

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: P646642

Luminaire Tested: S123DR-S560D840-X4F0-XX-UDD-G-W

Issue Date: 3/20/2023

Test Information

Test Method: LM-79-2019
Report Number: P646642
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2301-905-1)
Test Lab: INNOVATION CENTER
Issue Date: 3/20/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: S123DR-S560D840-X4F0-XX-UDD-G-W
Description: DEFINE 3 DIRECT RECESSED WITH WALL GRAZE FLUSH OPTIC
STANDARD LIGHT ENGINE
Light Source: 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 2510.7 lumens
Efficiency: N/A
Efficacy: 135.0 lumens/watt
Spacing Criteria (0/90/45): 0.65 / 1.19 / 0.89
Luminous Opening: Rectangular (W 4' x L: 0.22' x H: 0')
CIE Type: Direct

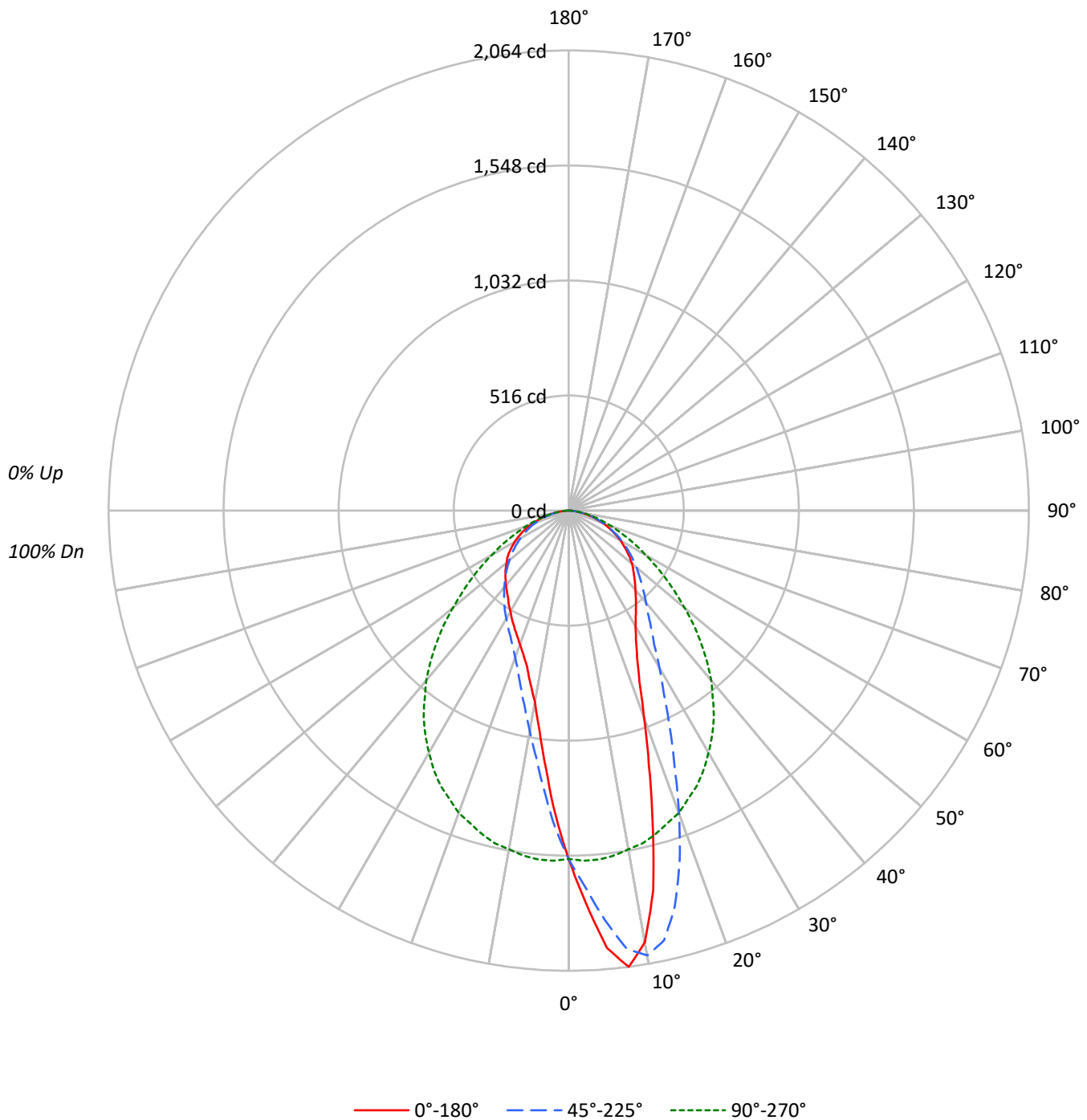
Input Watts (W): 18.6
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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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
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100		
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86		
2	101	94	88	82	99	92	86	82	88	84	80	85	81	78	82	79	76	74		
3	93	84	76	70	91	82	75	70	79	73	69	77	72	67	74	70	66	64		
4	86	75	67	61	84	74	67	61	72	65	60	69	64	59	67	62	58	56		
5	80	68	60	54	78	67	59	54	65	58	53	63	57	52	61	56	52	50		
6	74	62	54	48	73	61	53	48	60	53	47	58	52	47	56	51	47	45		
7	70	57	49	43	68	56	49	43	55	48	43	53	47	43	52	47	42	40		
8	65	53	45	39	64	52	44	39	51	44	39	49	43	39	48	43	39	37		
9	61	49	41	36	60	48	41	36	47	40	36	46	40	36	45	40	35	34		
10	58	45	38	33	57	45	38	33	44	37	33	43	37	33	42	37	33	31		

