

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P242472

Luminaire Tested: S123DRP-S560D840-X4F0-XX-UDD-A-W

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2024  
Report Number: P242472  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1802-639-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: S123DRP-S560D840-X4F0-XX-UDD-A-W  
Description: DEFINE 3 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER  
STANDARD LIGHT ENGINE  
Light Source: (92) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: -

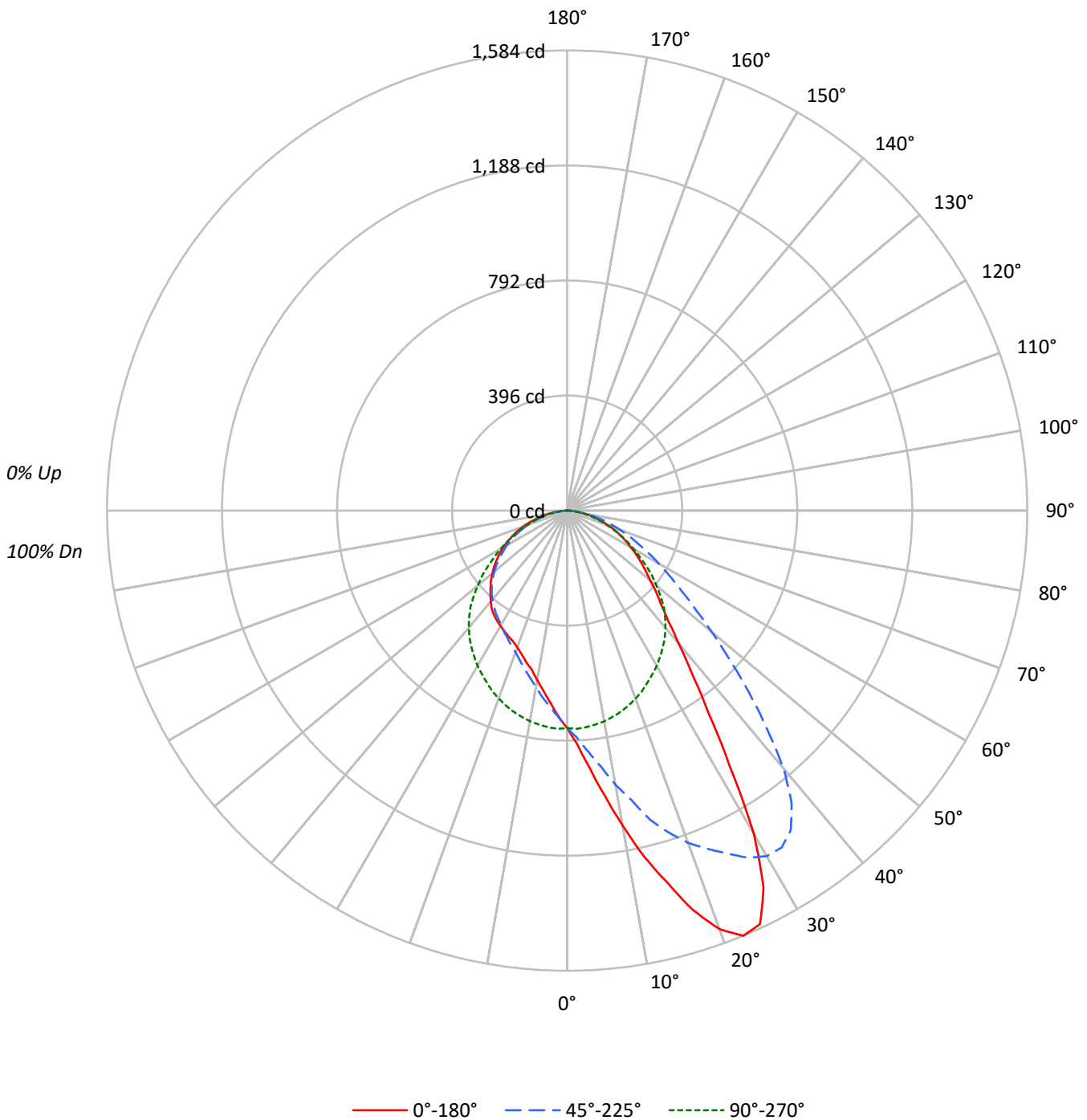
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2258.5 lumens  
Efficiency: N/A  
Efficacy: 120.1 lumens/watt  
Spacing Criteria (0/90/45): 1.37 / 1.23 / 1.5  
Luminous Opening: Rectangular (W 3.88' x L: 0.23' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 18.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): 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	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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100				100
1	110	105	101	98	107	103	99	96	99	96	93	95	92	90	91	89	87	85				85
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	78	74	72				72
3	92	82	74	68	89	80	73	67	77	71	66	75	69	65	72	68	64	62				62
4	84	73	65	58	82	72	64	58	69	62	57	67	61	56	65	60	56	53				53
5	78	66	57	51	76	64	56	50	62	55	50	60	54	49	59	53	49	47				47
6	72	59	51	44	70	58	50	44	56	49	44	55	48	43	53	48	43	41				41
7	67	54	45	39	65	53	45	39	52	44	39	50	44	39	49	43	38	36				36
8	62	49	41	35	61	49	41	35	47	40	35	46	39	35	45	39	35	33				33
9	58	45	37	32	57	45	37	32	43	36	32	42	36	31	41	36	31	29				29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	29	38	33	28	27				27

