

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: P919792

Luminaire Tested: DFN2DIP-PN4F0-110D110US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

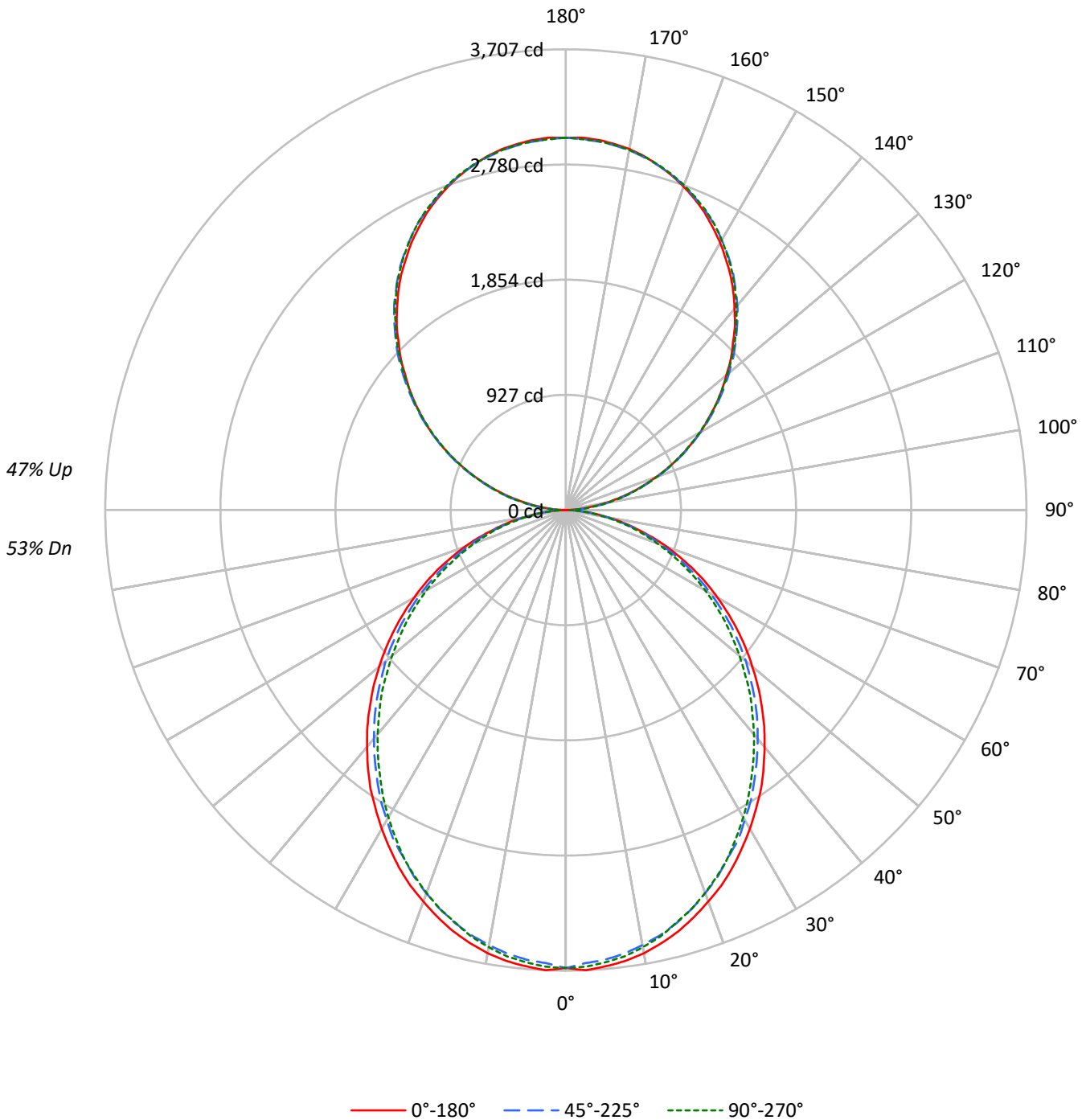
Test Method: LM-79-2019  
Report Number: P919792  
REPORT IS A COMBINATION OF REPORTS P899749 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D110US935-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17758.1 lumens  
Efficiency: N/A  
Efficacy: 86.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 205.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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	59	59	59	53			
1	98	94	90	87	91	87	84	81	74	72	70	63	61	59	52	51	50	45			
2	90	82	76	71	83	76	71	66	65	61	58	55	52	50	46	44	42	37			
3	82	72	65	59	75	67	61	55	58	53	49	49	45	42	41	38	36	32			
4	75	64	56	50	69	60	52	47	51	46	41	43	39	36	36	33	31	27			
5	69	57	49	43	63	53	46	40	46	40	36	39	35	31	33	29	27	24			
6	63	51	43	37	58	48	40	35	41	36	31	35	31	27	30	26	24	21			
7	59	46	38	33	54	43	36	31	37	32	28	32	28	24	27	24	21	18			
8	54	42	34	29	50	39	32	27	34	29	24	29	25	22	25	21	19	16			
9	51	38	31	26	47	36	29	24	31	26	22	27	23	19	23	20	17	15			
10	47	35	28	23	44	33	26	22	29	23	20	25	21	18	21	18	15	13			

