

Photometric Test Report

Relevant Standards

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

Prepared For

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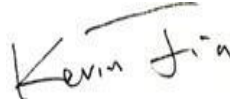
2019/1/2

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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	2686
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	$\geq 40\%$	55.1%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥ 130	140.2
Power (Input Wattage)	IES LM-79-2008	Worst Case	19.2
Input Voltage	IES LM-79-2008	Worst Case	120
Input Current	IES LM-79-2008	Worst Case	0.160
Allowable CCTs* (K)	IES LM-79-2008	≤ 5000	4966
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥ 80	85
Power Factor	ANSI C82.77:2014	≥ 0.873	0.970
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	STRP420-850U	A1
2	Goniophotometer Test	2018/12/29	STRP420-850U	A1
3	THD and PF Test	2018/12/29	STRP420-850U	A1

Remark(If any)

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3.0 Production Description

Luminaire Description: STRP420-850U

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.	STRP420-850U	Sample ID.	A1
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	119.94	60	0.160	19.1	0.997

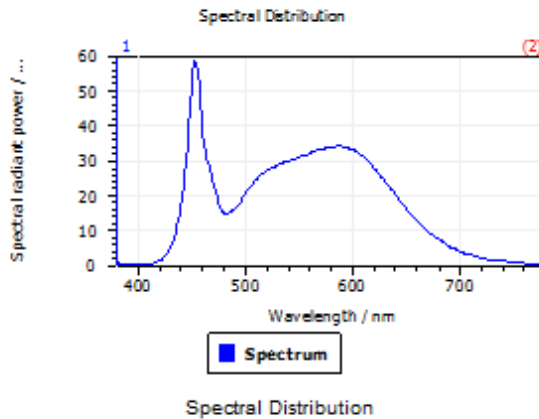
Test Result

CCT (K)	CRI (Ra)	Duv
4966	85	1.4E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



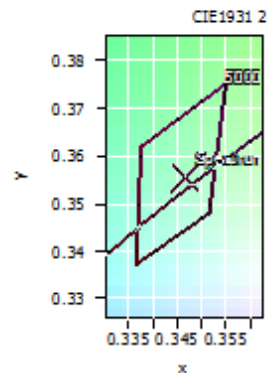
Spectral values

DominantWavelength	571.78 nm
Purity	0.106
PeakWavelength	452.75 nm
Width50%:	20.71 nm

Color Coordinates

Correlated Color Temperatu		4966 K
x: 0.3464	u: 0.2108	u': 0.2108
y: 0.3555	v: 0.3245	v': 0.4868
CRI01	83.2	CRI09
CRI02	90.5	CRI10
CRI03	94.3	CRI11
CRI04	83.7	CRI12
CRI05	83.7	CRI13
CRI06	85.8	CRI14
CRI07	87.1	CRI15
CRI08	68.5	CRI16

ResultsCRI 84.6



PlankDistance 1.4E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	STRP420-850U	Sample ID.	A1
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	119.99	60	0.160	19.2	0.996	Light Down

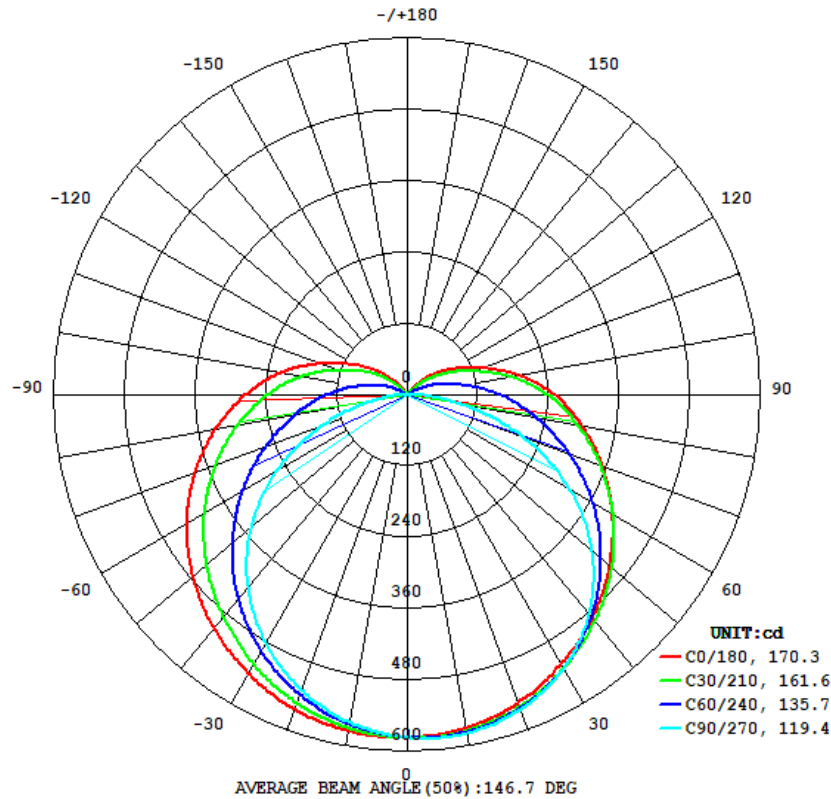
Test Result

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	
2686	55.1%	258.2	163.2	170.3	119.4	140.2