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

	0°	45°	90°	135°	180°
0°	9070	9070	9070	9070	9070
5°	10816	10137	9109	8248	8072
10°	13538	11785	9063	7599	7291
15°	16606	13821	8990	7088	6788
20°	19781	15694	8876	6687	6462
25°	21004	17407	8737	6492	6390
30°	18004	19221	8636	6368	6424
35°	12521	19859	8492	6347	6492
40°	9431	18334	8323	6332	6470
45°	7830	15164	8072	6289	6389
50°	7015	12236	7562	6166	6330
55°	6557	10152	7010	5991	6251
60°	6153	8781	6434	5818	6187
65°	5782	7727	5865	5521	5989
70°	5422	6900	5217	5075	5706
75°	4857	5976	4566	4533	5231
80°	4251	4907	3748	3672	4502
85°	3324	3838	2726	2670	3032

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 55°  
 Vertical Angle: 45°  
 Luminance: 17924 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	73.6	3.3
10°-20°	236.4	10.5
20°-30°	397.7	17.6
30°-40°	449.5	19.9
40°-50°	402.6	17.8
50°-60°	325.0	14.4
60°-70°	226.4	10.0
70°-80°	118.9	5.3
80°-90°	28.5	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°	707.7	31.3
0°-40°	1157.2	51.2
0°-60°	1884.8	83.5
0°-90°	2258.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2258.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	748	748	748	748	748	
5°	889	833	749	678	663	91
15°	1323	1101	716	565	541	382
25°	1570	1302	653	485	478	694
35°	846	1342	574	429	439	546
45°	457	885	471	367	373	360
55°	310	480	332	284	296	278
65°	202	269	204	192	209	201
75°	104	128	98	97	112	111
85°	24	28	20	19	22	29
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3
2.5°	805.6	804.8	803.0	804.5	801.6	797.6	797.2	793.6	783.1	782.4	779.5
5°	888.9	886.0	885.7	885.3	880.2	873.4	860.3	859.2	841.8	833.1	822.6
7.5°	989.7	988.6	985.7	982.5	965.4	957.1	944.8	928.8	908.5	888.9	876.6
10°	1099.9	1111.9	1097.0	1086.9	1077.5	1059.7	1039.0	1013.3	987.6	957.5	934.6
12.5°	1218.1	1222.5	1222.5	1213.1	1197.1	1167.7	1127.1	1098.1	1074.9	1019.8	1000.2
15°	1323.3	1345.4	1331.2	1298.6	1299.3	1273.6	1225.7	1173.2	1145.3	1101.4	1041.6
17.5°	1442.2	1446.2	1441.8	1411.4	1396.5	1359.2	1316.0	1267.1	1214.5	1161.2	1099.2
20°	1533.5	1531.4	1518.7	1504.5	1473.4	1445.8	1397.6	1341.4	1268.9	1216.7	1147.4
22.5°	1584.3	1580.3	1576.0	1564.7	1540.1	1510.0	1467.9	1405.2	1337.0	1260.2	1177.5
25°	1570.5	1575.2	1576.0	1572.7	1563.6	1545.9	1511.8	1462.8	1394.0	1301.5	1218.1
27.5°	1463.9	1475.9	1491.1	1501.3	1517.6	1528.5	1517.6	1486.8	1430.2	1347.6	1245.0
30°	1286.3	1271.8	1307.7	1353.0	1383.8	1438.2	1468.6	1470.5	1441.8	1373.3	1274.0
32.5°	1039.8	1063.3	1074.2	1132.6	1209.1	1271.8	1339.9	1400.5	1414.6	1374.8	1291.0
35°	846.2	866.1	895.1	924.1	996.6	1059.0	1165.6	1258.4	1332.3	1342.1	1288.8
37.5°	703.3	714.9	732.7	763.5	813.2	890.4	974.9	1095.6	1197.5	1269.3	1262.0
40°	596.0	598.9	619.6	641.7	680.1	741.0	815.4	919.0	1047.4	1158.7	1205.1
42.5°	515.5	522.8	528.6	549.6	578.3	620.3	688.1	769.3	884.2	1016.6	1118.4
45°	456.8	464.1	469.5	483.6	505.4	536.2	584.4	662.7	752.3	884.6	1006.8
47.5°	416.2	415.5	420.2	431.4	447.0	471.7	507.2	559.4	645.3	755.9	883.9
50°	372.0	377.8	379.2	387.6	399.2	416.2	444.5	487.3	554.7	648.9	764.2
52.5°	340.8	341.5	346.2	351.7	361.5	373.8	397.3	428.5	477.8	554.7	658.4
55°	310.3	310.3	314.3	319.0	324.8	336.8	353.1	377.8	418.0	480.4	568.1
57.5°	282.1	283.5	287.1	288.2	293.3	301.6	315.8	335.3	366.2	416.6	489.1
60°	253.8	257.0	256.7	259.6	263.9	270.1	281.7	296.9	323.7	362.2	420.9
