

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: P832475

Luminaire Tested: S123RDP-S560D950-4F0-1E-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: P832475  
 Test Lab: INNOVATION CENTER  
 Issue Date: 05/03/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: NEO-RAY  
 Catalog Number: S123RDP-S560D950-4F0-1E-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: 2310.1 lumens  
 Efficiency: N/A  
 Efficacy: 117.9 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

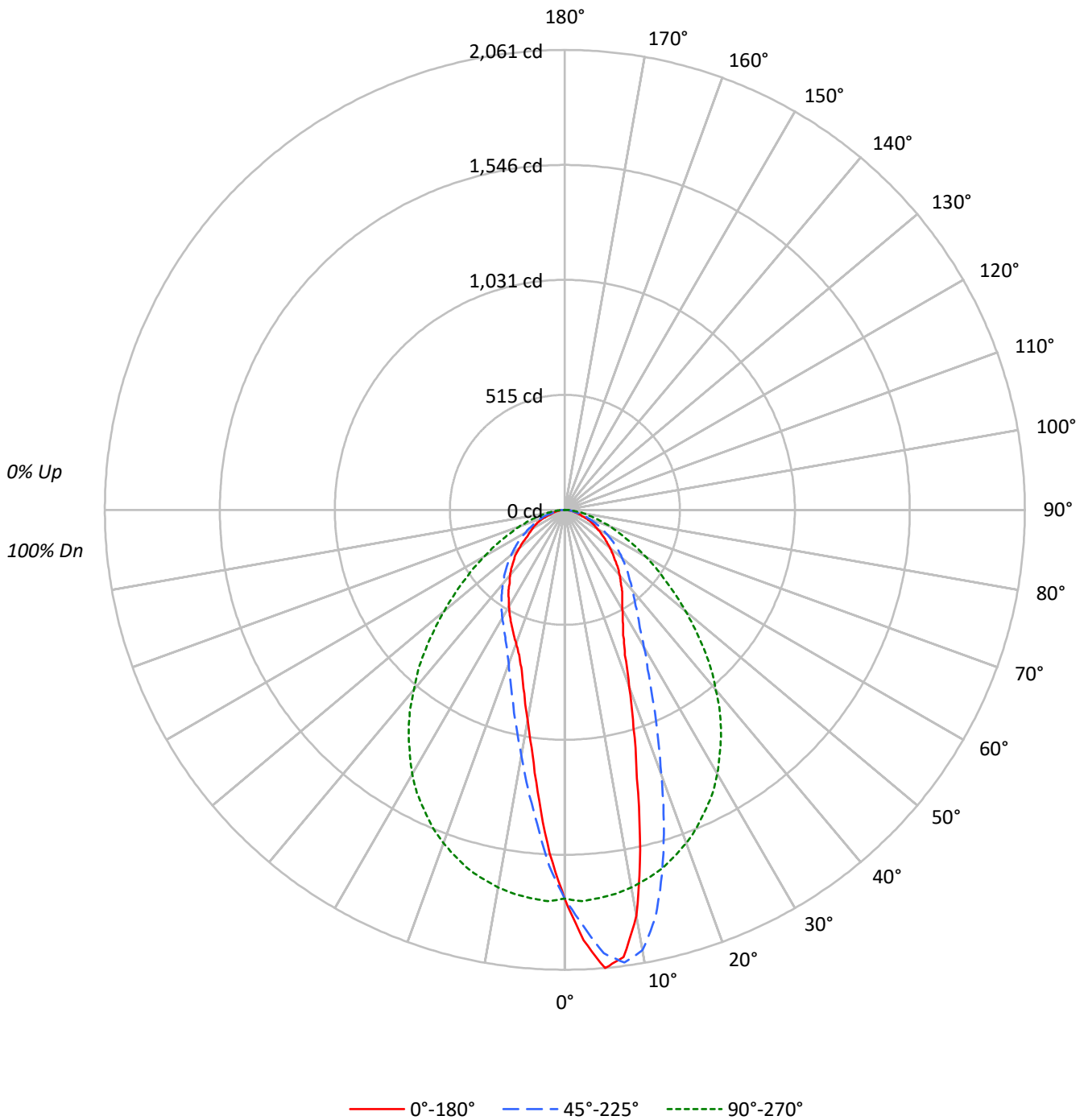
Input Watts (W): 19.6  
 Input Voltage (V): 120  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 24 FT

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°	18755	18755	18755	18755	18755
5°	22269	21558	18872	15257	14164
10°	20176	21898	18779	12223	10486
15°	13892	18775	18580	9990	8295
20°	9664	14455	18207	8424	7291
25°	7365	11017	17664	7487	6720
30°	6411	8809	16986	6953	6224
35°	5886	7430	16023	6501	5773
40°	5370	6635	14765	6058	5361
45°	4850	6068	13408	5638	4947
50°	4402	5598	11807	5228	4438
55°	3982	5142	10269	4827	3808
60°	3567	4676	8919	4383	3599
65°	3293	4149	7679	3940	3403
70°	2675	3585	6700	3563	2766
75°	2346	2853	5673	2957	2437
80°	2126	2411	4649	2479	2300
85°	1939	2112	3532	2248	2112

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 80°  
 Vertical Angle: 45°  
 Luminance: 14148 cd/sqm

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	158.8	6.9
10°-20°	367.5	15.9
20°-30°	421.6	18.3
30°-40°	415.6	18.0
40°-50°	366.5	15.9
50°-60°	282.0	12.2
60°-70°	185.4	8.0
70°-80°	90.0	3.9
80°-90°	22.7	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°	947.9	41.0
0°-40°	1363.5	59.0
0°-60°	2012.0	87.1
0°-90°	2310.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2310.1	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1742	1742	1742	1742	1742	
5°	2061	1995	1747	1412	1311	188
15°	1247	1685	1667	896	744	352
25°	620	928	1487	630	566	293
35°	448	565	1219	495	439	279
45°	319	399	881	370	325	247
55°	212	274	547	257	203	190
65°	129	163	302	155	134	127
75°	56	69	136	71	59	61
85°	16	17	29	18	17	18
