

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: P906149

Luminaire Tested: DFN2DIP-PN4F0-110D100US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

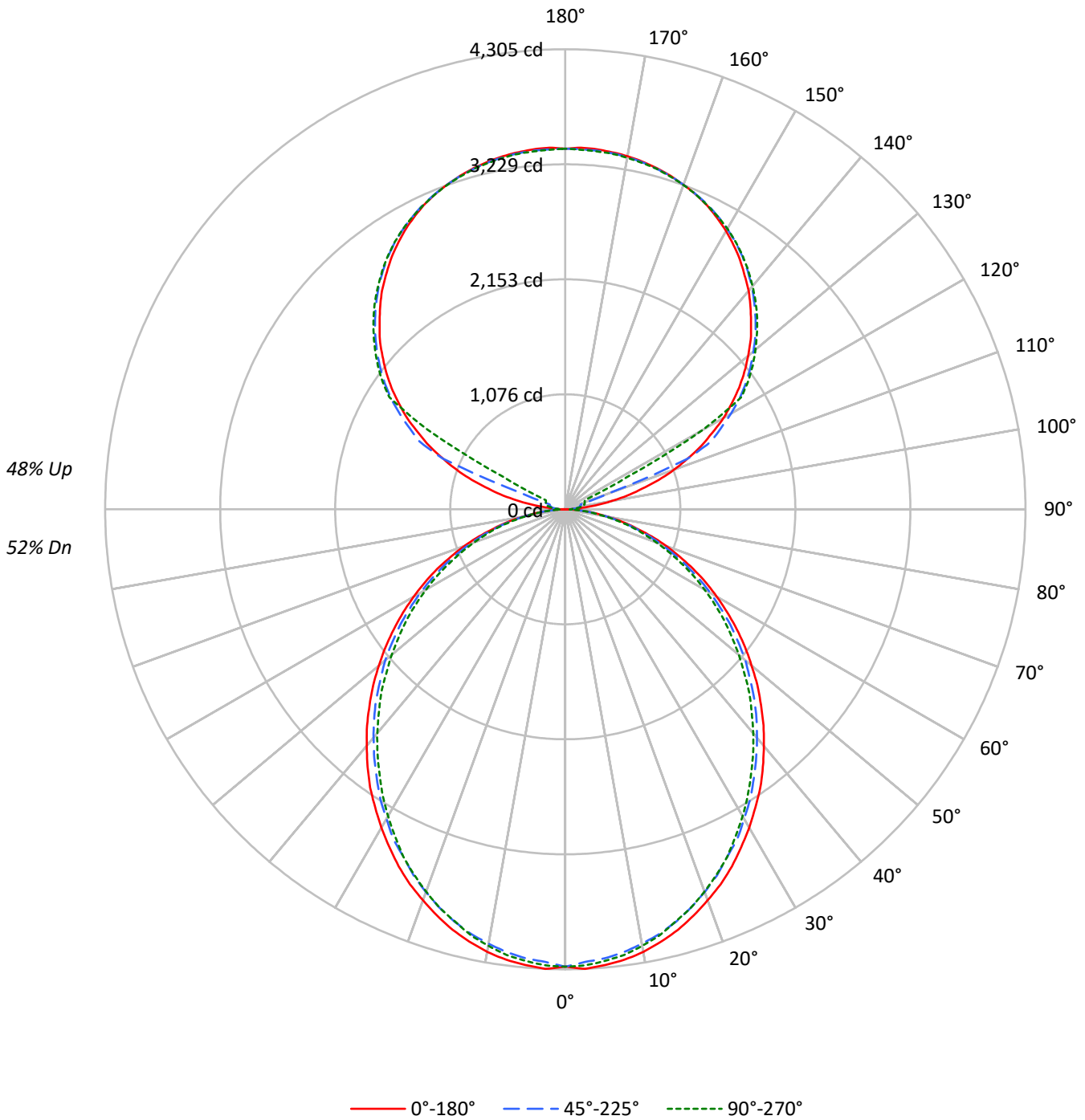
Test Method: LM-79-2019  
Report Number: P906149  
REPORT IS A COMBINATION OF REPORTS P901251 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D100US835-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 20790.0 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: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 189.2  
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	58	58	58	52	52	52	52
1	98	94	90	87	91	87	84	81	74	72	70	62	61	59	52	50	49	44	44	44	44
2	90	82	76	71	83	76	71	66	65	61	58	55	52	49	45	43	42	37	37	37	37
3	82	72	65	59	75	67	61	55	57	53	48	49	45	42	40	38	35	31	31	31	31
4	75	64	56	50	69	59	52	47	51	46	41	43	39	36	36	33	30	27	27	27	27
5	69	57	49	43	63	53	46	40	46	40	36	39	34	31	32	29	27	23	23	23	23
6	63	51	43	37	58	48	40	35	41	35	31	35	31	27	29	26	23	21	21	21	21
7	58	46	38	33	54	43	36	31	37	32	27	32	27	24	27	23	21	18	18	18	18
8	54	42	34	29	50	39	32	27	34	28	24	29	25	22	25	21	19	16	16	16	16
9	51	38	31	26	47	36	29	24	31	26	22	27	22	19	23	19	17	15	15	15	15
10	47	35	28	23	44	33	26	22	29	23	20	25	21	18	21	18	15	13	13	13	13

