

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: P919772

Luminaire Tested: DFN2DIP-PN4F0-110D060US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

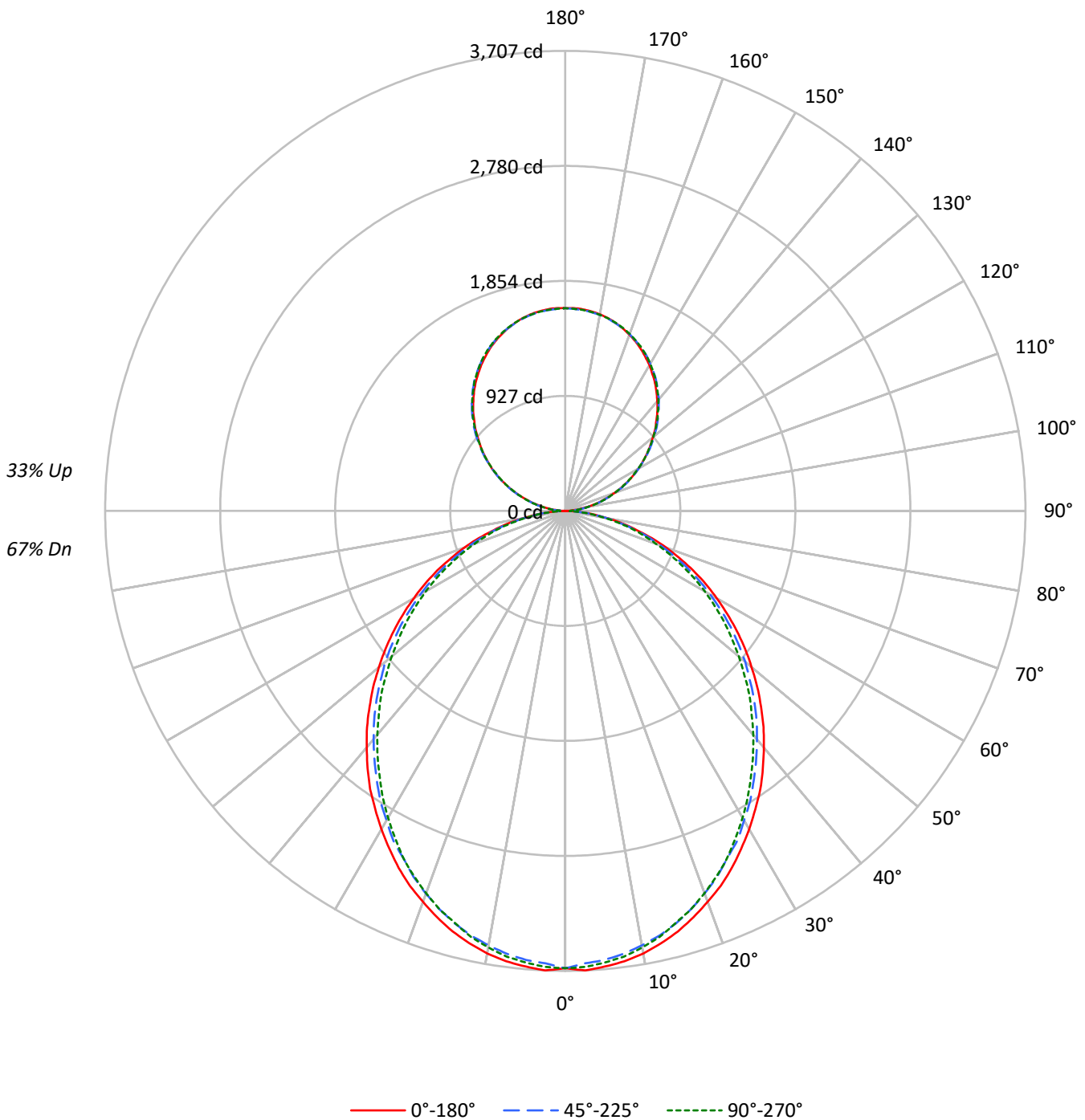
Test Method: LM-79-2019  
Report Number: P919772  
REPORT IS A COMBINATION OF REPORTS P899659 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D060US935-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13948.2 lumens  
Efficiency: N/A  
Efficacy: 87.5 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: Semi-Direct  
  
Input Watts (W): 159.4  
Input Voltage (V):  
Input Current (A<sub>in</sub>): 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				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	111	111	111	111	105	105	105	105	93	93	93	82	82	82	72	72	72	67				67
1	102	97	93	90	96	92	88	85	82	79	76	72	70	68	64	62	61	57				57
2	93	85	79	73	87	80	75	70	72	67	63	63	60	57	56	54	51	47				47
3	85	75	67	61	79	71	64	58	63	58	53	56	52	48	50	46	44	40				40
4	77	66	58	52	73	63	55	50	56	50	46	50	45	42	44	41	38	35				35
5	71	59	51	45	67	56	49	43	50	44	39	45	40	36	40	36	33	30				30
6	66	53	45	39	62	51	43	37	45	39	35	41	36	32	36	32	29	26				26
7	61	48	40	34	57	46	38	33	41	35	31	37	32	28	33	29	26	23				23
8	56	44	36	30	53	42	34	29	38	32	27	34	29	25	31	26	23	21				21
9	53	40	32	27	50	38	31	26	35	29	24	31	26	23	28	24	21	19				19
10	49	37	29	24	46	35	28	24	32	26	22	29	24	21	26	22	19	17				17