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°	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4
2.5°	1930.9	1924.9	1918.8	1917.0	1915.2	1909.5	1903.8	1890.9	1878.1	1864.9	1851.7
5°	2061.0	2061.7	2062.4	2060.6	2058.8	2051.3	2043.8	2028.1	2012.4	1995.2	1978.1
7.5°	2021.0	2032.4	2043.8	2046.0	2048.1	2053.8	2059.5	2056.0	2052.4	2046.0	2039.5
10°	1845.9	1845.2	1844.5	1857.4	1870.2	1908.4	1946.7	1966.3	1986.0	2003.5	2021.0
12.5°	1560.2	1561.3	1562.3	1604.5	1646.6	1682.7	1718.8	1768.8	1818.8	1872.7	1926.7
15°	1246.6	1264.1	1281.6	1319.1	1356.6	1410.9	1465.2	1532.3	1599.5	1684.8	1770.2
17.5°	1023.7	1031.2	1038.7	1074.8	1110.8	1162.3	1213.7	1289.8	1365.9	1475.9	1585.9
20°	843.7	850.5	857.2	883.3	909.4	958.7	1008.0	1080.5	1153.0	1261.9	1370.9
22.5°	704.4	717.6	730.8	748.3	765.8	801.5	837.2	911.2	985.1	1084.4	1183.7
25°	620.1	626.1	632.2	647.2	662.2	696.5	730.8	779.7	828.7	927.6	1026.6
27.5°	562.9	564.7	566.5	577.6	588.6	610.8	632.9	678.3	723.7	805.1	886.5
30°	515.8	519.0	522.2	530.8	539.4	555.4	571.5	603.6	635.8	708.7	781.5
32.5°	479.3	481.1	482.9	490.1	497.2	509.0	520.8	546.1	571.5	627.2	682.9
35°	447.9	448.3	448.6	454.0	459.3	470.8	482.2	503.3	524.3	565.4	606.5
37.5°	412.2	414.7	417.2	421.1	425.1	435.1	445.1	462.2	479.3	513.3	547.2
40°	382.2	384.3	386.5	391.1	395.8	403.6	411.5	427.2	442.9	472.2	501.5
42.5°	352.2	353.6	355.0	359.7	364.3	374.0	383.6	396.1	408.6	432.9	457.2
45°	318.6	322.2	325.8	330.8	335.8	344.0	352.2	365.0	377.9	398.6	419.3
47.5°	290.7	292.5	294.3	298.6	302.9	312.9	322.9	334.3	345.8	365.0	384.3
50°	262.9	263.6	264.3	268.2	272.2	281.1	290.0	303.3	316.5	334.3	352.2
52.5°	236.5	238.2	240.0	244.0	247.9	254.0	260.0	273.6	287.2	304.7	322.2
55°	212.2	213.2	214.3	217.2	220.0	227.2	234.3	246.1	257.9	274.0	290.0
57.5°	189.3	190.7	192.2	194.3	196.5	202.9	209.3	219.7	230.0	246.1	262.2
60°	165.7	167.5	169.3	171.8	174.3	179.3	184.3	193.6	202.9	217.2	231.5
62.5°	148.6	148.9	149.3	151.4	153.6	157.2	160.7	168.2	175.7	190.0	204.3
65°	129.3	130.4	131.4	132.5	133.6	136.4	139.3	145.7	152.2	162.9	173.6
67.5°	109.3	110.4	111.4	113.2	115.0	117.5	120.0	124.3	128.6	138.6	148.6
