

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: P929228

Luminaire Tested: DFN2DIP-HX4F0-060D080US940-FLLONL

Issue Date: 12/12/2024

**Test Information**

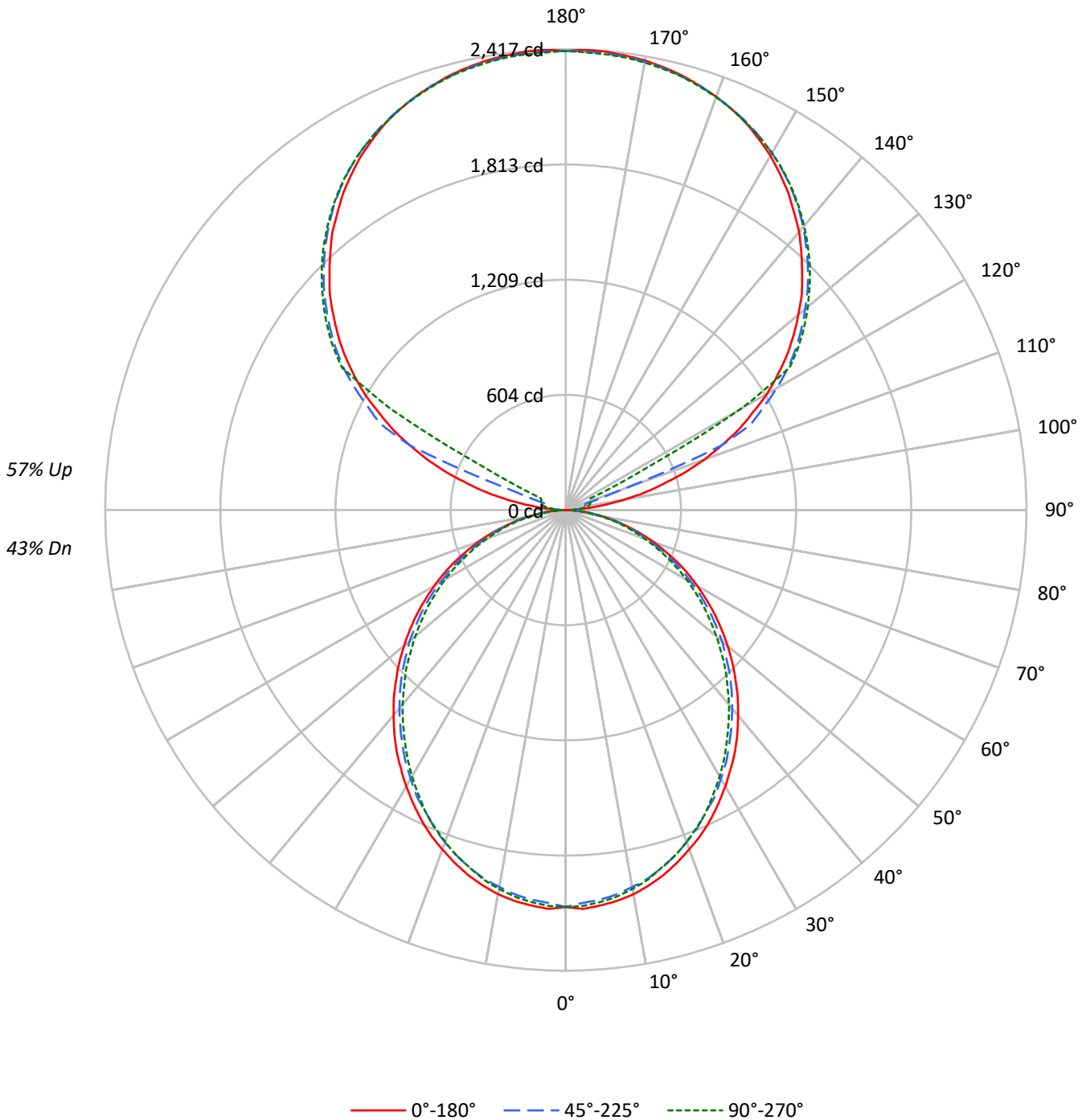
Test Method: LM-79-2019  
Report Number: P929228  
REPORT IS A COMBINATION OF REPORTS P900895 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D080US940-FLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12363.1 lumens  
Efficiency: N/A  
Efficacy: 109.9 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): 112.5  
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

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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	105	105	105	105	96	96	96	96	79	79	79	64	64	64	50	50	50	43			43
1	96	92	88	85	88	84	81	78	70	67	65	56	55	53	44	43	42	36			36
2	88	80	74	69	80	74	68	64	61	57	54	49	47	44	39	37	35	30			30
3	80	71	63	58	73	65	58	53	54	49	45	44	40	38	34	32	30	26			26
4	73	62	55	49	66	57	50	45	48	43	39	39	35	32	31	28	26	22			22
5	67	56	48	42	61	51	44	39	43	37	33	35	31	28	28	25	23	19			19
6	62	50	42	36	56	46	39	34	38	33	29	31	27	24	25	22	20	17			17
7	57	45	37	32	52	41	34	29	35	29	25	29	25	22	23	20	18	15			15
8	53	41	33	28	48	38	31	26	32	26	23	26	22	19	21	18	16	13			13
9	49	37	30	25	45	34	28	23	29	24	20	24	20	17	19	16	14	12			12
10	46	34	27	22	42	31	25	21	27	22	18	22	18	16	18	15	13	11			11

