

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: P928548

Luminaire Tested: DFN2DIP-HX4F0-050D090US930-FLLONL

Issue Date: 12/12/2024

**Test Information**

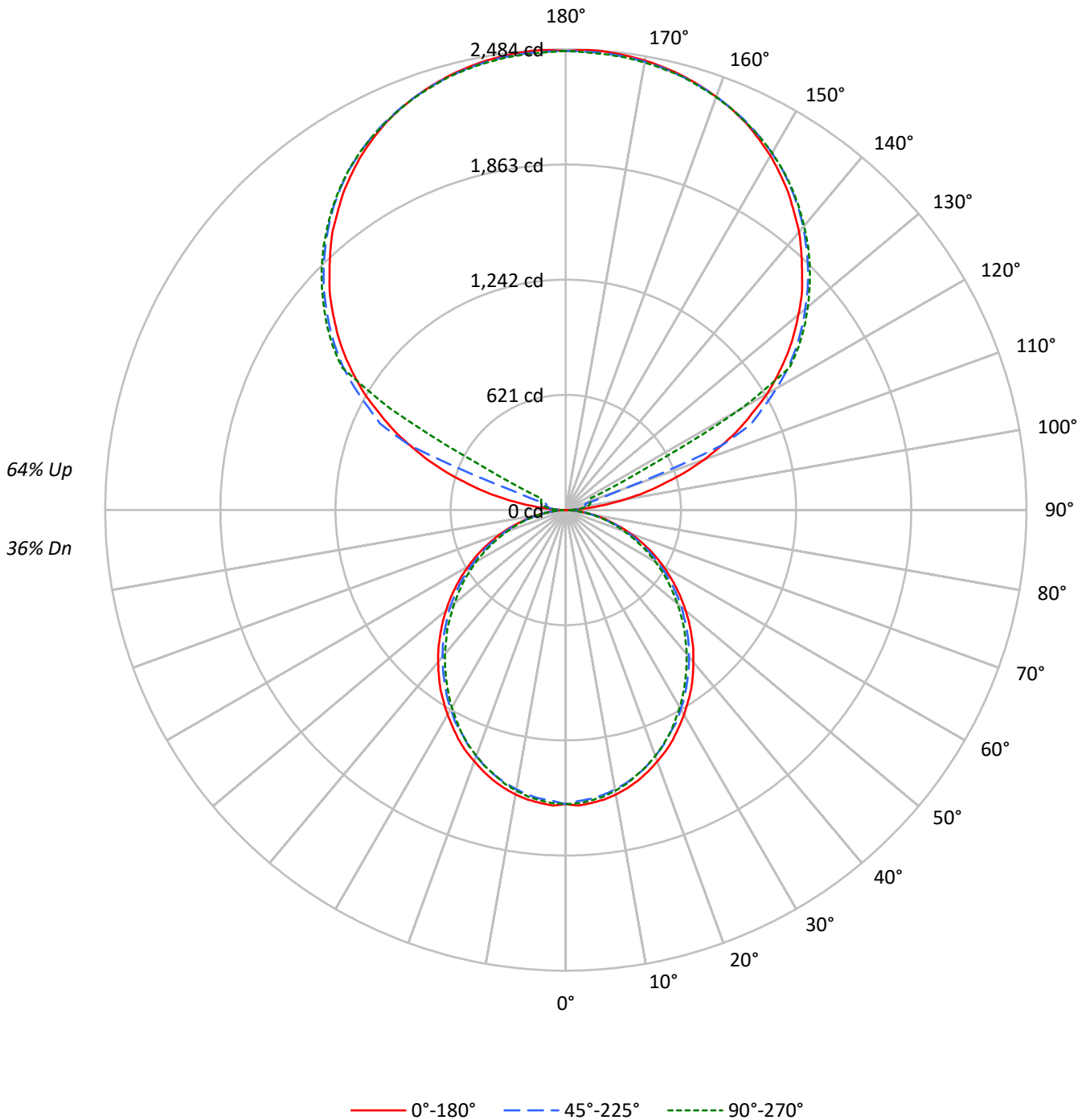
Test Method: LM-79-2019  
Report Number: P928548  
REPORT IS A COMBINATION OF REPORTS P900911 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-050D090US930-FLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11295.9 lumens  
Efficiency: N/A  
Efficacy: 101.2 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): 111.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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				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	94	94	94	94	75	75	75	59	59	59	43	43	43	36				36
1	95	90	87	83	85	82	79	76	66	64	62	51	50	49	38	37	36	30				30
2	86	79	73	68	78	72	66	62	58	54	51	45	43	41	33	32	31	25				25
3	79	69	62	56	71	63	57	52	51	47	43	40	37	34	30	28	26	21				21
4	72	61	54	48	65	56	49	44	45	40	37	36	32	29	26	24	22	18				18
5	66	54	47	41	59	50	43	38	40	35	31	32	28	25	24	21	19	16				16
6	61	49	41	35	55	44	38	33	36	31	27	29	25	22	22	19	17	14				14
7	56	44	36	31	50	40	33	28	33	28	24	26	22	20	20	17	15	12				12
8	52	40	32	27	47	36	30	25	30	25	21	24	20	17	18	16	14	11				11
9	48	36	29	24	44	33	27	22	27	22	19	22	18	16	17	14	12	10				10
10	45	33	26	21	41	30	24	20	25	20	17	20	17	14	15	13	11	9				9

