

Photometric Test Report

Relevant Standards

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

Prepared For

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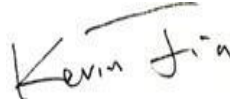
2018/9/27

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Approved By



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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	2538	P
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	$\geq 40\%$	63.7%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥ 130	134.0	P
Allowable CCTs* (K)	IES LM-79-2008	≤ 5000	5005	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥ 80	85	P
Power Factor	ANSI C82.77:2014	≥ 0.873	0.970	P
			0.997	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	$\leq 25\%$	6.79%	P
			5.59%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/9/27	STRP220-850U	C1
2	Goniophotometer Test	2018/9/27	STRP220-850U	C1
3	THD and PF Test	2018/9/27	STRP220-850U	C1

Remark(If any)

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3.0 Production Description

Luminaire Description: STRP220-850U

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.	STRP220-850U	Sample ID.	C1
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	0.160	19.1	0.997

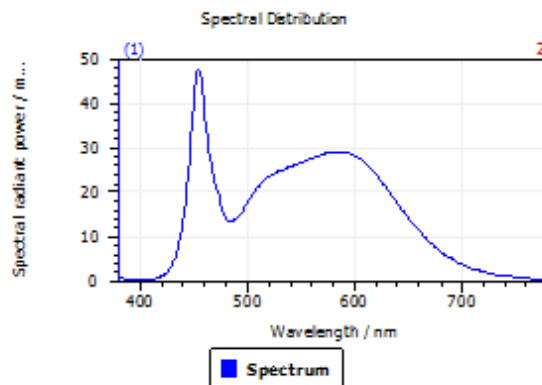
Test Result

CCT (K)	CRI (Ra)	Duv
5005	85	2.1E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

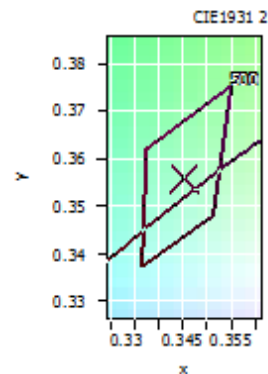
DominantWavelength	570.69 nm
Purity	0.105
PeakWavelength	453.94 nm
Radiant Power	5.813 W
Width50%	23.89 nm

Color Coordinates

Correlated Color Temperature 5005 K

x: 0.3454 u: 0.2099 u': 0.2099
y: 0.3560 v: 0.3245 v': 0.4868

ResultsCRICRI01	83.3	ResultsCRICRI09	14.5
ResultsCRICRI02	91.4	ResultsCRICRI10	78.6
ResultsCRICRI03	94.9	ResultsCRICRI11	82.0
ResultsCRICRI04	82.8	ResultsCRICRI12	62.5
ResultsCRICRI05	83.5	ResultsCRICRI13	85.8
ResultsCRICRI06	86.8	ResultsCRICRI14	97.7
ResultsCRICRI07	86.7	ResultsCRICRI15	78.1
ResultsCRICRI08	68.2	ResultsCRICRI16	74.7
ResultsCRI	84.7		



PlanckDistance 2.1E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	STRP220-850U	Sample ID.	C1
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

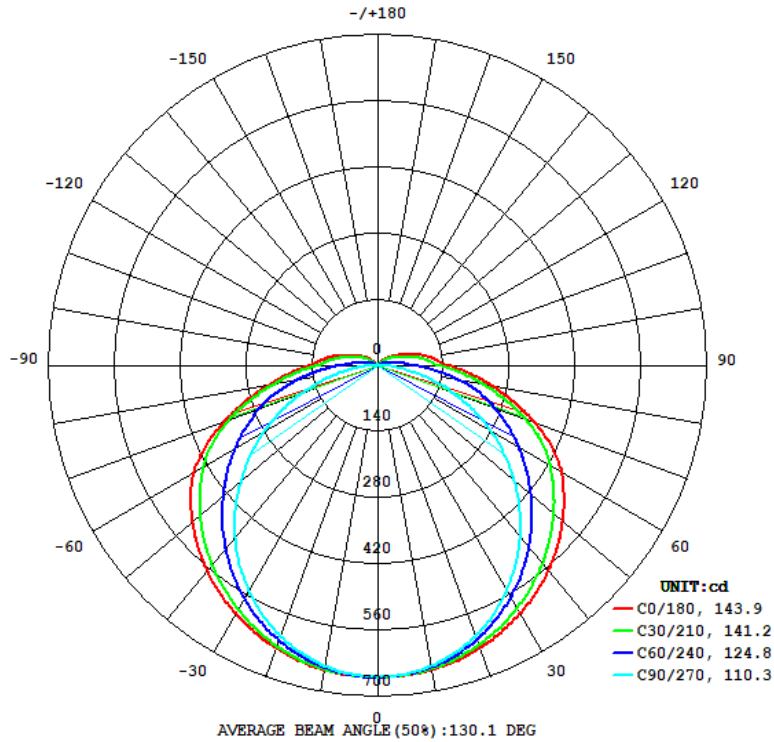
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.3	120.01	60	0.158	18.9	0.996	Light Down