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

	0°	45°	90°
0°	3124	3124	3124
5°	3129	3081	3102
10°	3104	3040	3061
15°	3058	2991	2996
20°	2997	2921	2929
25°	2935	2839	2852
30°	2858	2762	2754
35°	2786	2671	2650
40°	2696	2579	2551
45°	2606	2487	2450
50°	2509	2391	2333
55°	2406	2279	2225
60°	2290	2146	2102
65°	2164	2010	1957
70°	2004	1842	1801
75°	1781	1642	1658
80°	1513	1388	1382
85°	1094	947	925

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2606 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	402.8	1.9
10°-20°	1133.5	5.5
20°-30°	1665.7	8.0
30°-40°	1934.7	9.3
40°-50°	1932.3	9.3
50°-60°	1684.9	8.1
60°-70°	1245.5	6.0
70°-80°	704.7	3.4
80°-90°	191.9	0.9
90°-100°	111.3	0.5
100°-110°	414.9	2.0
110°-120°	1100.3	5.3
120°-130°	1824.9	8.8
130°-140°	1938.4	9.3
140°-150°	1801.5	8.7
150°-160°	1448.4	7.0
160°-170°	933.3	4.5
170°-180°	321.2	1.5
0°-30°	3202.1	15.4
0°-40°	5136.7	24.7
0°-60°	8753.8	42.1
0°-90°	10895.9	52.4
90°-120°	1626.4	7.8
90°-150°	7191.2	34.6
90°-180°	9894.0	47.6
0°-180°	20790.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4280	4280	4280	4280	4280	
5°	4280	4264	4219	4251	4244	406
15°	4074	4050	3996	4013	3992	1148
25°	3688	3655	3585	3593	3585	1697
35°	3182	3140	3074	3050	3029	1987
45°	2589	2560	2498	2453	2437	1998
55°	1959	1934	1885	1836	1815	1752
65°	1321	1296	1255	1218	1198	1306
75°	691	683	662	638	646	738
85°	169	165	161	148	144	188
90°	2	29	49	61	66	19
95°	159	78	95	108	105	188
105°	742	816	149	176	186	793
115°	1404	1446	1507	376	200	1382
125°	1985	2017	2064	2081	2088	1771
135°	2457	2496	2518	2542	2537	1898
145°	2850	2847	2889	2906	2894	1782
155°	3138	3116	3146	3160	3141	1446
165°	3306	3292	3299	3316	3299	934
175°	3382	3365	3370	3387	3363	322
180°	3375	3375	3375	3375	3375	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	4280.2	4280.2	4280.2	4280.2	4280.2
2.5°	4305.0	4284.5	4239.1	4280.2	4272.3
5°	4280.2	4264.0	4218.6	4251.3	4243.5
7.5°	4251.3	4226.9	4181.5	4214.7	4206.4
10°	4206.4	4177.5	4128.2	4160.9	4148.7
12.5°	4144.4	4119.9	4070.6	4091.1	4082.8
15°	4074.5	4050.0	3996.3	4012.9	3992.4
17.5°	3988.0	3963.6	3909.9	3930.4	3909.9
20°	3893.3	3868.8	3811.2	3823.4	3807.3
22.5°	3799.0	3761.8	3708.1	3708.1	3699.8
25°	3687.6	3654.9	3585.0	3592.9	3585.0
27.5°	3564.0	3535.2	3481.9	3469.7	3449.2
30°	3440.9	3407.7	3346.1	3333.9	3317.3
32.5°	3309.0	3284.6	3218.6	3193.7	3177.1
35°	3181.5	3140.5	3074.5	3049.6	3029.1
37.5°	3037.4	3000.3	2934.4	2905.5	2885.0
40°	2889.4	2856.2	2790.3	2753.6	2737.0
42.5°	2745.3	2712.1	2646.6	2605.1	2580.7
45°	2589.0	2560.1	2498.1	2453.2	2436.6
47.5°	2436.6	2407.8	2341.8	2296.4	2271.9
50°	2275.9	2255.4	2197.7	2140.1	2119.6
52.5°	2119.6	2090.7	2037.5	1992.0	1963.2
55°	1959.3	1934.4	1885.1	1835.7	1815.2
57.5°	1798.6	1778.1	1724.4	1675.0	1658.4
60°	1637.9	1621.8	1564.1	1518.7	1506.5
62.5°	1481.6	1452.8	1411.7	1370.7	1354.1
65°	1321.3	1296.4	1255.4	1218.3	1197.8
67.5°	1156.7	1135.8	1099.1	1070.3	1053.7
70°	1004.3	987.7	950.6	921.8	905.6
72.5°	848.0	831.4	810.9	782.1	769.8
75°	691.2	683.4	662.4	638.0	646.3
77.5°	551.5	534.9	526.6	514.4	502.2
80°	411.8	407.4	399.1	386.9	378.6
82.5°	279.9	279.9	276.0	259.4	259.4
85°	168.6	164.6	160.7	148.0	144.1
87.5°	74.2	65.9	57.6	45.4	41.0
90°	2.3	29.3	48.7	61.2	65.8
92.5°	61.2	51.3	58.6	63.5	65.8
95°	158.6	78.0	95.1	107.6	105.0
97.5°	285.6	85.5	124.4	131.9	134.3
100°	432.4	97.7	139.2	158.6	163.6
102.5°	593.3	588.7	144.1	170.8	178.3
105°	742.4	815.7	149.1	175.7	185.6
107.5°	915.8	976.7	154.0	180.7	190.5
110°	1081.9	1133.0	427.4	183.3	192.8