**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: 0°  
 Vertical Angle: 45°  
 Luminance: 2244 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	346.9	2.5
10°-20°	975.9	7.0
20°-30°	1434.2	10.3
30°-40°	1665.7	11.9
40°-50°	1663.7	11.9
50°-60°	1450.7	10.4
60°-70°	1072.4	7.7
70°-80°	606.7	4.3
80°-90°	164.8	1.2
90°-100°	101.1	0.7
100°-110°	321.2	2.3
110°-120°	549.7	3.9
120°-130°	723.0	5.2
130°-140°	811.5	5.8
140°-150°	795.8	5.7
150°-160°	667.5	4.8
160°-170°	442.7	3.2
170°-180°	154.7	1.1
0°-30°	2757.0	19.8
0°-40°	4422.7	31.7
0°-60°	7537.0	54.0
0°-90°	9380.9	67.3
90°-120°	972.0	7.0
90°-150°	3302.3	23.7
90°-180°	4567.0	32.7
0°-180°	13948.2	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°	2	18	48	45	47	13
95°	72	86	88	88	86	80
105°	296	300	303	306	306	313
115°	552	560	557	556	552	546
125°	802	815	811	806	805	717
135°	1038	1053	1056	1055	1051	802
145°	1260	1270	1278	1279	1274	787
155°	1441	1445	1449	1456	1452	663
165°	1567	1566	1566	1576	1569	442
175°	1631	1627	1624	1634	1625	155
180°	1634	1634	1634	1634	1634	



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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°	1.5	17.7	48.3	45.3	46.8
92.5°	30.6	41.4	42.9	44.3	44.3
95°	71.9	85.7	88.2	88.2	85.7
97.5°	119.7	132.5	137.9	137.9	137.9
100°	174.9	186.1	190.1	190.1	188.6
102.5°	233.0	241.3	246.8	248.2	246.8
105°	296.5	300.5	303.4	305.9	305.9
107.5°	359.6	365.5	365.5	366.4	359.6
110°	420.7	428.5	428.5	428.5	424.6



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	486.6	495.0	493.5	489.6	486.6
115°	551.6	559.6	557.1	555.6	551.6
117.5°	616.2	627.1	620.1	616.2	612.3
120°	681.2	692.1	681.2	681.2	676.7
122.5°	740.3	754.1	747.2	743.3	740.3
125°	802.4	814.7	810.7	806.3	804.9
127.5°	863.0	878.2	872.8	866.9	863.0
130°	919.6	937.4	934.9	931.9	926.5
132.5°	983.2	996.9	997.9	991.0	987.0
135°	1037.8	1053.1	1056.0	1054.6	1050.6
137.5°	1098.9	1111.2	1113.7	1112.7	1106.8
140°	1152.6	1164.9	1171.8	1171.8	1166.4
142.5°	1207.7	1220.0	1224.0	1225.5	1220.0
145°	1260.0	1269.8	1277.7	1279.2	1273.8
147.5°	1306.7	1319.0	1325.0	1327.4	1322.0
150°	1355.0	1363.4	1368.8	1373.2	1368.8
152.5°	1397.8	1406.3	1413.2	1418.6	1413.2
155°	1440.7	1444.7	1449.1	1456.0	1451.6
157.5°	1477.6	1480.7	1483.1	1493.0	1486.1
160°	1510.7	1513.6	1515.1	1523.4	1517.6
162.5°	1541.2	1541.2	1542.6	1552.0	1545.1
165°	1567.3	1565.8	1565.8	1575.7	1568.8
167.5°	1591.0	1586.6	1586.6	1596.4	1589.5
170°	1608.7	1604.7	1603.3	1613.1	1604.7
172.5°	1621.0	1617.0	1615.6	1625.4	1617.0
175°	1630.8	1626.9	1623.9	1633.8	1625.4
177.5°	1636.2	1632.4	1629.4	1637.7	1629.4
180°	1633.8	1633.8	1633.8	1633.8	1633.8



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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	12.17	13.21	12.97	14.03	15.03	11.73	12.77	12.53	13.59	14.59
	3H	13.85	14.79	14.66	15.61	16.64	13.37	14.30	14.17	15.13	16.16
	4H	14.45	15.33	15.27	16.16	17.21	13.96	14.84	14.78	15.68	16.72
	6H	14.86	15.67	15.69	16.52	17.57	14.37	15.18	15.20	16.02	17.08
	8H	14.97	15.75	15.82	16.61	17.66	14.48	15.25	15.32	16.11	17.17
	12H	15.03	15.77	15.88	16.62	17.70	14.53	15.27	15.38	16.12	17.20
4H	2H	12.66	13.54	13.48	14.37	15.41	12.31	13.19	13.13	14.02	15.06
	3H	14.54	15.28	15.38	16.15	17.20	14.14	14.88	14.98	15.74	16.80
	4H	15.27	15.94	16.12	16.80	17.89	14.85	15.52	15.70	16.38	17.47
	6H	15.79	16.37	16.66	17.26	18.35	15.37	15.95	16.24	16.84	17.93
	8H	15.95	16.49	16.82	17.38	18.48	15.52	16.06	16.39	16.95	18.05
	12H	16.03	16.52	16.92	17.42	18.53	15.59	16.08	16.48	16.98	18.09
8H	4H	15.48	16.02	16.35	16.90	18.00	15.11	15.65	15.98	16.53	17.63
	6H	16.12	16.57	17.02	17.49	18.60	15.74	16.19	16.64	17.12	18.22
	8H	16.34	16.74	17.25	17.66	18.78	15.96	16.36	16.87	17.28	18.39
	12H	16.49	16.84	17.40	17.75	18.92	16.08	16.43	17.00	17.35	18.52
12H	4H	15.47	15.96	16.36	16.86	17.97	15.11	15.60	16.00	16.50	17.61
	6H	16.15	16.55	17.06	17.47	18.59	15.79	16.19	16.70	17.10	18.22
	8H	16.40	16.75	17.32	17.67	18.84	16.03	16.38	16.94	17.29	18.46