

Photometric Test Report

Relevant Standards

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

Prepared For

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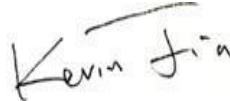
2019/1/2

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1.0 Test Summary

DLC Technical Requirements v4.4

Indoor / Linear Ambient Direct Linear Ambient Luminaire			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	≥ 1500	5579
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	$\geq 40\%$	61.9%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥ 130	141.3
Power (Input Wattage)	IES LM-79-2008	Worst Case	39.5
Input Voltage	IES LM-79-2008	Worst Case	120
Input Current	IES LM-79-2008	Worst Case	0.330
Allowable CCTs* (K)	IES LM-79-2008	≤ 5000	4937
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥ 80	84
Power Factor	ANSI C82.77:2014	≥ 0.873	0.974
Total Harmonic Distortion (A%)	ANSI C82.77:2014	$\leq 25\%$	8.31%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/12/29	STRP440-850U	B1
2	Goniophotometer Test	2018/12/29	STRP440-850U	B1
3	THD and PF Test	2018/12/29	STRP440-850U	B1

Remark(If any)

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3.0 Production Description

Luminaire Description: STRP440-850U

Electrical Specification: 120V-277V, 50/60HZ, 40W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	STRP440-850U	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	119.97	60	0.330	39.5	0.997

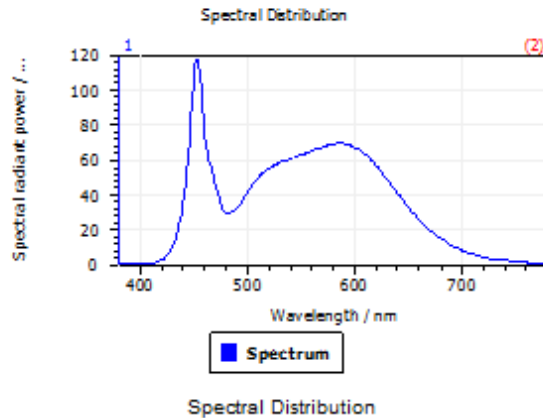
Test Result

CCT (K)	CRI (Ra)	Duv
4937	84	1.6E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results

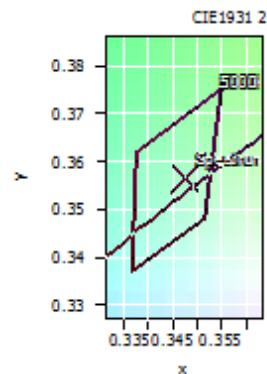


Spectral values

DominantWavelength	571.95 nm
Purity	0.112
PeakWavelength	452.53 nm
Width50%:	20.17 nm

Color Coordinates

Correlated Color Temperature		4937 K
x: 0.3473	u: 0.2109	u': 0.2109
y: 0.3566	v: 0.3249	v': 0.4874
CRI01	82.2	CRI09
CRI02	90.4	CRI10
CRI03	94.6	CRI11
CRI04	81.6	CRI12
CRI05	82.2	CRI13
CRI06	85.7	CRI14
CRI07	87.1	CRI15
CRI08	67.5	CRI16
ResultsCRI	83.9	



PlanckDistance 1.6E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	STRP440-850U	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	120.03	60	0.330	39.5	0.996	Light Down

