

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: P905508

Luminaire Tested: DFN2DIP-HX4F0-090D060US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

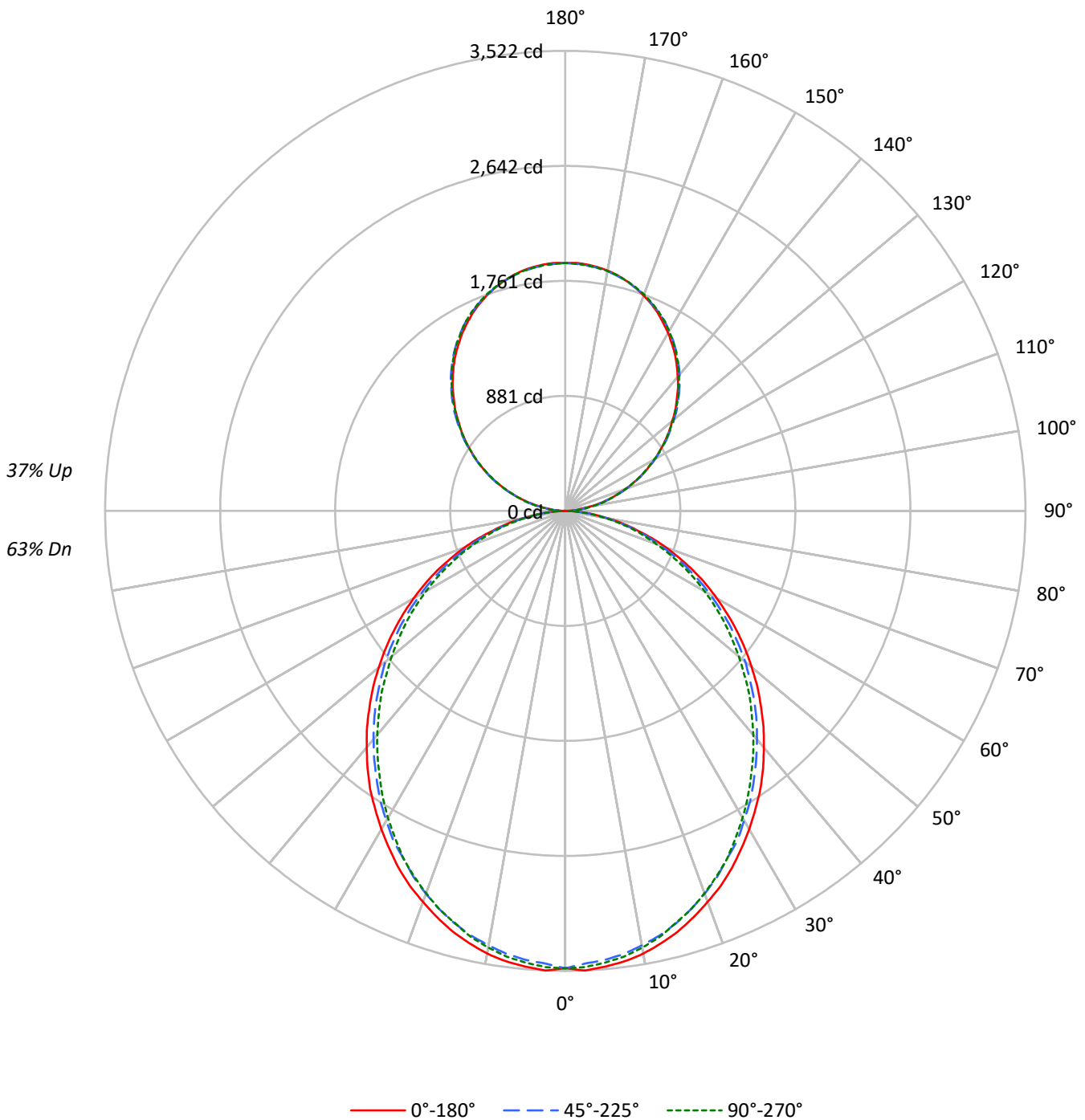
Test Method: LM-79-2019  
Report Number: P905508  
REPORT IS A COMBINATION OF REPORTS P899345 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-090D060US835-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14220.0 lumens  
Efficiency: N/A  
Efficacy: 115.9 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: Semi-Direct  
  
Input Watts (W): 122.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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	110	110	110	110	103	103	103	103	90	90	90	79	79	79	68	68	68	63			63
1	101	96	92	89	94	90	87	84	79	77	74	69	67	66	60	59	57	53			53
2	92	84	78	72	86	79	73	69	70	65	62	61	58	55	53	50	48	44			44
3	84	74	66	60	78	70	63	58	61	56	52	54	50	46	47	44	41	37			37
4	77	66	57	51	71	62	54	49	55	49	44	48	43	40	42	38	35	32			32
5	70	58	50	44	66	55	48	42	49	43	38	43	38	35	38	34	31	28			28
6	65	53	44	38	61	50	42	37	44	38	33	39	34	30	34	30	27	25			25
7	60	48	39	34	56	45	38	32	40	34	30	36	31	27	31	27	24	22			22
8	56	43	35	30	52	41	34	29	37	31	26	33	28	24	29	25	22	20			20
9	52	40	32	27	49	38	30	26	34	28	24	30	25	22	27	23	20	18			18
10	49	36	29	24	46	35	28	23	31	25	21	28	23	20	25	21	18	16			16

