

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: P923922

Luminaire Tested: DFN2DIP-TR4F0-110D120US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

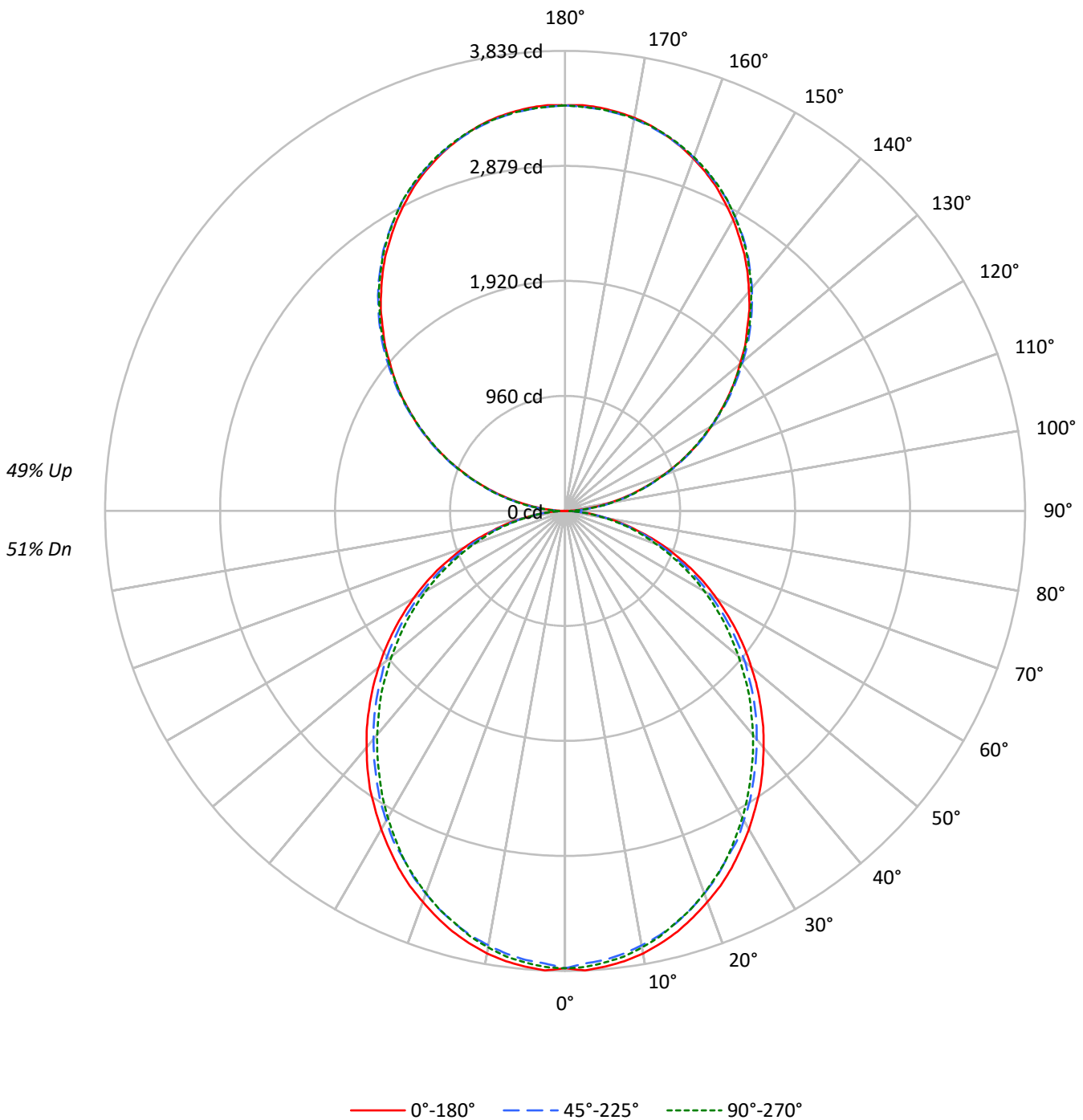
Test Method: LM-79-2019  
Report Number: P923922  
REPORT IS A COMBINATION OF REPORTS P900527 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-110D120US940-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 19180.7 lumens  
Efficiency: N/A  
Efficacy: 94.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 204  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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	107	107	107	107	99	99	99	99	84	84	84	70	70	70	57	57	57	57	57	57	51
1	98	94	90	86	90	87	83	80	73	71	69	61	60	58	50	49	48	48	48	48	43
2	89	82	76	70	82	76	70	66	64	60	57	54	51	48	44	42	40	40	40	40	36
3	81	72	65	59	75	67	60	55	57	52	48	48	44	41	39	37	34	34	34	34	30
4	74	64	56	50	68	59	52	47	50	45	41	42	38	35	35	32	30	30	30	30	26
5	68	57	49	43	63	53	45	40	45	40	35	38	34	30	32	28	26	26	26	26	23
6	63	51	43	37	58	47	40	35	41	35	31	34	30	27	29	25	23	23	23	23	20
7	58	46	38	32	54	43	36	31	37	31	27	31	27	24	26	23	20	20	20	20	18
8	54	42	34	29	50	39	32	27	34	28	24	29	24	21	24	21	18	18	18	18	16
9	50	38	31	25	46	36	29	24	31	25	22	26	22	19	22	19	16	16	16	16	14
10	47	35	28	23	43	33	26	22	28	23	19	24	20	17	21	17	15	15	15	15	13

