

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P904184

Luminaire Tested: DFN2DIP-SQ4F0-120D160US830-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P904184
REPORT IS A COMBINATION OF REPORTS P900215 AND P896915
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-120D160US830-FLLFLL
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

Summary

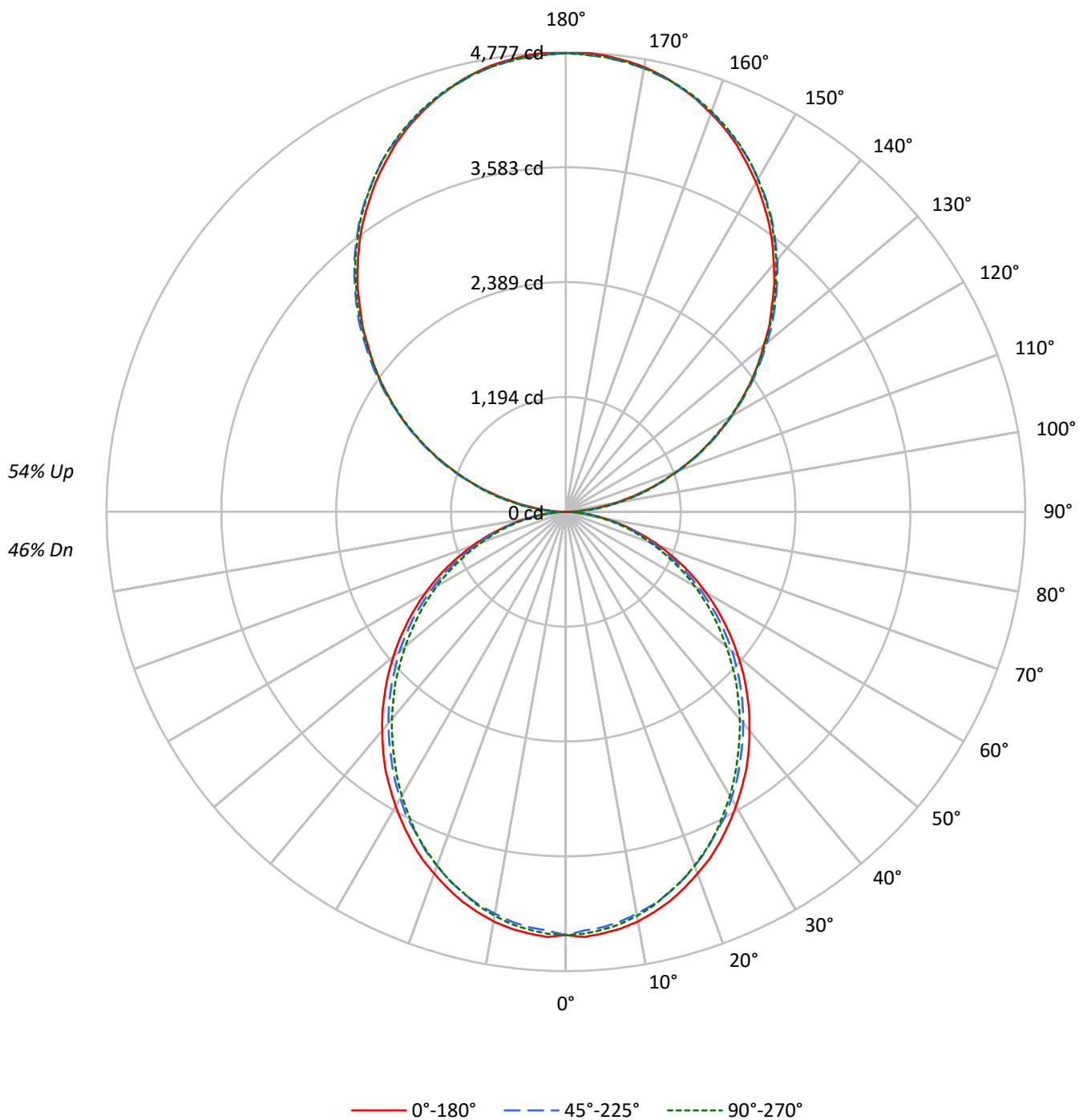
Lumens per Lamp: N/A
Luminaire Lumens: 24544.7 lumens
Efficiency: N/A
Efficacy: 102.4 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 239.7
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9933
Total Harmonic Distortion (THDi): 0.066
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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Luminous Intensity Polar Plot



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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20				20				20
RC	80				70				50				30				10
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RCR																	
0	106	106	106	106	97	97	97	97	81	81	81	66	66	66	52	52	52
1	97	93	89	85	89	85	82	79	71	69	66	58	56	55	46	45	44
2	88	81	75	70	81	74	69	65	62	58	55	51	48	46	41	39	37
3	80	71	64	58	73	65	59	54	55	50	46	45	42	39	36	34	32
4	74	63	55	49	67	58	51	46	49	43	39	40	36	33	32	29	27
5	67	56	48	42	62	52	45	39	44	38	34	36	32	29	29	26	24
6	62	50	42	36	57	46	39	34	39	34	30	33	28	25	26	23	21
7	57	45	37	32	53	42	35	30	36	30	26	30	25	22	24	21	19
8	53	41	33	28	49	38	31	26	32	27	23	27	23	20	22	19	17
9	50	37	30	25	45	35	28	24	30	24	21	25	21	18	20	17	15
10	46	34	27	22	42	32	25	21	27	22	19	23	19	16	19	16	14