62.5°	229.1	228.0	228.0	231.7	236.0	241.8	248.3	261.0	282.8	315.8	363.6
65°	201.6	200.8	203.4	205.6	207.0	211.4	217.2	228.8	244.0	269.4	308.2
67.5°	177.6	175.5	177.3	178.0	180.5	184.2	190.0	197.2	209.5	230.9	262.1
70°	153.0	151.2	150.8	151.5	153.7	156.3	160.2	167.1	178.4	194.7	216.1
72.5°	127.6	126.5	126.5	128.3	129.1	130.5	133.1	139.2	147.6	158.8	178.4
75°	103.7	103.7	103.7	104.0	105.1	106.6	108.8	112.0	118.9	127.6	141.0
77.5°	81.9	82.3	81.6	81.2	83.0	83.7	84.1	87.7	91.7	98.2	108.8
80°	60.9	59.1	59.8	60.9	61.6	62.0	63.1	63.8	67.1	70.3	77.2
82.5°	41.3	39.9	39.9	41.7	41.7	42.1	43.1	44.2	45.0	47.9	50.8
85°	23.9	23.9	24.3	24.3	24.7	24.3	25.4	25.7	25.7	27.6	29.7
87.5°	10.9	10.2	10.5	10.9	10.5	10.9	11.2	11.6	12.0	12.3	12.7
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):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3
2.5°	777.3	774.4	771.5	766.4	762.1	755.9	754.1	751.9	745.4	739.6	735.2
5°	818.6	809.9	797.2	785.6	776.2	763.5	756.3	748.6	737.8	728.0	720.0
7.5°	858.1	842.9	825.1	805.9	787.4	769.7	755.5	742.8	728.7	714.9	704.4
10°	907.1	882.4	854.9	825.1	799.8	775.1	754.4	736.3	716.7	699.7	685.6
12.5°	962.9	923.4	882.8	845.1	813.9	777.3	751.2	726.9	704.1	682.7	666.3
15°	1004.6	958.2	913.2	863.6	817.9	775.1	745.4	716.4	690.6	669.6	649.3
17.5°	1045.9	995.2	937.9	878.1	824.4	775.1	734.5	703.3	671.8	646.4	626.8
20°	1080.0	1020.2	953.1	890.4	829.5	772.9	727.3	688.1	653.3	626.1	603.3
22.5°	1109.4	1036.9	966.9	898.7	829.1	767.1	713.8	673.2	634.8	608.3	583.7
25°	1127.9	1044.1	974.5	895.8	820.1	757.0	699.0	653.3	615.6	584.4	559.4
27.5°	1145.3	1043.0	964.4	879.5	809.2	746.5	684.1	635.2	595.7	561.9	536.2
30°	1162.7	1044.8	946.6	862.8	791.8	726.5	666.3	617.0	575.0	540.5	516.6
32.5°	1173.5	1043.8	930.3	839.6	764.2	708.4	647.1	595.7	552.1	518.4	495.6
35°	1176.4	1037.6	911.1	805.9	734.1	677.9	626.8	573.9	528.6	497.0	470.9
37.5°	1170.3	1026.4	890.0	775.5	697.9	642.1	597.5	552.1	508.6	473.5	450.6
40°	1150.3	1015.5	864.7	742.8	660.2	606.9	570.3	526.0	483.3	450.3	429.2
42.5°	1112.3	993.4	836.7	706.6	621.0	567.7	534.7	499.6	459.7	429.2	408.2
45°	1045.6	959.3	808.8	670.3	582.6	527.5	497.8	470.9	434.3	404.2	386.1
47.5°	960.4	913.2	768.6	632.3	542.4	489.1	457.9	435.8	407.1	382.8	365.1
50°	870.8	853.8	727.6	593.1	502.1	450.3	420.5	401.0	381.8	357.5	341.5
52.5°	767.5	784.9	679.8	552.5	461.2	410.4	382.8	368.3	351.3	332.4	319.0
55°	671.8	709.9	623.2	506.1	420.5	372.0	345.5	331.7	321.6	306.7	294.7
57.5°	579.0	627.6	564.5	459.3	380.7	338.2	312.1	296.6	290.0	281.7	271.9
60°	498.1	546.0	500.7	412.2	340.4	300.5	278.1	265.4	258.9	253.4	245.4
62.5°	426.0	474.6	438.3	364.4	300.9	264.7	245.8	233.5	228.8	226.6	220.1
65°	361.1	402.8	377.4	314.3	263.6	230.9	213.2	204.5	199.8	198.7	194.3
67.5°	304.9	337.2	317.6	270.1	228.8	199.0	183.4	175.8	171.8	171.5	167.9
70°	249.8	279.5	265.4	223.3	188.9	166.8	153.7	147.2	145.0	144.7	142.8
72.5°	207.0	225.5	215.0	181.6	157.0	137.4	128.7	121.8	119.3	120.0	118.9
75°	159.5	175.1	168.6	144.3	122.9	109.8	101.9	97.5	95.3	96.4	95.0
77.5°	121.8	132.7	126.2	107.7	93.9	84.1	77.9	75.0	72.9	72.9	72.1
80°	86.6	92.4	89.2	79.0	68.2	60.2	55.5	53.7	52.6	52.2	51.8
82.5°	55.5	60.2	56.2	50.0	43.5	39.5	37.3	34.8	34.1	34.4	34.1
85°	31.2	33.0	31.5	27.2	24.3	22.1	20.7	19.6	18.9	19.2	18.5
87.5°	13.4	13.8	12.7	11.2	10.5	9.4	9.4	8.7	8.0	8.0	7.6
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):**

