

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: P923332

Luminaire Tested: DFN2DIP-SQ4F0-160D090US940-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P923332
REPORT IS A COMBINATION OF REPORTS P900129 AND P896915
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-160D090US940-FLLFLL
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

Summary

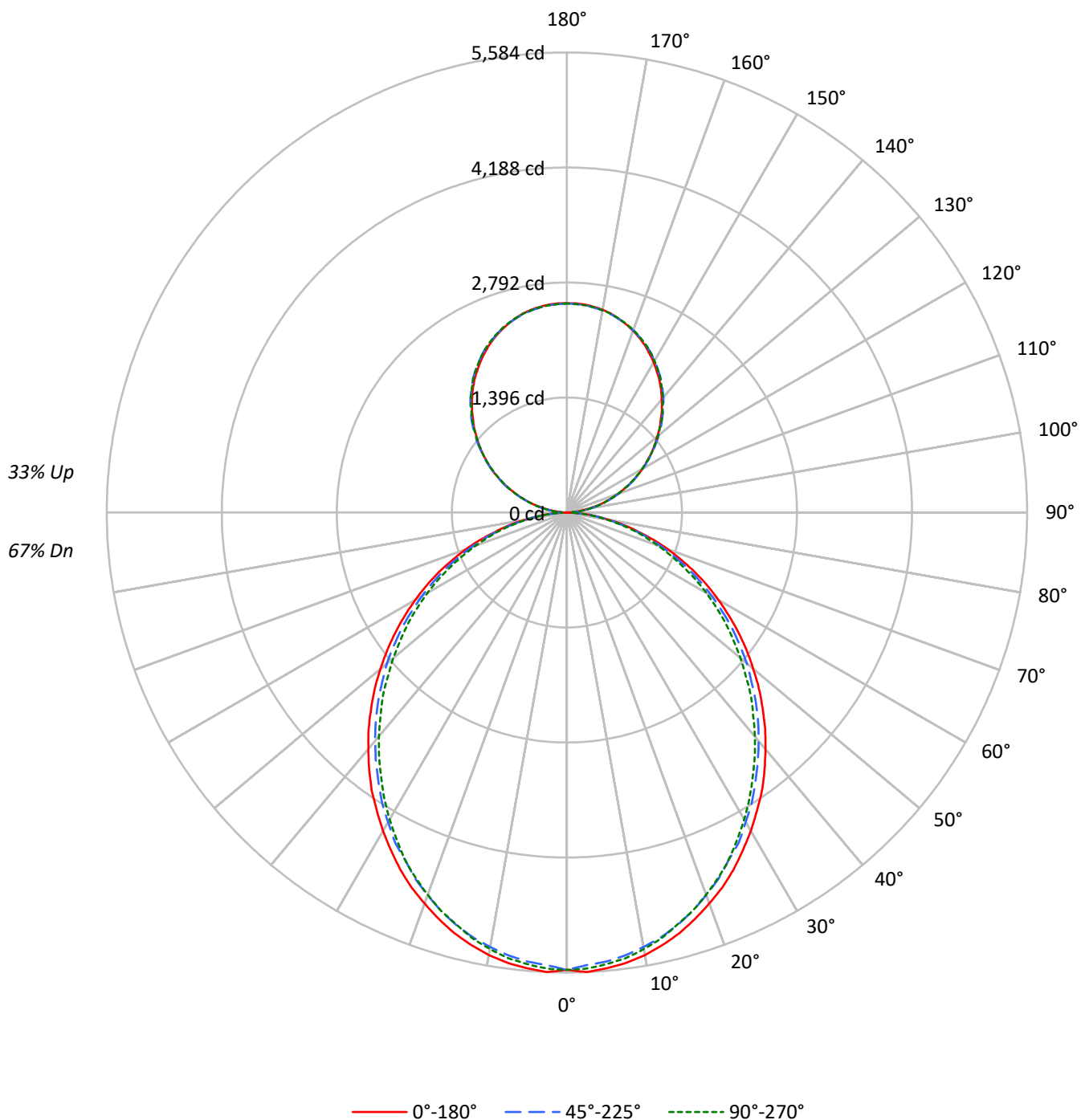
Lumens per Lamp: N/A
Luminaire Lumens: 21227.1 lumens
Efficiency: N/A
Efficacy: 90.9 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 233.4
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: P923332

