

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: P910020

Luminaire Tested: DFN2DIP-TR4F0-040D090US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

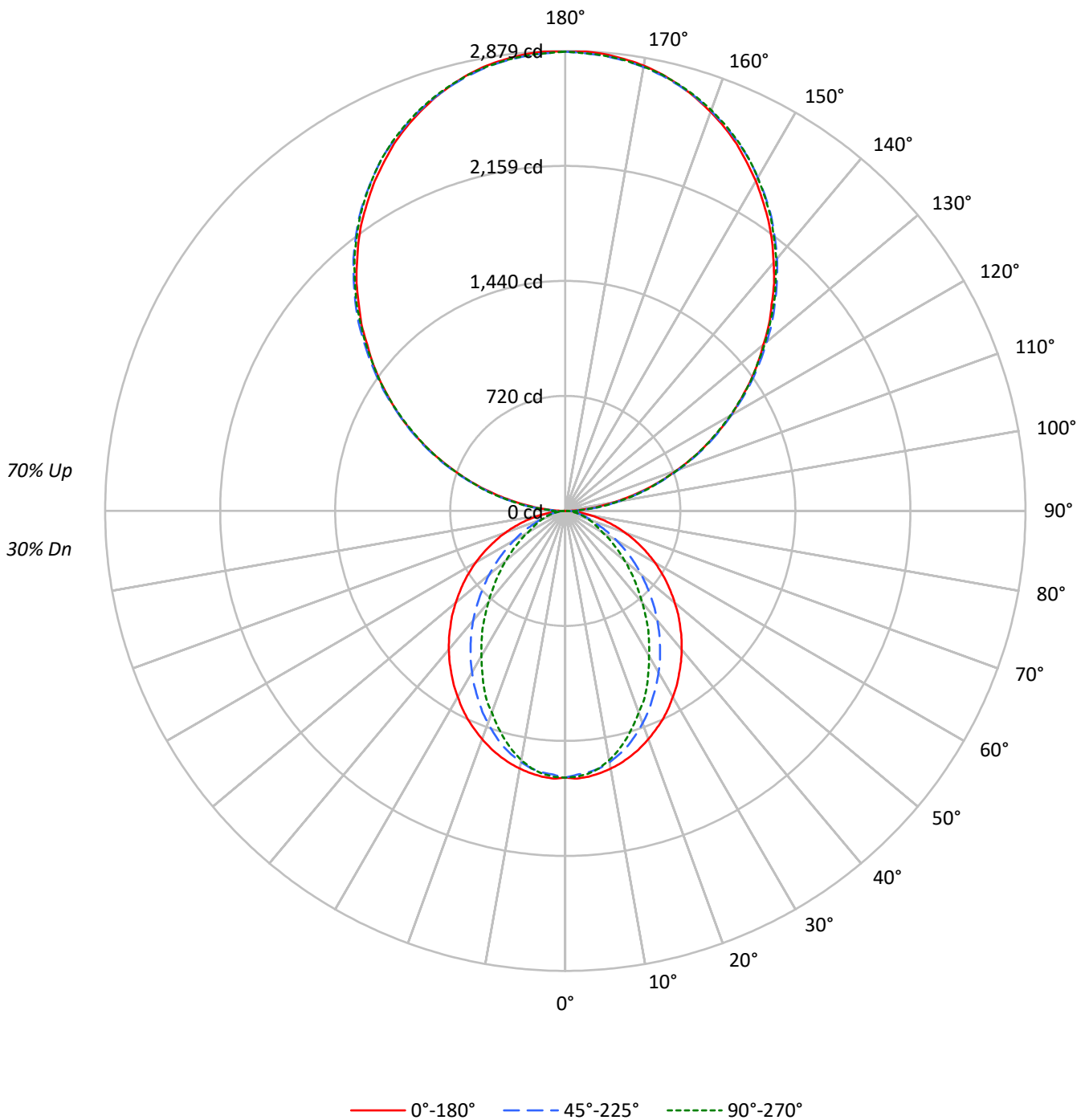
Test Method: LM-79-2019  
Report Number: P910020  
REPORT IS A COMBINATION OF REPORTS P900460 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D090US840-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11477.1 lumens  
Efficiency: N/A  
Efficacy: 115.2 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-Indirect  
  
Input Watts (W): 99.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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	102	102	102	102	92	92	92	92	72	72	72	54	54	54	38	38	38	38	38	38	38	30
1	94	89	86	83	84	80	77	75	64	62	60	48	47	46	34	33	32	34	33	32	26	
2	85	78	73	68	76	71	66	62	56	53	50	43	40	38	30	29	28	30	29	28	22	
3	78	69	62	57	70	62	57	52	50	46	42	38	35	33	27	25	24	27	25	24	19	
4	71	61	54	48	64	55	49	44	44	40	36	34	31	28	24	22	21	24	22	21	17	
5	66	55	47	41	59	49	43	38	40	35	31	30	27	25	22	20	18	22	20	18	15	
6	60	49	41	36	54	44	38	33	36	31	27	28	24	22	20	18	16	20	18	16	13	
7	56	44	37	31	50	40	33	29	32	27	24	25	22	19	18	16	14	18	16	14	12	
8	52	40	33	28	46	36	30	25	29	25	21	23	20	17	17	15	13	17	15	13	10	
9	48	36	29	25	43	33	27	23	27	22	19	21	18	15	16	13	12	16	13	12	10	
10	45	33	27	22	40	30	24	20	25	20	17	19	16	14	14	12	11	14	12	11	9	