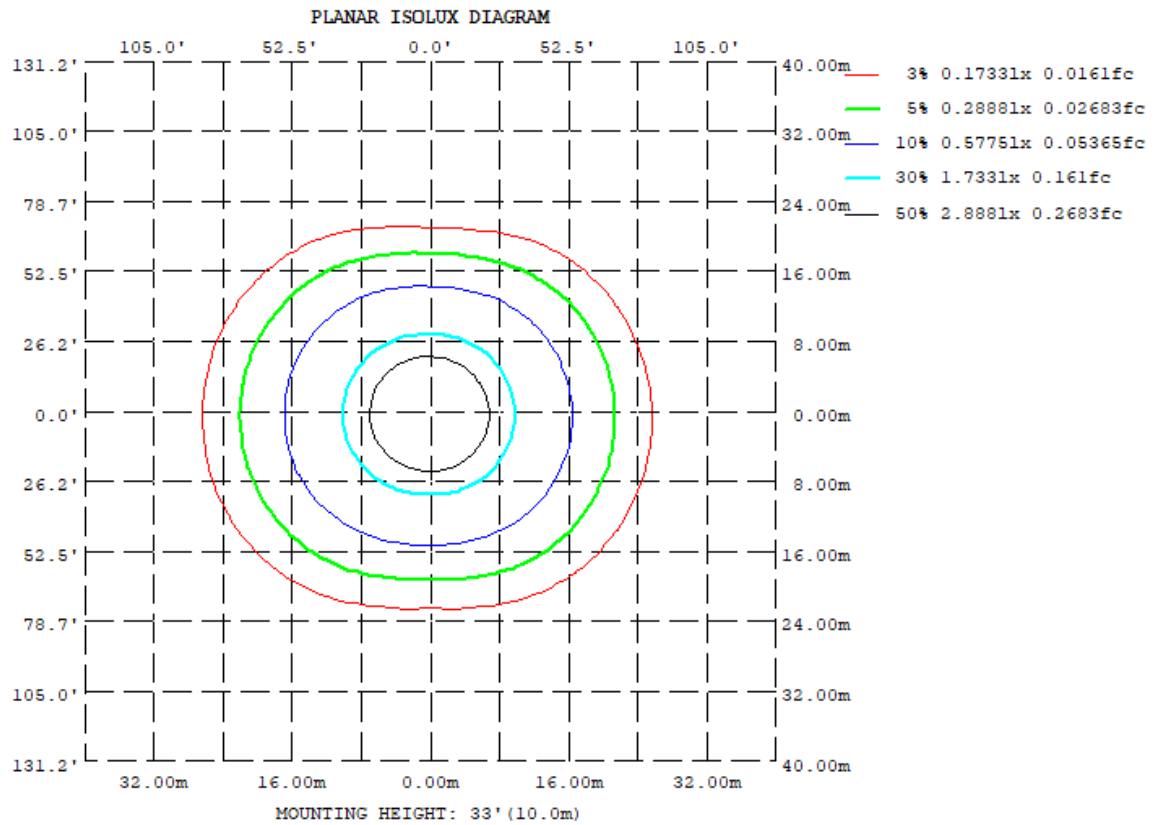
Length (ft)	lumen/ft
4	671

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	568.7	574.8	578.2	578.4	574.4	566.1	559.8	561.0
10	550.9	559.5	563.2	568.5	562.7	543.9	528.3	534.1
20	522.6	531.5	531.4	543.5	540.4	510.3	481.8	496.1
30	490.4	492.4	481.8	507.5	512.1	466.8	420.6	448.0
40	449.8	445.6	410.8	461.2	475.3	417.5	345.6	396.5
50	403.0	390.2	320.2	407.1	431.8	365.0	257.0	339.5
60	353.6	330.2	210.1	346.6	383.4	308.7	157.7	281.7
70	301.2	268.5	91.67	284.0	330.7	251.9	58.08	224.2
80	251.1	210.6	9.816	222.5	276.7	197.9	4.534	173.0
90	194.6	150.1	6.852	162.8	219.6	144.0	4.267	117.8
100	133.6	92.68	5.738	101.4	156.0	90.49	3.739	71.40
110	87.68	51.87	4.365	57.94	102.7	52.75	3.044	37.60
120	49.32	15.40	3.088	19.13	59.82	18.20	2.389	8.399
130	14.54	1.008	2.079	1.057	21.93	1.248	1.887	1.248
140	0.7851	0.8356	1.339	0.8359	1.194	1.245	1.544	1.240
150	0.8798	0.8845	0.9054	0.8371	1.337	1.324	1.302	1.238
160	0.9889	0.9825	0.9571	0.9560	1.313	1.326	1.251	1.222
170	1.178	1.153	1.122	1.105	1.175	1.164	1.127	1.107
180								