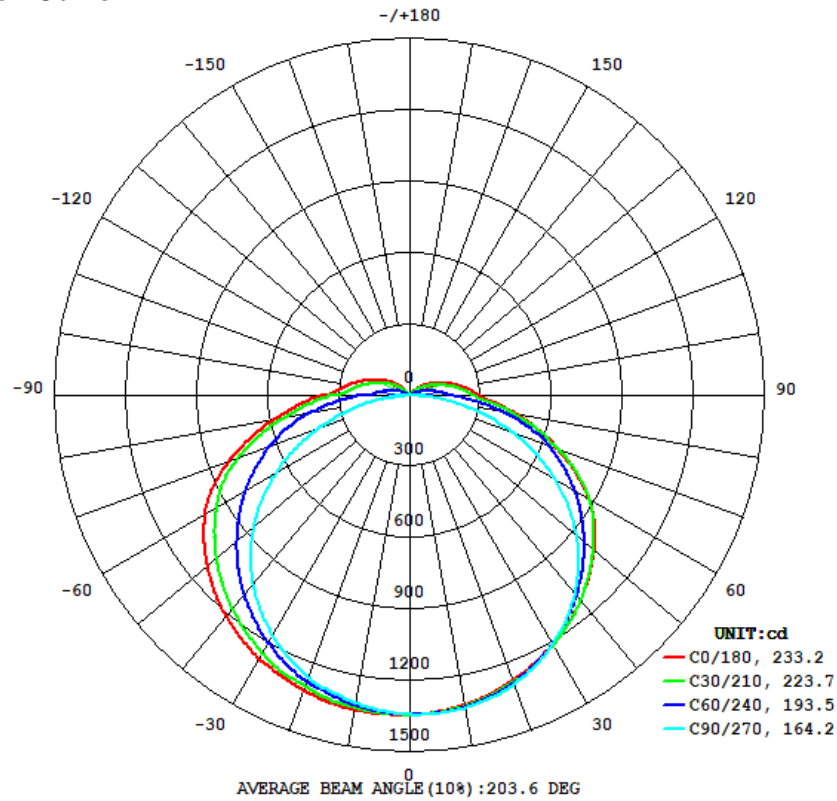
Test Result

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	
5579	61.9%	233.2	164.2	145.8	121.0	141.3

