

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: P924013

Luminaire Tested: DFN2DIP-4P3F0-020D050US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

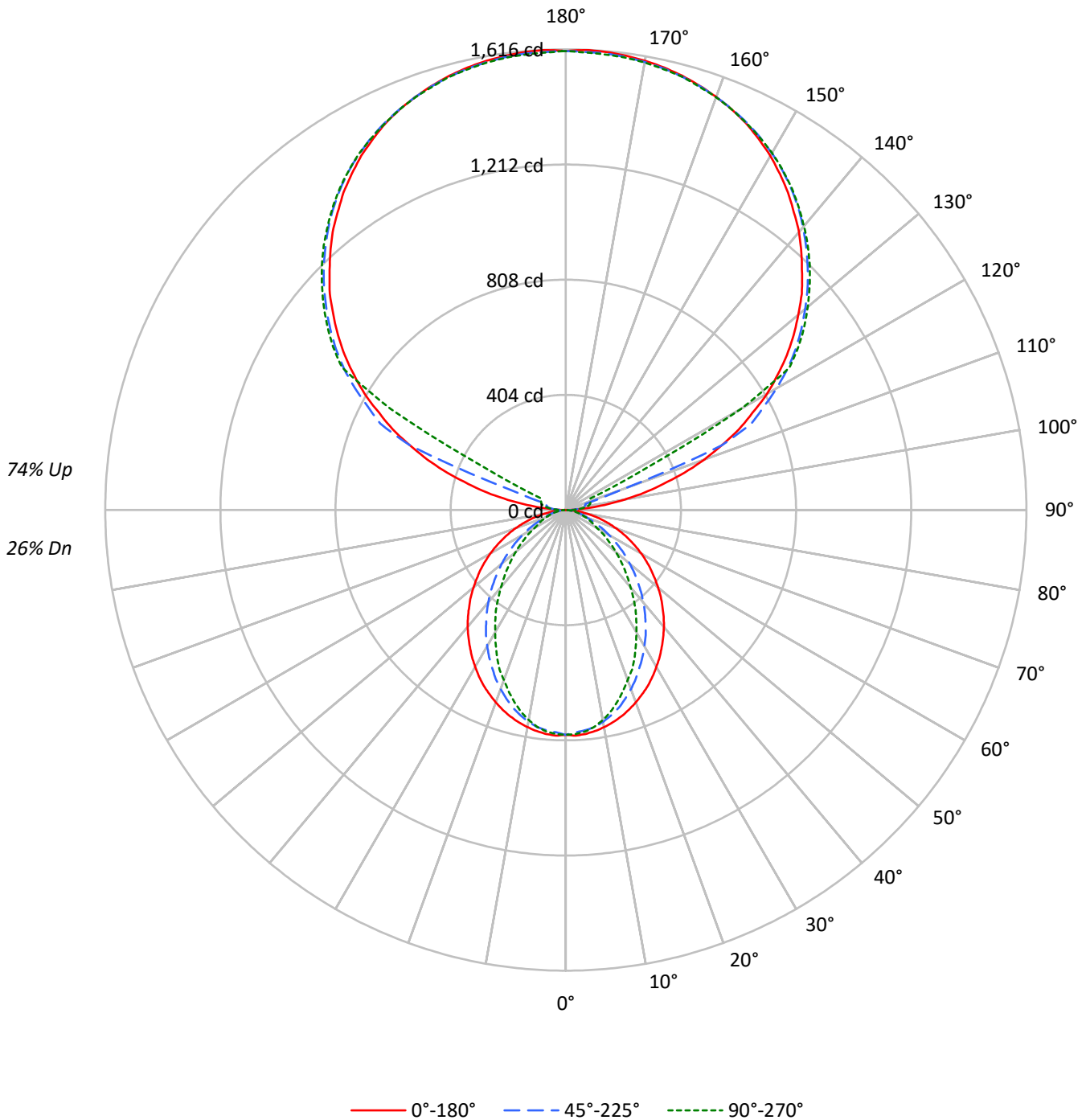
Test Method: LM-79-2019  
Report Number: P924013  
REPORT IS A COMBINATION OF REPORTS P900580 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D050US950-RLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6344.1 lumens  
Efficiency: N/A  
Efficacy: 117.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 53.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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				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	101	101	101	101	90	90	90	90	70	70	70	51	51	51	34	34	34	26				26
1	93	88	85	82	82	79	76	73	61	59	58	45	44	43	30	29	29	22				22
2	84	77	72	67	75	69	65	60	54	51	48	40	38	36	27	26	25	19				19
3	77	68	61	56	69	61	55	51	48	44	41	35	33	31	24	23	21	16				16
4	71	60	53	47	63	54	48	43	43	38	35	32	29	26	22	20	19	14				14
5	65	54	46	41	58	48	42	37	38	33	30	28	25	23	19	18	16	12				12
6	60	48	41	35	53	43	37	32	34	30	26	26	23	20	18	16	14	11				11
7	55	43	36	31	49	39	33	28	31	26	23	23	20	18	16	14	13	10				10
8	51	39	32	27	45	36	29	25	28	24	20	21	18	16	15	13	12	9				9
9	47	36	29	24	42	32	26	22	26	21	18	20	16	14	14	12	10	8				8
10	44	33	26	21	39	30	24	20	24	19	16	18	15	13	13	11	10	7				7

