

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: P928444

Luminaire Tested: DFN2DIP-HX4F0-110D100US927-FLLONL

Issue Date: 12/12/2024

**Test Information**

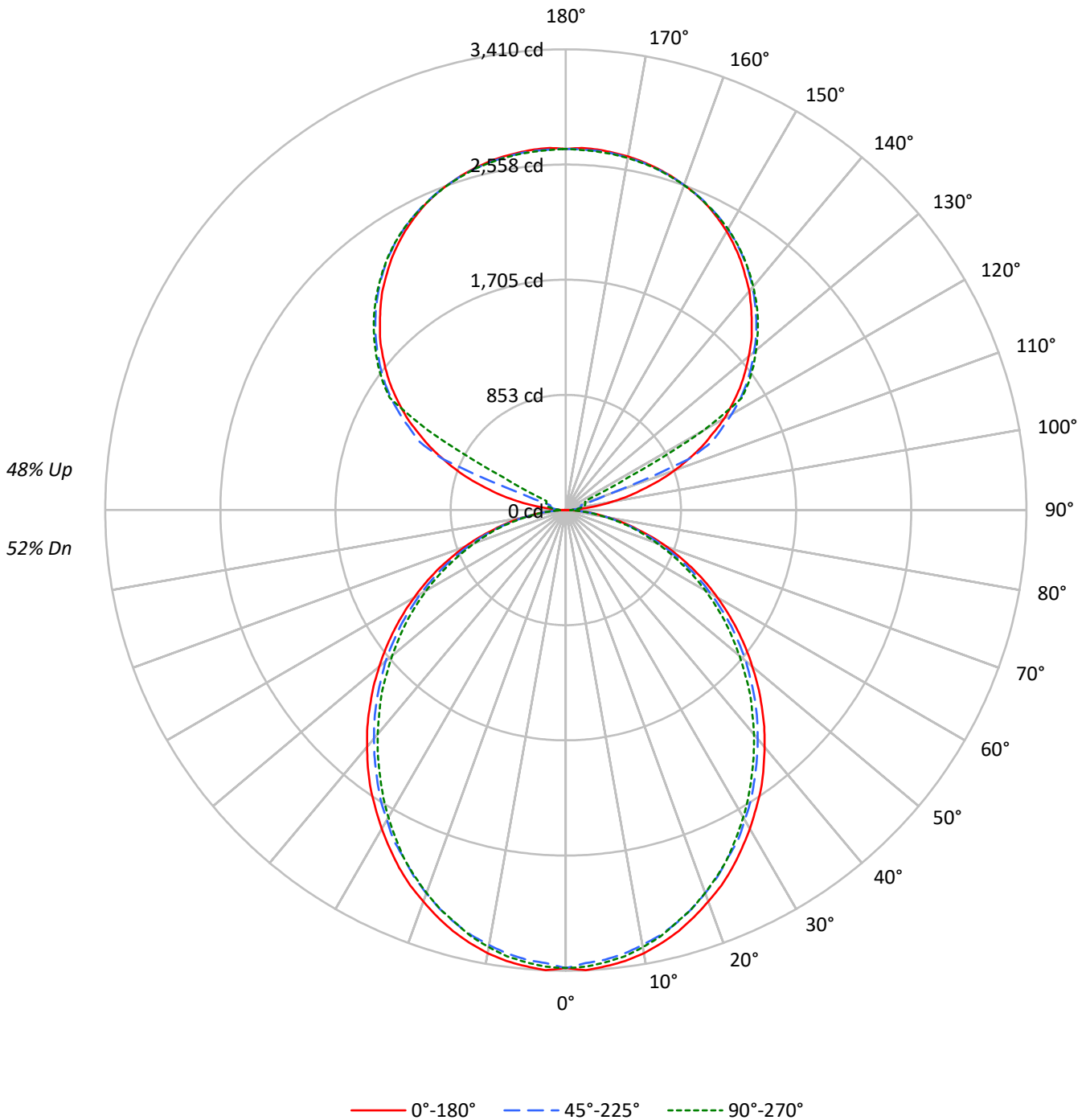
Test Method: LM-79-2019  
Report Number: P928444  
REPORT IS A COMBINATION OF REPORTS P900941 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-110D100US927-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16465.7 lumens  
Efficiency: N/A  
Efficacy: 87.4 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): 188.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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	108	108	108	108	100	100	100	100	85	85	85	71	71	71	58	58	58	52	52	52	52
1	98	94	90	87	91	87	84	81	74	72	70	62	61	59	52	50	49	44	44	44	44
2	90	82	76	71	83	76	71	66	65	61	58	55	52	49	45	43	42	37	37	37	37
3	82	72	65	59	75	67	61	55	57	53	48	49	45	42	40	38	35	31	31	31	31
4	75	64	56	50	69	59	52	47	51	46	41	43	39	36	36	33	30	27	27	27	27
5	69	57	49	43	63	53	46	40	46	40	36	39	34	31	32	29	27	23	23	23	23
6	63	51	43	37	58	48	40	35	41	35	31	35	31	27	29	26	23	21	21	21	21
7	58	46	38	33	54	43	36	31	37	32	27	32	27	24	27	23	21	18	18	18	18
8	54	42	34	29	50	39	32	27	34	28	24	29	25	22	25	21	19	16	16	16	16
9	51	38	31	26	47	36	29	24	31	26	22	27	22	19	23	19	17	15	15	15	15
10	47	35	28	23	44	33	26	22	29	23	20	25	21	18	21	18	15	13	13	13	13

