

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: P923064

Luminaire Tested: DFN2DIP-SQ4F0-060D160US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

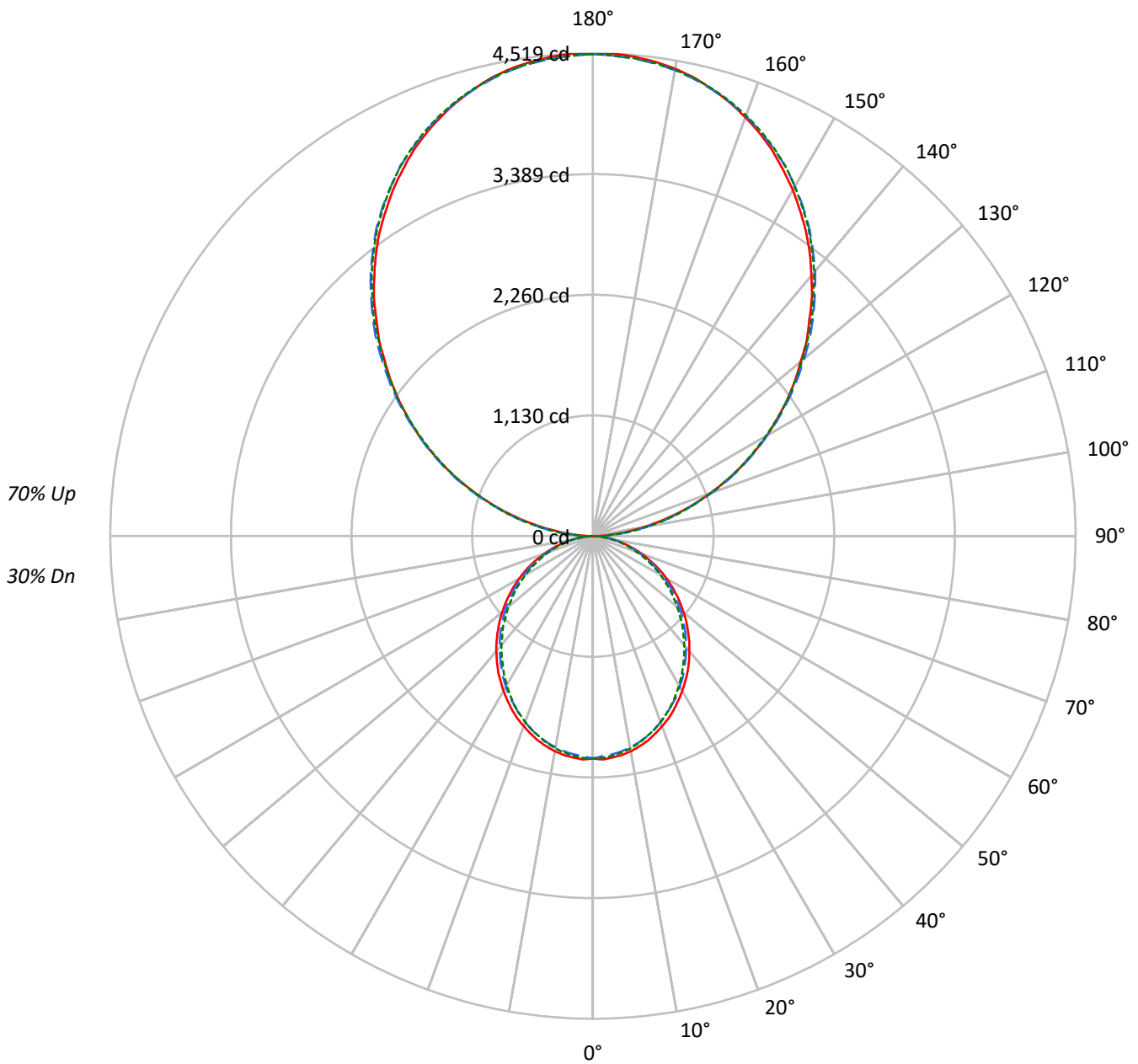
Test Method: LM-79-2019  
Report Number: P923064  
REPORT IS A COMBINATION OF REPORTS P900203 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-060D160US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17924.3 lumens  
Efficiency: N/A  
Efficacy: 104.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 172.1  
Input Voltage (V):  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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



— 0°-180°    - - 45°-225°    - - - 90°-270°



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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	102	102	102	102	92	92	92	92	72	72	72	54	54	54	37	37	37	37	37	37	30
1	93	89	85	82	83	80	77	74	63	61	59	47	46	45	33	32	32	32	32	32	25
2	85	78	72	67	76	70	65	61	55	52	49	42	39	37	29	28	27	27	27	27	21
3	77	68	61	56	69	61	55	51	49	44	41	37	34	32	26	24	23	23	23	23	18
4	71	60	53	47	63	54	48	43	43	38	35	33	30	27	23	21	19	19	19	19	15
5	65	54	46	40	58	48	42	37	38	34	30	29	26	23	21	19	17	17	17	17	13
6	60	48	40	34	53	43	37	32	35	30	26	26	23	20	19	17	15	15	15	15	12
7	55	43	35	30	49	39	32	28	31	26	23	24	20	18	17	15	13	13	13	13	10
8	51	39	32	26	46	35	29	24	28	24	20	22	18	16	16	13	12	12	12	12	9
9	47	35	28	23	42	32	26	22	26	21	18	20	17	14	14	12	11	11	11	11	8
10	44	32	25	21	40	29	23	19	24	19	16	18	15	13	13	11	10	10	10	10	8