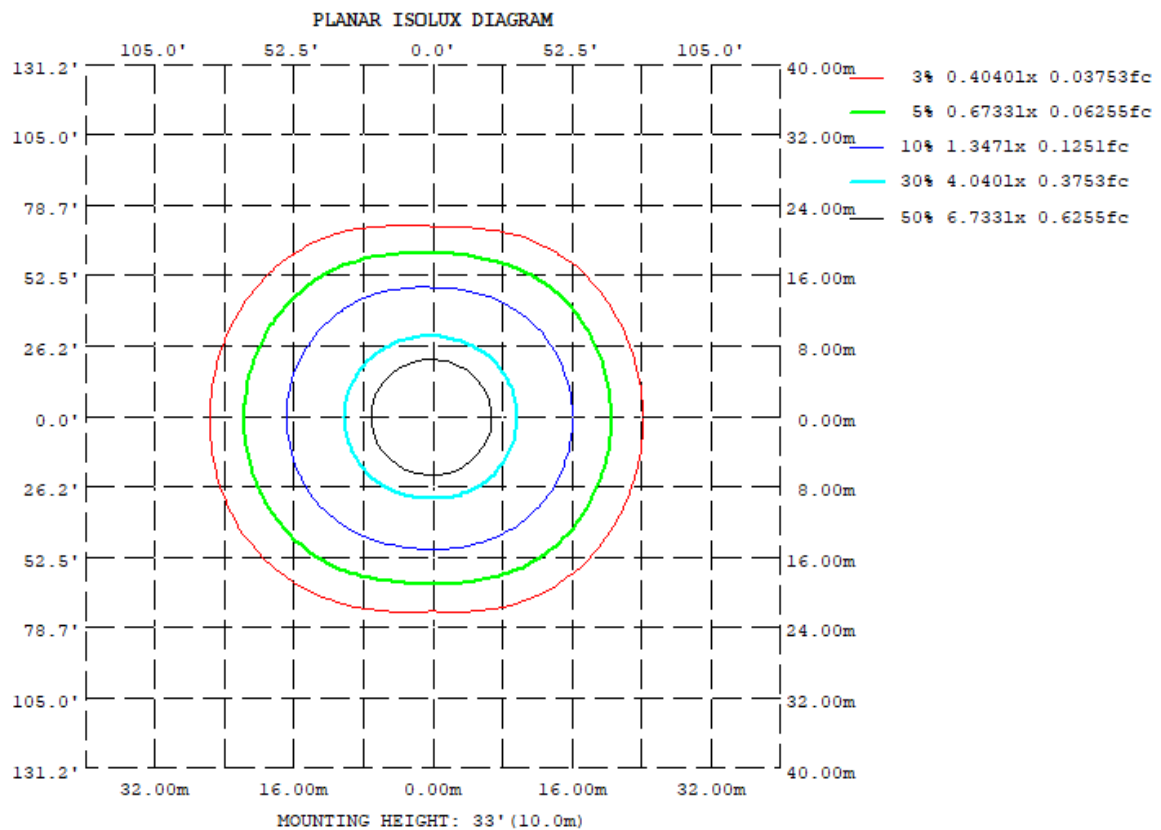
Length (ft)	lumen/ft
4	1395

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	1323	1328	1335	1345	1344	1331	1316	1315		
20	1276	1284	1292	1316	1321	1291	1261	1265		
30	1209	1211	1210	1258	1279	1227	1164	1180		
40	1125	1114	1089	1170	1211	1132	1031	1074		
50	1019	996.0	922.7	1059	1117	1018	861.4	951.8		
60	877.7	853.9	712.4	924.4	1000	882.9	655.4	809.0		
70	667.3	664.8	466.6	767.3	816.8	727.1	418.0	631.7		
80	455.0	427.5	199.2	544.1	585.0	499.3	169.9	399.8		
90	297.0	238.6	20.55	296.8	369.6	270.3	15.11	214.9		
100	230.0	168.0	13.51	190.2	267.2	179.6	11.59	148.5		
110	157.5	104.4	11.33	123.1	190.7	116.5	9.922	91.49		
120	103.9	57.45	8.647	72.91	130.8	70.01	7.856	48.72		
130	57.33	16.41	6.221	31.51	79.01	30.86	5.945	14.16		
140	17.79	2.123	4.249	2.777	34.15	3.519	4.497	2.858		
150	1.755	1.828	2.824	1.827	2.795	2.771	3.504	2.770		
160	1.974	2.014	2.025	1.923	3.031	3.051	2.884	2.821		
170	2.223	2.254	2.209	2.203	2.967	3.057	2.852	2.764		
180	2.693	2.639	2.550	2.514	2.692	2.677	2.596	2.542		

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	127.56	0 - 10	127.56	2.29%
10-20	371.05	0 - 20	498.61	8.94%
20-30	580.04	0 - 30	1078.65	19.33%
30-40	733.78	0 - 40	1812.43	32.48%
40-50	817.89	0 - 50	2630.32	47.14%
50-60	823.43	0 - 60	3453.75	61.90%
60-70	741.58	0 - 70	4195.33	75.19%
70-80	568.86	0 - 80	4764.19	85.39%
80-90	346.27	0 - 90	5110.46	91.59%
90-100	200.17	0 - 100	5310.63	95.18%
100-110	130.44	0 - 110	5441.07	97.52%
110-120	77.76	0 - 120	5518.83	98.91%
120-130	40.03	0 - 130	5558.86	99.63%
130-140	15.13	0 - 140	5573.99	99.90%
140-150	3.33	0 - 150	5577.32	99.96%
150-160	1.15	0 - 160	5578.47	99.98%
160-170	0.71	0 - 170	5579.18	100.00%
170-180	0.25	0 - 180	5579.43	100.00%