70°	85.0	85.0	85.0	87.9	90.7	95.0	99.3	102.5	105.7	113.9	122.2
72.5°	69.3	69.7	70.0	70.4	70.7	73.2	75.7	81.1	86.4	91.4	96.4
75°	56.4	56.8	57.1	57.5	57.9	58.6	59.3	61.1	62.9	68.6	74.3
77.5°	45.0	45.4	45.7	46.1	46.4	47.1	47.9	48.6	49.3	51.4	53.6
80°	34.3	34.6	35.0	35.4	35.7	36.1	36.4	37.1	37.9	38.9	40.0
82.5°	25.0	25.0	25.0	25.0	25.0	25.7	26.4	26.4	26.4	27.1	27.9
85°	15.7	15.7	15.7	16.1	16.4	16.4	16.4	16.8	17.1	17.1	17.1
87.5°	7.1	6.8	6.4	6.8	7.1	7.1	7.1	7.5	7.9	7.9	7.9
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):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4
2.5°	1849.9	1848.1	1830.9	1813.8	1797.0	1780.2	1767.7	1755.2	1734.1	1713.1	1699.8
5°	1964.5	1950.9	1923.8	1896.7	1855.9	1815.2	1780.9	1746.6	1703.1	1659.5	1623.1
7.5°	2028.5	2017.4	1984.5	1951.7	1897.7	1843.8	1790.2	1736.6	1672.3	1608.1	1553.0
10°	2030.2	2039.5	2012.4	1985.2	1924.5	1863.8	1790.9	1718.1	1631.6	1545.2	1474.1
12.5°	1966.7	2006.7	2001.0	1995.2	1933.4	1871.7	1783.1	1694.5	1588.4	1482.3	1393.4
15°	1847.7	1925.2	1948.1	1971.0	1919.9	1868.8	1768.1	1667.3	1542.7	1418.0	1315.9
17.5°	1694.5	1803.1	1863.4	1923.8	1886.7	1849.5	1739.1	1628.8	1488.4	1348.0	1236.9
20°	1513.0	1655.2	1749.9	1844.5	1830.9	1817.4	1703.4	1589.5	1438.0	1286.6	1166.2
22.5°	1333.7	1483.8	1614.5	1745.2	1759.1	1773.1	1658.1	1543.0	1377.3	1211.6	1089.1
25°	1179.1	1331.6	1487.3	1643.1	1674.5	1705.9	1596.6	1487.3	1315.5	1143.7	1021.9
27.5°	1031.6	1176.6	1348.0	1519.5	1576.6	1633.8	1533.8	1433.7	1254.8	1075.8	954.4
30°	911.2	1040.8	1215.9	1390.9	1470.5	1550.2	1458.4	1366.6	1189.1	1011.6	892.6
32.5°	799.0	915.1	1090.8	1266.6	1359.1	1451.6	1372.3	1293.0	1122.3	951.5	834.0
35°	710.4	814.4	978.3	1142.3	1245.9	1349.4	1284.4	1219.4	1052.6	885.8	774.7
37.5°	634.4	721.5	875.5	1029.4	1139.4	1249.4	1195.1	1140.9	984.0	827.2	722.2
40°	571.5	641.5	784.7	928.0	1035.8	1143.7	1097.3	1050.8	910.5	770.1	671.9
42.5°	517.6	577.9	706.5	835.1	934.0	1033.0	1002.3	971.5	844.4	717.2	626.1
45°	470.1	520.8	634.0	747.2	838.3	929.4	905.1	880.8	771.2	661.5	577.9
47.5°	427.9	471.5	572.6	673.7	755.4	837.2	814.7	792.2	701.5	610.8	534.7