CATALOG NUMBER: DFN2DIP-SQ4F0-160D090US940-FLLFLL

Luminous Intensity Polar Plot



TEST NUMBER: P923332

CATALOG NUMBER: DFN2DIP-SQ4F0-160D090US940-FLLFL

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20				20				20
RC	80				70				50				30				10
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RCR																	
0	111	111	111	111	105	105	105	105	93	93	93	81	81	81	71	71	71
1	102	97	93	89	95	92	88	85	81	79	76	72	70	68	63	62	60
2	92	85	78	73	87	80	74	70	71	67	63	63	60	57	56	53	51
3	84	75	67	61	79	71	64	58	63	58	53	56	52	48	49	46	43
4	77	66	58	52	72	63	55	50	56	50	45	50	45	41	44	40	37
5	71	59	51	44	67	56	48	43	50	44	39	45	40	36	40	36	33
6	66	53	45	39	61	50	43	37	45	39	34	41	35	31	36	32	29
7	61	48	40	34	57	46	38	33	41	35	30	37	32	28	33	29	26
8	56	44	36	30	53	42	34	29	38	31	27	34	29	25	30	26	23
9	53	40	32	27	49	38	31	26	35	29	24	31	26	23	28	24	21
10	49	37	29	24	46	35	28	24	32	26	22	29	24	20	26	22	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

TEST NUMBER: P923332

CATALOG NUMBER: DFN2DIP-SQ4F0-160D090US940-FLLFLL

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	522.5	2.5
10°-20°	1470.1	6.9
20°-30°	2160.5	10.2
30°-40°	2509.3	11.8
40°-50°	2506.2	11.8
50°-60°	2185.3	10.3
60°-70°	1615.4	7.6
70°-80°	914.0	4.3
80°-90°	248.4	1.2
90°-100°	157.1	0.7
100°-110°	499.0	2.4
110°-120°	854.0	4.0
120°-130°	1123.1	5.3
130°-140°	1260.7	5.9
140°-150°	1236.2	5.8
150°-160°	1037.0	4.9
160°-170°	687.7	3.2
170°-180°	240.4	1.1
0°-30°	4153.2	19.6
0°-40°	6662.5	31.4
0°-60°	11354.0	53.5
0°-90°	14131.9	66.6
90°-120°	1510.1	7.1
90°-150°	5130.1	24.2
90°-180°	7095.0	33.4
0°-180°	21227.1	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	28	75	70	73	20
95°	112	133	137	137	133	124
105°	461	467	471	475	475	486
115°	857	869	865	863	857	848
125°	1246	1266	1260	1253	1250	1114
135°	1612	1636	1641	1638	1632	1246
145°	1957	1973	1985	1987	1979	1223
155°	2238	2244	2251	2262	2255	1030
165°	2435	2432	2432	2448	2437	687
175°	2534	2527	2523	2538	2525	241
180°	2538	2538	2538	2538	2538	

TEST NUMBER: P923332

CATALOG NUMBER: DFN2DIP-SQ4F0-160D090US940-FLLFLL

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°	2.3	27.6	75.0	70.4	72.7
92.5°	47.4	64.3	66.6	68.8	68.8
95°	111.7	133.1	137.0	137.0	133.1
97.5°	185.9	205.8	214.3	214.3	214.3
100°	271.6	289.3	295.3	295.3	293.1
102.5°	361.9	375.0	383.3	385.7	383.3
105°	460.7	466.7	471.4	475.2	475.2
107.5°	558.6	567.8	567.8	569.3	558.6
110°	653.4	665.8	665.8	665.8	659.6

