

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: P832468

Luminaire Tested: S123RDP-S560D835-4F0-1E-UDD-G

Issue Date: 05/03/2024

Tested By:

Approved By:



NVLAP Lab Code: 200050-0

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Test Information

Test Method: LM-79-2019
 Report Number: P832468
 Test Lab: INNOVATION CENTER
 Issue Date: 05/03/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: NEO-RAY
 Catalog Number: S123RDP-S560D835-4F0-1E-UDD-G
 Description: DEFINE 3 DIRECT PENDANT LED LUMINAIRE
 DOWNLIGHT 560 LUMENS PER FOOT, GRAZE OPTIC

Light Source: -
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 2421.5 lumens
 Efficiency: N/A
 Efficacy: 123.5 lumens/watt
 Spacing Criteria (0/90/45): 0.55 / 1.17 / 0.8
 Luminous Opening: Rectangular (W 4' x L: 0.25' x H: 0')
 CIE Type: Direct

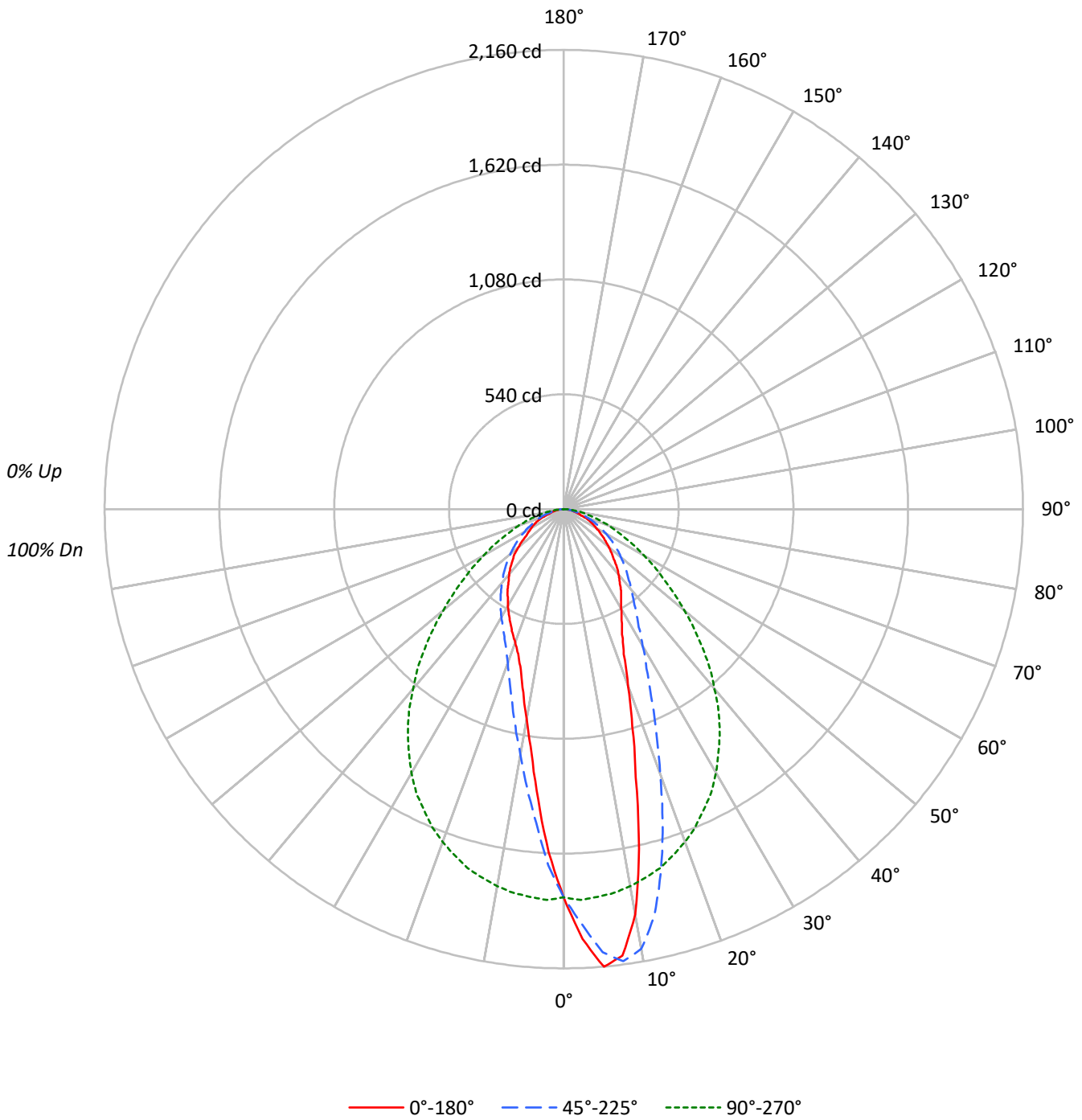
Input Watts (W): 19.6
 Input Voltage (V): 120
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 24 FT