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3	748.3
2.5°	732.7	730.2	726.5	721.1	716.7	709.9	709.9	710.9	710.9	710.6	709.9
5°	713.5	708.0	701.5	693.9	685.9	677.9	676.5	673.6	671.4	670.0	668.2
7.5°	693.9	684.8	675.8	665.3	656.2	648.6	643.1	638.4	635.5	632.3	629.7
10°	674.0	662.0	650.8	639.5	627.2	617.4	611.2	606.9	603.6	600.7	599.3
12.5°	650.4	636.3	623.6	613.1	599.3	589.1	583.3	581.9	577.9	571.0	567.4
15°	627.6	614.9	600.0	583.7	577.2	564.8	557.9	554.7	552.5	547.8	546.3
17.5°	608.7	591.7	574.6	562.7	550.7	540.9	536.9	532.6	529.7	525.3	524.2
20°	585.1	570.3	555.0	542.0	529.3	518.4	515.2	512.3	509.4	507.6	506.1
22.5°	561.2	546.3	534.4	522.4	508.6	502.5	498.9	495.6	493.8	492.7	491.2
25°	539.1	526.0	511.9	501.0	490.2	485.4	483.3	481.5	480.0	478.2	477.8
27.5°	519.5	505.0	493.1	482.5	474.6	470.6	468.0	467.0	467.0	467.7	468.0
30°	497.0	484.0	474.6	465.9	458.6	455.0	454.6	454.6	456.1	456.4	457.2
32.5°	476.4	466.2	456.8	448.5	443.4	441.2	443.0	443.0	444.1	445.2	446.6
35°	456.4	447.0	439.8	432.5	427.8	428.9	429.6	430.3	432.1	434.3	435.8
37.5°	437.6	428.9	421.3	415.5	412.6	414.7	416.6	418.0	420.2	422.0	423.4
40°	416.9	410.8	403.5	398.4	399.2	400.2	401.7	403.5	405.3	406.4	407.9
42.5°	397.7	391.2	386.1	382.1	383.2	384.7	385.4	386.1	388.3	390.5	391.2
45°	378.1	373.1	368.0	365.4	366.2	366.9	367.6	368.7	370.5	372.0	372.3
47.5°	356.0	352.4	349.1	346.2	347.7	347.3	348.4	350.6	351.3	352.0	354.2
50°	335.0	331.7	327.7	327.0	327.0	327.0	327.4	330.3	330.3	331.7	333.2
52.5°	311.8	310.0	307.8	306.3	305.6	305.6	307.4	308.5	309.2	311.4	312.9
55°	288.9	286.8	284.6	283.5	282.8	283.5	286.4	287.1	288.9	290.0	291.1
57.5°	265.0	263.6	261.8	261.0	261.0	261.4	263.6	265.4	265.7	269.4	270.8
60°	241.5	238.9	237.5	237.5	236.7	240.0	239.3	242.9	243.6	245.8	248.3
62.5°	217.2	213.5	213.2	213.2	214.6	215.0	216.4	217.5	219.7	222.6	224.4
65°	190.7	188.9	191.4	191.1	190.3	192.5	192.5	194.3	196.5	199.0	203.0
67.5°	166.0	164.6	165.3	165.0	166.0	167.5	168.6	170.0	172.6	175.5	178.0
70°	141.0	142.1	140.3	141.8	142.8	143.2	143.9	146.1	149.0	150.8	153.7
72.5°	116.7	116.4	117.1	117.5	118.6	119.3	120.0	122.5	125.8	127.3	129.4
75°	93.5	93.2	94.3	94.3	96.1	96.8	97.5	98.6	101.5	103.7	105.5
77.5°	72.5	72.9	72.5	74.0	73.2	73.6	75.8	76.9	77.2	81.9	82.7
80°	51.5	52.2	52.6	52.9	53.3	52.6	55.1	56.2	56.2	58.7	60.5
82.5°	33.4	33.7	34.8	35.2	35.2	36.3	35.9	36.6	37.7	38.4	41.0
85°	18.5	19.6	19.9	19.6	19.9	19.2	20.3	20.7	21.0	21.0	21.0
87.5°	7.3	7.6	7.3	7.6	7.3	7.6	7.6	6.9	6.9	8.0	6.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P242472

