

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: P923345

Luminaire Tested: DFN2DIP-SQ4F0-160D120US940-FLLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P923345
REPORT IS A COMBINATION OF REPORTS P901703 AND P898471
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-160D120US940-FLLONL
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

Summary

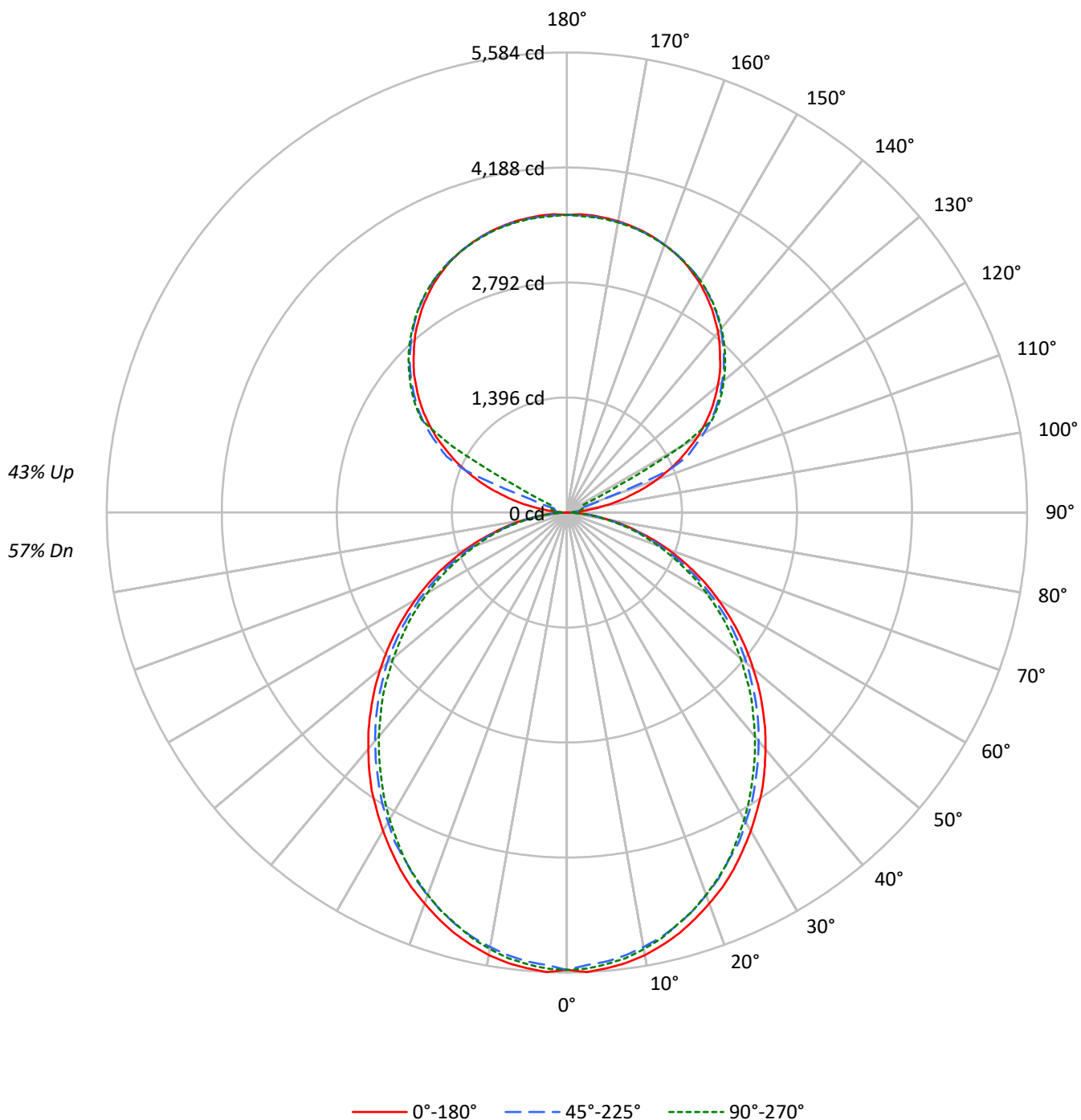
Lumens per Lamp: N/A
Luminaire Lumens: 24718.2 lumens
Efficiency: N/A
Efficacy: 96.3 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 256.8
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9971
Total Harmonic Distortion (THDi): 0.049
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