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

	0°	45°	90°
0°	1548	1548	1548
5°	1551	1527	1537
10°	1539	1507	1516
15°	1516	1482	1484
20°	1486	1448	1451
25°	1455	1407	1412
30°	1417	1368	1364
35°	1381	1323	1312
40°	1337	1278	1263
45°	1293	1232	1212
50°	1245	1184	1154
55°	1194	1129	1101
60°	1137	1063	1039
65°	1075	995	967
70°	995	912	889
75°	885	813	817
80°	753	686	680
85°	547	467	452

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 1293 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	196.0	1.6
10°-20°	551.5	4.5
20°-30°	810.5	6.6
30°-40°	941.3	7.6
40°-50°	940.1	7.6
50°-60°	819.8	6.6
60°-70°	606.0	4.9
70°-80°	342.9	2.8
80°-90°	94.7	0.8
90°-100°	79.4	0.6
100°-110°	296.0	2.4
110°-120°	785.1	6.4
120°-130°	1302.2	10.5
130°-140°	1383.2	11.2
140°-150°	1285.6	10.4
150°-160°	1033.6	8.4
160°-170°	666.0	5.4
170°-180°	229.2	1.9
0°-30°	1558.0	12.6
0°-40°	2499.3	20.2
0°-60°	4259.1	34.5
0°-90°	5302.7	42.9
90°-120°	1160.6	9.4
90°-150°	5131.6	41.5
90°-180°	7060.0	57.1
0°-180°	12363.1	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	2082	2082	2082	2082	2082	
5°	2082	2075	2052	2068	2065	198
15°	1982	1970	1944	1952	1942	558
25°	1794	1778	1744	1748	1744	826
35°	1548	1528	1496	1484	1474	967
45°	1260	1246	1215	1194	1186	972
55°	953	941	917	893	883	852
65°	643	631	611	593	583	636
75°	336	332	322	310	314	359
85°	82	80	78	72	70	91
90°	2	21	35	44	47	11
95°	113	56	68	77	75	134
105°	530	582	106	125	132	566
115°	1002	1032	1075	268	143	986
125°	1417	1439	1472	1485	1490	1263
135°	1753	1781	1797	1814	1811	1354
145°	2034	2032	2062	2074	2065	1272
155°	2239	2224	2245	2255	2241	1032
165°	2360	2349	2354	2366	2354	667
175°	2414	2401	2405	2417	2400	230
180°	2408	2408	2408	2408	2408	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	2082.5	2082.5	2082.5	2082.5	2082.5
2.5°	2094.6	2084.6	2062.5	2082.5	2078.6
5°	2082.5	2074.6	2052.5	2068.5	2064.6
7.5°	2068.5	2056.6	2034.5	2050.6	2046.6
10°	2046.6	2032.6	2008.5	2024.5	2018.5
12.5°	2016.5	2004.5	1980.5	1990.5	1986.5
15°	1982.4	1970.5	1944.4	1952.5	1942.5
17.5°	1940.4	1928.5	1902.4	1912.3	1902.4
20°	1894.3	1882.4	1854.3	1860.3	1852.4
22.5°	1848.4	1830.3	1804.2	1804.2	1800.1
25°	1794.2	1778.3	1744.2	1748.1	1744.2
27.5°	1734.0	1720.0	1694.1	1688.2	1678.2
30°	1674.2	1658.0	1628.1	1622.1	1614.0
32.5°	1610.0	1598.1	1566.0	1553.9	1545.8
35°	1548.0	1528.0	1495.9	1483.8	1473.8
37.5°	1477.9	1459.8	1427.7	1413.6	1403.7
40°	1405.8	1389.6	1357.6	1339.8	1331.7
42.5°	1335.7	1319.5	1287.7	1267.5	1255.6
45°	1259.7	1245.6	1215.4	1193.6	1185.5
47.5°	1185.5	1171.5	1139.4	1117.3	1105.4
50°	1107.3	1097.3	1069.3	1041.2	1031.2
52.5°	1031.2	1017.2	991.3	969.2	955.2
55°	953.3	941.1	917.2	893.2	883.2
57.5°	875.1	865.2	839.0	815.0	806.9
60°	796.9	789.1	761.1	738.9	733.0
62.5°	720.8	706.8	686.8	666.9	658.8
65°	642.9	630.8	610.8	592.7	582.7
67.5°	562.8	552.6	534.8	520.7	512.6
70°	488.6	480.6	462.5	448.5	440.6
72.5°	412.6	404.5	394.5	380.5	374.6
75°	336.3	332.5	322.3	310.4	314.4
77.5°	268.3	260.3	256.2	250.3	244.3
80°	200.3	198.2	194.2	188.2	184.2
82.5°	136.2	136.2	134.2	126.2	126.2
85°	82.0	80.1	78.1	72.0	70.1
87.5°	36.1	32.1	28.0	22.1	20.0
90°	1.7	20.9	34.8	43.6	47.0
92.5°	43.6	36.7	41.8	45.3	47.0
95°	113.2	55.7	67.9	76.8	74.9
97.5°	203.8	61.0	88.8	94.2	95.8
100°	308.5	69.8	99.4	113.2	116.7
102.5°	423.4	420.0	102.8	121.8	127.3
105°	529.8	582.1	106.3	125.4	132.5
107.5°	653.5	696.9	109.9	128.9	135.9
110°	772.1	808.5	305.1	130.8	137.6



