

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: P919820

Luminaire Tested: DFN2DIP-PN4F0-120D090US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

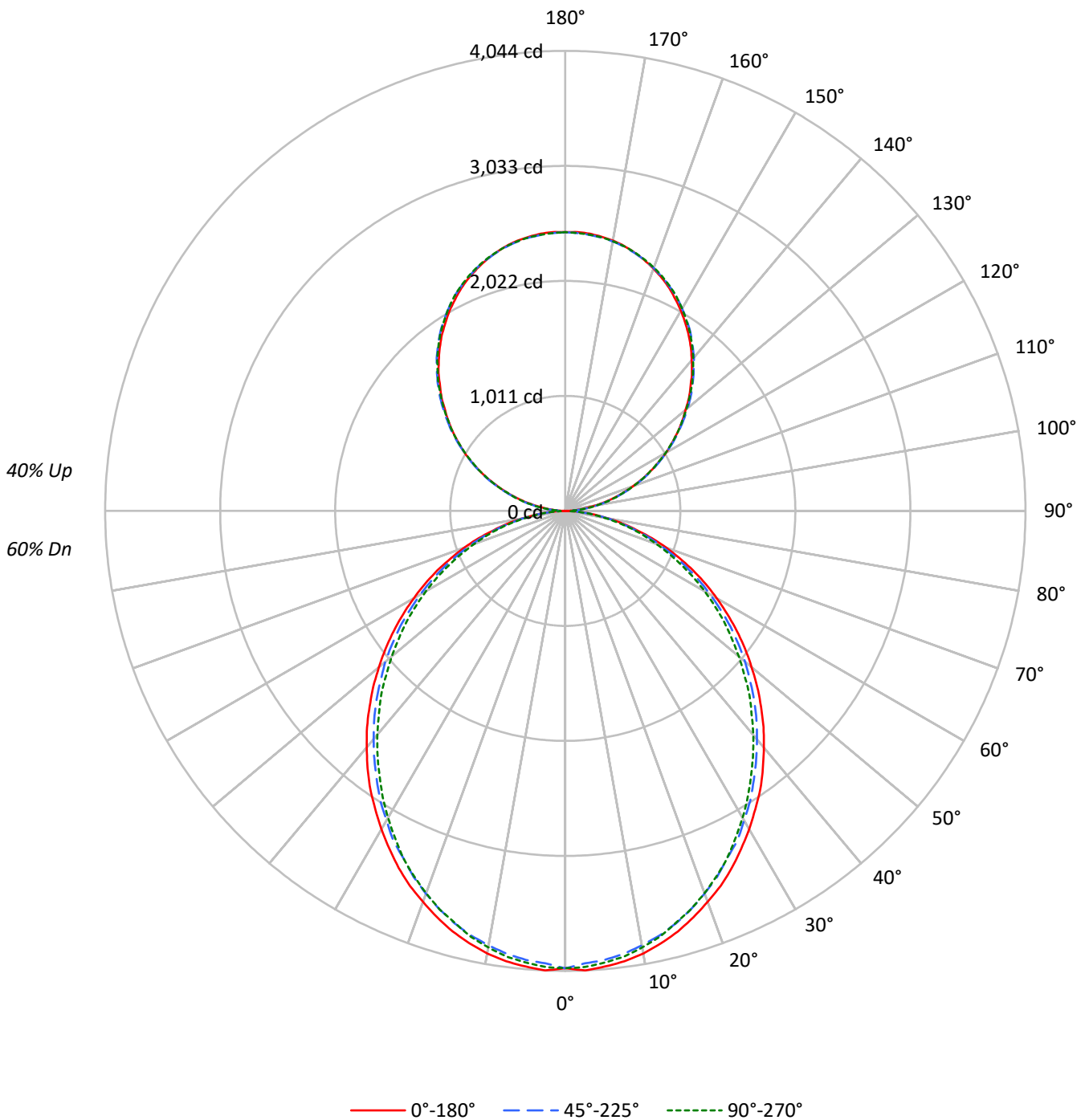
Test Method: LM-79-2019  
Report Number: P919820  
REPORT IS A COMBINATION OF REPORTS P899715 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D090US935-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17086.5 lumens  
Efficiency: N/A  
Efficacy: 88.6 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): 192.9  
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				
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	110	110	110	110	102	102	102	102	89	89	89	77	77	77	65	65	65	65	65	65	60
1	100	96	92	88	93	89	86	83	78	75	73	67	66	64	58	56	55	55	55	55	50
2	91	84	77	72	85	78	73	68	68	64	61	59	56	53	51	48	46	46	46	46	42
3	83	73	66	60	77	69	62	57	60	55	51	52	48	45	45	42	40	40	40	40	36
4	76	65	57	51	71	61	54	48	54	48	43	47	42	39	40	37	34	34	34	34	31
5	70	58	50	44	65	55	47	42	48	42	38	42	37	34	36	33	30	30	30	30	27
6	64	52	44	38	60	49	42	36	43	37	33	38	33	29	33	29	26	26	26	26	23
7	60	47	39	33	56	44	37	32	39	33	29	35	30	26	30	26	23	23	23	23	21
8	55	43	35	30	52	40	33	28	36	30	26	32	27	23	28	24	21	21	21	21	19
9	52	39	32	26	48	37	30	25	33	27	23	29	24	21	26	22	19	19	19	19	17
10	48	36	29	24	45	34	27	23	30	25	21	27	22	19	24	20	17	17	17	17	15

