

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: P923932

Luminaire Tested: DFN2DIP-TR4F0-120D050US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

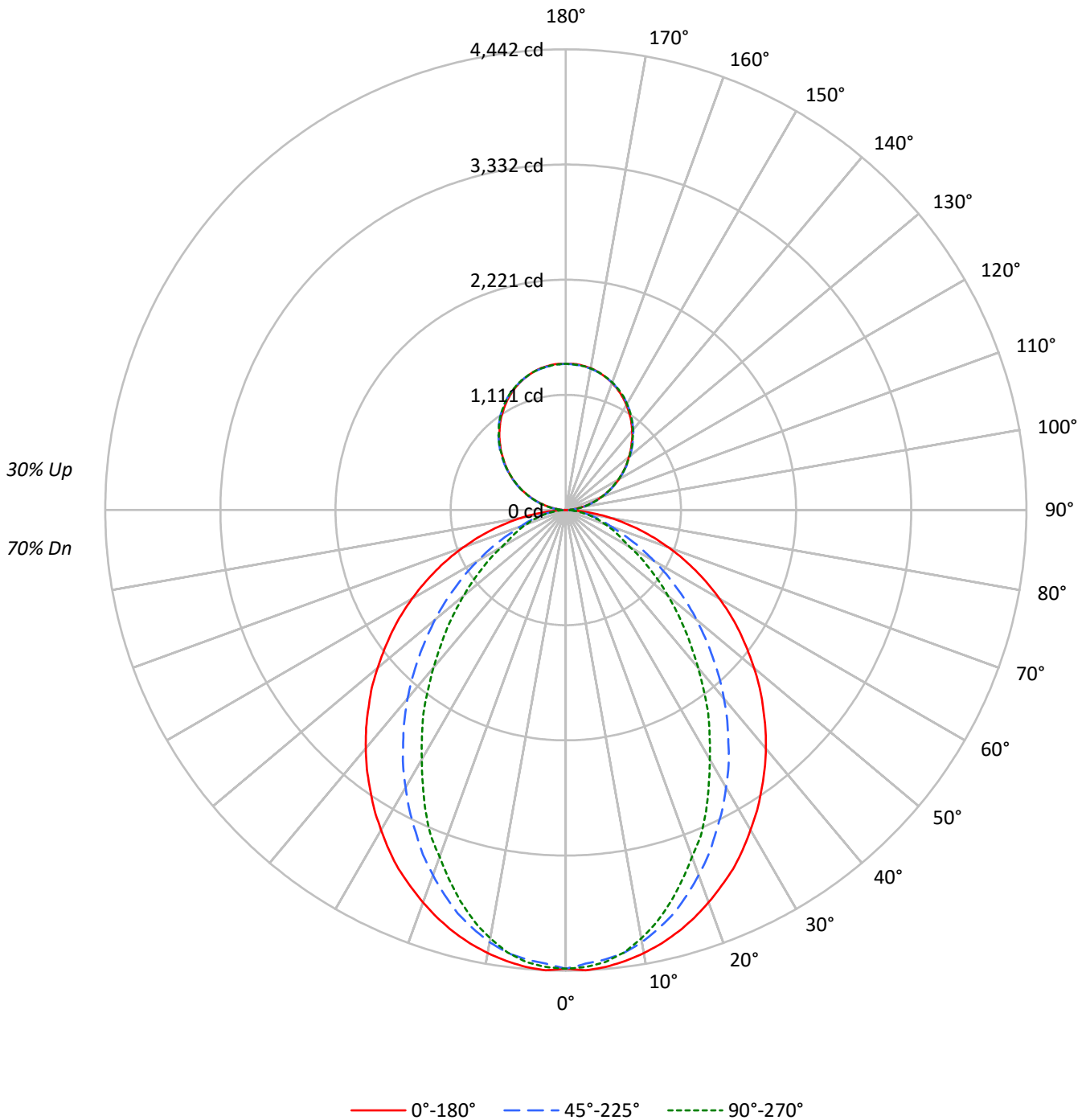
Test Method: LM-79-2019  
Report Number: P923932  
REPORT IS A COMBINATION OF REPORTS P900404 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D050US940-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13041.3 lumens  
Efficiency: N/A  
Efficacy: 79.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 163.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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	112	112	112	112	106	106	106	106	94	94	94	84	84	84	74	74	74	74	74	74	74
1	103	99	95	92	97	94	90	87	84	81	79	75	73	71	67	65	64	64	64	64	60
2	94	87	81	76	89	83	77	73	74	70	67	67	63	61	60	57	55	55	55	55	51
3	86	77	70	64	82	73	67	62	66	61	57	60	56	52	53	50	48	48	48	48	44
4	80	69	61	55	75	66	58	53	59	54	49	54	49	45	48	45	42	42	42	42	39
5	73	62	54	48	69	59	52	46	54	48	43	48	44	40	44	40	37	37	37	37	34
6	68	56	48	42	64	53	46	41	49	42	38	44	39	35	40	36	33	33	33	33	30
7	63	51	43	37	60	49	41	36	44	38	34	40	35	32	37	33	29	29	29	29	27
8	59	46	39	33	56	44	37	32	41	35	30	37	32	28	34	30	27	27	27	27	24
9	55	43	35	30	52	41	34	29	38	32	27	34	29	26	31	27	24	24	24	24	22
10	51	39	32	27	49	38	31	26	35	29	25	32	27	24	29	25	22	22	22	22	20

