

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: P923320

Luminaire Tested: DFN2DIP-SQ4F0-160D060US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

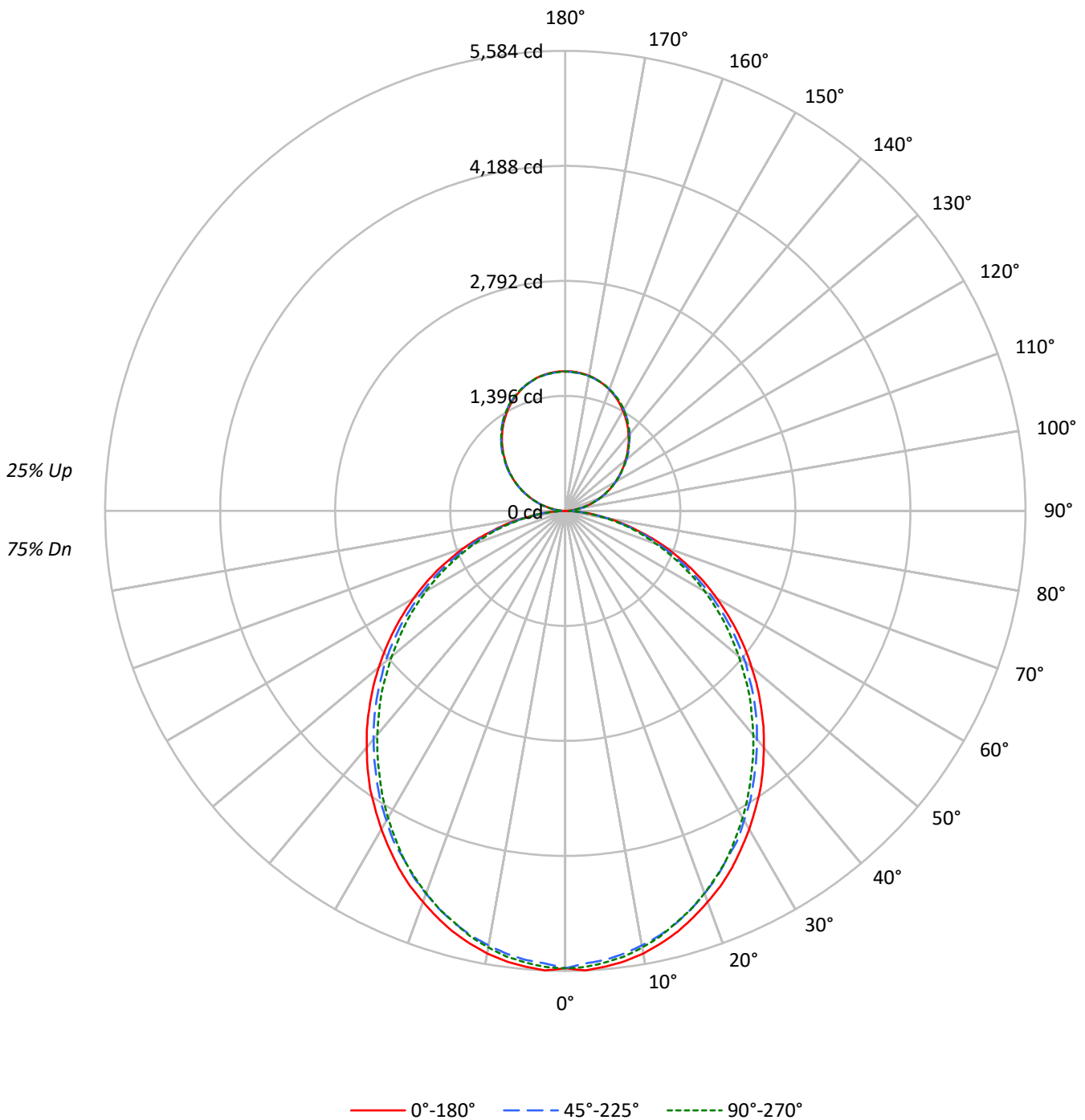
Test Method: LM-79-2019  
Report Number: P923320  
REPORT IS A COMBINATION OF REPORTS P900075 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D060US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18859.6 lumens  
Efficiency: N/A  
Efficacy: 89.0 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 (A<sub>in</sub>): 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

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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	113	113	113	113	108	108	108	108	97	97	97	88	88	88	79	79	79	79	79	79	75
1	103	99	95	91	98	94	91	87	85	83	80	77	75	73	70	68	67	67	67	67	63
2	94	86	80	75	89	82	77	72	75	70	66	68	64	61	62	59	56	56	56	56	53
3	86	76	68	62	81	73	66	60	66	61	56	60	56	52	55	51	48	48	48	48	45
4	79	67	59	53	75	64	57	51	59	53	48	54	49	45	49	45	41	41	41	41	38
5	72	60	52	45	69	58	50	44	53	46	41	48	43	39	44	40	36	36	36	36	33
6	67	54	46	40	63	52	44	39	48	41	36	44	38	34	40	35	32	32	32	32	29
7	62	49	41	35	59	47	39	34	43	37	32	40	34	30	37	32	28	28	28	28	26
8	58	45	37	31	55	43	36	30	40	33	29	37	31	27	34	29	25	25	25	25	23
9	54	41	33	28	51	39	32	27	36	30	26	34	28	24	31	26	23	23	23	23	21
10	50	38	30	25	48	36	29	25	34	28	23	31	26	22	29	24	21	21	21	21	19