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

	0°	45°	90°
0°	2521	2521	2521
5°	2525	2486	2502
10°	2505	2452	2469
15°	2468	2412	2416
20°	2418	2357	2362
25°	2369	2290	2299
30°	2307	2227	2220
35°	2249	2154	2135
40°	2177	2080	2055
45°	2105	2006	1974
50°	2026	1928	1879
55°	1944	1838	1791
60°	1851	1731	1692
65°	1749	1620	1574
70°	1620	1485	1447
75°	1441	1323	1330
80°	1226	1117	1107
85°	890	762	736

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2105 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	319.1	1.9
10°-20°	897.7	5.5
20°-30°	1319.3	8.0
30°-40°	1532.2	9.3
40°-50°	1530.4	9.3
50°-60°	1334.4	8.1
60°-70°	986.4	6.0
70°-80°	558.1	3.4
80°-90°	152.0	0.9
90°-100°	88.1	0.5
100°-110°	328.6	2.0
110°-120°	871.4	5.3
120°-130°	1445.3	8.8
130°-140°	1535.2	9.3
140°-150°	1426.8	8.7
150°-160°	1147.1	7.0
160°-170°	739.2	4.5
170°-180°	254.4	1.5
0°-30°	2536.0	15.4
0°-40°	4068.3	24.7
0°-60°	6933.0	42.1
0°-90°	8629.6	52.4
90°-120°	1288.1	7.8
90°-150°	5695.4	34.6
90°-180°	7836.0	47.6
0°-180°	16465.7	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	3390	3390	3390	3390	3390	
5°	3390	3377	3341	3367	3361	322
15°	3227	3208	3165	3178	3162	909
25°	2921	2895	2839	2846	2839	1344
35°	2520	2487	2435	2415	2399	1573
45°	2050	2028	1978	1943	1930	1582
55°	1552	1532	1493	1454	1438	1387
65°	1046	1027	994	965	949	1035
75°	547	541	525	505	512	584
85°	134	130	127	117	114	149
90°	2	23	39	48	52	15
95°	126	62	75	85	83	149
105°	588	646	118	139	147	628
115°	1112	1145	1193	298	159	1095
125°	1572	1598	1634	1648	1654	1402
135°	1946	1977	1994	2014	2010	1503
145°	2257	2255	2288	2302	2292	1412
155°	2485	2468	2491	2503	2487	1145
165°	2619	2607	2613	2626	2613	740
175°	2679	2665	2669	2683	2663	255
180°	2673	2673	2673	2673	2673	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3389.9	3389.9	3389.9	3389.9	3389.9
2.5°	3409.6	3393.3	3357.4	3389.9	3383.7
5°	3389.9	3377.1	3341.1	3367.0	3360.9
7.5°	3367.0	3347.7	3311.7	3338.0	3331.5
10°	3331.5	3308.6	3269.5	3295.4	3285.8
12.5°	3282.4	3263.0	3223.9	3240.2	3233.6
15°	3227.0	3207.6	3165.1	3178.2	3162.0
17.5°	3158.5	3139.2	3096.6	3112.9	3096.6
20°	3083.5	3064.1	3018.5	3028.1	3015.4
22.5°	3008.8	2979.3	2936.8	2936.8	2930.2
25°	2920.6	2894.7	2839.3	2845.6	2839.3
27.5°	2822.7	2799.9	2757.7	2748.0	2731.8
30°	2725.2	2698.9	2650.1	2640.4	2627.3
32.5°	2620.7	2601.4	2549.1	2529.4	2516.3
35°	2519.7	2487.3	2435.0	2415.3	2399.0
37.5°	2405.6	2376.2	2324.0	2301.2	2284.9
40°	2288.4	2262.1	2209.9	2180.9	2167.7
42.5°	2174.3	2148.0	2096.1	2063.2	2043.9
45°	2050.5	2027.6	1978.5	1942.9	1929.8
47.5°	1929.8	1907.0	1854.7	1818.7	1799.3
50°	1802.5	1786.3	1740.6	1695.0	1678.7
52.5°	1678.7	1655.8	1613.7	1577.7	1554.9
55°	1551.8	1532.0	1493.0	1453.9	1437.6
57.5°	1424.5	1408.3	1365.7	1326.6	1313.5
60°	1297.2	1284.5	1238.8	1202.8	1193.1
62.5°	1173.4	1150.6	1118.1	1085.6	1072.4
65°	1046.5	1026.7	994.3	964.9	948.7
67.5°	916.1	899.6	870.5	847.7	834.5
70°	795.4	782.3	752.9	730.1	717.2
72.5°	671.6	658.5	642.2	619.4	609.7
75°	547.4	541.3	524.6	505.3	511.9
77.5°	436.8	423.6	417.1	407.4	397.7
80°	326.1	322.7	316.1	306.4	299.9
82.5°	221.7	221.7	218.6	205.4	205.4
85°	133.5	130.4	127.3	117.2	114.1
87.5°	58.8	52.2	45.6	36.0	32.5
90°	1.8	23.2	38.6	48.5	52.1
92.5°	48.5	40.6	46.4	50.3	52.1
95°	125.6	61.8	75.3	85.2	83.2
97.5°	226.2	67.7	98.5	104.5	106.4
100°	342.5	77.4	110.2	125.6	129.6
102.5°	469.9	466.3	114.1	135.3	141.2
105°	588.0	646.0	118.1	139.2	147.0
107.5°	725.3	773.5	122.0	143.1	150.9
110°	856.9	897.3	338.5	145.2	152.7