TEST NUMBER: P923345

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US940-FLONL

Luminous Intensity Polar Plot



TEST NUMBER: P923345

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US940-FLONL

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
RCR																	
0	109	109	109	109	101	101	101	101	87	87	87		74	74	74		63
1	99	95	91	88	92	89	85	82	77	74	72		66	64	62		55
2	91	83	77	72	84	77	72	67	67	63	59		58	55	52		49
3	83	73	66	60	77	68	62	56	59	54	50		51	47	44		43
4	76	65	57	50	70	61	53	48	53	47	43		45	41	38		39
5	69	58	49	43	64	54	47	41	47	41	37		41	36	33		35
6	64	52	44	38	59	49	41	36	43	37	32		37	32	29		32
7	59	47	39	33	55	44	37	32	39	33	28		34	29	25		29
8	55	43	35	29	51	40	33	28	35	29	25		31	26	23		27
9	51	39	31	26	48	37	30	25	32	27	23		28	24	20		25
10	48	36	28	24	45	34	27	22	30	24	20		26	22	18		23

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	3895	3895	3895
5°	3902	3842	3868
10°	3870	3791	3817
15°	3813	3729	3736
20°	3736	3643	3653
25°	3659	3540	3558
30°	3563	3445	3436
35°	3473	3332	3306
40°	3361	3218	3184
45°	3249	3103	3058
50°	3127	2983	2912
55°	2999	2844	2779
60°	2855	2679	2626
65°	2698	2509	2445
70°	2497	2301	2252
75°	2219	2053	2075
80°	1885	1736	1733
85°	1362	1188	1165

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3249 cd/sqm

TEST NUMBER: P923345

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US940-FLONL

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	522.5	2.1
10°-20°	1470.1	5.9
20°-30°	2160.5	8.7
30°-40°	2509.3	10.2
40°-50°	2506.2	10.1
50°-60°	2185.3	8.8
60°-70°	1615.4	6.5
70°-80°	914.0	3.7
80°-90°	247.6	1.0
90°-100°	119.1	0.5
100°-110°	443.9	1.8
110°-120°	1177.3	4.8
120°-130°	1952.7	7.9
130°-140°	2074.2	8.4
140°-150°	1927.7	7.8
150°-160°	1549.8	6.3
160°-170°	998.7	4.0
170°-180°	343.7	1.4
0°-30°	4153.2	16.8
0°-40°	6662.5	27.0
0°-60°	11354.0	45.9
0°-90°	14131.0	57.2
90°-120°	1740.3	7.0
90°-150°	7694.9	31.1
90°-180°	10587.0	42.8
0°-180°	24718.2	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	5552	5552	5552	5552	5552	
5°	5552	5531	5472	5514	5504	527
15°	5285	5253	5183	5205	5178	1488
25°	4783	4740	4650	4660	4650	2201
35°	4127	4073	3988	3955	3929	2577
45°	3358	3321	3240	3182	3160	2592
55°	2541	2509	2445	2381	2354	2272
65°	1714	1682	1628	1580	1554	1694
75°	896	886	859	827	838	957
85°	219	214	208	192	187	244
90°	2	31	52	66	70	23
95°	170	84	102	115	112	201
105°	794	873	160	188	199	849
115°	1502	1547	1612	402	214	1479
125°	2124	2158	2208	2226	2234	1895
135°	2629	2671	2694	2720	2715	2031
145°	3050	3047	3091	3110	3096	1907
155°	3358	3334	3366	3381	3361	1547
165°	3538	3522	3530	3549	3530	1000
175°	3619	3601	3606	3624	3598	344
180°	3611	3611	3611	3611	3611	