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

	0°	45°	90°
0°	3513	3513	3513
5°	3519	3458	3480
10°	3484	3390	3366
15°	3436	3278	3191
20°	3373	3123	2976
25°	3308	2950	2769
30°	3221	2773	2506
35°	3135	2582	2274
40°	3048	2384	2009
45°	2947	2165	1769
50°	2843	1944	1535
55°	2734	1707	1309
60°	2608	1460	1078
65°	2462	1209	970
70°	2286	975	877
75°	2065	859	798
80°	1745	721	692
85°	1216	481	519

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2947 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	414.5	3.2
10°-20°	1137.8	8.7
20°-30°	1597.5	12.2
30°-40°	1741.4	13.4
40°-50°	1600.5	12.3
50°-60°	1256.9	9.6
60°-70°	818.2	6.3
70°-80°	421.2	3.2
80°-90°	111.5	0.9
90°-100°	87.3	0.7
100°-110°	277.2	2.1
110°-120°	474.5	3.6
120°-130°	624.0	4.8
130°-140°	700.4	5.4
140°-150°	686.8	5.3
150°-160°	576.1	4.4
160°-170°	382.1	2.9
170°-180°	133.5	1.0
0°-30°	3149.8	24.2
0°-40°	4891.2	37.5
0°-60°	7748.6	59.4
0°-90°	9099.4	69.8
90°-120°	838.9	6.4
90°-150°	2850.1	21.9
90°-180°	3942.0	30.2
0°-180°	13041.3	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4422	4422	4422	4422	4422	
5°	4422	4403	4350	4386	4375	419
15°	4206	4162	4026	3950	3910	1185
25°	3818	3690	3426	3262	3202	1756
35°	3290	3086	2734	2482	2393	2059
45°	2690	2421	2001	1717	1621	2077
55°	2045	1733	1301	1061	985	1827
65°	1381	1056	696	560	548	1369
75°	736	456	320	292	288	779
85°	172	88	76	76	76	197
90°	1	15	42	39	40	13
95°	62	74	76	76	74	69
105°	256	259	262	264	264	270
115°	476	483	481	480	476	471
125°	692	703	700	696	695	619
135°	896	909	911	910	907	692
145°	1087	1096	1103	1104	1099	679
155°	1243	1247	1251	1257	1253	572
165°	1353	1351	1351	1360	1354	382
175°	1408	1404	1402	1410	1403	134
180°	1410	1410	1410	1410	1410	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	4422.5	4422.5	4422.5	4422.5	4422.5
2.5°	4442.5	4422.5	4378.4	4418.7	4410.6
5°	4422.5	4402.6	4350.3	4386.4	4374.6
7.5°	4386.4	4362.6	4306.6	4322.3	4302.3
10°	4338.4	4310.4	4230.5	4218.2	4194.5
12.5°	4278.5	4242.5	4134.1	4110.4	4066.3
15°	4206.4	4162.2	4026.3	3950.3	3910.4
17.5°	4122.3	4058.2	3890.0	3802.2	3738.0
20°	4026.3	3946.1	3746.1	3646.3	3557.9
22.5°	3922.3	3830.2	3597.9	3462.0	3402.1
25°	3818.3	3690.0	3425.9	3262.0	3201.7
27.5°	3694.3	3557.9	3265.8	3077.7	2985.5
30°	3562.2	3409.8	3089.6	2885.8	2777.5
32.5°	3434.0	3249.7	2921.9	2681.6	2581.3
35°	3290.1	3085.8	2733.7	2481.5	2393.2
37.5°	3149.9	2929.5	2557.5	2281.1	2181.3
40°	3001.7	2761.8	2373.3	2089.2	1985.1
42.5°	2849.6	2593.6	2189.4	1893.0	1793.2
45°	2689.6	2421.3	2001.3	1716.8	1620.8
47.5°	2537.5	2253.5	1821.2	1536.8	1448.9
50°	2369.5	2085.4	1645.0	1368.6	1285.0
52.5°	2205.1	1904.9	1476.9	1212.7	1136.8
55°	2045.0	1732.9	1300.6	1060.7	984.7
57.5°	1881.1	1560.9	1144.8	920.6	856.5
60°	1713.0	1392.8	980.4	776.7	712.6
62.5°	1549.1	1228.9	840.3	648.5	616.5
65°	1380.9	1056.5	696.4	560.5	548.2
67.5°	1220.8	896.3	560.5	492.1	480.3
70°	1052.7	740.6	464.1	424.2	408.0
72.5°	892.6	596.2	388.1	356.2	348.2
75°	736.3	456.0	320.2	292.1	288.3
77.5°	580.5	324.0	252.3	236.1	228.0
80°	436.1	232.3	191.9	176.2	176.2
82.5°	304.1	156.2	132.1	123.9	123.9
85°	172.0	87.9	76.0	76.0	76.0
87.5°	64.1	31.8	31.8	28.0	28.0
90°	1.2	15.3	41.6	39.1	40.4
92.5°	26.4	35.7	37.0	38.3	38.3
95°	62.1	74.0	76.1	76.1	74.0
97.5°	103.3	114.3	119.0	119.0	119.0
100°	150.9	160.7	164.1	164.1	162.8
102.5°	201.1	208.3	212.9	214.3	212.9
105°	255.9	259.3	261.9	263.9	263.9
107.5°	310.3	315.4	315.4	316.3	310.3
110°	363.0	369.9	369.9	369.9	366.4