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	P3	10/30/2015	4/30/2016
Power Meter	IN0214	1/12/2016	1/12/2017
AC Power Source	IN0062	1/12/2016	1/12/2017
DC Power Supply	--	--	--
Room Thermometer	IN0145	1/13/2016	1/13/2017

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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				
1	111	107	103	100	108	104	101	98	100	97	95	96	94	92	93	91	89	87				
2	102	95	89	84	100	93	88	83	90	85	81	87	83	80	84	81	78	76				
3	94	85	78	73	92	84	77	72	81	75	71	78	74	70	76	72	69	67				
4	88	77	69	64	85	76	69	63	73	67	62	71	66	62	69	65	61	59				
5	82	70	62	56	80	69	62	56	67	61	56	65	60	55	63	58	54	53				
6	76	64	56	51	74	63	56	50	62	55	50	60	54	50	59	53	49	47				
7	71	59	51	46	70	58	51	46	57	50	45	56	50	45	54	49	45	43				
8	67	55	47	42	65	54	47	42	53	46	41	52	46	41	51	45	41	39				
9	63	51	43	38	62	50	43	38	49	43	38	48	42	38	47	42	38	36				
10	60	47	40	35	58	47	40	35	46	40	35	45	39	35	44	39	35	33				

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°	135°	180°
0°	19659	19659	19659	19659	19659
5°	23342	22598	19783	15991	14847
10°	21148	22954	19684	12813	10992
15°	14561	19681	19476	10473	8695
20°	10131	15152	19085	8830	7643
25°	7720	11548	18516	7848	7044
30°	6719	9232	17805	7287	6524
35°	6169	7788	16796	6815	6051
40°	5629	6955	15477	6350	5619
45°	5084	6360	14055	5911	5186
50°	4615	5868	12377	5479	4652
55°	4174	5390	10764	5059	3992
60°	3739	4900	9350	4594	3772
65°	3451	4348	8048	4129	3566
70°	2804	3758	7021	3736	2899
75°	2462	2990	5947	3098	2554
80°	2225	2529	4872	2597	2411
85°	2038	2223	3705	2359	2223

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 80°
 Vertical Angle: 45°
 Luminance: 14830 cd/sqm