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

	0°	45°	90°
0°	1179	1179	1179
5°	1181	1163	1171
10°	1172	1147	1155
15°	1154	1128	1130
20°	1131	1102	1105
25°	1108	1071	1075
30°	1079	1042	1038
35°	1052	1008	999
40°	1018	973	961
45°	984	938	923
50°	948	902	879
55°	909	860	838
60°	866	810	791
65°	818	758	736
70°	758	695	677
75°	674	619	622
80°	574	522	518
85°	416	356	344

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 1269 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	149.2	1.3
10°-20°	419.9	3.7
20°-30°	617.1	5.5
30°-40°	716.7	6.3
40°-50°	715.8	6.3
50°-60°	624.2	5.5
60°-70°	461.4	4.1
70°-80°	261.0	2.3
80°-90°	73.3	0.6
90°-100°	81.6	0.7
100°-110°	304.3	2.7
110°-120°	807.0	7.1
120°-130°	1338.5	11.8
130°-140°	1421.8	12.6
140°-150°	1321.4	11.7
150°-160°	1062.4	9.4
160°-170°	684.6	6.1
170°-180°	235.6	2.1
0°-30°	1186.2	10.5
0°-40°	1902.9	16.8
0°-60°	3242.9	28.7
0°-90°	4038.6	35.8
90°-120°	1193.0	10.6
90°-150°	5274.7	46.7
90°-180°	7257.0	64.2
0°-180°	11295.9	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	1586	1586	1586	1586	1586	
5°	1586	1580	1563	1575	1572	151
15°	1509	1500	1480	1487	1479	425
25°	1366	1354	1328	1331	1328	629
35°	1179	1163	1139	1130	1122	736
45°	959	948	925	909	903	740
55°	726	717	698	680	672	649
65°	490	480	465	451	444	484
75°	256	253	245	236	239	273
85°	62	61	60	55	53	70
90°	2	22	36	45	48	10
95°	116	57	70	79	77	138
105°	544	598	109	129	136	582
115°	1030	1060	1105	276	147	1014
125°	1456	1480	1514	1526	1532	1299
135°	1802	1831	1847	1865	1861	1392
145°	2090	2088	2119	2132	2123	1307
155°	2302	2286	2307	2318	2304	1061
165°	2425	2415	2420	2432	2420	685
175°	2481	2468	2472	2484	2466	236
180°	2476	2476	2476	2476	2476	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	1585.6	1585.6	1585.6	1585.6	1585.6
2.5°	1594.8	1587.2	1570.4	1585.6	1582.7
5°	1585.6	1579.6	1562.8	1574.9	1572.1
7.5°	1574.9	1565.9	1549.1	1561.4	1558.3
10°	1558.3	1547.6	1529.3	1541.4	1536.9
12.5°	1535.3	1526.3	1508.0	1515.6	1512.5
15°	1509.4	1500.3	1480.4	1486.6	1479.0
17.5°	1477.4	1468.3	1448.4	1456.0	1448.4
20°	1442.3	1433.3	1411.9	1416.4	1410.4
22.5°	1407.3	1393.6	1373.7	1373.7	1370.6
25°	1366.1	1354.0	1328.0	1331.0	1328.0
27.5°	1320.3	1309.6	1289.9	1285.3	1277.8
30°	1274.7	1262.4	1239.6	1235.1	1228.9
32.5°	1225.8	1216.8	1192.3	1183.1	1177.0
35°	1178.6	1163.4	1139.0	1129.8	1122.2
37.5°	1125.2	1111.5	1087.0	1076.4	1068.8
40°	1070.4	1058.1	1033.7	1020.1	1013.9
42.5°	1017.0	1004.7	980.4	965.0	956.0
45°	959.1	948.4	925.4	908.8	902.6
47.5°	902.6	891.9	867.6	850.7	841.7
50°	843.1	835.5	814.2	792.8	785.2
52.5°	785.2	774.5	754.8	738.0	727.3
55°	725.8	716.6	698.3	680.0	672.5
57.5°	666.3	658.7	638.8	620.5	614.3
60°	606.8	600.8	579.5	562.6	558.1
62.5°	548.9	538.2	523.0	507.7	501.6
65°	489.5	480.3	465.0	451.3	443.7
67.5°	428.5	420.8	407.2	396.5	390.3
70°	372.0	365.9	352.2	341.5	335.5
72.5°	314.2	308.0	300.4	289.7	285.2
75°	256.1	253.1	245.4	236.4	239.4
77.5°	204.3	198.1	195.1	190.5	186.1
80°	152.6	150.9	147.8	143.4	140.3
82.5°	103.7	103.7	102.2	96.1	96.1
85°	62.4	61.0	59.5	54.8	53.4
87.5°	27.5	24.4	21.4	16.8	15.2
90°	1.7	21.5	35.7	44.9	48.2
92.5°	44.9	37.7	43.0	46.6	48.2
95°	116.4	57.2	69.8	78.9	77.0
97.5°	209.5	62.8	91.3	96.7	98.5
100°	317.1	71.7	102.1	116.4	120.0
102.5°	435.2	431.8	105.7	125.3	130.8
105°	544.5	598.4	109.3	128.9	136.1
107.5°	671.7	716.4	113.0	132.5	139.8
110°	793.6	831.1	313.5	134.4	141.5