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

	0°	45°	90°
0°	2935	2935	2935
5°	2939	2894	2914
10°	2915	2856	2875
15°	2873	2809	2814
20°	2815	2744	2751
25°	2757	2666	2679
30°	2685	2594	2586
35°	2616	2509	2489
40°	2532	2422	2396
45°	2448	2336	2301
50°	2356	2246	2191
55°	2260	2141	2090
60°	2151	2016	1974
65°	2033	1887	1838
70°	1882	1731	1692
75°	1673	1543	1557
80°	1421	1304	1298
85°	1028	889	868

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2448 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	378.4	2.2
10°-20°	1064.6	6.2
20°-30°	1564.6	9.2
30°-40°	1817.2	10.6
40°-50°	1814.9	10.6
50°-60°	1582.5	9.3
60°-70°	1169.9	6.8
70°-80°	661.9	3.9
80°-90°	181.7	1.1
90°-100°	151.6	0.9
100°-110°	481.8	2.8
110°-120°	824.6	4.8
120°-130°	1084.4	6.3
130°-140°	1217.2	7.1
140°-150°	1193.6	7.0
150°-160°	1001.3	5.9
160°-170°	664.0	3.9
170°-180°	232.1	1.4
0°-30°	3007.6	17.6
0°-40°	4824.8	28.2
0°-60°	8222.2	48.1
0°-90°	10235.6	59.9
90°-120°	1458.0	8.5
90°-150°	4953.4	29.0
90°-180°	6851.0	40.1
0°-180°	17086.5	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4020	4020	4020	4020	4020	
5°	4020	4005	3962	3993	3986	382
15°	3827	3804	3754	3769	3750	1078
25°	3464	3433	3367	3375	3367	1594
35°	2988	2950	2888	2864	2845	1866
45°	2432	2405	2346	2304	2289	1877
55°	1840	1817	1771	1724	1705	1645
65°	1241	1218	1179	1144	1125	1227
75°	649	642	622	599	607	693
85°	158	155	151	139	135	177
90°	2	27	72	68	70	16
95°	108	128	132	132	128	120
105°	445	451	455	459	459	469
115°	828	839	836	833	828	818
125°	1204	1222	1216	1209	1207	1076
135°	1557	1580	1584	1582	1576	1203
145°	1890	1905	1916	1919	1911	1181
155°	2161	2167	2174	2184	2177	995
165°	2351	2349	2349	2364	2353	663
175°	2446	2440	2436	2451	2438	232
180°	2451	2451	2451	2451	2451	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	4020.3	4020.3	4020.3	4020.3	4020.3
2.5°	4043.6	4024.3	3981.7	4020.3	4012.9
5°	4020.3	4005.0	3962.4	3993.1	3985.7
7.5°	3993.1	3970.1	3927.5	3958.7	3950.9
10°	3950.9	3923.8	3877.5	3908.2	3896.8
12.5°	3892.7	3869.7	3823.3	3842.6	3834.8
15°	3827.0	3804.1	3753.6	3769.2	3749.9
17.5°	3745.9	3722.9	3672.4	3691.7	3672.4
20°	3656.8	3633.8	3579.8	3591.2	3576.1
22.5°	3568.2	3533.4	3482.9	3482.9	3475.2
25°	3463.6	3432.9	3367.3	3374.7	3367.3
27.5°	3347.6	3320.5	3270.5	3259.0	3239.8
30°	3231.9	3200.8	3142.9	3131.4	3115.9
32.5°	3108.0	3085.1	3023.1	2999.8	2984.2
35°	2988.3	2949.8	2887.8	2864.5	2845.2
37.5°	2852.9	2818.1	2756.1	2729.1	2709.8
40°	2714.0	2682.8	2620.8	2586.4	2570.8
42.5°	2578.6	2547.4	2485.9	2447.0	2424.0
45°	2431.7	2404.7	2346.4	2304.2	2288.6
47.5°	2288.6	2261.5	2199.6	2157.0	2134.0
50°	2137.7	2118.4	2064.2	2010.1	1990.8
52.5°	1990.8	1963.8	1913.7	1871.0	1844.0
55°	1840.3	1817.0	1770.6	1724.2	1704.9
57.5°	1689.4	1670.1	1619.6	1573.3	1557.7
60°	1538.4	1523.3	1469.1	1426.5	1415.0
62.5°	1391.6	1364.5	1326.0	1287.5	1271.9
65°	1241.1	1217.7	1179.1	1144.3	1125.1
67.5°	1086.5	1066.8	1032.3	1005.3	989.7
70°	943.3	927.7	892.9	865.8	850.7
72.5°	796.5	780.9	761.6	734.6	723.1
75°	649.3	641.9	622.2	599.3	607.0
77.5°	518.0	502.4	494.6	483.1	471.7
80°	386.8	382.6	374.9	363.4	355.6
82.5°	262.9	262.9	259.2	243.7	243.7
85°	158.3	154.6	150.9	139.1	135.3
87.5°	69.7	61.9	54.2	42.6	38.6
90°	2.2	26.6	72.4	67.9	70.2
92.5°	45.8	62.1	64.3	66.5	66.5
95°	107.9	128.5	132.2	132.2	128.5
97.5°	179.5	198.7	206.9	206.9	206.9
100°	262.3	279.3	285.2	285.2	283.0
102.5°	349.5	362.0	370.1	372.4	370.1
105°	444.8	450.6	455.1	458.8	458.8
107.5°	539.3	548.2	548.2	549.7	539.3
110°	630.9	642.8	642.8	642.8	636.9