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	980.7	1015.3	982.6	148.8	154.8
115°	1112.0	1144.9	1193.4	297.9	158.7
117.5°	1226.2	1264.8	1297.9	1021.1	514.5
120°	1353.9	1382.8	1417.8	1441.0	1179.8
122.5°	1462.1	1493.1	1531.9	1543.4	1545.4
125°	1572.4	1597.6	1634.4	1647.9	1653.6
127.5°	1672.9	1700.0	1729.2	1748.5	1750.3
130°	1767.7	1798.8	1819.9	1841.2	1839.4
132.5°	1864.4	1889.7	1910.9	1928.3	1926.5
135°	1945.8	1976.8	1994.0	2013.5	2009.6
137.5°	2030.8	2054.0	2073.5	2092.8	2087.0
140°	2113.8	2129.5	2150.6	2168.1	2158.4
142.5°	2183.7	2197.2	2222.3	2237.6	2228.1
145°	2257.2	2255.1	2288.0	2301.6	2291.9
147.5°	2320.8	2315.1	2347.9	2357.5	2350.0
150°	2382.8	2369.3	2400.3	2411.8	2402.1
152.5°	2434.9	2419.6	2448.5	2460.2	2446.6
155°	2485.3	2468.0	2491.2	2502.7	2487.4
157.5°	2525.9	2510.6	2528.0	2541.5	2525.9
160°	2560.9	2549.1	2560.9	2572.3	2558.8
162.5°	2591.6	2580.1	2589.8	2603.3	2585.9
165°	2618.7	2607.2	2613.0	2626.5	2613.0
167.5°	2640.1	2628.3	2634.4	2647.9	2630.4
170°	2657.5	2645.8	2649.7	2663.3	2645.8
172.5°	2669.0	2657.5	2661.4	2675.0	2657.5
175°	2678.6	2665.1	2669.0	2682.6	2663.3
177.5°	2682.6	2669.0	2671.1	2684.6	2667.1
180°	2672.9	2672.9	2672.9	2672.9	2672.9



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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	10.71	11.59	11.64	12.54	13.78	10.27	11.16	11.21	12.11	13.35
	3H	12.37	13.16	13.32	14.12	15.38	11.90	12.69	12.84	13.65	14.91
	4H	12.96	13.71	13.92	14.67	15.94	12.48	13.23	13.45	14.20	15.47
	6H	13.36	14.05	14.33	15.02	16.30	12.88	13.57	13.86	14.55	15.83
	8H	13.46	14.12	14.44	15.11	16.39	12.99	13.65	13.97	14.64	15.92
	12H	13.51	14.14	14.50	15.12	16.43	13.03	13.66	14.02	14.64	15.95
4H	2H	11.17	11.92	12.14	12.89	14.16	10.83	11.58	11.79	12.54	13.81
	3H	13.04	13.67	14.02	14.66	15.94	12.65	13.27	13.62	14.27	15.55
	4H	13.76	14.33	14.74	15.32	16.62	13.35	13.92	14.34	14.91	16.22
	6H	14.27	14.77	15.27	15.78	17.08	13.86	14.36	14.86	15.37	16.67
	8H	14.42	14.88	15.42	15.89	17.21	14.01	14.47	15.01	15.48	16.80
	12H	14.50	14.91	15.52	15.94	17.26	14.08	14.49	15.09	15.51	16.84
8H	4H	13.95	14.41	14.95	15.42	16.74	13.59	14.05	14.59	15.06	16.38
	6H	14.59	14.97	15.61	16.02	17.33	14.22	14.61	15.25	15.65	16.97
	8H	14.81	15.15	15.84	16.18	17.52	14.44	14.78	15.47	15.81	17.15
	12H	14.94	15.24	15.98	16.27	17.65	14.56	14.85	15.59	15.88	17.26
12H	4H	13.94	14.36	14.96	15.38	16.70	13.59	14.00	14.61	15.03	16.35
	6H	14.62	14.95	15.65	15.99	17.33	14.27	14.60	15.30	15.64	16.97
	8H	14.86	15.16	15.90	16.19	17.57	14.50	14.80	15.54	15.83	17.21