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

	0°	45°	90°
0°	1461	1461	1461
5°	1463	1441	1451
10°	1451	1422	1431
15°	1430	1399	1401
20°	1401	1366	1370
25°	1372	1328	1334
30°	1336	1292	1288
35°	1302	1249	1240
40°	1260	1207	1194
45°	1219	1164	1147
50°	1173	1119	1092
55°	1125	1067	1042
60°	1071	1005	985
65°	1012	941	917
70°	936	863	844
75°	832	770	778
80°	707	651	650
85°	510	445	437

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 3551 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	195.9	1.1
10°-20°	551.3	3.1
20°-30°	810.2	4.5
30°-40°	941.0	5.2
40°-50°	939.8	5.2
50°-60°	819.5	4.6
60°-70°	605.8	3.4
70°-80°	342.7	1.9
80°-90°	103.3	0.6
90°-100°	279.2	1.6
100°-110°	887.2	4.9
110°-120°	1518.3	8.5
120°-130°	1996.8	11.1
130°-140°	2241.4	12.5
140°-150°	2197.9	12.3
150°-160°	1843.7	10.3
160°-170°	1222.7	6.8
170°-180°	427.4	2.4
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0°-30°	1557.4	8.7
0°-40°	2498.4	13.9
0°-60°	4257.8	23.8
0°-90°	5309.6	29.6
90°-120°	2684.7	15.0
90°-150°	9120.8	50.9
90°-180°	12615.0	70.4
0°-180°	17924.3	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	2082	2082	2082	2082	2082	
5°	2082	2074	2052	2068	2064	198
15°	1982	1970	1944	1952	1942	558
25°	1794	1778	1744	1748	1744	825
35°	1548	1528	1495	1483	1473	966
45°	1259	1245	1215	1193	1185	972
55°	953	941	917	893	883	852
65°	643	631	611	592	583	635
75°	336	332	322	310	314	359
85°	82	80	78	72	70	91
90°	4	49	133	125	129	18
95°	199	237	244	244	237	221
105°	819	830	838	845	845	864
115°	1524	1545	1539	1534	1524	1507
125°	2216	2250	2239	2227	2223	1980
135°	2866	2909	2917	2913	2902	2216
145°	3480	3507	3529	3533	3518	2174
155°	3979	3990	4002	4021	4009	1832
165°	4329	4325	4325	4352	4333	1221
175°	4504	4494	4485	4513	4489	428
180°	4513	4513	4513	4513	4513	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	2081.8	2081.8	2081.8	2081.8	2081.8
2.5°	2093.9	2083.9	2061.8	2081.8	2078.0
5°	2081.8	2073.9	2051.8	2067.8	2064.0
7.5°	2067.8	2055.9	2033.8	2050.0	2045.9
10°	2045.9	2031.9	2007.9	2023.8	2017.9
12.5°	2015.8	2003.9	1979.9	1989.9	1985.8
15°	1981.7	1969.9	1943.8	1951.9	1941.9
17.5°	1939.7	1927.9	1901.8	1911.6	1901.8
20°	1893.6	1881.8	1853.7	1859.7	1851.8
22.5°	1847.8	1829.7	1803.6	1803.6	1799.6
25°	1793.6	1777.7	1743.7	1747.5	1743.7
27.5°	1733.5	1719.5	1693.5	1687.7	1677.7
30°	1673.7	1657.4	1627.5	1621.6	1613.5
32.5°	1609.4	1597.6	1565.5	1553.4	1545.3
35°	1547.5	1527.5	1495.4	1483.3	1473.3
37.5°	1477.4	1459.3	1427.3	1413.2	1403.2
40°	1405.3	1389.2	1357.2	1339.3	1331.2
42.5°	1335.2	1319.1	1287.3	1267.1	1255.2
45°	1259.3	1245.2	1215.0	1193.2	1185.1
47.5°	1185.1	1171.1	1139.1	1117.0	1105.0
50°	1107.0	1097.0	1069.0	1040.9	1030.9
52.5°	1030.9	1016.9	991.0	968.9	954.9
55°	953.0	940.8	916.9	892.9	882.9
57.5°	874.9	864.9	838.7	814.8	806.6
60°	796.7	788.8	760.8	738.7	732.7
62.5°	720.6	706.6	686.6	666.6	658.6
65°	642.7	630.6	610.6	592.5	582.6
67.5°	562.6	552.4	534.6	520.6	512.5
70°	488.5	480.5	462.4	448.4	440.5
72.5°	412.4	404.4	394.4	380.4	374.4
75°	336.2	332.4	322.2	310.3	314.3
77.5°	268.2	260.2	256.1	250.2	244.2
80°	200.3	198.1	194.1	188.2	184.1
82.5°	136.2	136.2	134.2	126.2	126.2
85°	81.9	80.1	78.1	72.0	70.1
87.5°	36.1	32.1	28.0	22.1	20.0
90°	4.1	49.0	133.3	125.2	129.2
92.5°	84.4	114.3	118.3	122.4	122.4
95°	198.6	236.7	243.5	243.5	236.7
97.5°	330.6	366.0	380.9	380.9	380.9
100°	483.0	514.2	525.1	525.1	521.0
102.5°	643.5	666.6	681.5	685.6	681.5
105°	818.9	829.8	838.0	844.8	844.8
107.5°	993.1	1009.4	1009.4	1012.2	993.1
110°	1161.8	1183.6	1183.6	1183.6	1172.7