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	420.0	427.2	426.0	422.6	420.0
115°	476.1	483.0	480.8	479.6	476.1
117.5°	531.8	541.2	535.2	531.8	528.4
120°	587.9	597.3	587.9	587.9	584.1
122.5°	638.9	650.9	644.9	641.5	638.9
125°	692.5	703.1	699.7	695.9	694.6
127.5°	744.8	758.0	753.3	748.1	744.8
130°	793.7	809.0	806.8	804.3	799.6
132.5°	848.6	860.4	861.3	855.3	851.9
135°	895.7	908.8	911.4	910.2	906.8
137.5°	948.4	959.0	961.2	960.3	955.2
140°	994.7	1005.4	1011.3	1011.3	1006.7
142.5°	1042.3	1053.0	1056.4	1057.7	1053.0
145°	1087.4	1095.9	1102.7	1104.0	1099.3
147.5°	1127.8	1138.4	1143.5	1145.7	1140.9
150°	1169.5	1176.7	1181.3	1185.2	1181.3
152.5°	1206.5	1213.7	1219.6	1224.3	1219.6
155°	1243.4	1246.8	1250.6	1256.6	1252.8
157.5°	1275.3	1277.8	1280.0	1288.5	1282.5
160°	1303.8	1306.4	1307.6	1314.8	1309.7
162.5°	1330.2	1330.2	1331.4	1339.5	1333.6
165°	1352.7	1351.4	1351.4	1359.9	1354.0
167.5°	1373.1	1369.2	1369.2	1377.8	1371.8
170°	1388.4	1385.0	1383.8	1392.2	1385.0
172.5°	1399.0	1395.6	1394.4	1402.8	1395.6
175°	1407.6	1404.1	1401.6	1410.1	1402.8
177.5°	1412.2	1408.8	1406.2	1413.5	1406.2
180°	1410.1	1410.1	1410.1	1410.1	1410.1



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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	13.18	14.20	13.96	15.00	15.96	9.16	10.18	9.93	10.97	11.93
	3H	14.87	15.79	15.66	16.59	17.58	10.36	11.27	11.15	12.08	13.07
	4H	15.49	16.35	16.30	17.16	18.16	10.82	11.68	11.62	12.49	13.49
	6H	15.92	16.72	16.74	17.53	18.55	11.15	11.95	11.97	12.76	13.78
	8H	16.05	16.81	16.88	17.65	18.66	11.25	12.00	12.07	12.84	13.86
	12H	16.12	16.84	16.95	17.67	18.71	11.30	12.02	12.13	12.85	13.89
4H	2H	13.22	14.09	14.03	14.89	15.90	9.77	10.64	10.58	11.45	12.45
	3H	15.07	15.79	15.89	16.63	17.65	11.14	11.86	11.96	12.70	13.72
	4H	15.77	16.42	16.60	17.26	18.31	11.70	12.35	12.53	13.19	14.24
	6H	16.29	16.86	17.15	17.72	18.77	12.13	12.69	12.98	13.56	14.61
	8H	16.47	17.00	17.33	17.86	18.92	12.26	12.79	13.12	13.65	14.71
	12H	16.58	17.05	17.45	17.93	19.00	12.34	12.81	13.21	13.69	14.76
8H	4H	15.75	16.28	16.61	17.14	18.20	11.99	12.52	12.85	13.38	14.44
	6H	16.32	16.76	17.21	17.66	18.72	12.52	12.95	13.40	13.86	14.92
	8H	16.54	16.93	17.43	17.82	18.90	12.71	13.10	13.60	13.99	15.07
	12H	16.69	17.03	17.58	17.92	19.05	12.84	13.18	13.73	14.07	15.20
12H	4H	15.71	16.18	16.59	17.06	18.13	12.01	12.48	12.88	13.36	14.43
	6H	16.30	16.68	17.19	17.58	18.66	12.57	12.95	13.46	13.85	14.93
	8H	16.53	16.87	17.42	17.76	18.89	12.79	13.13	13.68	14.02	15.15