

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: P929060

Luminaire Tested: DFN2DIP-HX4F0-100D110US935-FLLONL

Issue Date: 12/12/2024

**Test Information**

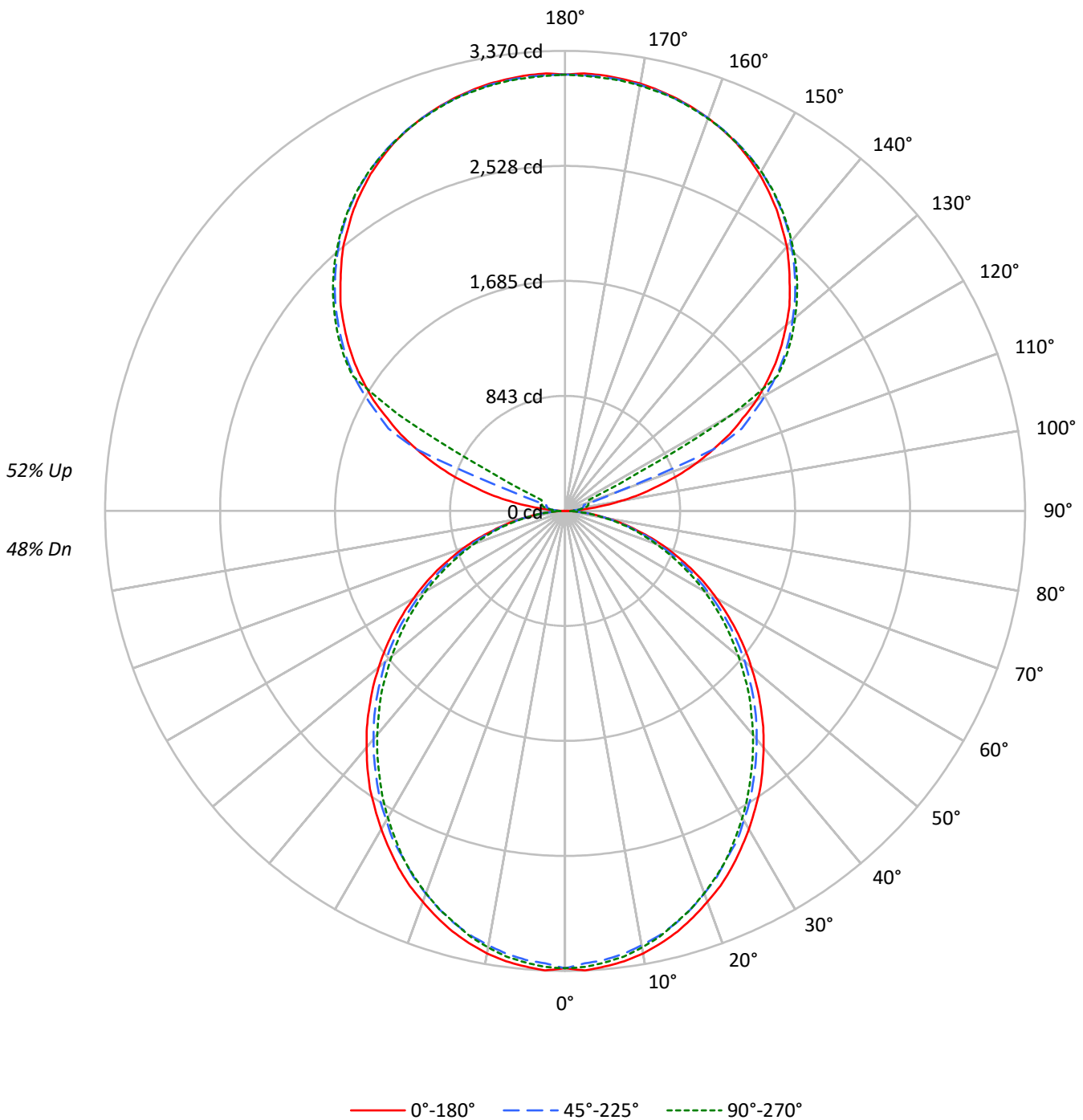
Test Method: LM-79-2019  
Report Number: P929060  
REPORT IS A COMBINATION OF REPORTS P900957 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-100D110US935-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17900.2 lumens  
Efficiency: N/A  
Efficacy: 95.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 186.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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			0	
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																					
0	107	107	107	107	98	98	98	98	82	82	82	67	67	67	54	54	54	48	48	48	48
1	97	93	89	86	89	86	82	79	72	70	67	59	58	56	48	47	46	40	40	40	40
2	89	81	75	70	81	75	70	65	63	59	56	52	49	47	42	40	38	34	34	34	34
3	81	71	64	58	74	66	60	54	56	51	47	46	43	40	37	35	33	28	28	28	28
4	74	63	55	49	68	58	51	46	49	44	40	41	37	34	33	30	28	24	24	24	24
5	68	56	48	42	62	52	45	40	44	39	34	37	33	29	30	27	25	21	21	21	21
6	62	50	42	37	57	47	40	34	40	34	30	33	29	26	27	24	22	19	19	19	19
7	58	46	38	32	53	42	35	30	36	30	26	30	26	23	25	22	19	17	17	17	17
8	54	41	34	28	49	38	31	27	33	27	23	28	23	20	23	20	17	15	15	15	15
9	50	38	30	25	46	35	28	24	30	25	21	25	21	18	21	18	16	13	13	13	13
10	47	35	27	23	43	32	26	21	28	23	19	24	19	17	20	16	14	12	12	12	12