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

	0°	45°	90°
0°	2604	2604	2604
5°	2608	2568	2585
10°	2587	2534	2550
15°	2550	2492	2496
20°	2498	2434	2440
25°	2447	2365	2375
30°	2384	2301	2293
35°	2323	2225	2206
40°	2248	2149	2123
45°	2174	2072	2039
50°	2093	1992	1941
55°	2008	1898	1851
60°	1912	1788	1748
65°	1807	1673	1626
70°	1674	1534	1495
75°	1489	1367	1374
80°	1267	1154	1143
85°	919	787	760

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2174 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	329.6	2.3
10°-20°	927.4	6.5
20°-30°	1362.9	9.6
30°-40°	1582.9	11.1
40°-50°	1580.9	11.1
50°-60°	1378.5	9.7
60°-70°	1019.0	7.2
70°-80°	576.6	4.1
80°-90°	157.6	1.1
90°-100°	117.4	0.8
100°-110°	373.1	2.6
110°-120°	638.5	4.5
120°-130°	839.7	5.9
130°-140°	942.5	6.6
140°-150°	924.2	6.5
150°-160°	775.3	5.5
160°-170°	514.2	3.6
170°-180°	179.7	1.3
0°-30°	2619.9	18.4
0°-40°	4202.8	29.6
0°-60°	7162.3	50.4
0°-90°	8915.4	62.7
90°-120°	1129.0	7.9
90°-150°	3835.4	27.0
90°-180°	5305.0	37.3
0°-180°	14220.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	3502	3502	3502	3502	3502	
5°	3502	3489	3452	3478	3472	332
15°	3334	3314	3270	3283	3266	939
25°	3017	2990	2933	2940	2933	1388
35°	2603	2570	2516	2495	2478	1626
45°	2118	2095	2044	2007	1994	1635
55°	1603	1583	1542	1502	1485	1433
65°	1081	1061	1027	997	980	1069
75°	566	559	542	522	529	604
85°	138	135	132	121	118	154
90°	2	21	56	53	54	14
95°	84	100	102	102	100	93
105°	344	349	352	355	355	363
115°	641	650	647	645	641	634
125°	932	946	942	936	935	833
135°	1205	1223	1226	1225	1220	932
145°	1463	1475	1484	1486	1479	914
155°	1673	1678	1683	1691	1686	770
165°	1820	1819	1819	1830	1822	514
175°	1894	1890	1886	1898	1888	180
180°	1898	1898	1898	1898	1898	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3501.9	3501.9	3501.9	3501.9	3501.9
2.5°	3522.3	3505.5	3468.4	3501.9	3495.5
5°	3501.9	3488.7	3451.6	3478.4	3471.9
7.5°	3478.4	3458.4	3421.2	3448.4	3441.6
10°	3441.6	3418.0	3377.6	3404.4	3394.4
12.5°	3390.8	3370.8	3330.5	3347.2	3340.5
15°	3333.7	3313.7	3269.7	3283.3	3266.5
17.5°	3262.9	3242.9	3199.0	3215.8	3199.0
20°	3185.4	3165.4	3118.2	3128.2	3115.0
22.5°	3108.2	3077.9	3033.9	3033.9	3027.1
25°	3017.1	2990.3	2933.2	2939.6	2933.2
27.5°	2916.0	2892.4	2848.9	2838.9	2822.1
30°	2815.3	2788.1	2737.7	2727.7	2714.2
32.5°	2707.4	2687.4	2633.4	2613.1	2599.5
35°	2603.1	2569.5	2515.5	2495.2	2478.4
37.5°	2485.2	2454.8	2400.8	2377.3	2360.5
40°	2364.0	2336.9	2282.9	2252.9	2239.4
42.5°	2246.1	2219.0	2165.4	2131.5	2111.5
45°	2118.2	2094.7	2043.9	2007.1	1993.6
47.5°	1993.6	1970.0	1916.0	1878.9	1858.9
50°	1862.1	1845.3	1798.1	1751.0	1734.2
52.5°	1734.2	1710.6	1667.0	1629.9	1606.3
55°	1603.1	1582.7	1542.3	1502.0	1485.2
57.5°	1471.6	1454.8	1410.9	1370.5	1356.9
60°	1340.1	1326.9	1279.7	1242.6	1232.6
62.5°	1212.2	1188.6	1155.0	1121.5	1107.9
65°	1081.1	1060.7	1027.1	996.8	980.0
67.5°	946.4	929.3	899.2	875.7	862.1
70°	821.7	808.1	777.8	754.2	741.0
72.5°	693.8	680.2	663.4	639.9	629.9
75°	565.6	559.1	542.0	522.0	528.8
77.5°	451.2	437.7	430.9	420.9	410.9
80°	336.9	333.3	326.5	316.5	309.8
82.5°	229.0	229.0	225.8	212.2	212.2
85°	137.9	134.7	131.5	121.1	117.9
87.5°	60.7	53.9	47.2	37.2	33.6
90°	1.7	20.6	56.1	52.6	54.3
92.5°	35.5	48.1	49.8	51.5	51.5
95°	83.5	99.5	102.4	102.4	99.5
97.5°	139.0	153.9	160.2	160.2	160.2
100°	203.1	216.2	220.8	220.8	219.1
102.5°	270.6	280.3	286.6	288.3	286.6
105°	344.4	349.0	352.4	355.3	355.3
107.5°	417.6	424.5	424.5	425.6	417.6
110°	488.6	497.7	497.7	497.7	493.1



