

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: P906953

Luminaire Tested: DFN2DIP-SQ4F0-160D060US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

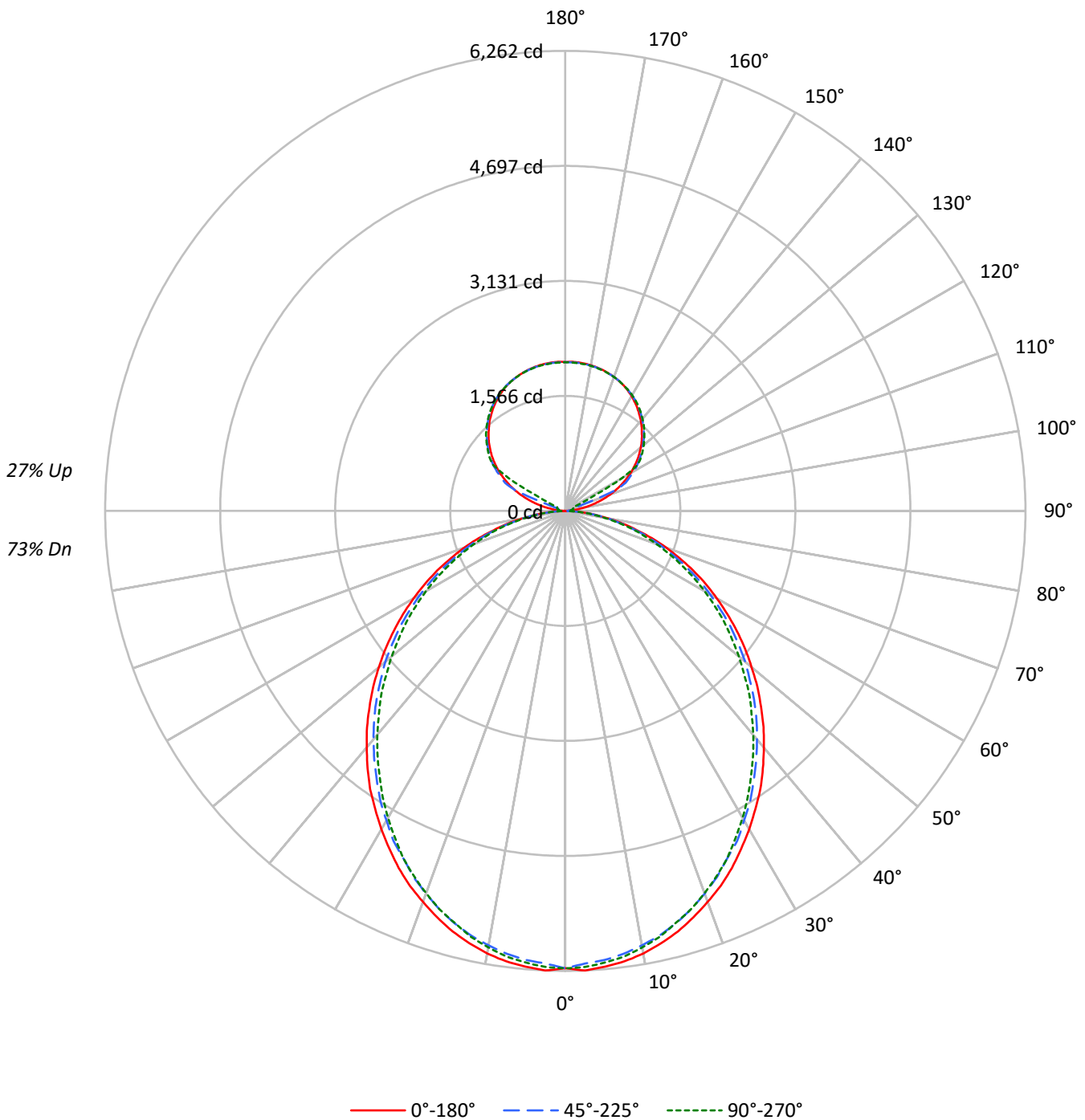
Test Method: LM-79-2019  
Report Number: P906953  
REPORT IS A COMBINATION OF REPORTS P901595 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D060US835-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 21780.0 lumens  
Efficiency: N/A  
Efficacy: 102.8 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-Direct  
  