CATALOG NUMBER: S123DRP-S560D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	748.3	748.3	748.3	748.3
2.5°	707.3	707.0	709.5	707.7
5°	666.0	667.1	663.4	663.4
7.5°	628.6	627.2	627.6	625.0
10°	594.9	592.8	592.0	592.4
12.5°	567.0	567.0	561.2	561.2
15°	546.3	539.5	538.7	540.9
17.5°	523.5	519.5	519.9	519.2
20°	506.1	503.9	503.6	501.0
22.5°	490.2	489.8	490.2	487.3
25°	477.5	479.3	477.8	477.8
27.5°	468.8	468.8	467.7	467.7
30°	458.6	458.3	459.0	459.0
32.5°	448.5	449.2	449.2	449.5
35°	437.9	438.3	439.4	438.7
37.5°	424.2	426.0	425.6	426.3
40°	408.2	409.3	408.9	408.9
42.5°	391.9	392.6	391.5	390.8
45°	373.8	373.1	374.1	372.7
47.5°	353.8	354.2	354.6	356.0
50°	333.9	336.1	336.1	335.7
52.5°	314.3	315.0	316.9	316.9
55°	294.0	294.7	295.5	295.8
57.5°	273.4	273.0	274.4	274.8
60°	251.2	251.2	254.1	255.2
62.5°	227.7	229.1	232.0	229.9
65°	204.8	207.7	207.4	208.8
67.5°	180.9	182.7	185.6	185.6
70°	156.6	158.4	159.9	161.0
72.5°	133.1	133.8	137.8	135.6
75°	108.0	110.6	112.7	111.7
77.5°	84.1	87.4	88.1	87.0
80°	63.1	62.7	64.9	64.5
82.5°	42.1	41.7	42.4	42.8
85°	22.5	23.6	22.1	21.8
87.5°	6.5	6.5	6.2	5.8
90°	0.0	0.0	0.0	0.0