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CATALOG NUMBER: DFN2DIP-HX4F0-090D060US835-FLLFLL

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	565.2	574.9	573.2	568.6	565.2
115°	640.7	649.9	647.0	645.3	640.7
117.5°	715.7	728.3	720.2	715.7	711.1
120°	791.2	803.8	791.2	791.2	786.0
122.5°	859.8	875.8	867.8	863.3	859.8
125°	931.9	946.2	941.6	936.5	934.8
127.5°	1002.3	1020.0	1013.7	1006.9	1002.3
130°	1068.1	1088.7	1085.8	1082.4	1076.1
132.5°	1141.9	1157.9	1159.0	1151.0	1146.4
135°	1205.4	1223.1	1226.5	1224.8	1220.2
137.5°	1276.3	1290.6	1293.5	1292.3	1285.5
140°	1338.7	1353.0	1361.0	1361.0	1354.7
142.5°	1402.7	1417.0	1421.6	1423.3	1417.0
145°	1463.4	1474.8	1484.0	1485.7	1479.4
147.5°	1517.7	1532.0	1538.9	1541.7	1535.4
150°	1573.8	1583.5	1589.8	1594.9	1589.8
152.5°	1623.5	1633.3	1641.3	1647.6	1641.3
155°	1673.3	1677.9	1683.0	1691.1	1685.9
157.5°	1716.2	1719.7	1722.5	1734.0	1726.0
160°	1754.6	1758.0	1759.7	1769.4	1762.6
162.5°	1790.0	1790.0	1791.7	1802.6	1794.6
165°	1820.3	1818.6	1818.6	1830.1	1822.1
167.5°	1847.8	1842.7	1842.7	1854.1	1846.1
170°	1868.4	1863.8	1862.1	1873.5	1863.8
172.5°	1882.7	1878.1	1876.4	1887.8	1878.1
175°	1894.1	1889.6	1886.1	1897.6	1887.8
177.5°	1900.4	1895.9	1892.4	1902.1	1892.4
180°	1897.6	1897.6	1897.6	1897.6	1897.6



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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	11.69	12.68	12.53	13.54	14.62	11.26	12.25	12.10	13.11	14.19
	3H	13.36	14.25	14.22	15.12	16.23	12.89	13.78	13.74	14.65	15.75
	4H	13.96	14.80	14.83	15.67	16.79	13.48	14.32	14.35	15.20	16.32
	6H	14.36	15.14	15.25	16.02	17.15	13.89	14.66	14.77	15.55	16.68
	8H	14.47	15.21	15.36	16.11	17.24	14.00	14.73	14.89	15.64	16.77
	12H	14.53	15.23	15.42	16.12	17.28	14.04	14.75	14.94	15.64	16.80
4H	2H	12.17	13.01	13.04	13.89	15.00	11.82	12.66	12.70	13.54	14.66
	3H	14.05	14.75	14.93	15.66	16.79	13.66	14.36	14.54	15.27	16.40
	4H	14.77	15.41	15.67	16.31	17.47	14.36	15.00	15.26	15.91	17.06
	6H	15.29	15.84	16.20	16.77	17.93	14.88	15.43	15.79	16.36	17.52
	8H	15.45	15.96	16.36	16.89	18.06	15.03	15.55	15.95	16.47	17.64
	12H	15.52	15.99	16.46	16.93	18.11	15.10	15.57	16.04	16.51	17.69
8H	4H	14.98	15.49	15.89	16.42	17.59	14.62	15.13	15.53	16.06	17.23
	6H	15.61	16.04	16.55	17.01	18.18	15.25	15.68	16.19	16.64	17.82
	8H	15.84	16.21	16.79	17.17	18.36	15.47	15.85	16.42	16.80	17.99
	12H	15.97	16.31	16.93	17.26	18.50	15.59	15.92	16.54	16.87	18.11
12H	4H	14.97	15.43	15.90	16.38	17.55	14.62	15.08	15.55	16.02	17.20
	6H	15.65	16.02	16.60	16.98	18.17	15.29	15.67	16.24	16.63	17.82
	8H	15.89	16.23	16.85	17.18	18.42	15.54	15.87	16.49	16.82	18.06