

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: P242471

Luminaire Tested: S123DRP-S340D840-X4F0-XX-UDD-A-W

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2024  
Report Number: P242471  
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-S340D840-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: -

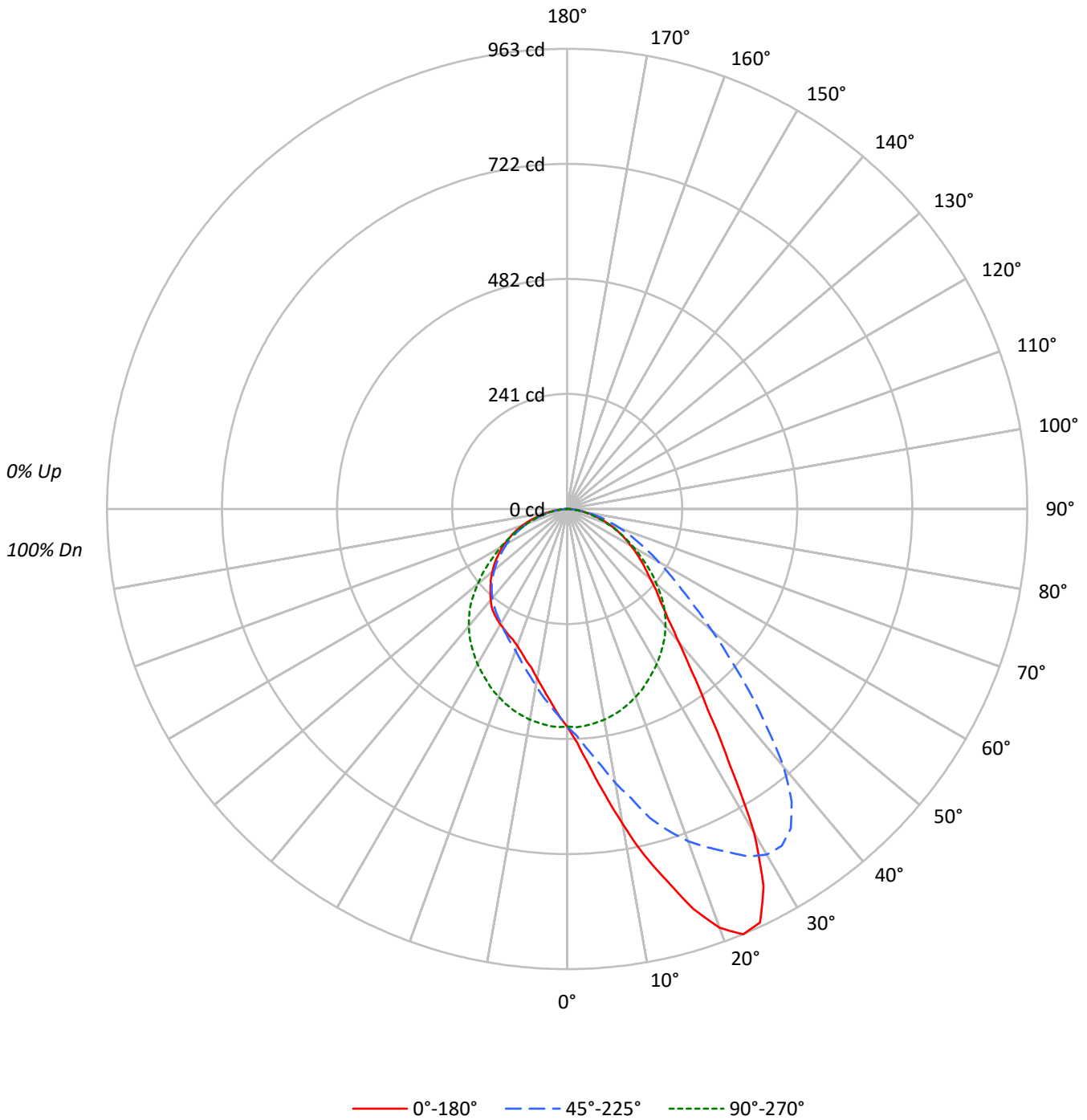
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1373.4 lumens  
Efficiency: N/A  
Efficacy: 118.4 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): 11.6  
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	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	
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	78	74				72	
3	92	82	74	68	89	80	73	67	77	71	66	75	69	65	72	68	64				62	
4	84	73	65	58	82	72	64	58	69	62	57	67	61	56	65	60	56				53	
5	78	66	57	51	76	64	56	50	62	55	50	60	54	49	59	53	49				47	
6	72	59	51	44	70	58	50	44	56	49	44	55	48	43	53	48	43				41	
7	67	54	45	39	65	53	45	39	52	44	39	50	44	39	49	43	38				36	
8	62	49	41	35	61	49	41	35	47	40	35	46	39	35	45	39	35				33	
9	58	45	37	32	57	45	37	32	43	36	32	42	36	31	41	36	31				29	
10	55	42	34	29	53	41	34	29	40	33	29	39	33	29	38	33	28				27	