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

	0°	45°	90°
0°	3032	3032	3032
5°	3037	2990	3010
10°	3012	2950	2969
15°	2968	2901	2905
20°	2908	2833	2840
25°	2849	2753	2765
30°	2774	2678	2669
35°	2704	2589	2567
40°	2616	2500	2471
45°	2530	2410	2372
50°	2435	2316	2257
55°	2335	2207	2152
60°	2223	2077	2032
65°	2101	1944	1890
70°	1945	1781	1736
75°	1729	1585	1595
80°	1469	1336	1325
85°	1063	907	878

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 2637 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	359.2	1.9
10°-20°	1010.7	5.3
20°-30°	1485.4	7.7
30°-40°	1725.2	9.0
40°-50°	1723.0	9.0
50°-60°	1502.4	7.8
60°-70°	1110.6	5.8
70°-80°	628.4	3.3
80°-90°	175.5	0.9
90°-100°	209.4	1.1
100°-110°	665.4	3.5
110°-120°	1138.7	5.9
120°-130°	1497.5	7.8
130°-140°	1680.9	8.8
140°-150°	1648.3	8.6
150°-160°	1382.7	7.2
160°-170°	917.0	4.8
170°-180°	320.5	1.7
0°-30°	2855.3	14.9
0°-40°	4580.5	23.9
0°-60°	7805.9	40.7
0°-90°	9720.4	50.7
90°-120°	2013.4	10.5
90°-150°	6840.1	35.7
90°-180°	9460.0	49.3
0°-180°	19180.7	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	3817	3817	3817	3817	3817	
5°	3817	3802	3762	3791	3784	362
15°	3633	3611	3564	3578	3560	1023
25°	3288	3259	3197	3204	3197	1513
35°	2837	2800	2742	2719	2701	1772
45°	2309	2283	2228	2188	2173	1782
55°	1747	1725	1681	1637	1619	1562
65°	1178	1156	1120	1086	1068	1165
75°	616	609	591	569	576	658
85°	150	147	143	132	128	168
90°	3	37	100	94	97	19
95°	149	178	183	183	178	166
105°	614	622	628	634	634	648
115°	1143	1159	1154	1151	1143	1130
125°	1662	1688	1679	1670	1667	1485
135°	2150	2181	2188	2184	2176	1662
145°	2610	2630	2646	2650	2638	1631
155°	2984	2992	3002	3016	3007	1374
165°	3246	3243	3243	3264	3250	916
175°	3378	3370	3364	3384	3367	321
180°	3384	3384	3384	3384	3384	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3816.7	3816.7	3816.7	3816.7	3816.7
2.5°	3838.8	3820.5	3780.0	3816.7	3809.7
5°	3816.7	3802.3	3761.8	3790.9	3784.0
7.5°	3790.9	3769.2	3728.7	3758.3	3750.9
10°	3750.9	3725.1	3681.2	3710.3	3699.4
12.5°	3695.6	3673.8	3629.8	3648.1	3640.7
15°	3633.3	3611.4	3563.5	3578.3	3560.1
17.5°	3556.1	3534.4	3486.5	3504.8	3486.5
20°	3471.7	3449.8	3398.5	3409.4	3395.0
22.5°	3387.6	3354.4	3306.6	3306.6	3299.1
25°	3288.3	3259.1	3196.8	3203.8	3196.8
27.5°	3178.1	3152.4	3104.8	3094.0	3075.7
30°	3068.3	3038.7	2983.8	2972.9	2958.1
32.5°	2950.7	2928.9	2870.1	2847.9	2833.1
35°	2837.0	2800.4	2741.6	2719.4	2701.1
37.5°	2708.5	2675.4	2616.6	2590.9	2572.6
40°	2576.5	2546.9	2488.1	2455.4	2440.6
42.5°	2448.0	2418.4	2360.0	2323.0	2301.2
45°	2308.6	2282.9	2227.6	2187.5	2172.7
47.5°	2172.7	2147.1	2088.2	2047.7	2025.9
50°	2029.4	2011.2	1959.7	1908.3	1890.1
52.5°	1890.1	1864.3	1816.9	1776.3	1750.6
55°	1747.1	1724.9	1681.0	1636.9	1618.6
57.5°	1603.8	1585.6	1537.7	1493.6	1478.8
60°	1460.5	1446.2	1394.7	1354.2	1343.4
62.5°	1321.2	1295.5	1258.8	1222.3	1207.5
65°	1178.2	1156.0	1119.5	1086.4	1068.1
67.5°	1031.4	1012.8	980.1	954.4	939.6
70°	895.5	880.7	847.7	822.0	807.5
72.5°	756.2	741.4	723.1	697.4	686.4
75°	616.4	609.4	590.7	568.9	576.3
77.5°	491.8	477.0	469.6	458.7	447.8
80°	367.2	363.3	355.9	345.0	337.6
82.5°	249.6	249.6	246.1	231.3	231.3
85°	150.3	146.8	143.3	132.0	128.5
87.5°	66.2	58.8	51.4	40.5	36.6
90°	3.0	36.7	100.0	93.9	96.9
92.5°	63.2	85.7	88.7	91.8	91.8
95°	148.9	177.5	182.6	182.6	177.5
97.5°	247.9	274.5	285.7	285.7	285.7
100°	362.2	385.7	393.8	393.8	390.7
102.5°	482.6	499.9	511.1	514.2	511.1
105°	614.2	622.3	628.5	633.6	633.6
107.5°	744.8	757.1	757.1	759.0	744.8
110°	871.3	887.6	887.6	887.6	879.5