TEST NUMBER: P923332

CATALOG NUMBER: DFN2DIP-SQ4F0-160D090US940-FLLFLL

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	756.0	769.0	766.7	760.6	756.0
115°	857.0	869.2	865.4	863.2	857.0
117.5°	957.3	974.1	963.4	957.3	951.1
120°	1058.3	1075.0	1058.3	1058.3	1051.3
122.5°	1150.0	1171.5	1160.8	1154.7	1150.0
125°	1246.5	1265.6	1259.5	1252.6	1250.4
127.5°	1340.6	1364.3	1355.9	1346.8	1340.6
130°	1428.6	1456.2	1452.3	1447.7	1439.3
132.5°	1527.3	1548.7	1550.2	1539.5	1533.5
135°	1612.2	1635.9	1640.6	1638.3	1632.2
137.5°	1707.1	1726.3	1730.1	1728.6	1719.4
140°	1790.6	1809.6	1820.3	1820.3	1812.0
142.5°	1876.2	1895.3	1901.5	1903.8	1895.3
145°	1957.4	1972.6	1984.9	1987.2	1978.8
147.5°	2030.1	2049.2	2058.3	2062.2	2053.8
150°	2105.1	2118.1	2126.5	2133.3	2126.5
152.5°	2171.6	2184.6	2195.3	2203.8	2195.3
155°	2238.2	2244.3	2251.2	2261.9	2255.0
157.5°	2295.5	2300.2	2304.0	2319.2	2308.5
160°	2346.8	2351.4	2353.8	2366.7	2357.5
162.5°	2394.2	2394.2	2396.6	2411.1	2400.4
165°	2434.8	2432.5	2432.5	2447.8	2437.1
167.5°	2471.6	2464.7	2464.7	2479.9	2469.2
170°	2499.1	2493.0	2490.7	2506.0	2493.0
172.5°	2518.2	2512.1	2509.8	2525.1	2512.1
175°	2533.5	2527.4	2522.8	2538.2	2525.1
177.5°	2541.9	2535.8	2531.2	2544.2	2531.2
180°	2538.2	2538.2	2538.2	2538.2	2538.2

TEST NUMBER: P923332

CATALOG NUMBER: DFN2DIP-SQ4F0-160D090US940-FLLFLL

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	13.41	14.44	14.21	15.27	16.28	12.97	14.00	13.77	14.82	15.84
	3H	15.09	16.02	15.90	16.85	17.89	14.60	15.53	15.41	16.36	17.40
	4H	15.69	16.56	16.52	17.40	18.46	15.19	16.07	16.02	16.91	17.96
	6H	16.10	16.91	16.94	17.76	18.82	15.60	16.41	16.44	17.26	18.32
	8H	16.21	16.98	17.06	17.85	18.91	15.71	16.48	16.56	17.35	18.41
	12H	16.27	17.00	17.12	17.86	18.95	15.76	16.49	16.62	17.35	18.45
4H	2H	13.89	14.77	14.73	15.61	16.66	13.54	14.42	14.37	15.26	16.31
	3H	15.78	16.51	16.63	17.39	18.45	15.37	16.10	16.22	16.98	18.05
	4H	16.50	17.17	17.36	18.04	19.14	16.08	16.75	16.94	17.62	18.71
	6H	17.03	17.61	17.91	18.51	19.60	16.60	17.18	17.48	18.07	19.17
	8H	17.19	17.73	18.07	18.62	19.73	16.75	17.29	17.63	18.18	19.29
	12H	17.27	17.76	18.17	18.67	19.79	16.82	17.31	17.72	18.22	19.34
8H	4H	16.72	17.25	17.59	18.14	19.26	16.34	16.88	17.22	17.77	18.88
	6H	17.36	17.81	18.26	18.74	19.85	16.98	17.42	17.88	18.35	19.47
	8H	17.58	17.98	18.50	18.90	20.03	17.19	17.59	18.11	18.51	19.64
	12H	17.73	18.08	18.65	18.99	20.17	17.32	17.66	18.23	18.58	19.76
12H	4H	16.71	17.19	17.61	18.10	19.22	16.34	16.83	17.24	17.74	18.85
	6H	17.39	17.79	18.31	18.71	19.84	17.02	17.42	17.93	18.34	19.47
	8H	17.64	17.99	18.56	18.91	20.09	17.26	17.61	18.18	18.53	19.71