50°	389.3	426.5	510.8	595.1	668.7	742.2	723.7	705.1	630.1	555.1	489.3
52.5°	352.9	383.6	459.3	535.1	594.4	653.7	639.4	625.1	567.2	509.3	449.7
55°	318.3	346.5	410.4	474.3	525.1	575.8	561.5	547.2	502.2	457.2	404.7
57.5°	286.8	311.5	363.3	415.1	455.4	495.8	489.0	482.2	444.7	407.2	364.0
60°	253.6	275.7	320.4	365.0	397.5	430.1	422.2	414.3	387.5	360.8	323.6
62.5°	224.0	243.6	279.3	315.0	341.5	367.9	362.2	356.5	336.1	315.8	285.0
65°	192.9	212.2	241.1	270.0	290.7	311.5	306.5	301.5	286.1	270.7	246.1
67.5°	164.7	180.7	205.7	230.7	244.7	258.6	255.7	252.9	241.1	229.3	210.0
70°	136.1	150.0	170.7	191.5	201.1	210.7	211.8	212.9	202.2	191.5	177.2
72.5°	107.5	118.6	137.9	157.2	164.7	172.2	171.8	171.4	165.0	158.6	145.7
75°	82.5	90.7	105.7	120.7	127.2	133.6	135.0	136.4	130.4	124.3	117.2
77.5°	59.3	65.0	76.4	87.9	95.0	102.2	102.9	103.6	100.7	97.9	91.1
80°	41.8	43.6	50.7	57.9	65.4	72.9	73.9	75.0	72.2	69.3	65.0
82.5°	28.9	30.0	32.5	35.0	41.1	47.1	48.6	50.0	48.6	47.1	42.5
85°	17.5	17.9	18.9	20.0	22.9	25.7	27.1	28.6	27.9	27.1	24.6
87.5°	7.9	7.9	8.2	8.6	9.3	10.0	11.8	13.6	12.5	11.4	10.4
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°	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4	1742.4
2.5°	1686.6	1666.3	1645.9	1631.3	1616.6	1598.4	1580.2	1579.5	1578.8	1565.2	1551.6
5°	1586.6	1551.3	1515.9	1481.2	1446.6	1412.0	1377.3	1369.5	1361.6	1349.8	1338.0
7.5°	1498.0	1441.6	1385.2	1340.9	1296.6	1261.9	1227.3	1203.7	1180.1	1161.9	1143.7
10°	1403.0	1333.0	1263.0	1209.4	1155.9	1118.3	1080.8	1053.7	1026.6	1013.7	1000.8
12.5°	1304.4	1228.4	1152.3	1099.8	1047.3	1002.3	957.3	932.6	908.0	890.1	872.2
15°	1213.7	1131.9	1050.1	994.4	938.7	896.5	854.4	829.7	805.1	787.2	769.4
17.5°	1125.8	1043.3	960.8	904.4	848.0	809.7	771.5	747.6	723.7	712.6	701.5
20°	1045.8	962.6	879.4	826.2	773.0	735.4	697.9	685.1	672.2	661.9	651.5
22.5°	966.5	886.5	806.5	755.4	704.4	677.2	650.1	639.7	629.4	621.5	613.6
25°	900.1	820.5	740.8	696.2	651.5	630.4	609.4	602.6	595.8	587.9	580.1
27.5°	833.0	757.2	681.5	645.8	610.1	592.9	575.8	567.2	558.6	552.2	545.8