TEST NUMBER: P923345

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US940-FLONL

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	5551.5	5551.5	5551.5	5551.5	5551.5
2.5°	5583.8	5557.1	5498.3	5551.5	5541.3
5°	5551.5	5530.6	5471.6	5514.2	5503.9
7.5°	5514.2	5482.4	5423.5	5466.5	5455.8
10°	5455.8	5418.4	5354.5	5396.9	5381.0
12.5°	5375.4	5343.7	5279.6	5306.3	5295.5
15°	5284.7	5253.1	5183.3	5204.9	5178.3
17.5°	5172.6	5140.9	5071.2	5097.8	5071.2
20°	5049.7	5018.0	4943.2	4959.1	4938.1
22.5°	4927.4	4879.3	4809.5	4809.5	4798.8
25°	4783.0	4740.5	4649.8	4660.1	4649.8
27.5°	4622.6	4585.3	4516.2	4500.4	4473.7
30°	4462.9	4419.9	4340.0	4324.2	4302.7
32.5°	4291.9	4260.2	4174.6	4142.4	4120.9
35°	4126.6	4073.3	3987.7	3955.4	3928.9
37.5°	3939.7	3891.5	3806.0	3768.5	3742.0
40°	3747.6	3704.6	3619.1	3571.5	3550.0
42.5°	3560.8	3517.7	3432.7	3379.0	3347.2
45°	3358.0	3320.6	3240.2	3181.8	3160.3
47.5°	3160.3	3122.9	3037.4	2978.5	2946.8
50°	2951.9	2925.3	2850.5	2775.7	2749.1
52.5°	2749.1	2711.8	2642.7	2583.7	2546.4
55°	2541.3	2509.0	2445.0	2381.0	2354.4
57.5°	2332.9	2306.2	2236.6	2172.6	2151.1
60°	2124.4	2103.5	2028.7	1969.8	1953.9
62.5°	1921.6	1884.3	1831.0	1777.8	1756.3
65°	1713.8	1681.5	1628.3	1580.2	1553.5
67.5°	1500.3	1473.1	1425.6	1388.1	1366.6
70°	1302.6	1281.1	1233.0	1195.6	1174.7
72.5°	1099.8	1078.3	1051.8	1014.3	998.5
75°	896.5	886.4	859.2	827.4	838.2
77.5°	715.3	693.8	683.1	667.2	651.3
80°	534.0	528.4	517.6	501.8	491.1
82.5°	363.0	363.0	357.9	336.4	336.4
85°	218.6	213.5	208.4	192.0	186.9
87.5°	96.3	85.5	74.7	58.9	53.2
90°	2.5	31.3	52.2	65.5	70.4
92.5°	65.5	54.9	62.7	67.9	70.4
95°	169.7	83.5	101.7	115.1	112.4
97.5°	305.7	91.6	133.1	141.2	143.7
100°	462.6	104.6	148.9	169.7	175.0
102.5°	634.9	629.9	154.2	182.8	190.8
105°	794.3	872.9	159.5	188.1	198.6
107.5°	979.9	1045.1	164.8	193.3	203.8
110°	1157.7	1212.4	457.4	196.1	206.3



