

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: P928774

Luminaire Tested: DFN2DIP-HX4F0-110D110US930-RLLONL

Issue Date: 12/12/2024

**Test Information**

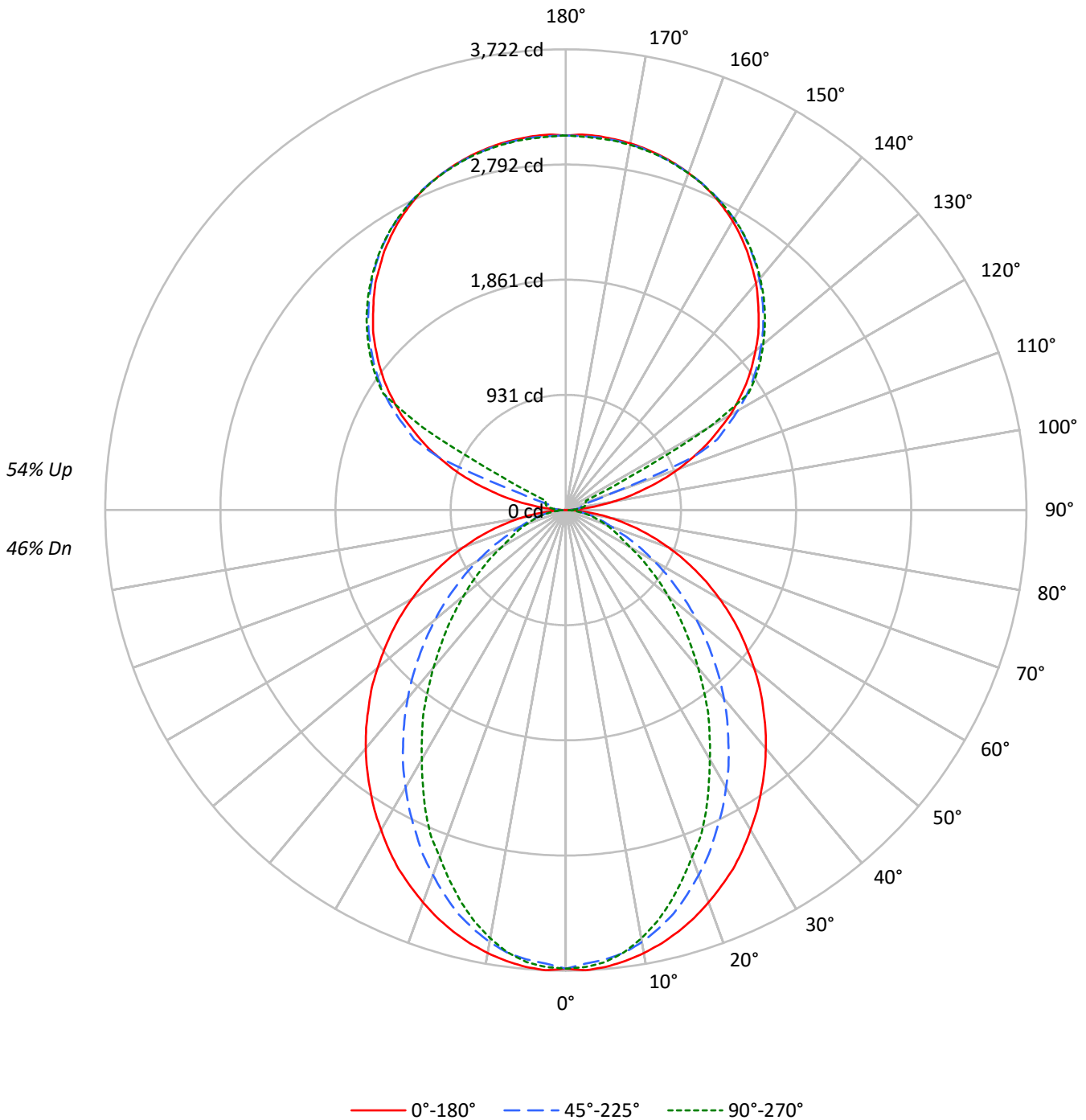
Test Method: LM-79-2019  
Report Number: P928774  
REPORT IS A COMBINATION OF REPORTS P900960 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-110D110US930-RLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16495.6 lumens  
Efficiency: N/A  
Efficacy: 82.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 199.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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	106	106	106	106	98	98	98	98	81	81	81	66	66	66	53	53	53	46			46
1	97	93	90	86	89	86	83	80	72	70	68	59	58	56	47	46	45	40			40
2	89	82	76	71	82	76	70	66	63	60	57	52	50	48	42	40	39	34			34
3	81	72	65	60	75	67	61	56	56	52	48	47	43	41	38	35	34	29			29
4	75	64	57	51	68	60	53	48	50	45	41	42	38	35	34	31	29	26			26
5	69	58	50	44	63	53	46	41	45	40	36	38	34	31	31	28	26	23			23
6	63	52	44	38	58	48	41	36	41	36	32	34	30	27	28	25	23	20			20
7	59	47	39	34	54	44	37	32	37	32	28	31	27	24	26	23	21	18			18
8	55	43	35	30	50	40	33	28	34	29	25	29	25	22	24	21	19	16			16
9	51	39	32	27	47	36	30	25	31	26	22	27	23	20	22	19	17	15			15
10	48	36	29	24	44	33	27	23	29	24	20	25	21	18	20	18	15	13			13