4.3 Goniophotometer Test

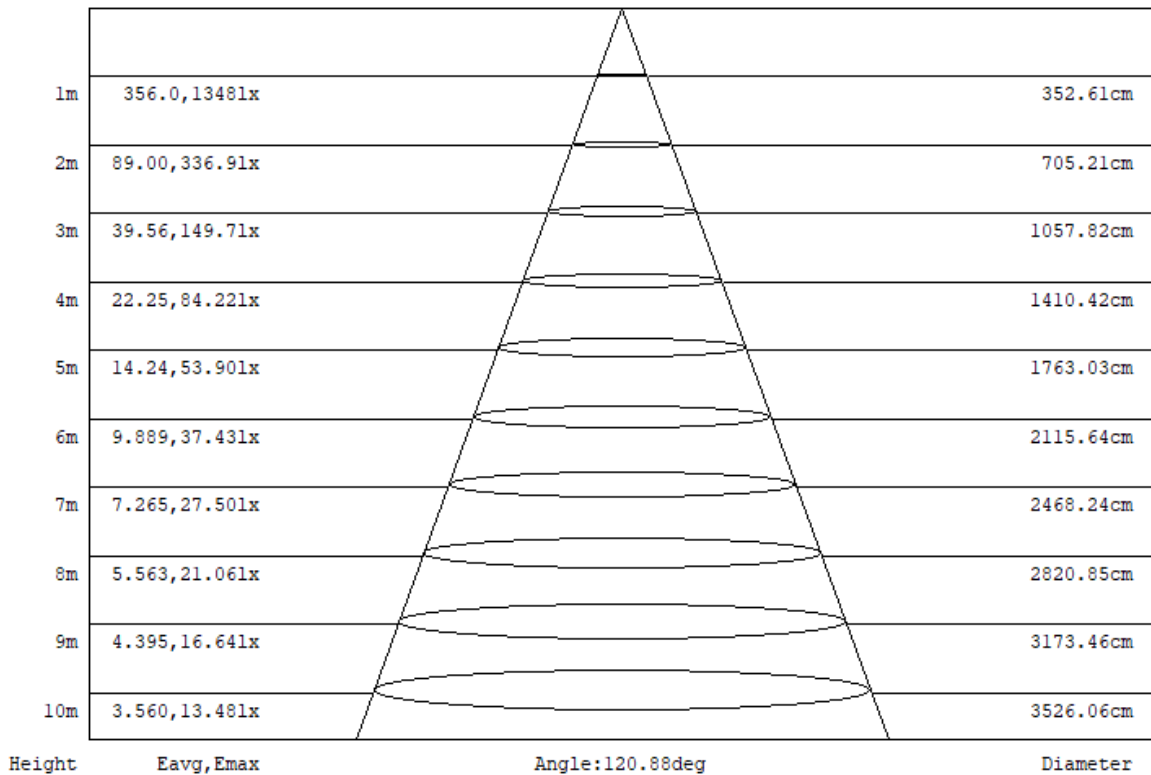
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	117	117	117	117	113	113	113	113	106	106	106	100	100	100	94	94	94	92
1	104	98	93	88	100	95	90	86	89	85	82	84	81	78	79	76	74	71
2	94	84	76	70	90	81	74	68	76	70	65	72	67	62	67	63	60	57
3	85	73	64	56	81	70	62	55	66	59	53	62	56	51	59	54	49	47
4	77	64	54	47	74	62	53	46	58	51	44	55	48	43	52	46	41	39
5	70	57	47	40	68	55	46	39	52	44	38	49	42	37	46	40	36	33
6	65	51	41	34	62	49	40	34	46	39	33	44	37	32	42	36	31	28
7	60	46	36	30	58	44	36	30	42	34	29	40	33	28	38	32	27	25
8	56	41	33	26	54	40	32	26	38	31	25	36	30	25	35	29	24	22
9	52	38	29	24	50	37	29	23	35	28	23	33	27	22	32	26	22	20
10	49	35	27	21	47	34	26	21	32	25	20	31	25	20	30	24	20	18

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	STRP440-850U	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	277.05	60	0.146	39.4	0.974	8.31%
25.3	119.97	60	0.330	39.5	0.997	5.92%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2018/12/26	2019/12/25
DLF108	Auxiliary Lamp	2018/12/26	2019/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF116	AC Power Source	2018/12/26	2019/12/25
DLF113	Power Meter	2018/12/26	2019/12/25
DLF112	Temperature Recorder	2018/12/26	2019/12/25
DLF114	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF101	Goniophotometer	2018/12/26	2019/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF104	AC Power Source	2018/12/26	2019/12/25
DLF507	DC Power Source	2018/12/26	2019/12/25
DLF102	Power Meter	2018/12/26	2019/12/25
DLF111	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF119	Power Meter	2018/12/26	2019/12/25
DLF031	Temperature data logger	2018/12/26	2019/12/25
DLF022	Digital power meter	2018/12/26	2019/12/25
DLF003	Temperature & Humidity Datalogger	2018/12/26	2019/12/25

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