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

	0°	45°	90°
0°	1326	1326	1326
5°	1328	1305	1314
10°	1315	1280	1271
15°	1297	1237	1205
20°	1273	1179	1124
25°	1249	1114	1045
30°	1216	1047	946
35°	1184	975	859
40°	1151	900	759
45°	1113	817	668
50°	1073	734	579
55°	1032	645	494
60°	984	551	407
65°	930	456	366
70°	863	368	331
75°	779	324	301
80°	659	272	261
85°	459	182	196

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 2240 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	156.5	1.4
10°-20°	429.5	3.7
20°-30°	603.0	5.3
30°-40°	657.4	5.7
40°-50°	604.2	5.3
50°-60°	474.5	4.1
60°-70°	308.9	2.7
70°-80°	159.0	1.4
80°-90°	48.8	0.4
90°-100°	177.9	1.5
100°-110°	565.2	4.9
110°-120°	967.2	8.4
120°-130°	1272.0	11.1
130°-140°	1427.7	12.4
140°-150°	1400.0	12.2
150°-160°	1174.4	10.2
160°-170°	778.9	6.8
170°-180°	272.2	2.4
0°-30°	1189.0	10.4
0°-40°	1846.4	16.1
0°-60°	2925.1	25.5
0°-90°	3441.7	30.0
90°-120°	1710.2	14.9
90°-150°	5809.9	50.6
90°-180°	8035.0	70.0
0°-180°	11477.1	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	1670	1670	1670	1670	1670	
5°	1670	1662	1642	1656	1651	158
15°	1588	1571	1520	1491	1476	447
25°	1441	1393	1293	1231	1209	663
35°	1242	1165	1032	937	903	777
45°	1015	914	756	648	612	784
55°	772	654	491	400	372	690
65°	521	399	263	212	207	517
75°	278	172	121	110	109	294
85°	65	33	29	29	29	75
90°	3	31	85	80	82	11
95°	126	151	155	155	151	141
105°	522	529	534	538	538	551
115°	971	984	980	978	971	960
125°	1412	1433	1426	1419	1416	1261
135°	1826	1853	1858	1855	1848	1411
145°	2217	2234	2248	2250	2241	1385
155°	2535	2542	2550	2562	2554	1167
165°	2757	2755	2755	2772	2760	778
175°	2869	2862	2857	2874	2860	273
180°	2874	2874	2874	2874	2874	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	1669.5	1669.5	1669.5	1669.5	1669.5
2.5°	1677.1	1669.5	1652.8	1668.1	1665.0
5°	1669.5	1661.9	1642.2	1655.9	1651.4
7.5°	1655.9	1646.9	1625.8	1631.6	1624.2
10°	1637.8	1627.2	1597.0	1592.4	1583.5
12.5°	1615.2	1601.5	1560.6	1551.7	1535.0
15°	1587.9	1571.2	1519.9	1491.3	1476.2
17.5°	1556.2	1532.0	1468.4	1435.3	1411.1
20°	1519.9	1489.7	1414.1	1376.4	1343.1
22.5°	1480.7	1445.9	1358.2	1306.9	1284.3
25°	1441.4	1393.0	1293.2	1231.4	1208.6
27.5°	1394.6	1343.1	1232.8	1161.9	1127.0
30°	1344.7	1287.2	1166.3	1089.3	1048.5
32.5°	1296.4	1226.8	1103.0	1012.3	974.4
35°	1242.0	1164.9	1032.0	936.8	903.4
37.5°	1189.1	1105.9	965.4	861.1	823.4
40°	1133.2	1042.6	896.0	788.7	749.4
42.5°	1075.7	979.1	826.5	714.6	676.9
45°	1015.3	914.0	755.5	648.1	611.9
47.5°	958.0	850.7	687.5	580.2	546.9
50°	894.4	787.2	621.0	516.6	485.0
52.5°	832.4	719.1	557.5	457.8	429.1
55°	772.0	654.2	491.0	400.4	371.7
57.5°	710.1	589.3	432.1	347.5	323.4
60°	646.6	525.7	370.1	293.2	269.0
62.5°	584.8	463.9	317.2	244.8	232.8
65°	521.3	398.8	262.9	211.6	206.9
67.5°	460.9	338.4	211.6	185.8	181.3
70°	397.4	279.5	175.2	160.2	154.0
72.5°	337.0	225.1	146.5	134.5	131.5
75°	277.9	172.2	120.9	110.3	108.9
77.5°	219.1	122.3	95.2	89.2	86.0
80°	164.6	87.7	72.4	66.6	66.6
82.5°	114.8	59.0	49.9	46.8	46.8
85°	64.9	33.2	28.7	28.7	28.7
87.5°	24.2	12.0	12.0	10.6	10.6
90°	2.6	31.2	84.9	79.7	82.3
92.5°	53.7	72.8	75.4	78.0	78.0
95°	126.5	150.8	155.1	155.1	150.8
97.5°	210.6	233.1	242.7	242.7	242.7
100°	307.6	327.6	334.5	334.5	331.9
102.5°	409.9	424.6	434.1	436.8	434.1
105°	521.7	528.6	533.8	538.2	538.2
107.5°	632.6	643.0	643.0	644.7	632.6
110°	740.0	754.0	754.0	754.0	747.0



