

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: P921832

Luminaire Tested: DFN2DIP-HX4F0-060D110US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

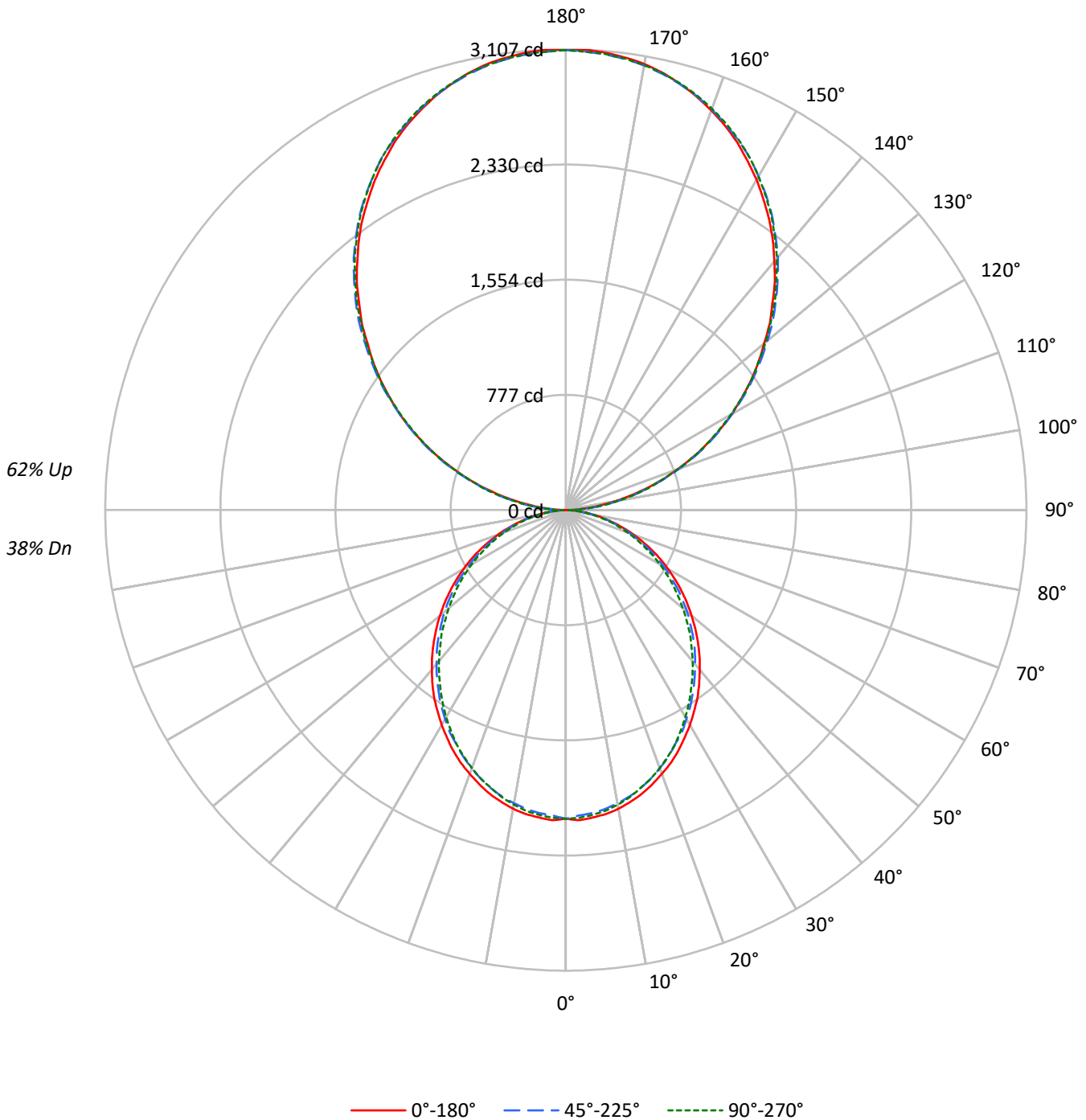
Test Method: LM-79-2019  
Report Number: P921832  
REPORT IS A COMBINATION OF REPORTS P899429 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D110US940-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13977.6 lumens  
Efficiency: N/A  
Efficacy: 117.1 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: Semi-Indirect  
  