30°	773.7	703.7	633.6	604.0	574.4	559.4	544.4	535.1	525.8	519.7	513.6
32.5°	716.5	654.4	592.2	566.9	541.5	526.8	512.2	503.3	494.3	487.2	480.1
35°	663.7	609.7	555.8	532.6	509.3	494.7	480.1	471.1	462.2	455.1	447.9
37.5°	617.2	568.3	519.3	497.6	475.8	462.9	450.1	440.8	431.5	424.0	416.5
40°	573.6	530.4	487.2	466.1	445.1	431.1	417.2	409.0	400.8	394.0	387.2
42.5°	535.1	495.4	455.8	435.1	414.3	401.1	387.9	378.3	368.6	364.7	360.8
45°	494.3	459.3	424.3	404.3	384.3	370.4	356.5	348.3	340.0	336.5	332.9
47.5°	458.6	426.1	393.6	374.0	354.3	341.8	329.3	322.9	316.5	311.5	306.5
50°	423.6	392.2	360.8	341.8	322.9	312.2	301.5	293.6	285.7	282.2	278.6
52.5°	390.0	361.5	332.9	313.6	294.3	284.0	273.6	266.8	260.0	252.5	245.0
55°	352.2	327.2	302.2	285.0	267.9	257.2	246.5	238.6	230.7	222.9	215.0
57.5°	320.8	296.1	271.5	256.1	240.7	230.4	220.0	211.5	202.9	196.5	190.0
60°	286.5	265.0	243.6	228.6	213.6	203.6	193.6	185.4	177.2	173.9	170.7
62.5°	254.3	234.3	214.3	201.1	187.9	178.2	168.6	163.2	157.9	155.7	153.6
65°	221.5	204.3	187.2	175.0	162.9	154.7	146.4	143.9	141.4	139.7	137.9
67.5°	190.7	176.1	161.4	150.7	140.0	134.3	128.6	125.7	122.9	120.7	118.6
70°	162.9	150.0	137.2	127.9	118.6	113.2	107.9	105.4	102.9	98.9	95.0
72.5°	132.9	122.9	112.9	105.7	98.6	93.9	89.3	84.3	79.3	75.7	72.2
75°	110.0	100.0	90.0	83.2	76.4	71.1	65.7	63.9	62.2	61.1	60.0
77.5°	84.3	75.7	67.2	61.8	56.4	53.9	51.4	50.4	49.3	48.9	48.6
80°	60.7	53.6	46.4	43.6	40.7	40.0	39.3	38.6	37.9	37.5	37.1
82.5°	37.9	34.3	30.7	30.0	29.3	28.9	28.6	28.2	27.9	27.5	27.1
85°	22.1	20.7	19.3	18.9	18.6	18.2	17.9	17.9	17.9	17.9	17.9
87.5°	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	8.9	8.6
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: P832475

CATALOG NUMBER: S123RDP-S560D950-4F0-1E-UDD-G

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	1742.4	1742.4	1742.4	1742.4
2.5°	1548.0	1544.5	1543.0	1541.6
5°	1326.9	1315.9	1313.4	1310.9
7.5°	1139.1	1134.4	1119.1	1103.7
10°	986.5	972.3	965.8	959.4
12.5°	859.0	845.8	843.7	841.5
15°	760.1	750.8	747.6	744.4
17.5°	695.1	688.7	684.7	680.8
20°	646.9	642.2	639.4	636.5
22.5°	610.1	606.5	604.4	602.2