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	1238.2	1282.0	1240.6	187.9	195.5
115°	1404.1	1445.6	1506.8	376.1	200.4
117.5°	1548.2	1597.0	1638.7	1289.3	649.6
120°	1709.5	1746.0	1790.1	1819.4	1489.7
122.5°	1846.1	1885.2	1934.2	1948.7	1951.3
125°	1985.3	2017.2	2063.6	2080.7	2087.9
127.5°	2112.3	2146.5	2183.3	2207.7	2210.0
130°	2232.0	2271.2	2297.9	2324.8	2322.5
132.5°	2354.1	2386.0	2412.7	2434.7	2432.4
135°	2456.8	2495.9	2517.7	2542.3	2537.4
137.5°	2564.1	2593.4	2618.0	2642.4	2635.1
140°	2669.0	2688.8	2715.4	2737.5	2725.3
142.5°	2757.2	2774.3	2805.9	2825.3	2813.2
145°	2850.0	2847.4	2888.9	2906.0	2893.8
147.5°	2930.3	2923.1	2964.5	2976.7	2967.2
150°	3008.6	2991.5	3030.7	3045.2	3033.0
152.5°	3074.4	3055.0	3091.6	3106.3	3089.2
155°	3138.0	3116.2	3145.5	3160.0	3140.6
157.5°	3189.3	3169.9	3191.9	3209.0	3189.3
160°	3233.4	3218.6	3233.4	3247.9	3230.8
162.5°	3272.2	3257.7	3269.9	3287.0	3265.0
165°	3306.4	3291.9	3299.2	3316.3	3299.2
167.5°	3333.4	3318.6	3326.2	3343.3	3321.2
170°	3355.4	3340.7	3345.6	3362.7	3340.7
172.5°	3369.9	3355.4	3360.4	3377.5	3355.4
175°	3382.1	3365.0	3369.9	3387.1	3362.7
177.5°	3387.1	3369.9	3372.6	3389.7	3367.6
180°	3374.9	3374.9	3374.9	3374.9	3374.9



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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	11.46	12.34	12.39	13.29	14.53	11.02	11.90	11.95	12.85	14.09
	3H	13.12	13.91	14.07	14.88	16.14	12.64	13.43	13.59	14.39	15.65
	4H	13.71	14.46	14.67	15.43	16.70	13.23	13.98	14.19	14.94	16.21
	6H	14.12	14.81	15.09	15.78	17.06	13.62	14.32	14.60	15.29	16.57
	8H	14.22	14.88	15.20	15.87	17.15	13.73	14.39	14.71	15.38	16.66
	12H	14.27	14.90	15.26	15.88	17.19	13.77	14.40	14.76	15.38	16.69
4H	2H	11.92	12.67	12.89	13.64	14.91	11.57	12.32	12.54	13.29	14.56
	3H	13.79	14.42	14.77	15.42	16.70	13.39	14.02	14.37	15.01	16.29
	4H	14.51	15.08	15.50	16.07	17.38	14.09	14.66	15.08	15.65	16.96
	6H	15.03	15.52	16.03	16.54	17.84	14.60	15.10	15.60	16.11	17.42
	8H	15.18	15.64	16.18	16.65	17.97	14.75	15.21	15.75	16.22	17.54
	12H	15.26	15.67	16.28	16.70	18.02	14.82	15.23	15.84	16.26	17.58
8H	4H	14.71	15.17	15.71	16.18	17.50	14.34	14.80	15.34	15.81	17.12
	6H	15.34	15.73	16.37	16.77	18.09	14.97	15.35	15.99	16.40	17.71
	8H	15.57	15.90	16.60	16.94	18.27	15.18	15.52	16.22	16.55	17.89
	12H	15.70	16.00	16.74	17.03	18.41	15.30	15.60	16.34	16.62	18.00
12H	4H	14.70	15.11	15.71	16.13	17.46	14.33	14.75	15.35	15.77	17.10
	6H	15.37	15.71	16.41	16.75	18.08	15.01	15.35	16.04	16.38	17.72
	8H	15.62	15.92	16.66	16.94	18.32	15.25	15.54	16.28	16.57	17.95