Input Watts (W): 119.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P921832  
CATALOG NUMBER: DFN2DIP-HX4F0-060D110US940-FLLFLL

### Luminous Intensity Polar Plot





TEST NUMBER: P921832  
 CATALOG NUMBER: DFN2DIP-HX4F0-060D110US940-FLLFLL

**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	104	104	104	104	95	95	95	95	77	77	77	60	60	60	45	45	45	38			38
1	95	91	87	84	86	83	79	76	67	65	63	53	51	50	40	39	38	32			32
2	87	79	73	68	78	72	67	63	59	55	52	46	44	42	35	33	32	27			27
3	79	70	62	57	71	63	57	52	52	47	44	41	38	35	31	29	27	23			23
4	72	62	54	48	65	56	49	44	46	41	37	37	33	30	28	25	23	19			19
5	66	55	47	41	60	50	43	38	41	36	32	33	29	26	25	22	20	17			17
6	61	49	41	35	55	45	38	33	37	32	28	30	26	23	23	20	18	15			15
7	56	44	36	31	51	41	34	29	33	28	24	27	23	20	21	18	16	13			13
8	52	40	32	27	47	37	30	25	30	25	22	25	21	18	19	16	14	12			12
9	48	37	29	24	44	34	27	23	28	23	19	23	19	16	17	15	13	11			11
10	45	33	26	22	41	31	24	20	26	21	17	21	17	14	16	14	12	10			10

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

	0°	45°	90°
0°	1548	1548	1548
5°	1551	1526	1537
10°	1538	1506	1516
15°	1516	1482	1484
20°	1485	1447	1450
25°	1455	1406	1412
30°	1417	1368	1363
35°	1381	1323	1311
40°	1337	1277	1262
45°	1293	1232	1212
50°	1244	1184	1154
55°	1194	1129	1100
60°	1137	1063	1039
65°	1074	995	967
70°	995	912	889
75°	885	813	817
80°	753	686	679
85°	546	467	452

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 2338 cd/sqm



TEST NUMBER: P921832

CATALOG NUMBER: DFN2DIP-HX4F0-060D110US940-FLLFLL

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	195.9	1.4
10°-20°	551.3	3.9
20°-30°	810.2	5.8
30°-40°	941.0	6.7
40°-50°	939.8	6.7
50°-60°	819.5	5.9
60°-70°	605.8	4.3
70°-80°	342.7	2.5
80°-90°	99.3	0.7
90°-100°	192.0	1.4
100°-110°	609.9	4.4
110°-120°	1043.8	7.5
120°-130°	1372.7	9.8
130°-140°	1540.8	11.0
140°-150°	1511.0	10.8
150°-160°	1267.5	9.1
160°-170°	840.6	6.0
170°-180°	293.8	2.1
0°-30°	1557.4	11.1
0°-40°	2498.4	17.9
0°-60°	4257.8	30.5
0°-90°	5305.6	38.0
90°-120°	1845.7	13.2
90°-150°	6270.1	44.9
90°-180°	8672.0	62.0
0°-180°	13977.6	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	2082	2082	2082	2082	2082	
5°	2082	2074	2052	2068	2064	198
15°	1982	1970	1944	1952	1942	558
25°	1794	1778	1744	1748	1744	825
35°	1548	1528	1495	1483	1473	966
45°	1259	1245	1215	1193	1185	972
55°	953	941	917	893	883	852
65°	643	631	611	592	583	635
75°	336	332	322	310	314	359
85°	82	80	78	72	70	91
90°	3	34	92	86	89	14
95°	136	163	167	167	163	152
105°	563	570	576	581	581	594
115°	1048	1062	1058	1055	1048	1036
125°	1524	1547	1539	1531	1528	1361
135°	1970	2000	2005	2002	1995	1523
145°	2392	2411	2426	2429	2418	1495
155°	2736	2743	2752	2765	2756	1259
165°	2976	2973	2973	2992	2979	840
175°	3097	3089	3083	3102	3086	294
180°	3102	3102	3102	3102	3102	