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°	135°	180°
0°	18828	18828	18828	18828	18828
5°	23812	22268	18997	15234	14068
10°	24042	24788	18870	12305	10664
15°	18109	22939	18741	10311	9018
20°	12617	18549	18503	8991	8191
25°	9621	14229	18094	8243	7683
30°	8323	11309	17443	7789	7274
35°	7722	9471	16692	7424	6985
40°	7311	8475	15636	7083	6889
45°	7068	7871	14297	6784	6845
50°	6945	7434	12709	6525	6810
55°	6687	7023	11151	6292	6840
60°	6449	6639	9610	6063	6728
65°	6059	6224	8291	5810	6595
70°	5594	5774	7049	5492	6207
75°	5065	5233	6043	5028	5670
80°	4177	4476	4781	4378	4781
85°	3304	3608	3512	3816	3816

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 80°

Vertical Angle: 45°

Luminance: 16323 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	147.7	5.9
10°-20°	367.6	14.6
20°-30°	435.1	17.3
30°-40°	437.3	17.4
40°-50°	401.0	16.0
50°-60°	331.0	13.2
60°-70°	234.2	9.3
70°-80°	125.1	5.0
80°-90°	31.7	1.3
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	950.4	37.9
0°-40°	1387.7	55.3
0°-60°	2119.6	84.4
0°-90°	2510.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2510.7	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1563	1563	1563	1563	1563	
5°	1969	1841	1571	1260	1163	188
15°	1452	1839	1502	827	723	401
25°	724	1070	1361	620	578	342
35°	525	644	1135	505	475	330
45°	415	462	839	398	402	321
55°	318	334	531	300	326	285
65°	212	218	291	204	231	211
75°	109	112	130	108	122	114
85°	24	26	25	28	28	28
90°	0	0	0	0	0	

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CANDELA DISTRIBUTION (FULL):