Test Result

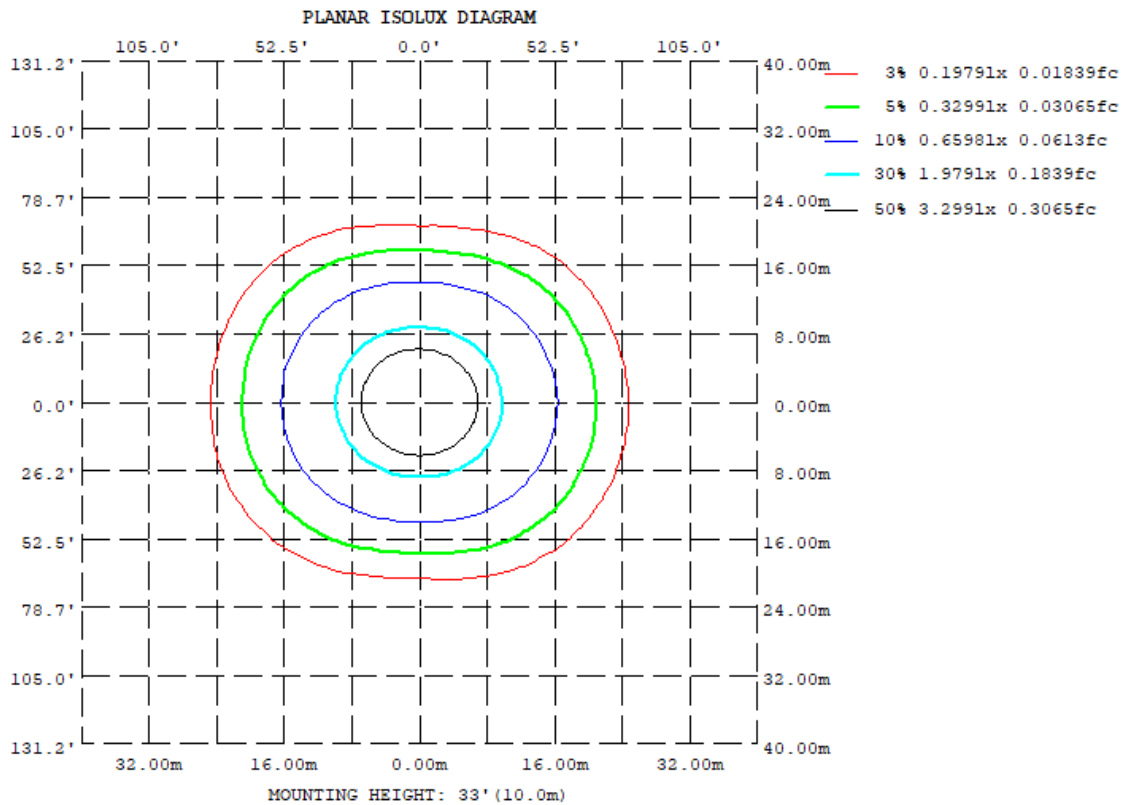
Flux(lm)	Zonal Lumen Requirement(0° - 60°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		0-180	90-270	0-180	90-270	
2538	63.7%	221.9	161.0	143.9	110.3	134.0

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
γ	C0	C45	C90	C135	C180	C225	C270	C315		
10	653.3	649.2	645.6	649.7	654.7	649.6	645.9	648.6		
20	636.0	622.2	609.0	622.8	636.2	624.4	608.7	620.6		
30	605.1	579.5	549.4	578.3	605.9	582.0	550.2	574.3		
40	566.1	523.9	472.4	521.3	566.6	527.0	472.9	517.3		
50	513.9	460.6	380.7	456.4	514.6	463.8	380.7	451.0		
60	453.2	390.1	279.1	384.5	451.9	393.9	280.2	378.2		
70	356.4	310.4	171.9	307.1	349.2	313.7	174.1	299.6		
80	245.5	203.9	69.47	201.9	236.8	205.5	71.59	195.9		
90	150.2	107.6	9.547	102.7	145.9	108.1	9.800	99.85		
100	113.4	74.34	7.178	66.58	107.4	72.07	7.429	66.83		
110	73.27	42.78	6.598	38.53	66.27	41.60	6.847	37.38		
120	45.30	25.47	5.697	22.08	43.11	24.32	5.982	21.04		
130	26.03	11.02	4.621	7.702	24.34	9.512	4.988	7.723		
140	9.403	2.005	3.532	2.235	7.779	2.464	3.965	2.645		
150	0.6917	1.444	2.481	1.590	1.118	1.905	2.984	2.126		
160	0.7650	1.005	1.539	1.070	1.235	1.386	2.025	1.680		
170	0.8711	0.9155	0.9580	0.9053	1.212	1.243	1.281	1.245		
180	1.041	1.077	1.094	1.061	1.039	1.066	1.093	1.076		