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

	0°	45°	90°
0°	3895	3895	3895
5°	3902	3842	3868
10°	3870	3791	3817
15°	3813	3729	3736
20°	3736	3643	3653
25°	3659	3540	3558
30°	3563	3445	3436
35°	3473	3332	3306
40°	3361	3218	3184
45°	3249	3103	3058
50°	3127	2983	2912
55°	2999	2844	2779
60°	2855	2679	2626
65°	2698	2509	2445
70°	2497	2301	2252
75°	2219	2053	2075
80°	1885	1736	1733
85°	1362	1188	1165

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 3249 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	522.5	2.8
10°-20°	1470.1	7.8
20°-30°	2160.5	11.5
30°-40°	2509.3	13.3
40°-50°	2506.2	13.3
50°-60°	2185.3	11.6
60°-70°	1615.4	8.6
70°-80°	914.0	4.8
80°-90°	246.0	1.3
90°-100°	104.7	0.6
100°-110°	332.7	1.8
110°-120°	569.3	3.0
120°-130°	748.8	4.0
130°-140°	840.5	4.5
140°-150°	824.2	4.4
150°-160°	691.4	3.7
160°-170°	458.5	2.4
170°-180°	160.3	0.8
0°-30°	4153.2	22.0
0°-40°	6662.5	35.3
0°-60°	11354.0	60.2
0°-90°	14129.5	74.9
90°-120°	1006.7	5.3
90°-150°	3420.1	18.1
90°-180°	4730.0	25.1
0°-180°	18859.6	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	5552	5552	5552	5552	5552	
5°	5552	5531	5472	5514	5504	527
15°	5285	5253	5183	5205	5178	1488
25°	4783	4740	4650	4660	4650	2201
35°	4127	4073	3988	3955	3929	2577
45°	3358	3321	3240	3182	3160	2592
55°	2541	2509	2445	2381	2354	2272
65°	1714	1682	1628	1580	1554	1694
75°	896	886	859	827	838	957
85°	219	214	208	192	187	244
90°	2	18	50	47	48	18
95°	74	89	91	91	89	83
105°	307	311	314	317	317	324
115°	571	580	577	575	571	565
125°	831	844	840	835	834	743
135°	1075	1091	1094	1092	1088	831
145°	1305	1315	1323	1325	1319	815
155°	1492	1496	1501	1508	1503	687
165°	1623	1622	1622	1632	1625	458
175°	1689	1685	1682	1692	1683	160
180°	1692	1692	1692	1692	1692	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	5551.5	5551.5	5551.5	5551.5	5551.5
2.5°	5583.8	5557.1	5498.3	5551.5	5541.3
5°	5551.5	5530.6	5471.6	5514.2	5503.9
7.5°	5514.2	5482.4	5423.5	5466.5	5455.8
10°	5455.8	5418.4	5354.5	5396.9	5381.0
12.5°	5375.4	5343.7	5279.6	5306.3	5295.5
15°	5284.7	5253.1	5183.3	5204.9	5178.3
17.5°	5172.6	5140.9	5071.2	5097.8	5071.2
20°	5049.7	5018.0	4943.2	4959.1	4938.1
22.5°	4927.4	4879.3	4809.5	4809.5	4798.8
25°	4783.0	4740.5	4649.8	4660.1	4649.8
27.5°	4622.6	4585.3	4516.2	4500.4	4473.7
30°	4462.9	4419.9	4340.0	4324.2	4302.7
32.5°	4291.9	4260.2	4174.6	4142.4	4120.9
35°	4126.6	4073.3	3987.7	3955.4	3928.9
37.5°	3939.7	3891.5	3806.0	3768.5	3742.0
40°	3747.6	3704.6	3619.1	3571.5	3550.0
42.5°	3560.8	3517.7	3432.7	3379.0	3347.2
45°	3358.0	3320.6	3240.2	3181.8	3160.3
47.5°	3160.3	3122.9	3037.4	2978.5	2946.8
50°	2951.9	2925.3	2850.5	2775.7	2749.1
52.5°	2749.1	2711.8	2642.7	2583.7	2546.4
55°	2541.3	2509.0	2445.0	2381.0	2354.4
57.5°	2332.9	2306.2	2236.6	2172.6	2151.1
60°	2124.4	2103.5	2028.7	1969.8	1953.9
62.5°	1921.6	1884.3	1831.0	1777.8	1756.3
65°	1713.8	1681.5	1628.3	1580.2	1553.5
67.5°	1500.3	1473.1	1425.6	1388.1	1366.6
70°	1302.6	1281.1	1233.0	1195.6	1174.7
72.5°	1099.8	1078.3	1051.8	1014.3	998.5
75°	896.5	886.4	859.2	827.4	838.2
77.5°	715.3	693.8	683.1	667.2	651.3
80°	534.0	528.4	517.6	501.8	491.1
82.5°	363.0	363.0	357.9	336.4	336.4
85°	218.6	213.5	208.4	192.0	186.9
87.5°	96.3	85.5	74.7	58.9	53.2
90°	1.5	18.4	50.0	46.9	48.4
92.5°	31.7	42.9	44.4	45.9	45.9
95°	74.5	88.7	91.3	91.3	88.7
97.5°	123.9	137.2	142.9	142.9	142.9
100°	181.1	192.8	196.9	196.9	195.4
102.5°	241.3	249.9	255.6	257.1	255.6
105°	307.1	311.2	314.2	316.8	316.8
107.5°	372.4	378.5	378.5	379.5	372.4
110°	435.7	443.8	443.8	443.8	439.7