	0°	10°	20°	22.5°	30°	40°	45°	50°	60°	67.5°	70°
0°	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6
2.5°	1761.3	1757.7	1739.5	1727.9	1730.8	1704.7	1688.8	1675.7	1667.0	1646.0	1635.1
5°	1968.7	1978.8	1967.2	1961.4	1931.7	1884.6	1841.1	1831.6	1791.0	1741.0	1723.6
7.5°	2064.4	2070.2	2062.9	2062.9	2053.5	2011.5	1981.0	1957.1	1887.5	1822.9	1793.2
10°	1965.0	1978.1	2006.4	2019.4	2038.3	2032.5	2026.0	2016.5	1969.4	1894.7	1860.6
12.5°	1746.8	1762.7	1819.3	1827.3	1891.8	1954.2	1974.5	1997.7	2002.0	1938.9	1902.0
15°	1451.7	1495.9	1547.4	1572.0	1654.0	1785.2	1838.9	1902.0	1976.7	1950.5	1921.5
17.5°	1195.7	1212.4	1267.5	1319.7	1401.6	1553.2	1652.5	1746.8	1907.0	1933.1	1915.0
20°	984.0	999.2	1071.7	1068.1	1176.9	1347.3	1446.6	1555.4	1791.7	1876.6	1873.0
22.5°	826.6	850.6	891.2	913.6	992.0	1143.5	1237.8	1373.4	1660.5	1794.6	1809.2
25°	723.7	741.1	765.7	785.3	846.2	970.9	1070.3	1181.9	1495.2	1687.3	1723.6
27.5°	653.3	660.6	685.2	696.8	737.4	844.8	921.6	1023.9	1342.2	1567.0	1617.7
30°	598.2	603.3	625.0	628.7	660.6	738.2	812.8	896.2	1192.8	1443.0	1501.0
32.5°	559.8	563.4	580.1	581.5	605.5	662.0	714.2	792.5	1051.4	1310.3	1382.1
35°	525.0	527.2	539.5	543.1	558.3	601.1	643.9	704.1	939.0	1190.6	1269.7
37.5°	494.5	497.4	504.7	509.0	521.4	555.4	584.4	634.5	831.0	1065.9	1153.7
40°	464.8	469.9	474.9	474.9	488.7	514.8	538.8	580.1	738.2	957.1	1034.7
42.5°	439.4	444.5	446.7	447.4	454.6	478.6	498.9	527.2	667.8	860.7	936.8
45°	414.8	416.9	419.1	420.6	425.6	446.7	461.9	488.7	601.1	771.5	845.5
47.5°	392.3	392.3	393.7	395.9	399.5	414.8	427.8	447.4	543.8	691.8	752.7
50°	370.5	370.5	368.4	369.8	372.0	383.6	396.6	412.6	490.2	618.5	672.9
52.5°	344.4	344.4	345.2	343.0	345.2	355.3	365.5	381.4	444.5	551.1	597.5
55°	318.3	321.2	319.0	317.6	320.5	327.0	334.3	348.1	401.7	497.4	534.4
57.5°	292.2	293.7	292.9	295.1	293.7	299.5	306.0	315.4	363.3	437.2	472.0
60°	267.6	267.6	266.1	267.6	267.6	270.5	275.5	285.0	324.1	385.8	414.8
62.5°	240.0	240.7	241.5	240.7	240.0	243.6	248.0	254.5	290.0	335.7	357.5
65°	212.5	213.2	215.4	214.6	213.9	217.5	218.3	225.5	252.3	291.5	307.4
67.5°	187.8	186.4	187.1	188.5	189.3	190.0	191.4	198.7	217.5	249.4	262.5
70°	158.8	160.2	159.5	161.7	160.2	162.4	163.9	169.0	187.1	208.1	216.8
72.5°	132.7	133.4	133.4	135.6	134.9	137.0	138.5	140.7	153.7	172.6	176.2
75°	108.8	108.8	110.2	110.9	110.9	110.9	112.4	113.8	124.7	136.3	139.9
77.5°	82.7	86.3	85.6	86.3	87.0	89.2	87.7	90.6	97.2	103.7	105.9
80°	60.2	60.2	60.9	61.6	63.1	64.5	64.5	67.4	70.3	74.0	76.1
82.5°	38.4	39.2	41.3	42.1	42.8	45.0	45.0	45.0	48.6	50.0	50.0
85°	23.9	22.5	23.9	24.7	25.4	26.1	26.1	27.6	28.3	29.0	29.0
87.5°	11.6	11.6	11.6	11.6	12.3	12.3	12.3	12.3	13.1	13.1	13.1
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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CANDELA DISTRIBUTION (continued):