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	856.2	870.9	868.3	861.4	856.2
115°	970.6	984.4	980.1	977.5	970.6
117.5°	1084.1	1103.2	1091.1	1084.1	1077.1
120°	1198.5	1217.5	1198.5	1198.5	1190.6
122.5°	1302.4	1326.8	1314.6	1307.7	1302.4
125°	1411.7	1433.3	1426.4	1418.6	1416.0
127.5°	1518.2	1545.1	1535.6	1525.2	1518.2
130°	1617.9	1649.1	1644.8	1639.5	1630.0
132.5°	1729.7	1753.9	1755.7	1743.5	1736.7
135°	1825.8	1852.7	1858.0	1855.3	1848.5
137.5°	1933.3	1955.0	1959.3	1957.6	1947.2
140°	2027.8	2049.4	2061.5	2061.5	2052.0
142.5°	2124.9	2146.5	2153.4	2156.1	2146.5
145°	2216.8	2234.0	2247.9	2250.5	2241.0
147.5°	2299.1	2320.7	2331.1	2335.4	2325.9
150°	2384.0	2398.7	2408.2	2416.0	2408.2
152.5°	2459.3	2474.1	2486.2	2495.8	2486.2
155°	2534.8	2541.6	2549.5	2561.6	2553.8
157.5°	2599.7	2604.9	2609.3	2626.6	2614.4
160°	2657.8	2663.0	2665.6	2680.3	2669.9
162.5°	2711.5	2711.5	2714.1	2730.6	2718.5
165°	2757.4	2754.8	2754.8	2772.2	2760.1
167.5°	2799.0	2791.3	2791.3	2808.5	2796.4
170°	2830.2	2823.3	2820.8	2838.0	2823.3
172.5°	2851.9	2845.0	2842.4	2859.7	2845.0
175°	2869.2	2862.3	2857.1	2874.5	2859.7
177.5°	2878.7	2871.9	2866.6	2881.3	2866.6
180°	2874.5	2874.5	2874.5	2874.5	2874.5



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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	5.89	6.58	7.00	7.68	9.22	1.86	2.55	2.98	3.66	5.19
	3H	7.55	8.17	8.68	9.29	10.83	3.04	3.65	4.16	4.77	6.32
	4H	8.15	8.74	9.29	9.86	11.41	3.48	4.07	4.62	5.19	6.74
	6H	8.57	9.11	9.71	10.23	11.79	3.80	4.34	4.94	5.46	7.02
	8H	8.69	9.20	9.84	10.34	11.90	3.88	4.40	5.03	5.53	7.09
	12H	8.75	9.23	9.90	10.36	11.94	3.92	4.41	5.07	5.54	7.12
4H	2H	5.89	6.47	7.03	7.59	9.14	2.44	3.02	3.58	4.14	5.69
	3H	7.70	8.19	8.85	9.33	10.90	3.78	4.26	4.92	5.41	6.97
	4H	8.39	8.84	9.54	9.97	11.56	4.32	4.77	5.47	5.90	7.49
	6H	8.90	9.28	10.05	10.43	12.01	4.73	5.12	5.89	6.27	7.85
	8H	9.07	9.43	10.22	10.57	12.17	4.86	5.22	6.01	6.36	7.96
	12H	9.16	9.48	10.33	10.64	12.24	4.92	5.24	6.09	6.40	8.00
8H	4H	8.35	8.70	9.50	9.85	11.44	4.59	4.95	5.74	6.09	7.69
	6H	8.91	9.20	10.08	10.39	11.98	5.10	5.40	6.28	6.59	8.18
	8H	9.12	9.38	10.30	10.55	12.16	5.29	5.55	6.48	6.72	8.33
	12H	9.26	9.48	10.44	10.65	12.29	5.41	5.63	6.59	6.80	8.44
12H	4H	8.29	8.62	9.46	9.77	11.37	4.59	4.91	5.76	6.07	7.67
	6H	8.88	9.14	10.06	10.31	11.92	5.15	5.41	6.33	6.58	8.19
	8H	9.10	9.32	10.28	10.49	12.13	5.36	5.58	6.54	6.75	8.39