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	730.0	742.5	740.3	734.4	730.0
115°	827.5	839.3	835.6	833.4	827.5
117.5°	924.3	940.6	930.2	924.3	918.3
120°	1021.8	1038.0	1021.8	1021.8	1015.1
122.5°	1110.4	1131.2	1120.8	1114.9	1110.4
125°	1203.6	1222.0	1216.2	1209.4	1207.3
127.5°	1294.4	1317.3	1309.2	1300.4	1294.4
130°	1379.4	1406.0	1402.3	1397.8	1389.7
132.5°	1474.7	1495.4	1496.8	1486.5	1480.7
135°	1556.7	1579.6	1584.1	1581.8	1576.0
137.5°	1648.3	1666.8	1670.5	1669.0	1660.2
140°	1728.9	1747.3	1757.6	1757.6	1749.5
142.5°	1811.6	1830.1	1836.0	1838.2	1830.1
145°	1890.0	1904.7	1916.5	1918.7	1910.6
147.5°	1960.1	1978.6	1987.4	1991.1	1983.1
150°	2032.6	2045.1	2053.2	2059.9	2053.2
152.5°	2096.8	2109.4	2119.7	2127.9	2119.7
155°	2161.1	2167.0	2173.7	2184.0	2177.4
157.5°	2216.5	2220.9	2224.6	2239.4	2229.0
160°	2266.0	2270.5	2272.7	2285.2	2276.3
162.5°	2311.8	2311.8	2314.0	2328.1	2317.7
165°	2351.0	2348.7	2348.7	2363.5	2353.2
167.5°	2386.4	2379.8	2379.8	2394.5	2384.2
170°	2413.0	2407.1	2404.9	2419.7	2407.1
172.5°	2431.5	2425.6	2423.4	2438.2	2425.6
175°	2446.3	2440.3	2435.9	2450.7	2438.2
177.5°	2454.4	2448.5	2444.0	2456.6	2444.0
180°	2450.7	2450.7	2450.7	2450.7	2450.7



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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	11.89	12.84	12.75	13.73	14.85	11.44	12.40	12.31	13.29	14.41
	3H	13.56	14.42	14.43	15.31	16.46	13.07	13.93	13.95	14.83	15.98
	4H	14.15	14.96	15.04	15.87	17.02	13.66	14.48	14.56	15.38	16.54
	6H	14.56	15.31	15.46	16.22	17.39	14.06	14.81	14.97	15.72	16.90
	8H	14.67	15.38	15.58	16.31	17.48	14.17	14.89	15.09	15.82	16.99
	12H	14.72	15.40	15.64	16.32	17.52	14.22	14.90	15.14	15.82	17.02
4H	2H	12.36	13.17	13.26	14.08	15.23	12.01	12.82	12.91	13.72	14.88
	3H	14.24	14.91	15.15	15.85	17.02	13.83	14.51	14.74	15.45	16.62
	4H	14.96	15.58	15.88	16.51	17.71	14.54	15.16	15.46	16.09	17.29
	6H	15.48	16.01	16.42	16.97	18.17	15.06	15.59	15.99	16.54	17.74
	8H	15.63	16.13	16.57	17.08	18.29	15.20	15.70	16.14	16.65	17.87
	12H	15.71	16.16	16.67	17.13	18.35	15.27	15.72	16.23	16.69	17.91
8H	4H	15.16	15.66	16.10	16.61	17.82	14.79	15.29	15.73	16.24	17.45
	6H	15.80	16.21	16.76	17.20	18.42	15.42	15.84	16.39	16.83	18.04
	8H	16.02	16.39	17.00	17.37	18.60	15.64	16.00	16.61	16.98	18.21
	12H	16.16	16.48	17.14	17.46	18.73	15.76	16.08	16.74	17.06	18.33
12H	4H	15.15	15.60	16.11	16.57	17.79	14.79	15.24	15.75	16.21	17.42
	6H	15.83	16.20	16.80	17.18	18.41	15.47	15.83	16.44	16.81	18.04
	8H	16.08	16.40	17.06	17.37	18.65	15.71	16.03	16.68	17.00	18.28