

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: P924656

Luminaire Tested: DFN2DIP-HX4F0-120D050US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

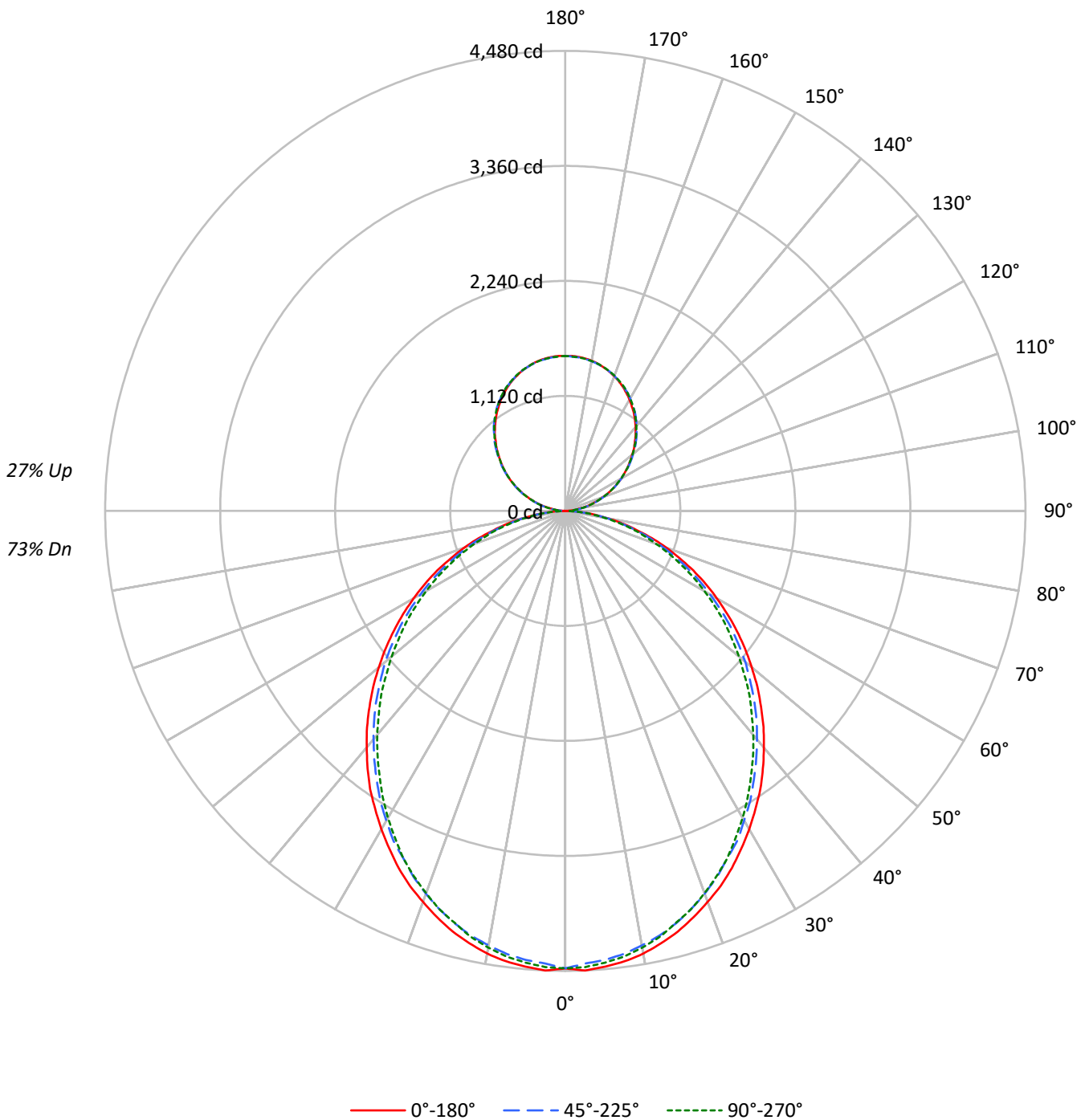
Test Method: LM-79-2019  
Report Number: P924656  
REPORT IS A COMBINATION OF REPORTS P899333 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-120D050US950-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15555.0 lumens  
Efficiency: N/A  
Efficacy: 100.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 154.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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	113	113	113	113	107	107	107	107	96	96	96	86	86	86	77	77	77	77	77	77	73
1	103	98	94	91	97	94	90	87	84	82	79	76	74	72	68	67	65	65	65	65	61
2	94	86	80	74	89	82	76	71	74	69	66	67	63	60	60	57	55	55	55	55	51
3	86	76	68	62	81	72	65	60	65	60	55	59	55	51	53	50	47	47	47	47	44
4	78	67	59	53	74	64	57	51	58	52	47	53	48	44	48	44	40	40	40	40	37
5	72	60	51	45	68	57	50	44	52	46	41	47	42	38	43	39	35	35	35	35	33
6	67	54	45	39	63	52	44	38	47	41	36	43	38	33	39	35	31	31	31	31	29
7	62	49	41	35	58	47	39	34	43	36	32	39	34	30	36	31	28	28	28	28	25
8	57	45	36	31	54	43	35	30	39	33	28	36	30	27	33	28	25	25	25	25	23
9	53	41	33	28	51	39	32	27	36	30	25	33	28	24	30	26	22	22	22	22	20
10	50	38	30	25	48	36	29	24	33	27	23	31	25	22	28	24	20	20	20	20	19