Input Watts (W): 211.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P906953  
CATALOG NUMBER: DFN2DIP-SQ4F0-160D060US835-FLLONL

### Luminous Intensity Polar Plot





TEST NUMBER: P906953

CATALOG NUMBER: DFN2DIP-SQ4F0-160D060US835-FLLONL

**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	113	113	113	113	107	107	107	107	96	96	96	86	86	86	77	77	77	77	77	77	73
1	103	98	94	91	97	94	90	87	84	82	79	76	74	72	68	67	65	65	65	65	61
2	94	86	80	74	89	82	76	71	74	69	66	67	63	60	60	57	55	55	55	55	51
3	86	76	68	62	81	72	65	60	65	60	55	59	55	51	53	50	47	47	47	47	44
4	78	67	59	53	74	64	57	51	58	52	47	53	48	44	48	44	40	40	40	40	37
5	72	60	51	45	68	57	50	44	52	46	41	47	42	38	43	39	35	35	35	35	32
6	67	54	45	39	63	52	44	38	47	41	36	43	37	33	39	35	31	31	31	31	29
7	62	49	41	35	58	47	39	34	43	36	32	39	34	30	36	31	28	28	28	28	25
8	57	44	36	31	54	43	35	30	39	33	28	36	30	27	33	28	25	25	25	25	23
9	53	41	33	28	51	39	32	27	36	30	25	33	28	24	30	26	22	22	22	22	20
10	50	38	30	25	48	36	29	24	33	27	23	31	25	22	28	24	20	20	20	20	19

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

	0°	45°	90°
0°	4368	4368	4368
5°	4375	4308	4338
10°	4340	4251	4280
15°	4276	4182	4190
20°	4190	4086	4097
25°	4104	3970	3990
30°	3996	3863	3853
35°	3894	3736	3708
40°	3769	3608	3570
45°	3644	3480	3429
50°	3507	3346	3266
55°	3364	3190	3116
60°	3202	3005	2945
65°	3025	2814	2742
70°	2800	2581	2525
75°	2489	2302	2327
80°	2114	1947	1944
85°	1528	1332	1306

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 3644 cd/sqm



TEST NUMBER: P906953  
 CATALOG NUMBER: DFN2DIP-SQ4F0-160D060US835-FLLONL

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	586.0	2.7
10°-20°	1648.7	7.6
20°-30°	2422.9	11.1
30°-40°	2814.1	12.9
40°-50°	2810.6	12.9
50°-60°	2450.7	11.3
60°-70°	1811.6	8.3
70°-80°	1025.0	4.7
80°-90°	274.1	1.3
90°-100°	66.8	0.3
100°-110°	248.9	1.1
110°-120°	660.2	3.0
120°-130°	1094.9	5.0
130°-140°	1163.0	5.3
140°-150°	1080.9	5.0
150°-160°	869.0	4.0
160°-170°	560.0	2.6
170°-180°	192.7	0.9
0°-30°	4657.5	21.4
0°-40°	7471.6	34.3
0°-60°	12732.9	58.5
0°-90°	15843.5	72.7
90°-120°	975.8	4.5
90°-150°	4314.7	19.8
90°-180°	5936.0	27.3
0°-180°	21780.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	6226	6226	6226	6226	6226	
5°	6226	6202	6136	6184	6172	591
15°	5926	5891	5813	5837	5807	1669
25°	5364	5316	5214	5226	5214	2468
35°	4628	4568	4472	4436	4406	2890
45°	3766	3724	3634	3568	3544	2906
55°	2850	2814	2742	2670	2640	2548
65°	1922	1886	1826	1772	1742	1900
75°	1005	994	964	928	940	1073
85°	245	239	234	215	210	273
90°	1	18	29	37	40	20
95°	95	47	57	65	63	113
105°	445	489	89	105	111	476
115°	842	867	904	226	120	829
125°	1191	1210	1238	1248	1253	1062
135°	1474	1498	1511	1525	1522	1139
145°	1710	1708	1733	1744	1736	1069
155°	1883	1870	1887	1896	1884	868
165°	1984	1975	1980	1990	1980	560
175°	2029	2019	2022	2032	2018	193
180°	2025	2025	2025	2025	2025	