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

	0°	45°	90°
0°	2755	2755	2755
5°	2760	2712	2729
10°	2733	2659	2640
15°	2695	2571	2503
20°	2646	2450	2335
25°	2595	2315	2172
30°	2527	2176	1966
35°	2460	2026	1785
40°	2392	1872	1577
45°	2313	1700	1389
50°	2231	1526	1205
55°	2146	1341	1028
60°	2047	1147	846
65°	1934	951	762
70°	1797	767	690
75°	1624	676	628
80°	1374	568	545
85°	961	381	411

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2313 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	347.3	2.1
10°-20°	953.3	5.8
20°-30°	1338.4	8.1
30°-40°	1458.9	8.8
40°-50°	1340.9	8.1
50°-60°	1053.1	6.4
60°-70°	685.5	4.2
70°-80°	352.9	2.1
80°-90°	95.4	0.6
90°-100°	99.8	0.6
100°-110°	371.9	2.3
110°-120°	986.4	6.0
120°-130°	1636.0	9.9
130°-140°	1737.8	10.5
140°-150°	1615.1	9.8
150°-160°	1298.5	7.9
160°-170°	836.7	5.1
170°-180°	288.0	1.7
0°-30°	2638.9	16.0
0°-40°	4097.9	24.8
0°-60°	6491.9	39.4
0°-90°	7625.6	46.2
90°-120°	1458.0	8.8
90°-150°	6446.8	39.1
90°-180°	8870.0	53.8
0°-180°	16495.6	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	3705	3705	3705	3705	3705	
5°	3705	3688	3645	3675	3665	351
15°	3524	3487	3373	3310	3276	993
25°	3199	3092	2870	2733	2682	1471
35°	2756	2585	2290	2079	2005	1725
45°	2253	2028	1677	1438	1358	1740
55°	1713	1452	1090	889	825	1531
65°	1157	885	584	470	459	1147
75°	617	382	268	245	242	652
85°	144	74	64	64	64	165
90°	2	26	44	55	59	15
95°	142	70	85	96	94	168
105°	666	731	134	158	166	711
115°	1259	1296	1351	337	180	1239
125°	1780	1808	1850	1865	1872	1587
135°	2202	2238	2257	2279	2275	1701
145°	2555	2553	2590	2605	2594	1598
155°	2813	2794	2820	2833	2816	1296
165°	2964	2951	2958	2973	2958	837
175°	3032	3017	3021	3036	3015	289
180°	3026	3026	3026	3026	3026	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3705.2	3705.2	3705.2	3705.2	3705.2
2.5°	3721.9	3705.2	3668.2	3702.1	3695.3
5°	3705.2	3688.5	3644.8	3675.0	3665.1
7.5°	3675.0	3655.0	3608.1	3621.3	3604.5
10°	3634.8	3611.3	3544.4	3534.1	3514.2
12.5°	3584.6	3554.4	3463.7	3443.7	3406.7
15°	3524.1	3487.1	3373.3	3309.6	3276.1
17.5°	3453.7	3400.0	3259.1	3185.4	3131.7
20°	3373.3	3306.0	3138.5	3054.9	2980.9
22.5°	3286.2	3208.9	3014.4	2900.5	2850.3
25°	3199.0	3091.5	2870.3	2732.9	2682.4
27.5°	3095.1	2980.9	2736.1	2578.5	2501.3
30°	2984.4	2856.7	2588.5	2417.7	2327.0
32.5°	2877.0	2722.6	2447.9	2246.6	2162.7
35°	2756.4	2585.3	2290.4	2079.1	2005.1
37.5°	2639.1	2454.4	2142.7	1911.1	1827.6
40°	2514.8	2313.9	1988.4	1750.3	1663.2
42.5°	2387.5	2173.0	1834.3	1586.0	1502.4
45°	2253.4	2028.5	1676.7	1438.3	1358.0
47.5°	2126.0	1888.0	1525.8	1287.5	1213.9
50°	1985.1	1747.1	1378.2	1146.6	1076.5
52.5°	1847.4	1595.9	1237.3	1016.1	952.3
55°	1713.3	1451.8	1089.7	888.7	825.0
57.5°	1576.0	1307.7	959.1	771.3	717.5
60°	1435.1	1166.9	821.4	650.7	597.0
62.5°	1297.8	1029.6	704.1	543.3	516.5
65°	1156.9	885.1	583.5	469.6	459.3
67.5°	1022.8	751.0	469.6	412.3	402.4
70°	881.9	620.5	388.8	355.4	341.9
72.5°	747.8	499.5	325.2	298.5	291.7
75°	616.9	382.1	268.2	244.7	241.6
77.5°	486.3	271.5	211.3	197.8	191.0
80°	365.4	194.6	160.8	147.7	147.7
82.5°	254.7	130.9	110.7	103.9	103.9
85°	144.1	73.7	63.7	63.7	63.7
87.5°	53.7	26.7	26.7	23.5	23.5
90°	2.1	26.2	43.7	54.8	59.0
92.5°	54.8	46.0	52.5	57.0	59.0
95°	142.2	69.9	85.2	96.4	94.1
97.5°	256.1	76.7	111.5	118.3	120.4
100°	387.6	87.6	124.8	142.2	146.6
102.5°	531.9	527.7	129.2	153.1	159.9
105°	665.5	731.3	133.7	157.5	166.4
107.5°	821.0	875.6	138.1	161.9	170.8
110°	969.9	1015.7	383.2	164.3	172.9