LUMINOUS INTENSITY:cd

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	54.75	0 - 10	54.75	2.04%
10-20	159.04	0 - 20	213.79	7.96%
20-30	247.98	0 - 30	461.77	17.19%
30-40	313.29	0 - 40	775.06	28.86%
40-50	349.70	0 - 50	1124.76	41.88%
50-60	354.43	0 - 60	1479.19	55.08%
60-70	329.03	0 - 70	1808.22	67.33%
70-80	280.08	0 - 80	2088.30	77.76%
80-90	219.75	0 - 90	2308.05	85.94%
90-100	162.99	0 - 100	2471.04	92.01%
100-110	107.42	0 - 110	2578.46	96.01%
110-120	62.49	0 - 120	2640.95	98.34%
120-130	31.18	0 - 130	2672.13	99.50%
130-140	10.72	0 - 140	2682.85	99.90%
140-150	1.72	0 - 150	2684.57	99.97%
150-160	0.51	0 - 160	2685.08	99.98%
160-170	0.31	0 - 170	2685.39	100.00%
170-180	0.11	0 - 180	2685.50	100.00%

4.3 Goniophotometer Test

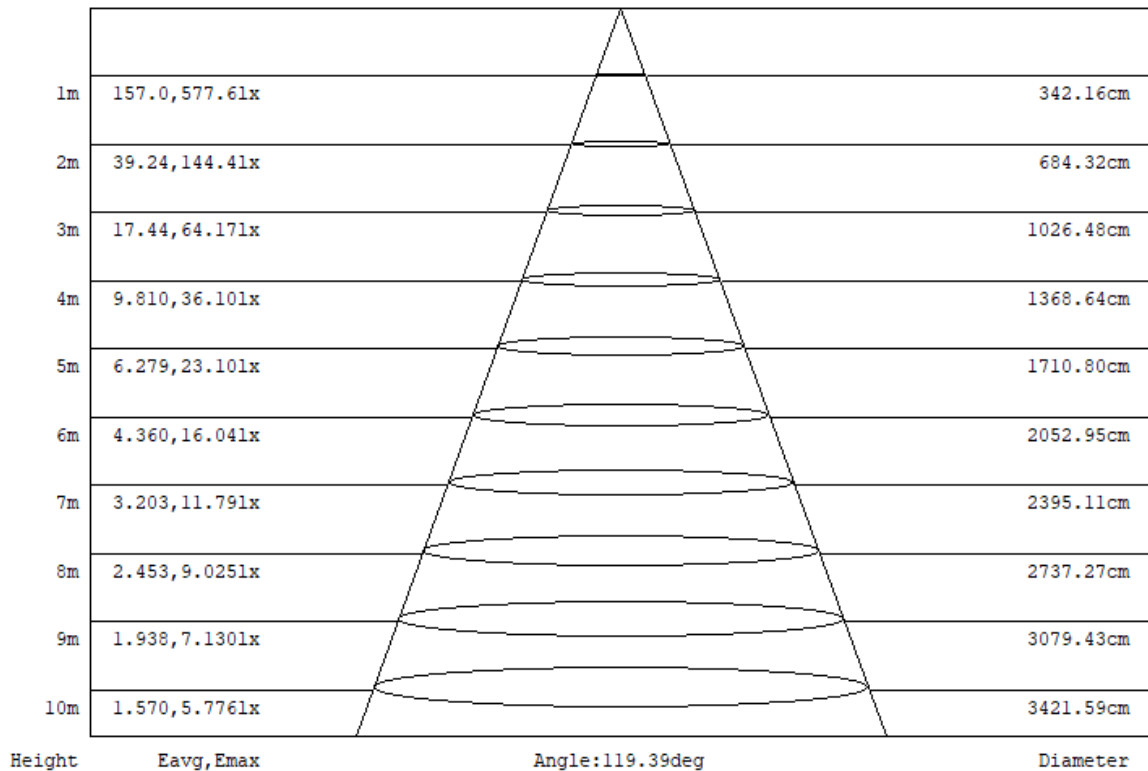
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	116	116	116	116	111	111	111	111	103	103	103	96	96	96	89	89	89	86
1	102	96	90	85	98	92	87	83	85	81	77	79	76	72	73	70	68	65
2	91	82	74	67	87	79	71	65	73	66	61	67	62	58	62	58	54	51
3	83	71	61	54	79	68	59	53	63	56	50	58	52	47	54	49	45	42
4	75	62	52	45	72	60	51	44	55	48	42	51	45	40	47	42	37	35
5	69	55	45	38	66	53	44	37	49	41	35	46	39	34	42	37	32	29
6	63	49	40	33	60	47	38	32	44	36	31	41	34	29	38	32	28	25
7	59	44	35	29	56	43	34	28	40	32	27	37	31	26	35	29	24	22
8	54	40	31	25	52	39	31	25	36	29	24	34	27	23	32	26	22	20
9	51	37	28	22	48	36	28	22	33	26	21	31	25	20	29	24	19	17
10	47	34	26	20	45	33	25	20	31	24	19	29	23	18	27	22	18	16

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	STRP420-850U	Sample ID.	A1
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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	277.07	60	0.070	18.9	0.970	8.31%
25.3	119.94	60	0.160	19.1	0.997	5.68%

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*****