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	166.5	6.9
10°-20°	385.2	15.9
20°-30°	442.0	18.3
30°-40°	435.6	18.0
40°-50°	384.2	15.9
50°-60°	295.6	12.2
60°-70°	194.3	8.0
70°-80°	94.4	3.9
80°-90°	23.8	1.0
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°	993.7	41.0
0°-40°	1429.3	59.0
0°-60°	2109.0	87.1
0°-90°	2421.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2421.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1826	1826	1826	1826	1826	
5°	2160	2091	1831	1480	1374	197
15°	1307	1766	1748	940	780	369
25°	650	972	1559	661	593	307
35°	470	593	1278	519	460	293
45°	334	418	923	388	341	259
55°	222	287	574	270	213	200
65°	136	171	316	162	140	133
75°	59	72	143	74	61	64
85°	16	18	30	19	18	19
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°	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4
2.5°	2024.1	2017.7	2011.3	2009.5	2007.6	2001.6	1995.6	1982.1	1968.6	1954.8	1940.9
5°	2160.3	2161.1	2161.8	2160.0	2158.1	2150.2	2142.4	2125.9	2109.4	2091.4	2073.5
7.5°	2118.4	2130.4	2142.4	2144.6	2146.9	2152.8	2158.8	2155.1	2151.4	2144.6	2137.9
10°	1934.9	1934.2	1933.4	1946.9	1960.4	2000.5	2040.5	2061.1	2081.7	2100.1	2118.4
12.5°	1635.4	1636.5	1637.7	1681.8	1726.0	1763.8	1801.7	1854.1	1906.5	1963.0	2019.6
15°	1306.7	1325.0	1343.4	1382.7	1422.0	1478.9	1535.8	1606.2	1676.6	1766.1	1855.6
17.5°	1073.1	1080.9	1088.8	1126.6	1164.4	1218.3	1272.2	1352.0	1431.7	1547.1	1662.4
20°	884.4	891.5	898.6	925.9	953.2	1004.9	1056.6	1132.6	1208.6	1322.8	1437.0
22.5°	738.3	752.2	766.0	784.4	802.7	840.2	877.6	955.1	1032.6	1136.7	1240.8
25°	650.0	656.3	662.7	678.4	694.2	730.1	766.0	817.3	868.6	972.3	1076.1
27.5°	590.1	591.9	593.8	605.4	617.0	640.2	663.5	711.0	758.6	843.9	929.3
30°	540.6	544.0	547.4	556.4	565.4	582.2	599.1	632.8	666.4	742.8	819.2
32.5°	502.5	504.3	506.2	513.7	521.2	533.5	545.9	572.5	599.1	657.5	715.9
35°	469.5	469.9	470.3	475.9	481.5	493.5	505.5	527.5	549.6	592.7	635.7
37.5°	432.1	434.7	437.3	441.4	445.5	456.0	466.5	484.5	502.5	538.0	573.6
40°	400.6	402.9	405.1	410.0	414.8	423.1	431.3	447.8	464.3	495.0	525.7
42.5°	369.2	370.7	372.2	377.0	381.9	392.0	402.1	415.2	428.3	453.8	479.2
45°	334.0	337.7	341.5	346.7	351.9	360.6	369.2	382.6	396.1	417.8	439.6
47.5°	304.8	306.6	308.5	313.0	317.5	328.0	338.5	350.4	362.4	382.6	402.9
50°	275.6	276.3	277.1	281.2	285.3	294.7	304.0	317.9	331.7	350.4	369.2
52.5°	247.9	249.7	251.6	255.7	259.8	266.2	272.6	286.8	301.0	319.4	337.7
55°	222.4	223.5	224.6	227.6	230.6	238.1	245.6	258.0	270.3	287.2	304.0
57.5°	198.4	199.9	201.4	203.7	205.9	212.7	219.4	230.3	241.1	258.0	274.8
60°	173.7	175.6	177.5	180.1	182.7	188.0	193.2	202.9	212.7	227.6	242.6
62.5°	155.8	156.1	156.5	158.7	161.0	164.7	168.5	176.3	184.2	199.2	214.2
65°	135.5	136.7	137.8	138.9	140.0	143.0	146.0	152.8	159.5	170.7	182.0
67.5°	114.6	115.7	116.8	118.7	120.6	123.2	125.8	130.3	134.8	145.3	155.8
70°	89.1	89.1	89.1	92.1	95.1	99.6	104.1	107.5	110.8	119.4	128.0
72.5°	72.6	73.0	73.4	73.8	74.1	76.8	79.4	85.0	90.6	95.8	101.1
75°	59.2	59.5	59.9	60.3	60.7	61.4	62.2	64.0	65.9	71.9	77.9
77.5°	47.2	47.5	47.9	48.3	48.7	49.4	50.2	50.9	51.7	53.9	56.2
80°	35.9	36.3	36.7	37.1	37.4	37.8	38.2	38.9	39.7	40.8	41.9
82.5°	26.2	26.2	26.2	26.2	26.2	27.0	27.7	27.7	27.7	28.5	29.2
85°	16.5	16.5	16.5	16.8	17.2	17.2	17.2	17.6	18.0	18.0	18.0
87.5°	7.5	7.1	6.7	7.1	7.5	7.5	7.5	7.9	8.2	8.2	8.2
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°	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4
2.5°	1939.1	1937.2	1919.2	1901.2	1883.7	1866.1	1852.9	1839.8	1817.8	1795.7	1781.8
5°	2059.2	2045.0	2016.6	1988.1	1945.4	1902.7	1866.8	1830.9	1785.2	1739.5	1701.3
7.5°	2126.3	2114.7	2080.2	2045.8	1989.2	1932.7	1876.5	1820.4	1753.0	1685.6	1627.9
10°	2128.1	2137.9	2109.4	2081.0	2017.3	1953.7	1877.3	1800.9	1710.3	1619.7	1545.2
12.5°	2061.5	2103.4	2097.4	2091.4	2026.7	1961.9	1869.0	1776.2	1665.0	1553.8	1460.6
15°	1936.8	2018.1	2042.0	2066.0	2012.4	1958.9	1853.3	1747.7	1617.1	1486.4	1379.3
17.5°	1776.2	1890.0	1953.3	2016.6	1977.6	1938.7	1823.0	1707.3	1560.2	1413.0	1296.6
20°	1586.0	1735.0	1834.2	1933.4	1919.2	1905.0	1785.6	1666.1	1507.4	1348.6	1222.4
22.5°	1398.0	1555.3	1692.3	1829.4	1844.0	1858.6	1738.0	1617.4	1443.7	1270.0	1141.6
25°	1235.9	1395.8	1559.0	1722.3	1755.2	1788.2	1673.6	1559.0	1378.9	1198.9	1071.2
27.5°	1081.3	1233.3	1413.0	1592.7	1652.6	1712.5	1607.7	1502.9	1315.3	1127.7	1000.4