TEST NUMBER: P921832

CATALOG NUMBER: DFN2DIP-HX4F0-060D110US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	2081.8	2081.8	2081.8	2081.8	2081.8
2.5°	2093.9	2083.9	2061.8	2081.8	2078.0
5°	2081.8	2073.9	2051.8	2067.8	2064.0
7.5°	2067.8	2055.9	2033.8	2050.0	2045.9
10°	2045.9	2031.9	2007.9	2023.8	2017.9
12.5°	2015.8	2003.9	1979.9	1989.9	1985.8
15°	1981.7	1969.9	1943.8	1951.9	1941.9
17.5°	1939.7	1927.9	1901.8	1911.6	1901.8
20°	1893.6	1881.8	1853.7	1859.7	1851.8
22.5°	1847.8	1829.7	1803.6	1803.6	1799.6
25°	1793.6	1777.7	1743.7	1747.5	1743.7
27.5°	1733.5	1719.5	1693.5	1687.7	1677.7
30°	1673.7	1657.4	1627.5	1621.6	1613.5
32.5°	1609.4	1597.6	1565.5	1553.4	1545.3
35°	1547.5	1527.5	1495.4	1483.3	1473.3
37.5°	1477.4	1459.3	1427.3	1413.2	1403.2
40°	1405.3	1389.2	1357.2	1339.3	1331.2
42.5°	1335.2	1319.1	1287.3	1267.1	1255.2
45°	1259.3	1245.2	1215.0	1193.2	1185.1
47.5°	1185.1	1171.1	1139.1	1117.0	1105.0
50°	1107.0	1097.0	1069.0	1040.9	1030.9
52.5°	1030.9	1016.9	991.0	968.9	954.9
55°	953.0	940.8	916.9	892.9	882.9
57.5°	874.9	864.9	838.7	814.8	806.6
60°	796.7	788.8	760.8	738.7	732.7
62.5°	720.6	706.6	686.6	666.6	658.6
65°	642.7	630.6	610.6	592.5	582.6
67.5°	562.6	552.4	534.6	520.6	512.5
70°	488.5	480.5	462.4	448.4	440.5
72.5°	412.4	404.4	394.4	380.4	374.4
75°	336.2	332.4	322.2	310.3	314.3
77.5°	268.2	260.2	256.1	250.2	244.2
80°	200.3	198.1	194.1	188.2	184.1
82.5°	136.2	136.2	134.2	126.2	126.2
85°	81.9	80.1	78.1	72.0	70.1
87.5°	36.1	32.1	28.0	22.1	20.0
90°	2.8	33.7	91.7	86.1	88.8
92.5°	58.0	78.6	81.3	84.2	84.2
95°	136.5	162.7	167.4	167.4	162.7
97.5°	227.3	251.6	261.9	261.9	261.9
100°	332.0	353.5	361.0	361.0	358.2
102.5°	442.4	458.2	468.6	471.4	468.6
105°	563.0	570.5	576.1	580.8	580.8
107.5°	682.7	693.9	693.9	695.8	682.7
110°	798.7	813.7	813.7	813.7	806.2