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	908.2	940.3	909.9	137.8	143.4
115°	1029.9	1060.3	1105.2	275.9	146.9
117.5°	1135.6	1171.4	1202.0	945.7	476.4
120°	1253.9	1280.7	1313.0	1334.5	1092.7
122.5°	1354.1	1382.8	1418.8	1429.3	1431.3
125°	1456.2	1479.6	1513.6	1526.2	1531.5
127.5°	1549.3	1574.4	1601.5	1619.3	1621.0
130°	1637.2	1665.9	1685.5	1705.2	1703.6
132.5°	1726.7	1750.1	1769.7	1785.9	1784.2
135°	1802.0	1830.7	1846.7	1864.8	1861.2
137.5°	1880.8	1902.2	1920.3	1938.2	1932.9
140°	1957.7	1972.2	1991.8	2007.9	1999.0
142.5°	2022.4	2035.0	2058.1	2072.4	2063.5
145°	2090.5	2088.5	2119.0	2131.6	2122.6
147.5°	2149.4	2144.1	2174.5	2183.5	2176.4
150°	2206.9	2194.3	2223.0	2233.6	2224.7
152.5°	2255.1	2240.8	2267.7	2278.5	2265.9
155°	2301.7	2285.7	2307.2	2317.9	2303.6
157.5°	2339.4	2325.1	2341.3	2353.8	2339.4
160°	2371.6	2360.8	2371.6	2382.3	2369.8
162.5°	2400.2	2389.5	2398.5	2411.0	2394.9
165°	2425.3	2414.6	2420.0	2432.5	2420.0
167.5°	2445.1	2434.2	2439.7	2452.3	2436.1
170°	2461.2	2450.4	2454.0	2466.5	2450.4
172.5°	2471.9	2461.2	2464.8	2477.4	2461.2
175°	2480.8	2468.2	2471.9	2484.4	2466.5
177.5°	2484.4	2471.9	2473.8	2486.3	2470.2
180°	2475.5	2475.5	2475.5	2475.5	2475.5



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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	6.36	7.11	7.43	8.18	9.64	5.93	6.68	7.00	7.75	9.21
	3H	8.01	8.68	9.09	9.76	11.24	7.54	8.21	8.62	9.29	10.77
	4H	8.60	9.23	9.69	10.31	11.80	8.12	8.76	9.21	9.84	11.33
	6H	8.99	9.58	10.09	10.66	12.16	8.52	9.10	9.62	10.19	11.68
	8H	9.09	9.65	10.20	10.75	12.24	8.62	9.17	9.72	10.28	11.77
	12H	9.14	9.67	10.25	10.76	12.28	8.66	9.19	9.77	10.28	11.80
4H	2H	6.81	7.44	7.91	8.53	10.01	6.46	7.10	7.56	8.18	9.67
	3H	8.67	9.20	9.77	10.30	11.80	8.27	8.80	9.38	9.91	11.41
	4H	9.38	9.86	10.49	10.96	12.48	8.97	9.46	10.08	10.56	12.07
	6H	9.89	10.30	11.00	11.43	12.94	9.48	9.89	10.59	11.02	12.53
	8H	10.03	10.42	11.15	11.54	13.06	9.62	10.01	10.74	11.13	12.65
	12H	10.10	10.45	11.24	11.58	13.11	9.68	10.03	10.81	11.16	12.69
8H	4H	9.56	9.95	10.68	11.07	12.60	9.20	9.59	10.32	10.71	12.24
	6H	10.19	10.51	11.33	11.67	13.19	9.83	10.15	10.97	11.31	12.83
	8H	10.41	10.69	11.56	11.83	13.38	10.04	10.33	11.19	11.46	13.01
	12H	10.54	10.79	11.69	11.92	13.50	10.16	10.40	11.30	11.54	13.12
12H	4H	9.54	9.90	10.68	11.02	12.56	9.19	9.55	10.33	10.67	12.20
	6H	10.22	10.50	11.37	11.64	13.18	9.87	10.15	11.01	11.29	12.83
	8H	10.46	10.71	11.61	11.84	13.42	10.10	10.35	11.25	11.48	13.06