**AVERAGE LUMINANCE (cd/sqm):**

	0°	45°	90°
0°	2491	2491	2491
5°	2495	2457	2473
10°	2475	2424	2440
15°	2439	2384	2388
20°	2390	2329	2334
25°	2341	2263	2272
30°	2280	2201	2194
35°	2222	2129	2110
40°	2151	2056	2031
45°	2080	1982	1950
50°	2002	1905	1857
55°	1921	1816	1770
60°	1829	1710	1672
65°	1729	1601	1555
70°	1601	1467	1430
75°	1424	1308	1315
80°	1212	1104	1094
85°	879	753	728

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2080 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	315.3	1.8
10°-20°	887.2	5.0
20°-30°	1303.8	7.3
30°-40°	1514.3	8.5
40°-50°	1512.4	8.4
50°-60°	1318.8	7.4
60°-70°	974.9	5.4
70°-80°	551.6	3.1
80°-90°	151.2	0.8
90°-100°	105.4	0.6
100°-110°	392.9	2.2
110°-120°	1042.0	5.8
120°-130°	1728.3	9.7
130°-140°	1835.9	10.3
140°-150°	1706.2	9.5
150°-160°	1371.8	7.7
160°-170°	883.9	4.9
170°-180°	304.2	1.7
0°-30°	2506.3	14.0
0°-40°	4020.6	22.5
0°-60°	6851.8	38.3
0°-90°	8529.5	47.7
90°-120°	1540.3	8.6
90°-150°	6810.7	38.0
90°-180°	9371.0	52.4
0°-180°	17900.2	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	3350	3350	3350	3350	3350	
5°	3350	3338	3302	3328	3322	318
15°	3189	3170	3128	3141	3125	898
25°	2886	2861	2806	2812	2806	1328
35°	2490	2458	2406	2387	2371	1555
45°	2026	2004	1955	1920	1907	1564
55°	1534	1514	1476	1437	1421	1371
65°	1034	1015	983	954	938	1023
75°	541	535	518	499	506	578
85°	132	129	126	116	113	147
90°	2	28	46	58	62	16
95°	150	74	90	102	99	178
105°	703	773	141	166	176	751
115°	1330	1369	1427	356	190	1309
125°	1880	1910	1954	1971	1978	1677
135°	2327	2364	2384	2408	2403	1797
145°	2699	2697	2736	2752	2741	1688
155°	2972	2951	2979	2993	2974	1370
165°	3132	3118	3125	3141	3125	885
175°	3203	3187	3192	3208	3185	305
180°	3196	3196	3196	3196	3196	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3350.2	3350.2	3350.2	3350.2	3350.2
2.5°	3369.7	3353.6	3318.0	3350.2	3344.0
5°	3350.2	3337.6	3302.0	3327.7	3321.5
7.5°	3327.7	3308.5	3272.9	3298.9	3292.5
10°	3292.5	3269.9	3231.2	3256.9	3247.3
12.5°	3243.9	3224.8	3186.1	3202.2	3195.7
15°	3189.2	3170.1	3128.0	3141.0	3125.0
17.5°	3121.6	3102.4	3060.3	3076.4	3060.3
20°	3047.3	3028.2	2983.1	2992.7	2980.0
22.5°	2973.5	2944.5	2902.4	2902.4	2896.0
25°	2886.4	2860.8	2806.1	2812.2	2806.1
27.5°	2789.6	2767.1	2725.4	2715.9	2699.8
30°	2693.3	2667.3	2619.1	2609.5	2596.5
32.5°	2590.1	2570.9	2519.3	2499.8	2486.8
35°	2490.3	2458.2	2406.5	2387.0	2370.9
37.5°	2377.5	2348.4	2296.8	2274.2	2258.1
40°	2261.6	2235.6	2184.0	2155.3	2142.3
42.5°	2148.8	2122.8	2071.6	2039.1	2020.0
45°	2026.4	2003.9	1955.3	1920.1	1907.2
47.5°	1907.2	1884.6	1833.0	1797.4	1778.3
50°	1781.4	1765.3	1720.2	1675.1	1659.1
52.5°	1659.1	1636.5	1594.7	1559.3	1536.7
55°	1533.6	1514.2	1475.5	1436.8	1420.8
57.5°	1407.8	1391.7	1349.7	1311.1	1298.1
60°	1282.0	1269.4	1224.3	1188.7	1179.1
62.5°	1159.7	1137.1	1105.0	1072.9	1059.9
65°	1034.2	1014.8	982.7	953.6	937.5
67.5°	905.4	889.0	860.3	837.8	824.8
70°	786.1	773.1	744.1	721.5	708.9
72.5°	663.7	650.7	634.7	612.2	602.5
75°	541.1	534.9	518.5	499.4	505.8
77.5°	431.7	418.7	412.2	402.6	393.0
80°	322.3	318.9	312.4	302.8	296.4
82.5°	219.1	219.1	216.0	203.0	203.0
85°	131.9	128.9	125.8	115.9	112.8
87.5°	58.1	51.6	45.1	35.6	32.1
90°	2.2	27.7	46.1	57.9	62.3
92.5°	57.9	48.6	55.4	60.2	62.3
95°	150.2	73.9	90.1	101.9	99.4
97.5°	270.5	81.0	117.8	124.9	127.2
100°	409.5	92.6	131.8	150.2	154.9
102.5°	561.9	557.5	136.5	161.8	168.9
105°	703.1	772.6	141.2	166.4	175.8
107.5°	867.4	925.0	145.9	171.1	180.5
110°	1024.7	1073.1	404.8	173.6	182.6



