

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: P908920

Luminaire Tested: DFN2DIP-PN4F0-120D120US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

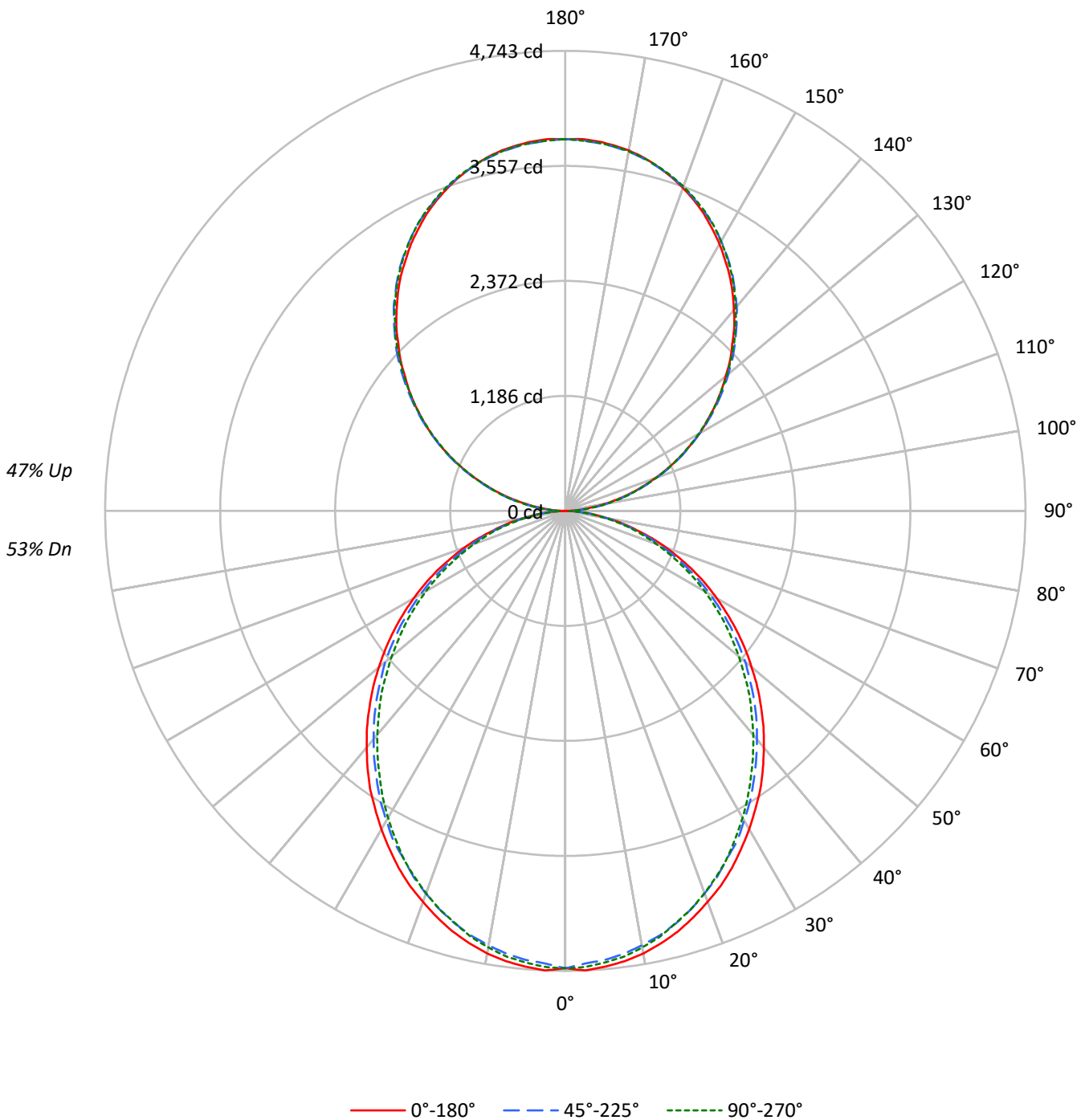
Test Method: LM-79-2019  
Report Number: P908920  
REPORT IS A COMBINATION OF REPORTS P899769 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D120US840-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22721.9 lumens  
Efficiency: N/A  
Efficacy: 98.9 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): 229.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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	108	108	108	108	100	100	100	100	85	85	85	71	71	71	59	59	59	59	59	59	53
1	98	94	90	87	91	87	84	81	74	72	70	63	61	59	52	51	50	52	51	50	45
2	90	82	76	71	83	76	71	66	65	61	58	55	52	50	46	44	42	46	44	42	37
3	82	72	65	59	75	67	61	55	58	53	49	49	45	42	41	38	36	41	38	36	32
4	75	64	56	50	69	60	52	47	51	46	41	43	39	36	36	33	31	36	33	31	27
5	69	57	49	43	63	53	46	40	46	40	36	39	35	31	33	29	27	33	29	27	24
6	63	51	43	37	58	48	40	35	41	36	31	35	31	27	30	26	24	30	26	24	21
7	59	46	38	33	54	43	36	31	37	32	28	32	28	24	27	24	21	27	24	21	18
8	54	42	34	29	50	39	32	27	34	29	24	29	25	22	25	21	19	25	21	19	16
9	51	38	31	26	47	36	29	24	31	26	22	27	23	19	23	20	17	23	20	17	15
10	47	35	28	23	44	33	26	22	29	23	20	25	21	18	21	18	15	21	18	15	13