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

	0°	45°	90°
0°	899	899	899
5°	900	884	890
10°	890	866	861
15°	877	837	816
20°	860	797	760
25°	843	752	707
30°	820	706	640
35°	798	657	580
40°	775	606	512
45°	749	550	451
50°	721	493	391
55°	692	432	333
60°	659	369	274
65°	621	305	247
70°	574	245	223
75°	516	214	202
80°	431	178	174
85°	292	116	129

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 1100 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	73.9	1.2
10°-20°	202.9	3.2
20°-30°	284.8	4.5
30°-40°	310.5	4.9
40°-50°	285.4	4.5
50°-60°	224.1	3.5
60°-70°	145.9	2.3
70°-80°	75.1	1.2
80°-90°	22.0	0.3
90°-100°	53.1	0.8
100°-110°	197.9	3.1
110°-120°	524.8	8.3
120°-130°	870.4	13.7
130°-140°	924.6	14.6
140°-150°	859.3	13.5
150°-160°	690.9	10.9
160°-170°	445.2	7.0
170°-180°	153.2	2.4
0°-30°	561.6	8.9
0°-40°	872.1	13.7
0°-60°	1381.7	21.8
0°-90°	1624.6	25.6
90°-120°	775.8	12.2
90°-150°	3430.2	54.1
90°-180°	4719.0	74.4
0°-180°	6344.1	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	789	789	789	789	789	
5°	789	785	776	782	780	75
15°	750	742	718	704	697	211
25°	681	658	611	582	571	313
35°	587	550	488	442	427	367
45°	480	432	357	306	289	370
55°	365	309	232	189	176	326
65°	246	188	124	100	98	244
75°	131	81	57	52	51	139
85°	31	16	14	14	14	35
90°	1	14	23	29	31	6
95°	76	37	45	51	50	90
105°	354	389	71	84	88	378
115°	670	690	719	179	96	659
125°	947	962	984	992	996	845
135°	1172	1191	1201	1213	1210	905
145°	1359	1358	1378	1386	1380	850
155°	1497	1486	1500	1507	1498	690
165°	1577	1570	1574	1582	1574	446
175°	1613	1605	1608	1616	1604	154
180°	1610	1610	1610	1610	1610	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	788.6	788.6	788.6	788.6	788.6
2.5°	792.1	788.6	780.7	787.9	786.5
5°	788.6	785.0	775.7	782.2	780.0
7.5°	782.2	777.9	767.9	770.7	767.1
10°	773.6	768.5	754.3	752.1	747.9
12.5°	762.9	756.4	737.2	733.0	725.0
15°	750.0	742.1	717.9	704.3	697.3
17.5°	735.1	723.6	693.7	677.9	666.6
20°	717.9	703.6	668.0	650.2	634.4
22.5°	699.4	683.0	641.6	617.3	606.6
25°	680.9	658.0	610.8	581.7	570.9
27.5°	658.7	634.4	582.3	548.7	532.3
30°	635.2	608.0	550.9	514.6	495.2
32.5°	612.3	579.5	521.0	478.1	460.3
35°	586.6	550.3	487.5	442.5	426.7
37.5°	561.6	522.3	456.0	406.8	388.9
40°	535.2	492.5	423.2	372.5	353.9
42.5°	508.1	462.5	390.4	337.5	319.8
45°	479.6	431.7	356.9	306.1	289.0
47.5°	452.5	401.8	324.7	274.0	258.3
50°	422.5	371.9	293.4	244.0	229.2
52.5°	393.1	339.6	263.3	216.3	202.7
55°	364.6	309.0	231.9	189.2	175.5
57.5°	335.4	278.3	204.2	164.2	152.7
60°	305.5	248.3	174.9	138.5	127.1
62.5°	276.2	219.1	149.9	115.6	109.9
65°	246.2	188.4	124.2	100.0	97.8
67.5°	217.7	159.8	100.0	87.8	85.7
70°	187.7	132.0	82.7	75.7	72.8
72.5°	159.1	106.3	69.2	63.5	62.1
75°	131.3	81.3	57.0	52.1	51.4
77.5°	103.5	57.8	44.9	42.1	40.6
80°	77.8	41.4	34.2	31.4	31.4
82.5°	54.2	27.9	23.6	22.1	22.1
85°	30.6	15.6	13.5	13.5	13.5
87.5°	11.4	5.7	5.7	5.0	5.0
90°	1.1	13.9	23.3	29.2	31.4
92.5°	29.2	24.5	28.0	30.3	31.4
95°	75.7	37.2	45.4	51.3	50.1
97.5°	136.2	40.8	59.3	63.0	64.0
100°	206.3	46.7	66.4	75.7	78.0
102.5°	283.1	280.8	68.8	81.5	85.1
105°	354.1	389.1	71.1	83.9	88.5
107.5°	436.8	465.8	73.5	86.1	90.9
110°	516.1	540.4	203.9	87.4	92.0