TEST NUMBER: P906953

CATALOG NUMBER: DFN2DIP-SQ4F0-160D060US835-FLLONL

**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	6225.7	6225.7	6225.7	6225.7	6225.7
2.5°	6261.9	6232.0	6166.0	6225.7	6214.2
5°	6225.7	6202.2	6136.1	6183.8	6172.3
7.5°	6183.8	6148.2	6082.1	6130.4	6118.3
10°	6118.3	6076.4	6004.7	6052.3	6034.5
12.5°	6028.2	5992.6	5920.8	5950.7	5938.6
15°	5926.5	5891.0	5812.8	5837.0	5807.1
17.5°	5800.8	5765.2	5687.1	5716.9	5687.1
20°	5662.9	5627.4	5543.5	5561.3	5537.8
22.5°	5525.8	5471.8	5393.6	5393.6	5381.6
25°	5363.8	5316.2	5214.5	5226.0	5214.5
27.5°	5184.0	5142.1	5064.6	5046.9	5017.0
30°	5004.9	4956.7	4867.1	4849.3	4825.2
32.5°	4813.1	4777.6	4681.6	4645.4	4621.3
35°	4627.7	4568.0	4472.0	4435.8	4406.0
37.5°	4418.1	4364.1	4268.2	4226.2	4196.4
40°	4202.7	4154.5	4058.6	4005.2	3981.1
42.5°	3993.2	3944.9	3849.6	3789.3	3753.7
45°	3765.8	3723.8	3633.7	3568.2	3544.1
47.5°	3544.1	3502.2	3406.3	3340.2	3304.7
50°	3310.4	3280.5	3196.7	3112.8	3083.0
52.5°	3083.0	3041.1	2963.6	2897.5	2855.6
55°	2849.9	2813.7	2741.9	2670.1	2640.3
57.5°	2616.2	2586.3	2508.2	2436.4	2412.3
60°	2382.4	2358.9	2275.1	2209.0	2191.2
62.5°	2155.0	2113.1	2053.4	1993.7	1969.6
65°	1921.9	1885.7	1826.0	1772.1	1742.2
67.5°	1682.5	1652.0	1598.7	1556.7	1532.6
70°	1460.8	1436.7	1382.7	1340.8	1317.3
72.5°	1233.4	1209.3	1179.5	1137.5	1119.8
75°	1005.4	994.0	963.5	927.9	940.0
77.5°	802.2	778.1	766.0	748.2	730.4
80°	598.9	592.6	580.5	562.7	550.7
82.5°	407.1	407.1	401.4	377.3	377.3
85°	245.2	239.4	233.7	215.3	209.6
87.5°	108.0	95.9	83.8	66.1	59.7
90°	1.4	17.6	29.2	36.7	39.5
92.5°	36.7	30.8	35.1	38.1	39.5
95°	95.2	46.8	57.1	64.6	63.0
97.5°	171.4	51.3	74.6	79.2	80.6
100°	259.4	58.6	83.5	95.2	98.1
102.5°	356.0	353.2	86.5	102.5	107.0
105°	445.4	489.4	89.4	105.4	111.4
107.5°	549.5	586.0	92.4	108.4	114.3
110°	649.2	679.8	256.5	110.0	115.7