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

	0°	45°	90°
0°	2690	2690	2690
5°	2694	2653	2671
10°	2673	2618	2635
15°	2633	2575	2579
20°	2580	2515	2522
25°	2527	2444	2456
30°	2461	2378	2371
35°	2398	2300	2281
40°	2321	2221	2196
45°	2244	2142	2109
50°	2160	2058	2009
55°	2072	1962	1916
60°	1972	1848	1810
65°	1863	1730	1685
70°	1725	1586	1550
75°	1533	1414	1427
80°	1303	1195	1190
85°	943	816	796

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 2346 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	346.9	2.0
10°-20°	975.9	5.5
20°-30°	1434.2	8.1
30°-40°	1665.7	9.4
40°-50°	1663.7	9.4
50°-60°	1450.7	8.2
60°-70°	1072.4	6.0
70°-80°	606.7	3.4
80°-90°	168.6	0.9
90°-100°	185.3	1.0
100°-110°	588.9	3.3
110°-120°	1007.8	5.7
120°-130°	1325.4	7.5
130°-140°	1487.7	8.4
140°-150°	1458.9	8.2
150°-160°	1223.8	6.9
160°-170°	811.6	4.6
170°-180°	283.7	1.6
0°-30°	2757.0	15.5
0°-40°	4422.7	24.9
0°-60°	7537.0	42.4
0°-90°	9384.8	52.8
90°-120°	1782.1	10.0
90°-150°	6054.2	34.1
90°-180°	8373.0	47.2
0°-180°	17758.1	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	3685	3685	3685	3685	3685	
5°	3685	3671	3632	3660	3654	350
15°	3508	3487	3441	3455	3437	988
25°	3175	3147	3087	3094	3087	1461
35°	2739	2704	2647	2626	2608	1711
45°	2229	2204	2151	2112	2098	1720
55°	1687	1666	1623	1580	1563	1508
65°	1138	1116	1081	1049	1031	1125
75°	595	588	570	549	556	635
85°	145	142	138	127	124	162
90°	3	32	88	83	86	17
95°	132	157	162	162	157	147
105°	544	551	556	561	561	574
115°	1011	1026	1021	1019	1011	1000
125°	1471	1494	1486	1478	1476	1315
135°	1903	1931	1936	1933	1926	1471
145°	2310	2328	2342	2345	2335	1443
155°	2641	2648	2657	2669	2661	1216
165°	2873	2871	2871	2889	2876	811
175°	2990	2983	2977	2995	2980	284
180°	2995	2995	2995	2995	2995	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3685.2	3685.2	3685.2	3685.2	3685.2
2.5°	3706.6	3688.9	3649.9	3685.2	3678.4
5°	3685.2	3671.3	3632.2	3660.4	3653.6
7.5°	3660.4	3639.4	3600.3	3628.8	3621.7
10°	3621.7	3596.8	3554.4	3582.5	3572.0
12.5°	3568.3	3547.2	3504.8	3522.4	3515.3
15°	3508.1	3487.0	3440.8	3455.1	3437.4
17.5°	3433.7	3412.7	3366.4	3384.1	3366.4
20°	3352.1	3331.0	3281.4	3291.9	3278.1
22.5°	3270.9	3238.9	3192.7	3192.7	3185.5
25°	3175.0	3146.9	3086.7	3093.5	3086.7
27.5°	3068.6	3043.8	2997.9	2987.4	2969.8
30°	2962.6	2934.0	2881.0	2870.5	2856.2
32.5°	2849.0	2828.0	2771.2	2749.8	2735.5
35°	2739.3	2704.0	2647.1	2625.7	2608.0
37.5°	2615.2	2583.3	2526.5	2501.6	2484.0
40°	2487.8	2459.2	2402.4	2370.8	2356.6
42.5°	2363.7	2335.1	2278.7	2243.0	2222.0
45°	2229.1	2204.2	2150.9	2112.2	2097.9
47.5°	2097.9	2073.1	2016.3	1977.2	1956.1
50°	1959.5	1941.9	1892.2	1842.6	1825.0
52.5°	1825.0	1800.1	1754.3	1715.1	1690.3
55°	1687.0	1665.5	1623.1	1580.5	1562.9
57.5°	1548.6	1530.9	1484.7	1442.2	1427.9
60°	1410.2	1396.4	1346.7	1307.6	1297.1
62.5°	1275.7	1250.9	1215.5	1180.2	1165.9
65°	1137.6	1116.2	1080.9	1049.0	1031.3
67.5°	995.9	977.9	946.3	921.5	907.2
70°	864.7	850.4	818.5	793.7	779.7
72.5°	730.1	715.8	698.2	673.4	662.8
75°	595.1	588.4	570.3	549.3	556.5
77.5°	474.8	460.5	453.4	442.9	432.4
80°	354.6	350.8	343.6	333.1	326.0
82.5°	241.0	241.0	237.6	223.3	223.3
85°	145.2	141.7	138.4	127.4	124.1
87.5°	63.9	56.7	49.6	39.1	35.3
90°	2.7	32.5	88.5	83.1	85.8
92.5°	56.0	75.9	78.5	81.3	81.3
95°	131.8	157.1	161.6	161.6	157.1
97.5°	219.5	242.9	252.9	252.9	252.9
100°	320.5	341.3	348.5	348.5	345.9
102.5°	427.1	442.5	452.5	455.1	452.5
105°	543.6	550.9	556.3	560.8	560.8
107.5°	659.2	670.0	670.0	671.8	659.2
110°	771.2	785.7	785.7	785.7	778.4