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	590.6	611.5	591.8	89.7	93.2
115°	669.8	689.6	718.7	179.4	95.6
117.5°	738.5	761.8	781.7	614.9	309.9
120°	815.4	832.8	853.8	867.9	710.5
122.5°	880.5	899.2	922.6	929.6	930.8
125°	946.9	962.2	984.3	992.4	996.0
127.5°	1007.5	1023.8	1041.5	1053.0	1054.2
130°	1064.7	1083.4	1096.1	1108.9	1107.9
132.5°	1123.0	1138.1	1150.8	1161.4	1160.3
135°	1171.9	1190.6	1200.9	1212.7	1210.3
137.5°	1223.0	1237.1	1248.8	1260.4	1257.0
140°	1273.1	1282.6	1295.2	1305.7	1300.0
142.5°	1315.2	1323.4	1338.5	1347.7	1341.9
145°	1359.4	1358.2	1378.0	1386.2	1380.3
147.5°	1397.8	1394.3	1414.1	1419.9	1415.4
150°	1435.1	1427.0	1445.6	1452.6	1446.7
152.5°	1466.5	1457.2	1474.7	1481.8	1473.5
155°	1496.8	1486.4	1500.4	1507.3	1498.1
157.5°	1521.2	1512.0	1522.5	1530.7	1521.2
160°	1542.3	1535.3	1542.3	1549.2	1541.1
162.5°	1560.8	1554.0	1559.7	1567.9	1557.4
165°	1577.2	1570.3	1573.7	1581.8	1573.7
167.5°	1590.0	1583.0	1586.6	1594.7	1584.2
170°	1600.5	1593.5	1595.9	1604.0	1593.5
172.5°	1607.5	1600.5	1602.9	1611.0	1600.5
175°	1613.3	1605.1	1607.5	1615.6	1604.0
177.5°	1615.6	1607.5	1608.7	1616.8	1606.3
180°	1609.8	1609.8	1609.8	1609.8	1609.8



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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	3.87	4.53	5.01	5.66	7.25	0.00	0.49	0.98	1.63	3.21
	3H	5.53	6.12	6.68	7.26	8.86	1.00	1.59	2.15	2.73	4.33
	4H	6.12	6.69	7.29	7.83	9.43	1.44	2.00	2.60	3.14	4.75
	6H	6.53	7.05	7.70	8.20	9.81	1.74	2.26	2.91	3.40	5.02
	8H	6.65	7.15	7.83	8.30	9.91	1.83	2.32	3.00	3.48	5.08
	12H	6.71	7.18	7.88	8.33	9.96	1.86	2.33	3.04	3.48	5.11
4H	2H	3.86	4.43	5.03	5.57	7.17	0.40	0.97	1.57	2.11	3.71
	3H	5.67	6.14	6.85	7.31	8.92	1.73	2.20	2.90	3.37	4.98
	4H	6.35	6.79	7.53	7.94	9.57	2.27	2.70	3.44	3.85	5.49
	6H	6.85	7.22	8.04	8.40	10.03	2.67	3.04	3.85	4.21	5.84
	8H	7.02	7.37	8.20	8.54	10.18	2.79	3.13	3.97	4.30	5.94
	12H	7.11	7.42	8.30	8.60	10.25	2.84	3.16	4.04	4.33	5.98
8H	4H	6.31	6.65	7.49	7.82	9.46	2.53	2.87	3.71	4.04	5.68
	6H	6.86	7.15	8.06	8.36	9.99	3.03	3.32	4.23	4.53	6.16
	8H	7.07	7.32	8.28	8.51	10.17	3.22	3.47	4.42	4.65	6.31
	12H	7.20	7.42	8.41	8.60	10.29	3.32	3.54	4.53	4.73	6.42
12H	4H	6.25	6.56	7.45	7.74	9.39	2.53	2.84	3.72	4.02	5.66
	6H	6.84	7.08	8.04	8.27	9.93	3.08	3.33	4.28	4.52	6.17
	8H	7.05	7.26	8.25	8.45	10.14	3.28	3.49	4.49	4.68	6.37