TEST NUMBER: P906953

CATALOG NUMBER: DFN2DIP-SQ4F0-160D060US835-FLLONL

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	742.9	769.2	744.3	112.7	117.3
115°	842.5	867.4	904.1	225.7	120.2
117.5°	928.9	958.2	983.2	773.6	389.7
120°	1025.7	1047.6	1074.1	1091.6	893.8
122.5°	1107.6	1131.1	1160.5	1169.2	1170.8
125°	1191.2	1210.3	1238.1	1248.4	1252.7
127.5°	1267.4	1287.9	1310.0	1324.6	1326.0
130°	1339.2	1362.7	1378.7	1394.9	1393.5
132.5°	1412.5	1431.6	1447.6	1460.8	1459.4
135°	1474.1	1497.6	1510.6	1525.4	1522.4
137.5°	1538.4	1556.0	1570.8	1585.4	1581.1
140°	1601.4	1613.3	1629.3	1642.5	1635.2
142.5°	1654.3	1664.6	1683.6	1695.2	1687.9
145°	1710.0	1708.4	1733.3	1743.6	1736.3
147.5°	1758.2	1753.8	1778.7	1786.0	1780.3
150°	1805.2	1794.9	1818.4	1827.1	1819.8
152.5°	1844.7	1833.0	1854.9	1863.8	1853.5
155°	1882.8	1869.7	1887.3	1896.0	1884.3
157.5°	1913.6	1901.9	1915.1	1925.4	1913.6
160°	1940.0	1931.1	1940.0	1948.7	1938.5
162.5°	1963.3	1954.6	1961.9	1972.2	1959.0
165°	1983.9	1975.2	1979.5	1989.8	1979.5
167.5°	2000.0	1991.2	1995.7	2006.0	1992.7
170°	2013.3	2004.4	2007.4	2017.6	2004.4
172.5°	2022.0	2013.3	2016.2	2026.5	2013.3
175°	2029.3	2019.0	2022.0	2032.2	2017.6
177.5°	2032.2	2022.0	2023.5	2033.8	2020.6
180°	2024.9	2024.9	2024.9	2024.9	2024.9



TEST NUMBER: P906953  
 CATALOG NUMBER: DFN2DIP-SQ4F0-160D060US835-FLLONL

**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	14.28	15.40	15.02	16.15	17.06	13.84	14.95	14.57	15.71	16.61
	3H	15.97	16.97	16.71	17.73	18.67	15.48	16.48	16.22	17.24	18.18
	4H	16.57	17.51	17.33	18.29	19.23	16.07	17.02	16.84	17.79	18.74
	6H	16.99	17.86	17.76	18.64	19.60	16.48	17.35	17.26	18.14	19.10
	8H	17.10	17.93	17.89	18.73	19.69	16.60	17.43	17.39	18.23	19.19
	12H	17.16	17.95	17.95	18.74	19.73	16.65	17.44	17.44	18.23	19.22
4H	2H	14.78	15.72	15.54	16.49	17.44	14.42	15.36	15.19	16.14	17.09
	3H	16.67	17.46	17.45	18.26	19.23	16.26	17.05	17.04	17.86	18.82
	4H	17.40	18.11	18.19	18.92	19.91	16.97	17.69	17.77	18.50	19.49
	6H	17.93	18.55	18.74	19.38	20.38	17.50	18.12	18.31	18.95	19.95
	8H	18.09	18.67	18.90	19.50	20.51	17.65	18.23	18.47	19.06	20.07
	12H	18.17	18.70	19.01	19.55	20.56	17.72	18.25	18.56	19.10	20.11
8H	4H	17.61	18.19	18.43	19.02	20.03	17.24	17.82	18.05	18.65	19.66
	6H	18.26	18.74	19.11	19.61	20.62	17.88	18.36	18.72	19.23	20.24
	8H	18.49	18.91	19.34	19.78	20.81	18.09	18.52	18.95	19.39	20.42
	12H	18.63	19.01	19.49	19.87	20.95	18.22	18.60	19.08	19.46	20.54
12H	4H	17.61	18.13	18.45	18.98	20.00	17.24	17.76	18.08	18.62	19.63
	6H	18.29	18.72	19.15	19.59	20.62	17.92	18.35	18.78	19.22	20.24
	8H	18.55	18.93	19.41	19.78	20.87	18.17	18.55	19.03	19.40	20.49