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	892.2	907.5	904.8	897.6	892.2
115°	1011.4	1025.8	1021.3	1018.6	1011.4
117.5°	1129.7	1149.5	1136.9	1129.7	1122.5
120°	1248.9	1268.8	1248.9	1248.9	1240.8
122.5°	1357.3	1382.5	1369.8	1362.6	1357.3
125°	1471.0	1493.6	1486.3	1478.2	1475.5
127.5°	1582.1	1610.1	1600.2	1589.3	1582.1
130°	1685.9	1718.5	1713.9	1708.5	1698.6
132.5°	1802.4	1827.7	1829.5	1816.9	1809.6
135°	1902.6	1930.6	1936.0	1933.4	1926.1
137.5°	2014.6	2037.2	2041.7	2039.9	2029.1
140°	2113.1	2135.6	2148.3	2148.3	2138.4
142.5°	2214.2	2236.8	2244.0	2246.7	2236.8
145°	2309.9	2328.0	2342.4	2345.1	2335.2
147.5°	2395.7	2418.3	2429.1	2433.6	2423.7
150°	2484.2	2499.6	2509.5	2517.6	2509.5
152.5°	2562.8	2578.1	2590.7	2600.7	2590.7
155°	2641.4	2648.5	2656.7	2669.4	2661.2
157.5°	2709.0	2714.5	2718.9	2737.0	2724.4
160°	2769.6	2775.0	2777.7	2793.1	2782.2
162.5°	2825.5	2825.5	2828.3	2845.4	2832.8
165°	2873.4	2870.7	2870.7	2888.7	2876.1
167.5°	2916.7	2908.6	2908.6	2926.7	2914.0
170°	2949.3	2942.0	2939.4	2957.4	2942.0
172.5°	2971.8	2964.6	2961.9	2980.0	2964.6
175°	2989.9	2982.7	2977.2	2995.3	2980.0
177.5°	2999.8	2992.6	2987.1	3002.6	2987.1
180°	2995.3	2995.3	2995.3	2995.3	2995.3



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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	10.98	11.86	11.91	12.81	14.04	10.54	11.42	11.47	12.37	13.60
	3H	12.64	13.44	13.58	14.40	15.65	12.16	12.95	13.10	13.91	15.16
	4H	13.23	13.98	14.19	14.95	16.21	12.74	13.50	13.70	14.46	15.72
	6H	13.63	14.33	14.60	15.30	16.57	13.14	13.84	14.11	14.81	16.08
	8H	13.74	14.40	14.72	15.39	16.66	13.25	13.91	14.22	14.90	16.17
	12H	13.79	14.42	14.77	15.40	16.70	13.29	13.92	14.27	14.90	16.20
4H	2H	11.44	12.19	12.40	13.16	14.42	11.09	11.84	12.05	12.81	14.07
	3H	13.31	13.94	14.28	14.93	16.21	12.91	13.54	13.88	14.53	15.81
	4H	14.03	14.60	15.01	15.59	16.89	13.61	14.19	14.59	15.17	16.47
	6H	14.55	15.04	15.54	16.05	17.35	14.12	14.62	15.12	15.63	16.93
	8H	14.70	15.16	15.70	16.17	17.48	14.27	14.73	15.27	15.74	17.05
	12H	14.78	15.19	15.79	16.21	17.53	14.34	14.75	15.35	15.77	17.09
8H	4H	14.23	14.69	15.22	15.69	17.01	13.86	14.32	14.85	15.32	16.64
	6H	14.86	15.25	15.88	16.29	17.60	14.49	14.87	15.51	15.92	17.23
	8H	15.09	15.42	16.12	16.46	17.79	14.70	15.04	15.73	16.07	17.40
	12H	15.22	15.52	16.25	16.54	17.92	14.82	15.12	15.85	16.14	17.52
12H	4H	14.22	14.63	15.23	15.65	16.97	13.85	14.27	14.87	15.29	16.61
	6H	14.89	15.23	15.92	16.26	17.59	14.53	14.87	15.56	15.90	17.23
	8H	15.14	15.44	16.17	16.46	17.84	14.77	15.06	15.80	16.09	17.46