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	62.48	0 - 10	62.48	2.46%
10-20	180.34	0 - 20	242.82	9.57%
20-30	277.83	0 - 30	520.65	20.51%
30-40	345.23	0 - 40	865.88	34.11%
40-50	376.95	0 - 50	1242.83	48.96%
50-60	372.14	0 - 60	1614.97	63.63%
60-70	330.19	0 - 70	1945.16	76.64%
70-80	248.98	0 - 80	2194.14	86.44%
80-90	149.78	0 - 90	2343.92	92.35%
90-100	86.02	0 - 100	2429.94	95.73%
100-110	53.31	0 - 110	2483.25	97.83%
110-120	30.14	0 - 120	2513.39	99.02%
120-130	15.80	0 - 130	2529.19	99.64%
130-140	6.20	0 - 140	2535.39	99.89%
140-150	1.66	0 - 150	2537.05	99.95%
150-160	0.72	0 - 160	2537.77	99.98%
160-170	0.34	0 - 170	2538.11	100.00%
170-180	0.10	0 - 180	2538.21	100.00%

4.3 Goniophotometer Test

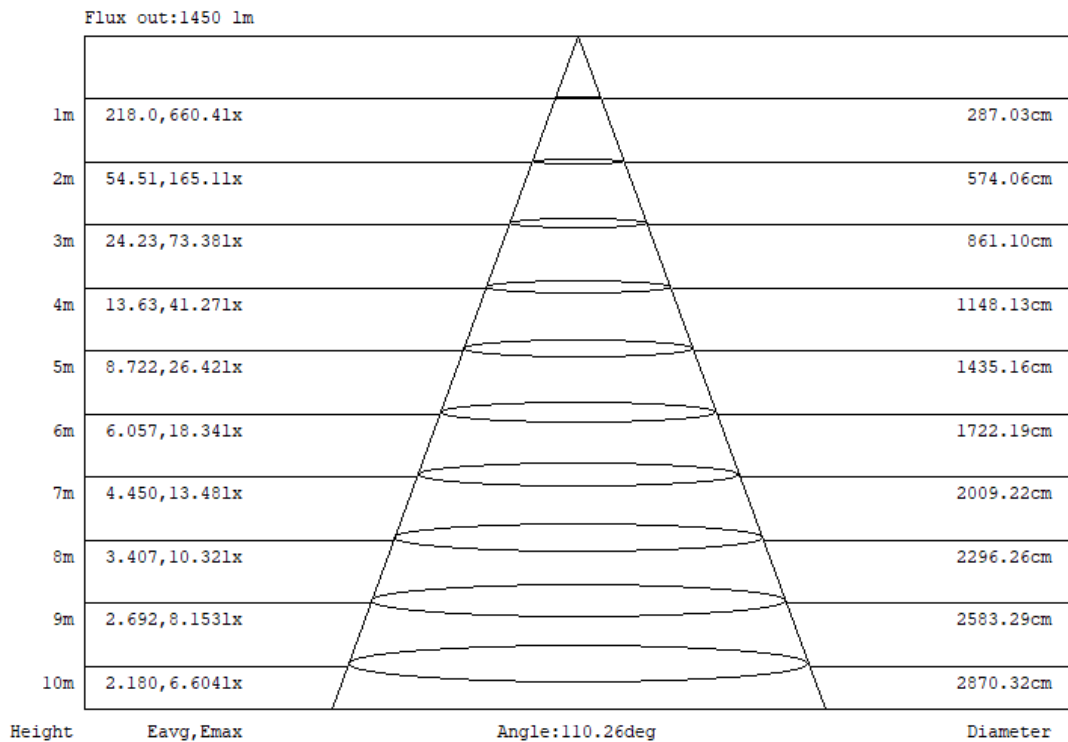
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	117	117	117	117	114	114	114	114	107	107	107	101	101	101	95	95	95	92
1	105	99	94	89	101	96	91	87	90	86	83	85	82	79	80	77	75	72
2	94	85	77	70	91	82	75	69	77	71	66	73	68	63	69	65	61	58
3	85	74	65	57	82	71	63	56	67	60	54	63	57	52	60	55	51	48
4	78	65	55	48	75	63	54	47	59	52	46	56	49	44	53	47	43	40
5	71	57	48	41	68	56	47	40	53	45	39	50	43	38	47	41	37	34
6	65	51	42	35	63	50	41	35	47	40	34	45	38	33	43	37	32	30
7	61	46	37	31	58	45	37	30	43	35	30	41	34	29	39	33	28	26
8	56	42	33	27	54	41	33	27	39	32	26	37	31	26	36	30	25	23
9	53	39	30	24	51	38	30	24	36	29	24	34	28	23	33	27	23	21
10	49	36	27	22	47	35	27	22	33	26	21	32	25	21	30	25	20	19

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	STRP220-850U	Sample ID.	C1
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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	277.06	60	0.071	19.0	0.970	6.79%
25.3	120.01	60	0.160	19.1	0.997	5.59%

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*****