30°	955.1	1091.0	1274.5	1457.9	1541.4	1624.9	1528.7	1432.5	1246.4	1060.3	935.6
32.5°	837.6	959.2	1143.4	1327.7	1424.6	1521.6	1438.5	1355.4	1176.4	997.4	874.2
35°	744.7	853.7	1025.5	1197.4	1305.9	1414.5	1346.4	1278.2	1103.4	928.5	812.1
37.5°	664.9	756.3	917.7	1079.0	1194.4	1309.7	1252.8	1195.9	1031.5	867.1	757.1
40°	599.1	672.4	822.6	972.7	1085.8	1198.9	1150.2	1101.5	954.4	807.2	704.3
42.5°	542.5	605.8	740.6	875.4	979.1	1082.8	1050.6	1018.4	885.1	751.8	656.3
45°	492.7	545.9	664.6	783.3	878.7	974.2	948.8	923.3	808.3	693.4	605.8
47.5°	448.5	494.2	600.2	706.1	791.9	877.6	854.0	830.4	735.3	640.2	560.5
50°	408.1	447.0	535.4	623.8	700.9	778.0	758.6	739.1	660.5	581.8	512.9
52.5°	369.9	402.1	481.5	560.9	623.0	685.2	670.2	655.2	594.6	533.9	471.4
55°	333.6	363.2	430.2	497.2	550.4	603.5	588.6	573.6	526.4	479.2	424.2
57.5°	300.7	326.5	380.8	435.1	477.4	519.7	512.6	505.5	466.1	426.8	381.5
60°	265.8	289.0	335.8	382.6	416.7	450.8	442.6	434.3	406.2	378.2	339.2
62.5°	234.8	255.3	292.8	330.2	357.9	385.6	379.7	373.7	352.3	331.0	298.8
65°	202.2	222.4	252.7	283.1	304.8	326.5	321.2	316.0	299.9	283.8	258.0
67.5°	172.6	189.5	215.7	241.9	256.5	271.1	268.1	265.1	252.7	240.4	220.2
70°	142.6	157.3	179.0	200.7	210.8	220.9	222.0	223.1	211.9	200.7	185.7
72.5°	112.7	124.3	144.5	164.7	172.6	180.5	180.1	179.7	173.0	166.2	152.8
75°	86.5	95.1	110.8	126.6	133.3	140.0	141.5	143.0	136.7	130.3	122.8
77.5°	62.2	68.1	80.1	92.1	99.6	107.1	107.8	108.6	105.6	102.6	95.5
80°	43.8	45.7	53.2	60.7	68.5	76.4	77.5	78.6	75.6	72.6	68.1
82.5°	30.3	31.5	34.1	36.7	43.1	49.4	50.9	52.4	50.9	49.4	44.6
85°	18.3	18.7	19.8	21.0	24.0	27.0	28.5	30.0	29.2	28.5	25.8
87.5°	8.2	8.2	8.6	9.0	9.7	10.5	12.4	14.2	13.1	12.0	10.9
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°	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4	1826.4
2.5°	1768.0	1746.6	1725.3	1709.9	1694.6	1675.5	1656.4	1655.6	1654.9	1640.7	1626.4
5°	1663.1	1626.1	1589.0	1552.7	1516.4	1480.0	1443.7	1435.5	1427.2	1414.9	1402.5
7.5°	1570.3	1511.1	1452.0	1405.5	1359.1	1322.8	1286.5	1261.8	1237.0	1218.0	1198.9
10°	1470.7	1397.3	1323.9	1267.7	1211.6	1172.3	1133.0	1104.5	1076.1	1062.6	1049.1
12.5°	1367.3	1287.6	1207.8	1152.8	1097.8	1050.6	1003.4	977.6	951.7	933.0	914.3
15°	1272.2	1186.5	1100.8	1042.4	983.9	939.8	895.6	869.8	843.9	825.2	806.5
17.5°	1180.1	1093.6	1007.2	948.0	888.8	848.8	808.7	783.6	758.6	746.9	735.3
20°	1096.3	1009.0	921.8	866.0	810.2	770.9	731.6	718.1	704.6	693.8	682.9
22.5°	1013.1	929.3	845.4	791.9	738.3	709.9	681.4	670.6	659.7	651.5	643.2
25°	943.5	860.0	776.5	729.7	682.9	660.8	638.7	631.6	624.5	616.3	608.0
27.5°	873.1	793.7	714.4	676.9	639.5	621.5	603.5	594.6	585.6	578.8	572.1
30°	811.0	737.6	664.2	633.1	602.0	586.3	570.6	560.9	551.1	544.8	538.4
32.5°	751.1	685.9	620.8	594.2	567.6	552.3	536.9	527.5	518.2	510.7	503.2
35°	695.7	639.1	582.6	558.2	533.9	518.6	503.2	493.8	484.5	477.0	469.5
37.5°	647.0	595.7	544.4	521.6	498.7	485.2	471.8	462.0	452.3	444.4	436.6
40°	601.3	556.0	510.7	488.6	466.5	451.9	437.3	428.7	420.1	413.0	405.9
42.5°	560.9	519.3	477.7	456.0	434.3	420.5	406.6	396.5	386.4	382.3	378.2
45°	518.2	481.5	444.8	423.8	402.9	388.3	373.7	365.0	356.4	352.7	348.9
47.5°	480.7	446.7	412.6	392.0	371.4	358.3	345.2	338.5	331.7	326.5	321.2
50°	444.0	411.1	378.2	358.3	338.5	327.2	316.0	307.8	299.5	295.8	292.0
52.5°	408.9	378.9	348.9	328.7	308.5	297.7	286.8	279.7	272.6	264.7	256.8
55°	369.2	343.0	316.7	298.8	280.8	269.6	258.3	250.1	241.9	233.6	225.4
57.5°	336.2	310.4	284.6	268.5	252.4	241.5	230.6	221.6	212.7	205.9	199.2
60°	300.3	277.8	255.3	239.6	223.9	213.4	202.9	194.3	185.7	182.3	179.0
62.5°	266.6	245.6	224.6	210.8	196.9	186.8	176.7	171.1	165.5	163.2	161.0
65°	232.1	214.2	196.2	183.5	170.7	162.1	153.5	150.9	148.3	146.4	144.5
67.5°	199.9	184.6	169.2	158.0	146.8	140.8	134.8	131.8	128.8	126.6	124.3
70°	170.7	157.3	143.8	134.0	124.3	118.7	113.1	110.5	107.8	103.7	99.6
72.5°	139.3	128.8	118.3	110.8	103.3	98.5	93.6	88.4	83.1	79.4	75.6
75°	115.3	104.8	94.4	87.2	80.1	74.5	68.9	67.0	65.1	64.0	62.9
77.5°	88.4	79.4	70.4	64.8	59.2	56.5	53.9	52.8	51.7	51.3	50.9
80°	63.6	56.2	48.7	45.7	42.7	41.9	41.2	40.4	39.7	39.3	38.9
82.5°	39.7	35.9	32.2	31.5	30.7	30.3	30.0	29.6	29.2	28.8	28.5
85°	23.2	21.7	20.2	19.8	19.5	19.1	18.7	18.7	18.7	18.7	18.7
87.5°	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.4	9.0
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):