TEST NUMBER: P921832

CATALOG NUMBER: DFN2DIP-HX4F0-060D110US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	924.0	939.9	937.1	929.6	924.0
115°	1047.5	1062.4	1057.7	1055.0	1047.5
117.5°	1170.0	1190.5	1177.4	1170.0	1162.5
120°	1293.4	1314.0	1293.4	1293.4	1285.0
122.5°	1405.7	1431.8	1418.7	1411.2	1405.7
125°	1523.5	1546.8	1539.4	1531.0	1528.1
127.5°	1638.5	1667.5	1657.2	1646.0	1638.5
130°	1746.1	1779.8	1775.0	1769.4	1759.2
132.5°	1866.7	1892.9	1894.8	1881.7	1874.2
135°	1970.5	1999.5	2005.1	2002.3	1994.8
137.5°	2086.5	2109.9	2114.5	2112.6	2101.5
140°	2188.4	2211.8	2224.9	2224.9	2214.7
142.5°	2293.2	2316.6	2324.1	2326.8	2316.6
145°	2392.3	2411.0	2426.0	2428.8	2418.5
147.5°	2481.2	2504.5	2515.8	2520.4	2510.2
150°	2572.9	2588.7	2599.0	2607.5	2599.0
152.5°	2654.2	2670.0	2683.2	2693.5	2683.2
155°	2735.6	2743.0	2751.5	2764.6	2756.1
157.5°	2805.7	2811.3	2815.9	2834.7	2821.5
160°	2868.4	2874.0	2876.7	2892.7	2881.5
162.5°	2926.3	2926.3	2929.2	2946.9	2933.8
165°	2975.9	2973.1	2973.1	2991.8	2978.7
167.5°	3020.8	3012.4	3012.4	3031.1	3018.0
170°	3054.5	3047.0	3044.2	3062.8	3047.0
172.5°	3077.8	3070.3	3067.6	3086.3	3070.3
175°	3096.6	3089.1	3083.4	3102.2	3086.3
177.5°	3106.8	3099.3	3093.7	3109.7	3093.7
180°	3102.2	3102.2	3102.2	3102.2	3102.2



TEST NUMBER: P921832  
 CATALOG NUMBER: DFN2DIP-HX4F0-060D110US940-FLLFLL

**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	7.56	8.32	8.62	9.38	10.82	7.13	7.89	8.18	8.95	10.38
	3H	9.21	9.90	10.28	10.97	12.42	8.74	9.43	9.81	10.49	11.94
	4H	9.80	10.45	10.87	11.52	12.97	9.32	9.97	10.40	11.04	12.50
	6H	10.19	10.79	11.28	11.86	13.33	9.72	10.31	10.80	11.39	12.86
	8H	10.30	10.86	11.38	11.95	13.42	9.82	10.39	10.91	11.48	12.94
	12H	10.34	10.88	11.43	11.96	13.45	9.86	10.40	10.95	11.48	12.97
4H	2H	8.01	8.66	9.09	9.73	11.19	7.67	8.31	8.75	9.38	10.84
	3H	9.87	10.41	10.96	11.51	12.98	9.48	10.02	10.57	11.11	12.58
	4H	10.58	11.08	11.67	12.16	13.66	10.17	10.67	11.27	11.76	13.25
	6H	11.09	11.52	12.19	12.63	14.11	10.68	11.11	11.78	12.22	13.70
	8H	11.24	11.64	12.34	12.74	14.24	10.83	11.22	11.93	12.33	13.83
	12H	11.31	11.67	12.43	12.78	14.29	10.88	11.25	12.00	12.36	13.87
8H	4H	10.77	11.17	11.87	12.27	13.77	10.41	10.81	11.51	11.91	13.41
	6H	11.40	11.73	12.52	12.87	14.37	11.03	11.36	12.16	12.51	14.01
	8H	11.62	11.91	12.75	13.03	14.55	11.25	11.54	12.38	12.66	14.18
	12H	11.75	12.00	12.88	13.12	14.68	11.36	11.61	12.50	12.74	14.29
12H	4H	10.75	11.11	11.87	12.23	13.73	10.40	10.76	11.52	11.87	13.38
	6H	11.43	11.72	12.56	12.84	14.36	11.08	11.36	12.21	12.49	14.01
	8H	11.67	11.92	12.80	13.04	14.60	11.31	11.56	12.44	12.68	14.24