TEST NUMBER: P923345

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US940-FLLONL

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	1325.0	1371.8	1327.5	201.1	209.1
115°	1502.4	1546.8	1612.3	402.4	214.5
117.5°	1656.7	1708.9	1753.5	1379.6	695.1
120°	1829.3	1868.3	1915.5	1946.9	1594.0
122.5°	1975.4	2017.3	2069.7	2085.3	2088.0
125°	2124.3	2158.5	2208.1	2226.4	2234.2
127.5°	2260.2	2296.9	2336.3	2362.3	2364.8
130°	2388.4	2430.3	2458.8	2487.7	2485.2
132.5°	2519.0	2553.1	2581.7	2605.3	2602.8
135°	2628.9	2670.8	2694.0	2720.4	2715.2
137.5°	2743.7	2775.0	2801.4	2827.4	2819.7
140°	2856.1	2877.1	2905.6	2929.3	2916.2
142.5°	2950.3	2968.7	3002.5	3023.3	3010.2
145°	3049.6	3046.9	3091.2	3109.6	3096.5
147.5°	3135.6	3127.9	3172.3	3185.3	3175.0
150°	3219.3	3201.1	3243.0	3258.5	3245.5
152.5°	3289.8	3269.0	3308.2	3323.9	3305.7
155°	3357.7	3334.5	3365.8	3381.4	3360.6
157.5°	3412.7	3391.9	3415.5	3433.8	3412.7
160°	3459.8	3444.1	3459.8	3475.4	3457.1
162.5°	3501.5	3486.0	3499.0	3517.3	3493.7
165°	3538.0	3522.5	3530.3	3548.7	3530.3
167.5°	3566.9	3551.1	3559.2	3577.5	3553.9
170°	3590.5	3574.7	3579.9	3598.2	3574.7
172.5°	3606.0	3590.5	3595.8	3614.1	3590.5
175°	3619.0	3600.7	3606.0	3624.4	3598.2
177.5°	3624.4	3606.0	3608.8	3627.1	3603.6
180°	3611.3	3611.3	3611.3	3611.3	3611.3

TEST NUMBER: P923345

CATALOG NUMBER: DFN2DIP-SQ4F0-160D120US940-FLLONL

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	12.65	13.58	13.54	14.49	15.65	12.20	13.13	13.09	14.04	15.21
	3H	14.32	15.15	15.22	16.07	17.26	13.83	14.66	14.73	15.58	16.77
	4H	14.91	15.70	15.83	16.63	17.83	14.41	15.20	15.34	16.13	17.33
	6H	15.32	16.04	16.25	16.98	18.19	14.82	15.54	15.75	16.48	17.69
	8H	15.42	16.12	16.36	17.07	18.28	14.92	15.62	15.86	16.57	17.78
	12H	15.48	16.14	16.42	17.08	18.32	14.97	15.63	15.91	16.57	17.81
4H	2H	13.12	13.90	14.04	14.83	16.03	12.76	13.55	13.69	14.48	15.68
	3H	14.99	15.65	15.93	16.61	17.82	14.58	15.24	15.52	16.20	17.42
	4H	15.71	16.31	16.66	17.27	18.51	15.29	15.89	16.24	16.84	18.08
	6H	16.24	16.75	17.20	17.73	18.97	15.80	16.32	16.76	17.30	18.54
	8H	16.39	16.87	17.35	17.84	19.10	15.95	16.44	16.91	17.41	18.66
	12H	16.47	16.91	17.45	17.89	19.15	16.02	16.46	17.00	17.44	18.70
8H	4H	15.92	16.40	16.88	17.37	18.62	15.54	16.02	16.50	16.99	18.25
	6H	16.55	16.96	17.54	17.97	19.22	16.17	16.57	17.16	17.58	18.84
	8H	16.78	17.13	17.77	18.13	19.40	16.39	16.74	17.38	17.74	19.01
	12H	16.92	17.23	17.92	18.22	19.54	16.51	16.82	17.51	17.81	19.13
12H	4H	15.90	16.34	16.89	17.33	18.59	15.54	15.97	16.52	16.96	18.22
	6H	16.58	16.94	17.58	17.94	19.21	16.21	16.57	17.21	17.57	18.84
	8H	16.83	17.15	17.83	18.14	19.46	16.45	16.77	17.45	17.76	19.08