	165°	170°	175°	180°
0°	1826.4	1826.4	1826.4	1826.4
2.5°	1622.7	1618.9	1617.4	1615.9
5°	1390.9	1379.3	1376.7	1374.1
7.5°	1194.0	1189.1	1173.0	1156.9
10°	1034.1	1019.1	1012.4	1005.7
12.5°	900.5	886.6	884.4	882.1
15°	796.7	787.0	783.6	780.3
17.5°	728.6	721.9	717.7	713.6
20°	678.1	673.2	670.2	667.2
22.5°	639.5	635.7	633.5	631.3
25°	602.4	596.8	594.9	593.1
27.5°	567.2	562.4	560.5	558.6
30°	534.3	530.2	527.5	524.9
32.5°	498.3	493.5	492.0	490.5
35°	466.5	463.5	462.0	460.5
37.5°	432.8	429.1	426.8	424.6
40°	404.0	402.1	401.0	399.9
42.5°	374.8	371.4	371.0	370.7
45°	345.6	342.2	341.5	340.7
47.5°	318.2	315.3	314.9	314.5
50°	287.9	283.8	280.8	277.8
52.5°	253.1	249.4	246.7	244.1
55°	221.3	217.2	214.9	212.7
57.5°	197.3	195.4	194.3	193.2
60°	177.8	176.7	176.0	175.2
62.5°	159.9	158.7	158.7	158.7
65°	143.4	142.3	141.2	140.0
67.5°	122.1	119.8	119.4	119.1
70°	96.2	92.9	92.5	92.1
72.5°	75.3	74.9	74.1	73.4
75°	62.2	61.4	61.4	61.4
77.5°	50.2	49.4	49.4	49.4
80°	38.6	38.2	38.6	38.9
82.5°	28.5	28.5	28.1	27.7
85°	18.3	18.0	18.0	18.0
87.5°	9.0	9.0	9.0	9.0
90°	0.0	0.0	0.0	0.0