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	504.0	512.6	511.1	507.0	504.0
115°	571.3	579.5	576.9	575.4	571.3
117.5°	638.2	649.4	642.2	638.2	634.1
120°	705.5	716.8	705.5	705.5	700.9
122.5°	766.7	781.0	773.8	769.8	766.7
125°	831.0	843.7	839.6	835.1	833.6
127.5°	893.8	909.5	903.9	897.9	893.8
130°	952.4	970.8	968.2	965.2	959.6
132.5°	1018.2	1032.5	1033.5	1026.4	1022.3
135°	1074.9	1090.7	1093.7	1092.2	1088.1
137.5°	1138.1	1150.8	1153.4	1152.4	1146.3
140°	1193.7	1206.5	1213.6	1213.6	1208.0
142.5°	1250.8	1263.6	1267.7	1269.2	1263.6
145°	1304.9	1315.1	1323.3	1324.8	1319.2
147.5°	1353.3	1366.1	1372.3	1374.7	1369.1
150°	1403.4	1412.0	1417.6	1422.2	1417.6
152.5°	1447.7	1456.4	1463.6	1469.2	1463.6
155°	1492.1	1496.2	1500.7	1508.0	1503.3
157.5°	1530.4	1533.5	1536.0	1546.2	1539.1
160°	1564.6	1567.6	1569.1	1577.8	1571.7
162.5°	1596.2	1596.2	1597.7	1607.4	1600.3
165°	1623.2	1621.7	1621.7	1631.9	1624.8
167.5°	1647.7	1643.2	1643.2	1653.3	1646.2
170°	1666.1	1662.0	1660.5	1670.6	1662.0
172.5°	1678.8	1674.7	1673.2	1683.4	1674.7
175°	1689.0	1685.0	1681.9	1692.1	1683.4
177.5°	1694.6	1690.6	1687.5	1696.1	1687.5
180°	1692.1	1692.1	1692.1	1692.1	1692.1



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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	14.05	15.19	14.76	15.92	16.78	13.60	14.74	14.31	15.47	16.34
	3H	15.73	16.76	16.46	17.50	18.39	15.24	16.27	15.97	17.01	17.90
	4H	16.34	17.30	17.08	18.05	18.96	15.84	16.81	16.58	17.56	18.47
	6H	16.75	17.65	17.51	18.41	19.33	16.25	17.15	17.01	17.91	18.83
	8H	16.87	17.72	17.63	18.50	19.42	16.37	17.22	17.13	18.00	18.92
	12H	16.93	17.74	17.70	18.51	19.46	16.42	17.23	17.19	18.00	18.95
4H	2H	14.54	15.51	15.29	16.26	17.17	14.19	15.16	14.93	15.90	16.81
	3H	16.44	17.25	17.20	18.03	18.96	16.03	16.84	16.79	17.62	18.55
	4H	17.17	17.90	17.94	18.69	19.64	16.74	17.48	17.52	18.26	19.22
	6H	17.70	18.34	18.49	19.15	20.11	17.27	17.91	18.06	18.72	19.68
	8H	17.86	18.46	18.65	19.26	20.24	17.42	18.02	18.22	18.82	19.80
	12H	17.95	18.49	18.76	19.31	20.29	17.50	18.04	18.31	18.86	19.84
8H	4H	17.39	17.98	18.18	18.79	19.76	17.01	17.61	17.80	18.41	19.39
	6H	18.03	18.53	18.86	19.38	20.35	17.65	18.14	18.47	18.99	19.97
	8H	18.26	18.70	19.10	19.55	20.54	17.87	18.31	18.70	19.15	20.14
	12H	18.41	18.79	19.25	19.63	20.68	18.00	18.38	18.83	19.22	20.27
12H	4H	17.39	17.92	18.20	18.75	19.73	17.02	17.55	17.83	18.38	19.36
	6H	18.07	18.51	18.90	19.35	20.34	17.69	18.13	18.53	18.98	19.97
	8H	18.32	18.71	19.16	19.55	20.60	17.94	18.33	18.78	19.17	20.22