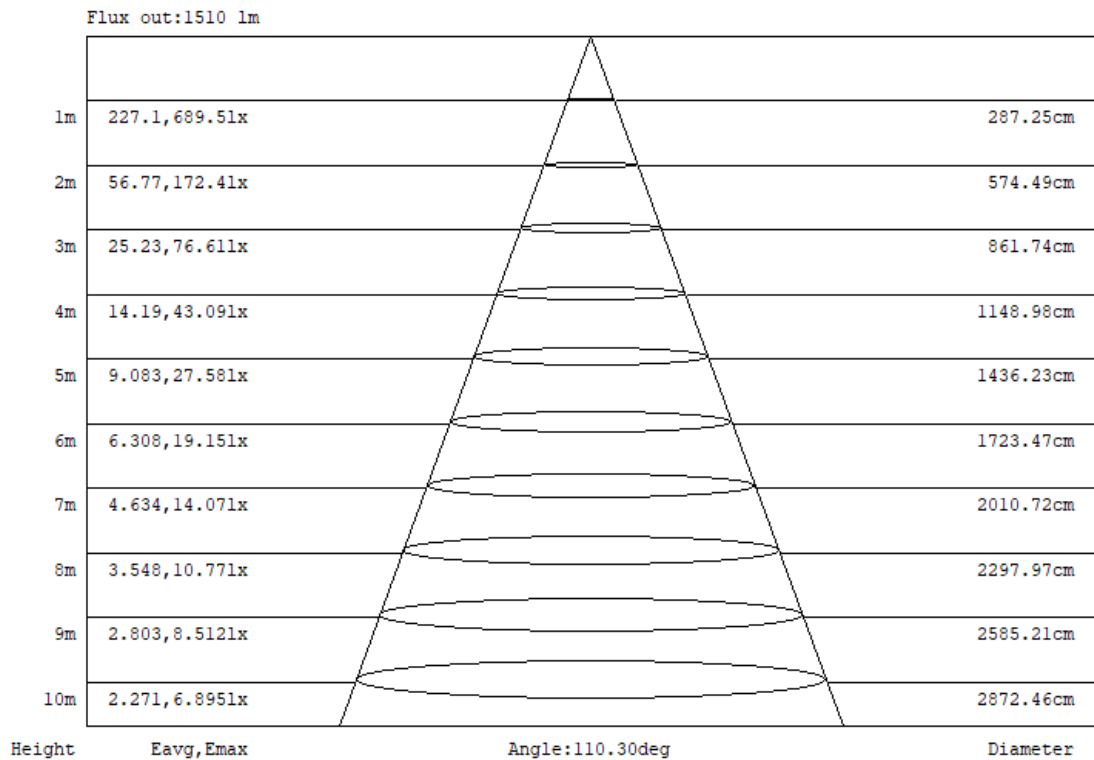
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
Rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	133	133	133	133	128	128	128	128	121	121	121	114	114	114	107	107	107	104
1	118	112	106	101	114	108	103	98	102	97	93	96	92	89	90	87	85	81
2	106	96	87	79	102	93	85	78	87	80	75	82	76	72	77	73	69	66
3	96	83	73	65	92	80	71	63	76	68	61	71	65	59	67	62	57	54
4	88	73	62	54	84	71	61	53	67	58	51	63	56	50	59	53	48	45
5	80	65	54	46	77	63	53	45	59	51	44	56	49	43	53	47	41	38
6	74	58	47	40	71	56	46	39	53	45	38	51	43	37	48	41	36	33
7	68	52	42	35	66	51	41	34	48	40	33	46	38	33	44	37	32	29
8	64	48	38	31	61	46	37	30	44	36	30	42	34	29	40	33	28	26
9	59	44	34	27	57	43	33	27	41	32	27	39	31	26	37	30	25	23
10	55	40	31	25	54	39	30	24	37	29	24	36	29	23	34	28	23	21

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	STRP220-840U	Sample ID.	B1
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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	277.04	60	0.071	19.1	0.970	7.29%
25.3	120.01	60	0.162	19.4	0.997	5.87%

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*****