TEST NUMBER: P242472  
 CATALOG NUMBER: S123DRP-S560D840-X4F0-XX-UDD-A-W

**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	18.04	19.60	18.41	19.91	20.23	18.60	20.15	18.96	20.47	20.78
	3H	19.59	20.99	19.97	21.32	21.68	19.93	21.33	20.31	21.66	22.02
	4H	20.16	21.47	20.56	21.82	22.20	20.39	21.71	20.79	22.05	22.43
	6H	20.56	21.77	20.97	22.14	22.53	20.68	21.90	21.10	22.27	22.66
	8H	20.67	21.83	21.09	22.22	22.62	20.76	21.92	21.18	22.31	22.71
	12H	20.74	21.85	21.17	22.23	22.66	20.79	21.90	21.22	22.28	22.71
4H	2H	19.20	20.51	19.60	20.86	21.24	19.36	20.67	19.76	21.02	21.40
	3H	20.79	21.89	21.20	22.28	22.69	21.17	22.26	21.58	22.66	23.06
	4H	21.41	22.40	21.85	22.81	23.25	21.73	22.72	22.17	23.13	23.57
	6H	21.89	22.74	22.34	23.19	23.64	22.10	22.96	22.55	23.40	23.86
	8H	22.02	22.83	22.49	23.27	23.74	22.19	22.99	22.65	23.43	23.90
	12H	22.12	22.83	22.60	23.31	23.78	22.24	22.96	22.72	23.44	23.91
8H	4H	21.90	22.70	22.36	23.14	23.61	22.04	22.84	22.50	23.28	23.75
	6H	22.45	23.11	22.94	23.60	24.08	22.55	23.21	23.04	23.70	24.18
	8H	22.63	23.23	23.15	23.74	24.22	22.69	23.29	23.21	23.80	24.29
	12H	22.78	23.30	23.29	23.79	24.36	22.79	23.32	23.30	23.81	24.37
12H	4H	21.95	22.67	22.43	23.14	23.61	22.05	22.77	22.53	23.25	23.72
	6H	22.52	23.12	23.03	23.63	24.11	22.58	23.18	23.09	23.69	24.17
	8H	22.76	23.29	23.27	23.78	24.34	22.79	23.31	23.29	23.80	24.37