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	1008.0	1025.4	1022.3	1014.1	1008.0
115°	1142.6	1159.0	1153.9	1150.8	1142.6
117.5°	1276.3	1298.8	1284.5	1276.3	1268.2
120°	1411.0	1433.4	1411.0	1411.0	1401.9
122.5°	1533.5	1562.0	1547.7	1539.5	1533.5
125°	1662.0	1687.5	1679.4	1670.2	1667.1
127.5°	1787.5	1819.1	1807.9	1795.6	1787.5
130°	1904.8	1941.5	1936.4	1930.3	1919.0
132.5°	2036.4	2065.0	2067.0	2052.7	2044.6
135°	2149.6	2181.3	2187.5	2184.3	2176.2
137.5°	2276.2	2301.7	2306.8	2304.7	2292.5
140°	2387.4	2412.9	2427.1	2427.1	2415.9
142.5°	2501.7	2527.2	2535.3	2538.3	2527.2
145°	2609.8	2630.2	2646.5	2649.6	2638.4
147.5°	2706.7	2732.2	2744.5	2749.6	2738.4
150°	2806.7	2824.0	2835.3	2844.5	2835.3
152.5°	2895.5	2912.8	2927.1	2938.4	2927.1
155°	2984.2	2992.4	3001.6	3015.9	3006.7
157.5°	3060.8	3066.9	3071.9	3092.4	3078.1
160°	3129.1	3135.3	3138.3	3155.7	3143.4
162.5°	3192.3	3192.3	3195.4	3214.8	3200.5
165°	3246.4	3243.4	3243.4	3263.7	3249.5
167.5°	3295.4	3286.2	3286.2	3306.6	3292.4
170°	3332.1	3323.9	3320.9	3341.3	3323.9
172.5°	3357.6	3349.4	3346.4	3366.8	3349.4
175°	3378.1	3369.9	3363.8	3384.1	3366.8
177.5°	3389.3	3381.1	3374.9	3392.3	3374.9
180°	3384.1	3384.1	3384.1	3384.1	3384.1



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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	11.18	12.05	12.13	13.02	14.28	10.75	11.62	11.70	12.58	13.85
	3H	12.84	13.62	13.80	14.60	15.88	12.37	13.15	13.33	14.12	15.41
	4H	13.43	14.17	14.41	15.15	16.44	12.96	13.69	13.93	14.67	15.97
	6H	13.83	14.51	14.82	15.49	16.80	13.35	14.03	14.34	15.02	16.32
	8H	13.94	14.58	14.93	15.58	16.89	13.46	14.11	14.45	15.11	16.41
	12H	13.98	14.60	14.98	15.59	16.92	13.50	14.12	14.50	15.11	16.44
4H	2H	11.64	12.38	12.63	13.36	14.65	11.30	12.04	12.28	13.02	14.31
	3H	13.51	14.13	14.50	15.14	16.44	13.12	13.73	14.11	14.74	16.05
	4H	14.23	14.79	15.23	15.79	17.12	13.82	14.38	14.82	15.38	16.71
	6H	14.74	15.22	15.75	16.25	17.58	14.33	14.82	15.34	15.84	17.17
	8H	14.89	15.34	15.90	16.36	17.70	14.48	14.93	15.49	15.95	17.29
	12H	14.96	15.37	16.00	16.41	17.75	14.54	14.95	15.57	15.99	17.33
8H	4H	14.42	14.87	15.44	15.89	17.24	14.06	14.51	15.08	15.53	16.88
	6H	15.05	15.43	16.09	16.49	17.83	14.69	15.07	15.73	16.13	17.47
	8H	15.27	15.60	16.32	16.65	18.01	14.91	15.24	15.95	16.28	17.64
	12H	15.41	15.70	16.46	16.74	18.14	15.02	15.31	16.07	16.35	17.76
12H	4H	14.41	14.82	15.44	15.85	17.20	14.06	14.47	15.09	15.50	16.85
	6H	15.08	15.41	16.13	16.46	17.82	14.73	15.06	15.78	16.11	17.47
	8H	15.33	15.62	16.38	16.66	18.06	14.97	15.26	16.02	16.30	17.70