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	3088	3088	3088
5°	3093	3046	3066
10°	3068	3005	3026
15°	3023	2956	2962
20°	2962	2888	2896
25°	2901	2807	2820
30°	2825	2731	2724
35°	2753	2641	2621
40°	2664	2551	2524
45°	2576	2460	2424
50°	2479	2365	2309
55°	2378	2255	2203
60°	2263	2124	2082
65°	2139	1989	1939
70°	1980	1824	1785
75°	1759	1627	1645
80°	1494	1376	1374
85°	1080	941	924

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3754 cd/sqm

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	414.2	1.7
10°-20°	1165.5	4.7
20°-30°	1712.8	7.0
30°-40°	1989.3	8.1
40°-50°	1986.8	8.1
50°-60°	1732.4	7.1
60°-70°	1280.6	5.2
70°-80°	724.6	3.0
80°-90°	204.8	0.8
90°-100°	295.1	1.2
100°-110°	937.8	3.8
110°-120°	1604.9	6.5
120°-130°	2110.7	8.6
130°-140°	2369.1	9.7
140°-150°	2323.2	9.5
150°-160°	1948.8	7.9
160°-170°	1292.4	5.3
170°-180°	451.7	1.8
0°-30°	3292.4	13.4
0°-40°	5281.7	21.5
0°-60°	9000.9	36.7
0°-90°	11210.9	45.7
90°-120°	2837.8	11.6
90°-150°	9640.8	39.3
90°-180°	13334.0	54.3
0°-180°	24544.7	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	4401	4401	4401	4401	4401	
5°	4401	4384	4338	4371	4363	418
15°	4190	4164	4109	4126	4105	1180
25°	3792	3758	3686	3694	3686	1745
35°	3271	3229	3161	3136	3115	2043
45°	2662	2632	2569	2522	2505	2054
55°	2015	1989	1938	1888	1866	1801
65°	1359	1333	1291	1253	1232	1343
75°	711	703	681	656	664	759
85°	173	169	165	152	148	193
90°	4	52	141	132	137	24
95°	210	250	257	257	250	234
105°	866	877	886	893	893	914
115°	1610	1634	1626	1622	1610	1593
125°	2342	2378	2367	2354	2350	2093
135°	3030	3074	3083	3079	3067	2342
145°	3678	3707	3730	3734	3719	2298
155°	4206	4218	4230	4251	4238	1936
165°	4576	4571	4571	4600	4580	1291
175°	4761	4750	4741	4770	4745	452
180°	4770	4770	4770	4770	4770	

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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	4401.0	4401.0	4401.0	4401.0	4401.0
2.5°	4426.6	4405.4	4358.8	4401.0	4392.9
5°	4401.0	4384.3	4337.7	4371.3	4363.2
7.5°	4371.3	4346.2	4299.5	4333.6	4325.1
10°	4325.1	4295.4	4244.7	4278.4	4265.9
12.5°	4261.3	4236.2	4185.5	4206.6	4198.0
15°	4189.5	4164.3	4109.1	4126.2	4105.1
17.5°	4100.6	4075.5	4020.2	4041.3	4020.2
20°	4003.2	3978.0	3918.8	3931.3	3914.8
22.5°	3906.2	3868.0	3812.8	3812.8	3804.3
25°	3791.7	3758.0	3686.2	3694.3	3686.2
27.5°	3664.6	3635.0	3580.2	3567.6	3546.6
30°	3538.0	3503.9	3440.6	3428.0	3411.0
32.5°	3402.4	3377.3	3309.5	3283.9	3266.9
35°	3271.3	3229.1	3161.3	3135.7	3114.6
37.5°	3123.1	3085.0	3017.2	2987.6	2966.5
40°	2971.0	2936.9	2869.0	2831.3	2814.2
42.5°	2822.8	2788.7	2721.3	2678.7	2653.5
45°	2662.0	2632.4	2568.6	2522.4	2505.4
47.5°	2505.4	2475.7	2407.9	2361.3	2336.1
50°	2340.1	2319.0	2259.7	2200.5	2179.3
52.5°	2179.3	2149.8	2095.0	2048.2	2018.6
55°	2014.6	1989.0	1938.2	1887.5	1866.4
57.5°	1849.4	1828.2	1773.0	1722.3	1705.2
60°	1684.1	1667.5	1608.3	1561.6	1549.0
62.5°	1523.4	1493.7	1451.6	1409.4	1392.3
65°	1358.7	1333.0	1290.8	1252.6	1231.6
67.5°	1189.4	1167.8	1130.1	1100.5	1083.5
70°	1032.6	1015.6	977.4	947.8	931.2
72.5°	871.9	854.9	833.8	804.2	791.5
75°	710.8	702.7	681.1	656.0	664.5
77.5°	567.0	550.0	541.5	528.9	516.3
80°	423.4	418.9	410.4	397.8	389.3
82.5°	287.8	287.8	283.8	266.7	266.7
85°	173.3	169.3	165.2	152.2	148.2
87.5°	76.3	67.8	59.3	46.7	42.2
90°	4.3	51.7	140.9	132.3	136.6
92.5°	89.2	120.8	125.1	129.4	129.4
95°	209.9	250.2	257.4	257.4	250.2
97.5°	349.4	386.8	402.7	402.7	402.7
100°	510.5	543.6	555.1	555.1	550.7
102.5°	680.1	704.6	720.4	724.7	720.4
105°	865.6	877.1	885.8	893.0	893.0
107.5°	1049.7	1067.0	1067.0	1069.9	1049.7
110°	1228.0	1251.0	1251.0	1251.0	1239.5