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

	0°	45°	90°
0°	3442	3442	3442
5°	3448	3394	3418
10°	3420	3349	3372
15°	3369	3295	3300
20°	3301	3218	3227
25°	3234	3127	3142
30°	3149	3042	3034
35°	3069	2942	2919
40°	2970	2841	2810
45°	2871	2740	2699
50°	2764	2634	2570
55°	2651	2511	2451
60°	2523	2365	2316
65°	2384	2214	2156
70°	2207	2030	1984
75°	1962	1809	1826
80°	1667	1529	1523
85°	1205	1043	1019

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 3002 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	443.8	2.0
10°-20°	1248.7	5.5
20°-30°	1835.1	8.1
30°-40°	2131.4	9.4
40°-50°	2128.7	9.4
50°-60°	1856.2	8.2
60°-70°	1372.1	6.0
70°-80°	776.3	3.4
80°-90°	215.8	0.9
90°-100°	237.2	1.0
100°-110°	753.5	3.3
110°-120°	1289.5	5.7
120°-130°	1696.0	7.5
130°-140°	1903.6	8.4
140°-150°	1866.7	8.2
150°-160°	1565.9	6.9
160°-170°	1038.5	4.6
170°-180°	363.0	1.6
0°-30°	3527.6	15.5
0°-40°	5659.0	24.9
0°-60°	9643.8	42.4
0°-90°	12008.1	52.8
90°-120°	2280.2	10.0
90°-150°	7746.5	34.1
90°-180°	10714.0	47.2
0°-180°	22721.9	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4715	4715	4715	4715	4715	
5°	4715	4698	4648	4684	4675	448
15°	4489	4462	4403	4421	4398	1264
25°	4062	4026	3950	3958	3950	1869
35°	3505	3460	3387	3360	3337	2189
45°	2852	2820	2752	2703	2684	2201
55°	2158	2131	2077	2022	2000	1930
65°	1456	1428	1383	1342	1320	1439
75°	762	753	730	703	712	813
85°	186	181	177	163	159	207
90°	3	42	113	106	110	22
95°	169	201	207	207	201	188
105°	696	705	712	718	718	734
115°	1294	1313	1307	1303	1294	1280
125°	1882	1911	1902	1892	1888	1682
135°	2434	2470	2477	2474	2465	1882
145°	2956	2979	2997	3001	2988	1847
155°	3380	3389	3399	3416	3405	1556
165°	3677	3673	3673	3696	3680	1037
175°	3826	3816	3810	3832	3813	363
180°	3832	3832	3832	3832	3832	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	4715.4	4715.4	4715.4	4715.4	4715.4
2.5°	4742.7	4720.1	4670.1	4715.4	4706.7
5°	4715.4	4697.5	4647.5	4683.6	4674.9
7.5°	4683.6	4656.6	4606.6	4643.2	4634.1
10°	4634.1	4602.3	4547.9	4584.0	4570.6
12.5°	4565.7	4538.7	4484.4	4507.0	4497.8
15°	4488.8	4461.8	4402.6	4420.9	4398.3
17.5°	4393.5	4366.6	4307.4	4330.0	4307.4
20°	4289.1	4262.1	4198.7	4212.1	4194.4
22.5°	4185.2	4144.3	4085.1	4085.1	4076.0
25°	4062.5	4026.4	3949.5	3958.2	3949.5
27.5°	3926.4	3894.6	3836.0	3822.4	3799.9
30°	3790.7	3754.2	3686.3	3672.9	3654.6
32.5°	3645.4	3618.6	3545.8	3518.5	3500.2
35°	3504.9	3459.8	3387.1	3359.7	3337.1
37.5°	3346.2	3305.4	3232.7	3201.0	3178.3
40°	3183.2	3146.6	3073.9	3033.5	3015.3
42.5°	3024.4	2987.9	2915.7	2870.0	2843.1
45°	2852.2	2820.5	2752.1	2702.6	2684.3
47.5°	2684.3	2652.5	2579.9	2529.9	2503.0
50°	2507.3	2484.7	2421.2	2357.6	2335.0
52.5°	2335.0	2303.3	2244.6	2194.5	2162.8
55°	2158.5	2131.1	2076.7	2022.4	1999.7
57.5°	1981.5	1958.8	1899.7	1845.3	1827.0
60°	1804.4	1786.7	1723.1	1673.1	1659.6
62.5°	1632.2	1600.4	1555.3	1510.1	1491.8
65°	1455.7	1428.3	1383.0	1342.1	1319.6
67.5°	1274.3	1251.2	1210.8	1179.1	1160.8
70°	1106.4	1088.1	1047.2	1015.5	997.7
72.5°	934.2	915.9	893.3	861.6	848.1
75°	761.5	752.9	729.7	702.9	712.0
77.5°	607.5	589.3	580.2	566.6	553.2
80°	453.6	448.8	439.7	426.3	417.1
82.5°	308.3	308.3	304.1	285.8	285.8
85°	185.7	181.4	177.0	163.1	158.8
87.5°	81.8	72.6	63.5	50.0	45.2
90°	3.4	41.6	113.2	106.3	109.8
92.5°	71.6	97.0	100.5	104.0	104.0
95°	168.6	201.1	206.8	206.8	201.1
97.5°	280.7	310.8	323.6	323.6	323.6
100°	410.2	436.8	446.0	446.0	442.5
102.5°	546.5	566.1	578.9	582.4	578.9
105°	695.6	704.8	711.8	717.5	717.5
107.5°	843.4	857.4	857.4	859.6	843.4
110°	986.7	1005.2	1005.2	1005.2	996.0