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

	0°	45°	90°
0°	3312	3312	3312
5°	3318	3266	3288
10°	3291	3223	3244
15°	3243	3170	3174
20°	3178	3097	3103
25°	3113	3009	3021
30°	3032	2927	2917
35°	2955	2831	2806
40°	2860	2733	2701
45°	2766	2636	2593
50°	2662	2533	2469
55°	2554	2415	2354
60°	2432	2274	2223
65°	2299	2129	2068
70°	2129	1951	1902
75°	1894	1739	1748
80°	1611	1468	1454
85°	1169	1000	967

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2766 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	419.3	2.7
10°-20°	1179.6	7.6
20°-30°	1733.6	11.1
30°-40°	2013.5	12.9
40°-50°	2011.0	12.9
50°-60°	1753.5	11.3
60°-70°	1296.2	8.3
70°-80°	733.4	4.7
80°-90°	197.9	1.3
90°-100°	93.4	0.6
100°-110°	296.6	1.9
110°-120°	507.6	3.3
120°-130°	667.5	4.3
130°-140°	749.3	4.8
140°-150°	734.8	4.7
150°-160°	616.4	4.0
160°-170°	408.8	2.6
170°-180°	142.9	0.9
0°-30°	3332.5	21.4
0°-40°	5345.9	34.4
0°-60°	9110.4	58.6
0°-90°	11337.8	72.9
90°-120°	897.5	5.8
90°-150°	3049.2	19.6
90°-180°	4217.0	27.1
0°-180°	15555.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4454	4454	4454	4454	4454	
5°	4454	4438	4390	4424	4416	423
15°	4240	4215	4159	4176	4155	1194
25°	3838	3804	3731	3739	3731	1766
35°	3311	3268	3200	3174	3152	2068
45°	2694	2664	2600	2553	2536	2079
55°	2039	2013	1962	1910	1889	1823
65°	1375	1349	1306	1268	1247	1360
75°	719	711	689	664	673	768
85°	175	171	167	154	150	196
90°	1	16	45	42	43	15
95°	66	79	81	81	79	74
105°	274	277	280	282	282	289
115°	509	517	514	513	509	504
125°	741	752	749	744	743	662
135°	958	972	975	974	970	741
145°	1163	1172	1180	1181	1176	727
155°	1330	1334	1338	1344	1340	612
165°	1447	1446	1446	1455	1449	408
175°	1506	1502	1500	1509	1501	143
180°	1509	1509	1509	1509	1509	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	4454.5	4454.5	4454.5	4454.5	4454.5
2.5°	4480.4	4459.0	4411.8	4454.5	4446.3
5°	4454.5	4437.6	4390.4	4424.5	4416.3
7.5°	4424.5	4399.0	4351.8	4386.3	4377.7
10°	4377.7	4347.7	4296.3	4330.4	4317.7
12.5°	4313.1	4287.7	4236.3	4257.7	4249.0
15°	4240.4	4215.0	4159.1	4176.3	4155.0
17.5°	4150.5	4125.0	4069.1	4090.5	4069.1
20°	4051.8	4026.4	3966.4	3979.1	3962.3
22.5°	3953.7	3915.0	3859.1	3859.1	3850.5
25°	3837.8	3803.7	3731.0	3739.2	3731.0
27.5°	3709.2	3679.2	3623.8	3611.0	3589.7
30°	3581.0	3546.5	3482.4	3469.7	3452.4
32.5°	3443.7	3418.4	3349.7	3323.8	3306.6
35°	3311.0	3268.4	3199.7	3173.9	3152.5
37.5°	3161.1	3122.5	3053.8	3023.9	3002.5
40°	3007.1	2972.6	2903.9	2865.7	2848.5
42.5°	2857.1	2822.6	2754.4	2711.3	2685.8
45°	2694.4	2664.4	2599.8	2553.1	2535.8
47.5°	2535.8	2505.8	2437.2	2390.0	2364.5
50°	2368.6	2347.2	2287.2	2227.2	2205.8
52.5°	2205.8	2175.9	2120.5	2073.1	2043.2
55°	2039.1	2013.2	1961.8	1910.5	1889.1
57.5°	1871.8	1850.5	1794.6	1743.2	1726.0
60°	1704.6	1687.8	1627.8	1580.6	1567.8
62.5°	1542.0	1511.9	1469.3	1426.5	1409.2
65°	1375.2	1349.2	1306.5	1267.9	1246.6
67.5°	1203.9	1182.0	1143.8	1113.9	1096.6
70°	1045.2	1027.9	989.3	959.3	942.6
72.5°	882.5	865.3	843.9	814.0	801.2
75°	719.4	711.2	689.4	664.0	672.6
77.5°	573.9	556.7	548.1	535.3	522.6
80°	428.5	424.0	415.4	402.7	394.0
82.5°	291.3	291.3	287.2	270.0	270.0
85°	175.4	171.3	167.2	154.1	150.0
87.5°	77.3	68.6	60.0	47.2	42.7
90°	1.3	16.4	44.6	41.9	43.2
92.5°	28.2	38.2	39.6	40.9	40.9
95°	66.4	79.2	81.4	81.4	79.2
97.5°	110.5	122.3	127.4	127.4	127.4
100°	161.4	171.9	175.5	175.5	174.2
102.5°	215.1	222.9	227.8	229.2	227.8
105°	273.8	277.4	280.2	282.4	282.4
107.5°	332.0	337.4	337.4	338.4	332.0
110°	388.4	395.7	395.7	395.7	392.0