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	1110.1	1149.3	1112.1	168.5	175.2
115°	1258.8	1295.9	1350.9	337.2	179.6
117.5°	1388.0	1431.7	1469.1	1155.8	582.3
120°	1532.5	1565.3	1604.8	1631.1	1335.5
122.5°	1655.0	1690.1	1734.0	1747.0	1749.4
125°	1779.8	1808.4	1850.0	1865.3	1871.8
127.5°	1893.7	1924.3	1957.3	1979.1	1981.3
130°	2001.0	2036.1	2060.0	2084.2	2082.2
132.5°	2110.4	2139.0	2163.0	2182.7	2180.7
135°	2202.5	2237.6	2257.1	2279.2	2274.7
137.5°	2298.7	2325.0	2347.0	2368.9	2362.4
140°	2392.8	2410.4	2434.4	2454.1	2443.2
142.5°	2471.8	2487.1	2515.5	2532.9	2522.0
145°	2555.0	2552.7	2589.8	2605.2	2594.3
147.5°	2627.1	2620.6	2657.7	2668.6	2660.1
150°	2697.2	2681.9	2717.0	2730.0	2719.1
152.5°	2756.2	2738.8	2771.6	2784.9	2769.5
155°	2813.2	2793.7	2819.9	2832.9	2815.5
157.5°	2859.2	2841.7	2861.5	2876.9	2859.2
160°	2898.7	2885.4	2898.7	2911.7	2896.3
162.5°	2933.5	2920.6	2931.5	2946.8	2927.1
165°	2964.2	2951.2	2957.7	2973.0	2957.7
167.5°	2988.4	2975.2	2981.9	2997.2	2977.5
170°	3008.2	2994.9	2999.3	3014.7	2994.9
172.5°	3021.1	3008.2	3012.6	3027.9	3008.2
175°	3032.0	3016.7	3021.1	3036.5	3014.7
177.5°	3036.5	3021.1	3023.5	3038.8	3019.1
180°	3025.6	3025.6	3025.6	3025.6	3025.6



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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	10.31	11.11	11.30	12.11	13.44	6.28	7.08	7.27	8.08	9.41
	3H	11.98	12.70	12.99	13.71	15.06	7.47	8.18	8.47	9.19	10.54
	4H	12.59	13.27	13.61	14.28	15.64	7.92	8.59	8.94	9.61	10.96
	6H	13.01	13.63	14.04	14.65	16.02	8.24	8.86	9.27	9.88	11.25
	8H	13.14	13.73	14.17	14.76	16.13	8.33	8.92	9.36	9.96	11.32
	12H	13.20	13.76	14.24	14.79	16.18	8.37	8.94	9.41	9.96	11.35
4H	2H	10.32	11.00	11.35	12.01	13.37	6.87	7.55	7.90	8.56	9.92
	3H	12.15	12.71	13.18	13.75	15.12	8.22	8.78	9.25	9.83	11.20
	4H	12.84	13.35	13.88	14.39	15.78	8.77	9.28	9.81	10.32	11.71
	6H	13.35	13.80	14.41	14.85	16.24	9.19	9.63	10.24	10.69	12.08
	8H	13.53	13.94	14.58	14.99	16.40	9.32	9.73	10.37	10.78	12.18
	12H	13.62	14.00	14.69	15.06	16.47	9.38	9.76	10.45	10.82	12.23
8H	4H	12.81	13.22	13.86	14.27	15.67	9.05	9.46	10.10	10.51	11.91
	6H	13.37	13.71	14.45	14.81	16.21	9.57	9.91	10.64	11.00	12.40
	8H	13.59	13.89	14.67	14.97	16.38	9.76	10.06	10.84	11.14	12.55
	12H	13.73	13.99	14.81	15.06	16.52	9.88	10.14	10.96	11.21	12.67
12H	4H	12.76	13.13	13.83	14.19	15.60	9.05	9.42	10.12	10.49	11.90
	6H	13.35	13.65	14.43	14.72	16.14	9.62	9.92	10.70	10.99	12.41
	8H	13.57	13.83	14.65	14.90	16.36	9.83	10.09	10.91	11.16	12.62