TEST NUMBER: P832468

CATALOG NUMBER: S123RDP-S560D835-4F0-1E-UDD-G

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	15.05	16.51	15.42	16.82	17.14	19.72	21.17	20.08	21.49	21.80
	3H	16.32	17.62	16.69	17.95	18.31	21.26	22.56	21.64	22.89	23.25
	4H	16.73	17.95	17.13	18.30	18.68	21.78	23.00	22.18	23.34	23.72
	6H	17.04	18.16	17.45	18.53	18.92	22.12	23.24	22.53	23.61	24.00
	8H	17.14	18.21	17.57	18.60	19.00	22.21	23.28	22.64	23.67	24.07
	12H	17.21	18.23	17.64	18.62	19.04	22.26	23.29	22.69	23.67	24.10
4H	2H	15.85	17.07	16.25	17.41	17.79	19.78	21.00	20.18	21.35	21.73
	3H	17.27	18.28	17.68	18.68	19.08	21.49	22.50	21.90	22.90	23.30
	4H	17.74	18.65	18.18	19.07	19.51	22.12	23.03	22.55	23.44	23.88
	6H	18.14	18.93	18.60	19.37	19.83	22.59	23.37	23.05	23.82	24.28
	8H	18.28	19.01	18.74	19.46	19.93	22.73	23.46	23.19	23.91	24.38
	12H	18.38	19.03	18.86	19.51	19.99	22.82	23.47	23.30	23.95	24.42
8H	4H	18.10	18.83	18.56	19.28	19.75	22.13	22.86	22.59	23.31	23.78
	6H	18.58	19.19	19.08	19.68	20.16	22.64	23.25	23.14	23.74	24.22
	8H	18.78	19.32	19.29	19.83	20.32	22.83	23.37	23.35	23.88	24.37
	12H	18.94	19.42	19.45	19.91	20.48	22.97	23.45	23.48	23.94	24.51
12H	4H	18.14	18.79	18.62	19.27	19.74	22.10	22.76	22.59	23.24	23.71
	6H	18.64	19.18	19.16	19.69	20.18	22.62	23.16	23.13	23.67	24.16
	8H	18.89	19.36	19.40	19.86	20.42	22.84	23.32	23.35	23.81	24.38