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	1141.6	1161.2	1157.7	1148.5	1141.6
115°	1294.0	1312.6	1306.8	1303.3	1294.0
117.5°	1445.4	1470.9	1454.7	1445.4	1436.2
120°	1598.0	1623.4	1598.0	1598.0	1587.6
122.5°	1736.7	1769.0	1752.8	1743.5	1736.7
125°	1882.2	1911.1	1901.9	1891.5	1887.9
127.5°	2024.4	2060.1	2047.4	2033.6	2024.4
130°	2157.2	2198.8	2193.0	2186.1	2173.3
132.5°	2306.2	2338.6	2340.9	2324.7	2315.5
135°	2434.5	2470.3	2477.3	2473.8	2464.6
137.5°	2577.8	2606.7	2612.4	2610.1	2596.3
140°	2703.7	2732.6	2748.8	2748.8	2736.0
142.5°	2833.2	2862.1	2871.2	2874.7	2862.1
145°	2955.6	2978.7	2997.2	3000.7	2988.0
147.5°	3065.3	3094.2	3108.2	3113.9	3101.2
150°	3178.7	3198.2	3211.0	3221.4	3211.0
152.5°	3279.1	3298.7	3315.0	3327.7	3315.0
155°	3379.6	3388.9	3399.3	3415.5	3405.1
157.5°	3466.4	3473.2	3479.0	3502.1	3486.0
160°	3543.7	3550.7	3554.1	3573.8	3559.9
162.5°	3615.3	3615.3	3618.9	3640.8	3624.6
165°	3676.6	3673.2	3673.2	3696.2	3680.1
167.5°	3732.1	3721.7	3721.7	3744.8	3728.6
170°	3773.7	3764.4	3760.9	3784.1	3764.4
172.5°	3802.5	3793.3	3789.8	3812.9	3793.3
175°	3825.7	3816.4	3809.5	3832.5	3812.9
177.5°	3838.4	3829.1	3822.1	3841.8	3822.1
180°	3832.5	3832.5	3832.5	3832.5	3832.5



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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	11.83	12.72	12.76	13.67	14.90	11.39	12.28	12.32	13.23	14.46
	3H	13.50	14.29	14.44	15.25	16.51	13.01	13.81	13.96	14.77	16.02
	4H	14.09	14.84	15.05	15.80	17.07	13.60	14.35	14.56	15.32	16.58
	6H	14.49	15.19	15.46	16.15	17.43	14.00	14.69	14.97	15.66	16.94
	8H	14.60	15.26	15.57	16.24	17.52	14.11	14.77	15.08	15.75	17.02
	12H	14.65	15.28	15.63	16.26	17.55	14.15	14.78	15.13	15.76	17.05
4H	2H	12.30	13.05	13.26	14.01	15.28	11.94	12.70	12.91	13.66	14.92
	3H	14.17	14.80	15.14	15.79	17.07	13.77	14.39	14.74	15.39	16.66
	4H	14.89	15.46	15.87	16.45	17.75	14.47	15.04	15.45	16.03	17.33
	6H	15.40	15.90	16.40	16.91	18.21	14.98	15.48	15.98	16.49	17.78
	8H	15.56	16.02	16.55	17.02	18.34	15.13	15.59	16.12	16.59	17.91
	12H	15.63	16.05	16.65	17.07	18.39	15.19	15.61	16.21	16.63	17.95
8H	4H	15.08	15.55	16.08	16.55	17.86	14.71	15.18	15.71	16.18	17.49
	6H	15.72	16.10	16.74	17.15	18.46	15.34	15.73	16.36	16.77	18.08
	8H	15.94	16.28	16.97	17.31	18.64	15.56	15.90	16.59	16.93	18.26
	12H	16.08	16.37	17.11	17.40	18.77	15.68	15.97	16.71	17.00	18.37
12H	4H	15.07	15.49	16.09	16.51	17.83	14.71	15.13	15.72	16.15	17.46
	6H	15.75	16.09	16.78	17.12	18.45	15.39	15.72	16.41	16.76	18.09
	8H	16.00	16.29	17.03	17.32	18.69	15.62	15.92	16.66	16.95	18.32