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	883.6	914.8	885.3	134.1	139.5
115°	1002.0	1031.6	1075.2	268.4	143.0
117.5°	1104.8	1139.6	1169.4	920.0	463.6
120°	1219.9	1245.9	1277.4	1298.3	1063.0
122.5°	1317.3	1345.3	1380.3	1390.6	1392.5
125°	1416.7	1439.4	1472.5	1484.7	1489.9
127.5°	1507.3	1531.7	1558.1	1575.4	1577.1
130°	1592.8	1620.7	1639.8	1659.0	1657.3
132.5°	1679.9	1702.6	1721.7	1737.4	1735.7
135°	1753.1	1781.1	1796.6	1814.2	1810.7
137.5°	1829.8	1850.6	1868.2	1885.6	1880.4
140°	1904.6	1918.7	1937.8	1953.5	1944.7
142.5°	1967.6	1979.7	2002.3	2016.2	2007.4
145°	2033.8	2031.9	2061.5	2073.7	2065.0
147.5°	2091.1	2085.9	2115.5	2124.2	2117.3
150°	2147.0	2134.7	2162.7	2173.0	2164.3
152.5°	2194.0	2180.0	2206.1	2216.7	2204.5
155°	2239.3	2223.8	2244.6	2255.0	2241.2
157.5°	2275.8	2262.0	2277.7	2289.9	2275.8
160°	2307.3	2296.8	2307.3	2317.7	2305.5
162.5°	2335.1	2324.7	2333.4	2345.6	2329.9
165°	2359.5	2349.2	2354.3	2366.5	2354.3
167.5°	2378.7	2368.2	2373.5	2385.7	2370.0
170°	2394.5	2383.9	2387.4	2399.7	2383.9
172.5°	2404.8	2394.5	2398.0	2410.2	2394.5
175°	2413.5	2401.3	2404.8	2417.0	2399.7
177.5°	2417.0	2404.8	2406.6	2418.8	2403.1
180°	2408.3	2408.3	2408.3	2408.3	2408.3



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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	8.10	8.90	9.11	9.92	11.29	7.67	8.47	8.68	9.49	10.86
	3H	9.75	10.47	10.78	11.51	12.90	9.28	10.00	10.31	11.03	12.42
	4H	10.34	11.02	11.38	12.06	13.45	9.87	10.55	10.90	11.58	12.98
	6H	10.74	11.36	11.79	12.40	13.81	10.26	10.89	11.31	11.93	13.34
	8H	10.84	11.44	11.89	12.49	13.90	10.36	10.96	11.42	12.02	13.42
	12H	10.89	11.45	11.95	12.50	13.93	10.41	10.97	11.46	12.02	13.45
4H	2H	8.55	9.23	9.60	10.27	11.67	8.21	8.89	9.25	9.92	11.32
	3H	10.41	10.98	11.47	12.05	13.46	10.02	10.59	11.07	11.65	13.06
	4H	11.13	11.65	12.19	12.70	14.13	10.72	11.24	11.78	12.30	13.73
	6H	11.64	12.09	12.71	13.17	14.59	11.23	11.68	12.30	12.76	14.18
	8H	11.79	12.21	12.86	13.28	14.72	11.38	11.79	12.44	12.86	14.31
	12H	11.86	12.24	12.95	13.32	14.77	11.44	11.81	12.52	12.90	14.35
8H	4H	11.32	11.74	12.39	12.81	14.25	10.96	11.38	12.03	12.45	13.89
	6H	11.95	12.29	13.04	13.41	14.85	11.59	11.93	12.68	13.04	14.48
	8H	12.17	12.47	13.27	13.57	15.03	11.80	12.10	12.90	13.20	14.66
	12H	12.30	12.57	13.40	13.66	15.16	11.91	12.18	13.02	13.27	14.77
12H	4H	11.30	11.68	12.39	12.76	14.21	10.95	11.33	12.04	12.41	13.86
	6H	11.98	12.28	13.08	13.38	14.84	11.63	11.93	12.73	13.03	14.48
	8H	12.22	12.49	13.32	13.58	15.08	11.86	12.13	12.96	13.22	14.72