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	449.3	457.1	455.7	452.1	449.3
115°	509.3	516.7	514.4	513.1	509.3
117.5°	569.0	579.0	572.6	569.0	565.3
120°	629.0	639.0	629.0	629.0	624.9
122.5°	683.5	696.3	689.9	686.3	683.5
125°	740.9	752.2	748.6	744.5	743.2
127.5°	796.8	810.9	805.9	800.4	796.8
130°	849.2	865.5	863.2	860.5	855.5
132.5°	907.8	920.5	921.5	915.1	911.5
135°	958.3	972.3	975.1	973.7	970.1
137.5°	1014.7	1026.0	1028.3	1027.4	1021.9
140°	1064.2	1075.6	1081.9	1081.9	1077.0
142.5°	1115.1	1126.6	1130.2	1131.5	1126.6
145°	1163.4	1172.5	1179.7	1181.1	1176.1
147.5°	1206.6	1218.0	1223.4	1225.7	1220.6
150°	1251.2	1258.9	1263.9	1268.0	1263.9
152.5°	1290.8	1298.5	1304.8	1309.8	1304.8
155°	1330.3	1333.9	1338.0	1344.4	1340.3
157.5°	1364.4	1367.1	1369.4	1378.5	1372.1
160°	1394.8	1397.6	1398.9	1406.7	1401.2
162.5°	1423.1	1423.1	1424.4	1433.1	1426.7
165°	1447.2	1445.8	1445.8	1454.9	1448.6
167.5°	1469.0	1464.9	1464.9	1474.0	1467.6
170°	1485.4	1481.8	1480.4	1489.5	1481.8
172.5°	1496.7	1493.1	1491.8	1500.8	1493.1
175°	1505.9	1502.2	1499.5	1508.6	1500.8
177.5°	1510.8	1507.2	1504.5	1512.2	1504.5
180°	1508.6	1508.6	1508.6	1508.6	1508.6



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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	13.32	14.43	14.05	15.19	16.09	12.89	14.00	13.62	14.76	15.66
	3H	15.00	16.00	15.75	16.76	17.70	14.53	15.53	15.27	16.29	17.22
	4H	15.60	16.54	16.36	17.32	18.26	15.13	16.07	15.89	16.84	17.79
	6H	16.01	16.89	16.79	17.67	18.63	15.54	16.41	16.31	17.19	18.15
	8H	16.13	16.96	16.91	17.76	18.72	15.65	16.48	16.44	17.28	18.24
	12H	16.18	16.98	16.98	17.77	18.76	15.70	16.49	16.49	17.29	18.28
4H	2H	13.81	14.76	14.58	15.53	16.48	13.47	14.41	14.24	15.19	16.13
	3H	15.70	16.49	16.48	17.30	18.26	15.31	16.10	16.09	16.91	17.87
	4H	16.43	17.15	17.22	17.95	18.94	16.02	16.74	16.82	17.55	18.54
	6H	16.96	17.58	17.77	18.41	19.41	16.55	17.17	17.36	18.00	19.00
	8H	17.11	17.70	17.93	18.52	19.53	16.70	17.28	17.52	18.11	19.12
	12H	17.20	17.72	18.04	18.57	19.59	16.78	17.30	17.61	18.15	19.16
8H	4H	16.65	17.23	17.46	18.05	19.06	16.28	16.87	17.10	17.69	18.70
	6H	17.29	17.77	18.13	18.64	19.65	16.93	17.41	17.77	18.28	19.29
	8H	17.51	17.94	18.37	18.81	19.83	17.14	17.57	18.00	18.44	19.46
	12H	17.66	18.03	18.51	18.89	19.97	17.27	17.65	18.13	18.51	19.59
12H	4H	16.64	17.17	17.48	18.02	19.03	16.29	16.81	17.13	17.66	18.68
	6H	17.32	17.75	18.18	18.62	19.64	16.97	17.40	17.82	18.26	19.29
	8H	17.58	17.95	18.43	18.81	19.89	17.22	17.60	18.08	18.45	19.53