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	1344.1	1367.3	1363.2	1352.3	1344.1
115°	1523.7	1545.4	1538.6	1534.5	1523.7
117.5°	1701.9	1731.8	1712.8	1701.9	1691.0
120°	1881.5	1911.4	1881.5	1881.5	1869.2
122.5°	2044.7	2082.9	2063.8	2052.9	2044.7
125°	2216.2	2250.1	2239.3	2227.0	2222.9
127.5°	2383.5	2425.6	2410.6	2394.3	2383.5
130°	2539.9	2588.9	2582.1	2573.9	2558.9
132.5°	2715.4	2753.5	2756.2	2737.2	2726.3
135°	2866.4	2908.6	2916.8	2912.7	2901.8
137.5°	3035.1	3069.1	3076.0	3073.2	3056.9
140°	3183.4	3217.4	3236.5	3236.5	3221.5
142.5°	3335.8	3369.8	3380.7	3384.8	3369.8
145°	3480.0	3507.2	3528.9	3533.0	3518.1
147.5°	3609.2	3643.3	3659.6	3666.4	3651.4
150°	3742.5	3765.7	3780.7	3792.9	3780.7
152.5°	3860.9	3884.0	3903.1	3918.0	3903.1
155°	3979.3	3990.1	4002.4	4021.4	4009.2
157.5°	4081.3	4089.5	4096.2	4123.4	4104.5
160°	4172.4	4180.6	4184.7	4207.8	4191.5
162.5°	4256.8	4256.8	4260.9	4286.7	4267.6
165°	4328.9	4324.8	4324.8	4352.0	4333.0
167.5°	4394.2	4382.0	4382.0	4409.2	4390.1
170°	4443.1	4432.2	4428.2	4455.4	4432.2
172.5°	4477.2	4466.3	4462.2	4489.4	4466.3
175°	4504.4	4493.5	4485.3	4512.6	4489.4
177.5°	4519.4	4508.5	4500.3	4523.5	4500.3
180°	4512.6	4512.6	4512.6	4512.6	4512.6



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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	6.33	7.04	7.45	8.15	9.68	5.89	6.59	7.00	7.70	9.24
	3H	7.99	8.62	9.11	9.73	11.28	7.49	8.13	8.62	9.24	10.79
	4H	8.57	9.17	9.70	10.28	11.84	8.07	8.67	9.21	9.79	11.35
	6H	8.96	9.51	10.10	10.63	12.20	8.46	9.01	9.60	10.13	11.70
	8H	9.07	9.59	10.21	10.73	12.29	8.56	9.09	9.71	10.22	11.78
	12H	9.11	9.61	10.26	10.74	12.32	8.60	9.10	9.75	10.23	11.81
4H	2H	6.77	7.37	7.91	8.49	10.05	6.42	7.02	7.56	8.14	9.69
	3H	8.63	9.13	9.78	10.27	11.84	8.22	8.72	9.37	9.87	11.44
	4H	9.34	9.80	10.49	10.93	12.52	8.92	9.38	10.07	10.51	12.10
	6H	9.85	10.25	11.01	11.40	12.98	9.42	9.81	10.57	10.97	12.55
	8H	10.00	10.37	11.15	11.52	13.11	9.56	9.93	10.72	11.08	12.67
	12H	10.07	10.40	11.24	11.56	13.16	9.62	9.95	10.79	11.11	12.71
8H	4H	9.53	9.89	10.68	11.04	12.64	9.15	9.52	10.30	10.66	12.26
	6H	10.15	10.46	11.33	11.65	13.24	9.77	10.07	10.95	11.26	12.86
	8H	10.38	10.64	11.56	11.81	13.42	9.98	10.25	11.16	11.42	13.03
	12H	10.50	10.74	11.69	11.90	13.55	10.09	10.33	11.28	11.49	13.14
12H	4H	9.50	9.84	10.67	11.00	12.60	9.14	9.47	10.31	10.63	12.23
	6H	10.18	10.45	11.36	11.62	13.23	9.81	10.08	10.99	11.25	12.86
	8H	10.42	10.65	11.60	11.82	13.47	10.04	10.27	11.22	11.44	13.09