25°	574.7	569.4	567.6	565.8
27.5°	541.1	536.5	534.7	532.9
30°	509.7	505.8	503.3	500.8
32.5°	475.4	470.8	469.3	467.9
35°	445.1	442.2	440.8	439.3
37.5°	412.9	409.3	407.2	405.0
40°	385.4	383.6	382.5	381.5
42.5°	357.5	354.3	354.0	353.6
45°	329.7	326.5	325.8	325.0
47.5°	303.6	300.8	300.4	300.0
50°	274.7	270.7	267.9	265.0
52.5°	241.5	237.9	235.4	232.9
55°	211.1	207.2	205.0	202.9
57.5°	188.2	186.5	185.4	184.3
60°	169.7	168.6	167.9	167.2
62.5°	152.5	151.4	151.4	151.4
65°	136.8	135.7	134.7	133.6
67.5°	116.4	114.3	113.9	113.6
70°	91.8	88.6	88.2	87.9
72.5°	71.8	71.4	70.7	70.0
75°	59.3	58.6	58.6	58.6
77.5°	47.9	47.1	47.1	47.1
80°	36.8	36.4	36.8	37.1
82.5°	27.1	27.1	26.8	26.4
85°	17.5	17.1	17.1	17.1
87.5°	8.6	8.6	8.6	8.6
90°	0.0	0.0	0.0	0.0

TEST NUMBER: P832475

CATALOG NUMBER: S123RDP-S560D950-4F0-1E-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	14.89	16.35	15.26	16.66	16.97	19.55	21.01	19.92	21.32	21.64
	3H	16.15	17.46	16.53	17.78	18.15	21.10	22.40	21.47	22.73	23.09
	4H	16.56	17.78	16.96	18.13	18.51	21.61	22.83	22.01	23.18	23.56
	6H	16.87	18.00	17.29	18.37	18.76	21.95	23.08	22.37	23.45	23.84
	8H	16.98	18.05	17.40	18.44	18.84	22.05	23.12	22.48	23.51	23.91
	12H	17.05	18.07	17.48	18.45	18.88	22.10	23.12	22.53	23.50	23.93
4H	2H	15.68	16.90	16.08	17.25	17.63	19.62	20.84	20.02	21.19	21.57
	3H	17.10	18.11	17.51	18.51	18.92	21.33	22.34	21.74	22.74	23.14
	4H	17.58	18.49	18.01	18.90	19.34	21.96	22.86	22.39	23.28	23.72
	6H	17.98	18.77	18.44	19.21	19.67	22.42	23.21	22.88	23.65	24.12
	8H	18.11	18.85	18.58	19.29	19.76	22.56	23.30	23.03	23.75	24.21
	12H	18.22	18.87	18.70	19.35	19.82	22.65	23.31	23.14	23.79	24.26
8H	4H	17.93	18.67	18.40	19.11	19.58	21.96	22.70	22.43	23.14	23.61
	6H	18.42	19.02	18.92	19.52	19.99	22.48	23.08	22.98	23.58	24.06
	8H	18.61	19.15	19.13	19.67	20.15	22.67	23.21	23.18	23.72	24.21
	12H	18.78	19.26	19.29	19.75	20.32	22.81	23.29	23.32	23.78	24.35
12H	4H	17.97	18.63	18.46	19.11	19.58	21.94	22.60	22.42	23.07	23.55
	6H	18.48	19.02	18.99	19.53	20.02	22.45	23.00	22.97	23.51	24.00
	8H	18.72	19.20	19.23	19.69	20.26	22.67	23.15	23.19	23.65	24.21