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	1172.8	1214.2	1174.9	178.0	185.1
115°	1329.8	1369.1	1427.1	356.2	189.8
117.5°	1466.4	1512.5	1552.0	1221.1	615.2
120°	1619.0	1653.6	1695.4	1723.1	1410.8
122.5°	1748.4	1785.5	1831.9	1845.6	1848.1
125°	1880.3	1910.5	1954.4	1970.6	1977.5
127.5°	2000.5	2032.9	2067.8	2090.9	2093.1
130°	2113.9	2151.0	2176.3	2201.8	2199.7
132.5°	2229.6	2259.8	2285.1	2305.9	2303.8
135°	2326.9	2363.9	2384.5	2407.9	2403.1
137.5°	2428.5	2456.2	2479.5	2502.6	2495.7
140°	2527.9	2546.5	2571.8	2592.6	2581.1
142.5°	2611.3	2627.5	2657.5	2675.9	2664.4
145°	2699.2	2696.7	2736.0	2752.3	2740.7
147.5°	2775.3	2768.5	2807.7	2819.3	2810.2
150°	2849.5	2833.3	2870.3	2884.1	2872.6
152.5°	2911.8	2893.4	2928.0	2942.0	2925.9
155°	2972.0	2951.3	2979.1	2992.8	2974.4
157.5°	3020.6	3002.1	3023.1	3039.2	3020.6
160°	3062.3	3048.3	3062.3	3076.0	3059.8
162.5°	3099.1	3085.4	3096.9	3113.1	3092.3
165°	3131.5	3117.8	3124.7	3140.8	3124.7
167.5°	3157.0	3143.1	3150.2	3166.4	3145.6
170°	3178.0	3163.9	3168.6	3184.8	3163.9
172.5°	3191.6	3178.0	3182.6	3198.8	3178.0
175°	3203.2	3187.0	3191.6	3207.9	3184.8
177.5°	3207.9	3191.6	3194.1	3210.3	3189.5
180°	3196.4	3196.4	3196.4	3196.4	3196.4



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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	10.22	11.06	11.20	12.05	13.36	9.79	10.63	10.77	11.62	12.93
	3H	11.88	12.64	12.87	13.64	14.96	11.41	12.16	12.40	13.16	14.49
	4H	12.47	13.18	13.47	14.19	15.52	12.00	12.71	13.00	13.71	15.05
	6H	12.87	13.53	13.88	14.53	15.88	12.39	13.05	13.40	14.06	15.41
	8H	12.97	13.60	13.99	14.62	15.97	12.50	13.12	13.52	14.15	15.49
	12H	13.02	13.62	14.04	14.63	16.00	12.54	13.14	13.56	14.15	15.52
4H	2H	10.68	11.40	11.69	12.40	13.73	10.34	11.05	11.34	12.05	13.39
	3H	12.55	13.14	13.56	14.17	15.52	12.15	12.75	13.17	13.78	15.13
	4H	13.26	13.81	14.29	14.83	16.20	12.86	13.40	13.88	14.43	15.80
	6H	13.78	14.25	14.81	15.29	16.66	13.37	13.84	14.40	14.88	16.25
	8H	13.93	14.36	14.96	15.40	16.79	13.51	13.95	14.55	14.99	16.37
	12H	14.00	14.40	15.05	15.45	16.84	13.58	13.97	14.63	15.03	16.42
8H	4H	13.46	13.90	14.49	14.94	16.32	13.10	13.54	14.13	14.58	15.96
	6H	14.09	14.45	15.15	15.53	16.91	13.73	14.09	14.79	15.17	16.55
	8H	14.31	14.63	15.38	15.70	17.09	13.94	14.26	15.01	15.33	16.73
	12H	14.44	14.72	15.51	15.78	17.22	14.06	14.34	15.13	15.40	16.84
12H	4H	13.44	13.84	14.50	14.89	16.28	13.09	13.49	14.14	14.54	15.93
	6H	14.12	14.44	15.19	15.50	16.90	13.77	14.09	14.83	15.15	16.55
	8H	14.36	14.64	15.43	15.70	17.14	14.00	14.28	15.07	15.35	16.79