	80°	90°	100°	110°	112.5°	120°	130°	135°	140°	150°	157.5°
0°	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6	1562.6
2.5°	1598.9	1572.0	1532.2	1499.5	1501.0	1471.2	1449.5	1421.2	1412.5	1403.8	1392.2
5°	1632.2	1570.6	1487.9	1421.9	1401.6	1352.3	1290.0	1259.5	1241.4	1209.5	1197.2
7.5°	1673.6	1560.4	1434.3	1331.3	1308.8	1226.9	1152.9	1116.7	1082.6	1060.1	1032.6
10°	1700.4	1542.3	1379.9	1243.6	1221.8	1128.3	1031.8	1005.7	962.9	935.4	909.3
12.5°	1720.7	1528.5	1324.1	1165.3	1129.7	1039.1	941.9	906.4	875.2	835.3	816.5
15°	1738.8	1502.4	1266.8	1083.3	1046.3	948.4	858.5	826.6	798.3	763.5	746.9
17.5°	1732.3	1470.5	1203.7	1010.8	973.8	877.4	791.1	754.8	736.0	705.5	693.9
20°	1724.3	1443.0	1144.2	941.9	901.3	811.4	727.3	701.2	682.3	662.8	652.6
22.5°	1698.9	1399.5	1084.0	878.8	840.4	750.5	678.7	657.0	642.4	628.7	620.0
25°	1656.2	1361.0	1025.3	815.7	785.3	701.2	640.3	620.0	610.5	596.8	588.8
27.5°	1603.2	1310.3	966.6	764.3	729.5	654.8	602.6	589.5	579.4	568.5	560.5
30°	1536.5	1253.7	909.3	714.2	682.3	616.3	571.4	559.8	550.4	539.5	530.1
32.5°	1451.7	1196.4	855.6	667.8	641.0	583.7	542.4	533.0	525.0	511.9	506.9
35°	1356.7	1134.8	802.7	623.6	598.2	548.2	514.1	504.7	496.7	485.8	481.5
37.5°	1260.2	1061.6	750.5	585.9	563.4	518.5	485.8	476.4	469.1	459.7	457.5
40°	1158.0	994.1	699.0	547.5	527.9	489.4	457.5	450.3	443.0	437.2	435.8
42.5°	1055.0	916.5	654.0	515.6	494.5	459.0	430.0	422.0	417.7	414.8	415.5
45°	957.9	839.0	607.6	478.6	464.1	431.4	404.6	398.1	394.5	392.3	395.2
47.5°	852.7	759.9	564.1	447.4	432.9	403.9	378.5	372.7	371.3	370.5	375.6
50°	759.9	678.0	517.0	415.5	403.2	373.4	353.1	348.1	346.6	348.8	356.0
52.5°	672.2	601.8	474.2	385.8	373.4	346.6	327.7	324.1	323.4	328.5	335.7
55°	585.2	530.8	427.8	353.1	340.8	317.6	303.1	299.5	298.7	308.9	315.4
57.5°	511.2	461.9	384.3	321.9	312.5	290.8	277.7	274.8	277.0	286.4	292.9
60°	438.7	398.8	344.4	288.6	281.3	262.5	252.3	251.6	253.8	264.7	271.2
62.5°	373.4	343.0	301.6	258.1	253.1	236.4	227.0	228.4	230.6	241.5	247.3
65°	317.6	290.8	259.6	227.7	221.2	209.6	203.0	203.8	208.1	217.5	223.3
67.5°	263.2	241.5	224.1	198.7	193.6	183.5	178.4	181.3	183.5	192.9	198.7
70°	217.5	200.1	187.1	168.2	164.6	155.9	152.3	155.9	158.1	166.1	173.3
72.5°	174.8	163.9	153.7	139.9	136.3	130.5	129.8	131.2	134.9	142.8	145.7
75°	135.6	129.8	121.1	112.4	110.2	107.3	106.6	108.0	111.7	116.0	118.9
77.5°	103.0	97.9	91.4	87.7	84.8	83.4	84.1	86.3	87.7	92.1	94.3
80°	74.7	68.9	67.4	62.4	61.6	60.9	62.4	63.1	65.3	68.2	69.6
82.5°	49.3	45.0	43.5	42.8	42.1	41.3	43.5	44.2	45.7	47.9	48.6
85°	26.8	25.4	25.4	24.7	25.4	26.8	26.8	27.6	27.6	28.3	27.6
87.5°	12.3	10.9	11.6	11.6	11.6	12.3	12.3	13.1	13.1	13.1	12.3
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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CANDELA DISTRIBUTION (continued):

	160°	170°	180°
0°	1562.6	1562.6	1562.6
2.5°	1391.5	1386.4	1366.1
5°	1186.3	1168.9	1163.1
7.5°	1029.7	1028.2	997.8
10°	897.0	899.1	871.6
12.5°	813.6	795.4	793.3
15°	742.5	725.8	722.9
17.5°	689.6	679.4	676.5
20°	649.7	643.9	638.8
22.5°	617.8	610.5	606.2
25°	585.9	579.4	577.9
27.5°	558.3	550.4	550.4
30°	530.1	525.0	522.8
32.5°	504.7	500.3	500.3
35°	480.0	477.8	474.9
37.5°	457.5	457.5	456.1
40°	435.8	438.0	438.0
42.5°	416.9	419.1	419.1
45°	396.6	400.3	401.7
47.5°	376.3	382.1	383.6
50°	358.2	362.6	363.3
52.5°	338.6	343.7	347.3
55°	318.3	323.4	325.6
57.5°	296.6	301.6	302.4
60°	272.6	277.7	279.2
62.5°	250.9	253.8	255.2
65°	224.1	228.4	231.3
67.5°	199.4	203.0	203.0
70°	172.6	174.0	176.2
72.5°	147.2	147.9	147.9
75°	119.6	121.1	121.8
77.5°	94.3	95.0	95.0
80°	69.6	68.9	68.9
82.5°	48.6	46.4	46.4
85°	27.6	26.8	27.6
87.5°	12.3	12.3	12.3
90°	0.0	0.0	0.0

(END OF REPORT)