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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	1420.7	1445.2	1440.9	1429.4	1420.7
115°	1610.5	1633.5	1626.4	1622.0	1610.5
117.5°	1798.9	1830.5	1810.4	1798.9	1787.4
120°	1988.8	2020.3	1988.8	1988.8	1975.8
122.5°	2161.2	2201.6	2181.4	2169.9	2161.2
125°	2342.5	2378.4	2366.9	2354.0	2349.7
127.5°	2519.3	2563.9	2548.1	2530.8	2519.3
130°	2684.7	2736.5	2729.3	2720.6	2704.8
132.5°	2870.2	2910.5	2913.3	2893.2	2881.7
135°	3029.8	3074.4	3083.1	3078.7	3067.2
137.5°	3208.1	3244.0	3251.3	3248.4	3231.1
140°	3364.9	3400.8	3421.0	3421.0	3405.1
142.5°	3526.0	3561.9	3573.4	3577.7	3561.9
145°	3678.4	3707.1	3730.1	3734.4	3718.6
147.5°	3814.9	3850.9	3868.2	3875.4	3859.5
150°	3955.8	3980.4	3996.2	4009.1	3996.2
152.5°	4081.0	4105.4	4125.6	4141.3	4125.6
155°	4206.1	4217.6	4230.5	4250.7	4237.8
157.5°	4313.9	4322.6	4329.8	4358.5	4338.4
160°	4410.2	4418.9	4423.3	4447.7	4430.4
162.5°	4499.4	4499.4	4503.7	4531.1	4510.9
165°	4575.7	4571.3	4571.3	4600.1	4580.0
167.5°	4644.7	4631.7	4631.7	4660.5	4640.3
170°	4696.4	4684.9	4680.7	4709.4	4684.9
172.5°	4732.4	4720.9	4716.6	4745.3	4720.9
175°	4761.2	4749.7	4741.0	4769.8	4745.3
177.5°	4777.0	4765.5	4756.8	4781.3	4756.8
180°	4769.8	4769.8	4769.8	4769.8	4769.8

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CIE UGR TABLE:

Reflectances:											
Ceiling		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Reference plane		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions		Viewed crosswise					Viewed endwise				
X=2H	Y=2H	10.79	11.61	11.78	12.62	13.95	10.34	11.17	11.34	12.17	13.50
	3H	12.45	13.19	13.45	14.20	15.55	11.96	12.70	12.96	13.71	15.06
	4H	13.04	13.74	14.05	14.75	16.11	12.54	13.24	13.56	14.26	15.62
	6H	13.44	14.08	14.47	15.10	16.48	12.94	13.58	13.97	14.60	15.98
	8H	13.54	14.16	14.58	15.20	16.56	13.04	13.66	14.07	14.69	16.06
	12H	13.59	14.18	14.63	15.21	16.60	13.08	13.67	14.12	14.70	16.09
4H	2H	11.24	11.94	12.27	12.96	14.32	10.89	11.59	11.91	12.61	13.97
	3H	13.11	13.69	14.14	14.74	16.11	12.70	13.29	13.73	14.33	15.71
	4H	13.83	14.36	14.87	15.40	16.80	13.40	13.94	14.44	14.98	16.37
	6H	14.34	14.80	15.39	15.86	17.26	13.91	14.37	14.96	15.43	16.82
	8H	14.50	14.92	15.54	15.98	17.39	14.06	14.49	15.11	15.54	16.95
	12H	14.57	14.96	15.64	16.02	17.44	14.12	14.51	15.19	15.58	16.99
8H	4H	14.02	14.45	15.07	15.50	16.91	13.64	14.07	14.69	15.13	16.53
	6H	14.66	15.01	15.73	16.11	17.51	14.27	14.63	15.35	15.72	17.13
	8H	14.88	15.19	15.96	16.27	17.69	14.49	14.80	15.57	15.88	17.30
	12H	15.01	15.29	16.10	16.36	17.83	14.60	14.88	15.68	15.95	17.41
12H	4H	14.00	14.39	15.07	15.46	16.87	13.64	14.03	14.70	15.09	16.51
	6H	14.68	15.00	15.77	16.08	17.50	14.31	14.63	15.39	15.71	17.13
	8H	14.93	15.20	16.01	16.28	17.74	14.55	14.82	15.63	15.90	17.36