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

	0°	45°	90°	135°	180°
0°	5515	5515	5515	5515	5515
5°	6578	6164	5539	5017	4908
10°	8233	7166	5510	4621	4433
15°	10098	8404	5466	4311	4127
20°	12028	9544	5397	4067	3930
25°	12772	10584	5314	3948	3887
30°	10948	11688	5251	3873	3906
35°	7613	12076	5164	3859	3948
40°	5734	11149	5062	3851	3935
45°	4762	9221	4909	3824	3884
50°	4266	7441	4597	3751	3849
55°	3988	6173	4262	3643	3802
60°	3741	5338	3913	3537	3762
65°	3516	4698	3565	3359	3643
70°	3296	4196	3172	3087	3470
75°	2955	3634	2777	2758	3180
80°	2583	2988	2276	2234	2736
85°	2031	2336	1655	1627	1836

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 55°  
 Vertical Angle: 45°  
 Luminance: 10899 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	44.7	3.3
10°-20°	143.7	10.5
20°-30°	241.8	17.6
30°-40°	273.3	19.9
40°-50°	244.8	17.8
50°-60°	197.6	14.4
60°-70°	137.7	10.0
70°-80°	72.3	5.3
80°-90°	17.3	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°	430.3	31.3
0°-40°	703.7	51.2
0°-60°	1146.1	83.5
0°-90°	1373.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1373.4	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	455	455	455	455	455	
5°	541	507	455	412	403	56
15°	805	670	436	344	329	232
25°	955	791	397	295	291	422
35°	514	816	349	261	267	332
45°	278	538	286	223	227	219
55°	189	292	202	172	180	169
65°	123	164	124	117	127	122
75°	63	78	59	59	68	67
85°	15	17	12	12	13	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°	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0
2.5°	489.9	489.4	488.3	489.2	487.4	485.0	484.8	482.6	476.2	475.7	474.0
5°	540.6	538.8	538.6	538.4	535.3	531.1	523.1	522.5	511.9	506.6	500.2
7.5°	601.8	601.2	599.4	597.4	587.1	582.0	574.5	564.8	552.5	540.6	533.1
10°	668.9	676.1	667.1	660.9	655.2	644.4	631.8	616.2	600.5	582.2	568.3
12.5°	740.7	743.4	743.4	737.6	727.9	710.1	685.4	667.8	653.7	620.1	608.2
15°	804.7	818.1	809.5	789.7	790.1	774.5	745.4	713.4	696.4	669.7	633.4
17.5°	877.0	879.4	876.8	858.2	849.2	826.5	800.3	770.5	738.5	706.1	668.4
20°	932.5	931.2	923.5	914.9	895.9	879.2	849.9	815.7	771.6	739.9	697.7
22.5°	963.4	961.0	958.3	951.5	936.5	918.2	892.6	854.5	813.0	766.3	716.0
25°	955.0	957.9	958.3	956.3	950.8	940.0	919.3	889.5	847.7	791.4	740.7
27.5°	890.2	897.5	906.7	912.9	922.8	929.4	922.8	904.1	869.7	819.4	757.0
30°	782.2	773.4	795.2	822.7	841.5	874.6	893.1	894.2	876.8	835.1	774.7
32.5°	632.3	646.6	653.2	688.7	735.2	773.4	814.8	851.6	860.2	836.0	785.0
35°	514.5	526.7	544.3	561.9	606.0	644.0	708.8	765.2	810.2	816.1	783.7
37.5°	427.7	434.7	445.5	464.3	494.5	541.4	592.8	666.2	728.2	771.8	767.4
40°	362.4	364.2	376.8	390.2	413.6	450.6	495.8	558.9	636.9	704.6	732.8
42.5°	313.5	317.9	321.4	334.2	351.6	377.2	418.4	467.8	537.7	618.2	680.1
45°	277.8	282.2	285.5	294.1	307.3	326.1	355.4	403.0	457.4	537.9	612.2
47.5°	253.1	252.6	255.5	262.3	271.8	286.8	308.4	340.2	392.4	459.7	537.5
50°	226.2	229.7	230.6	235.7	242.7	253.1	270.3	296.3	337.3	394.6	464.7
52.5°	207.2	207.7	210.5	213.8	219.8	227.3	241.6	260.6	290.6	337.3	400.3
55°	188.7	188.7	191.1	194.0	197.5	204.8	214.7	229.7	254.2	292.1	345.5
57.5°	171.5	172.4	174.6	175.3	178.3	183.4	192.0	203.9	222.7	253.3	297.4
60°	154.3	156.3	156.1	157.8	160.5	164.2	171.3	180.6	196.9	220.2	255.9
62.5°	139.3	138.7	138.7	140.9	143.5	147.0	151.0	158.7	172.0	192.0	221.1
65°	122.6	122.1	123.7	125.0	125.9	128.5	132.1	139.1	148.4	163.8	187.4
67.5°	108.0	106.7	107.8	108.2	109.8	112.0	115.5	119.9	127.4	140.4	159.4
70°	93.0	91.9	91.7	92.2	93.5	95.0	97.4	101.6	108.5	118.4	131.4
72.5°	77.6	76.9	76.9	78.0	78.5	79.4	80.9	84.7	89.7	96.6	108.5
75°	63.1	63.1	63.1	63.3	63.9	64.8	66.1	68.1	72.3	77.6	85.8
77.5°	49.8	50.0	49.6	49.4	50.5	50.9	51.1	53.4	55.8	59.7	66.1
80°	37.0	35.9	36.4	37.0	37.5	37.7	38.4	38.8	40.8	42.8	47.0
82.5°	25.1	24.3	24.3	25.4	25.4	25.6	26.2	26.9	27.3	29.1	30.9
85°	14.6	14.6	14.8	14.8	15.0	14.8	15.4	15.7	15.7	16.8	18.1
87.5°	6.6	6.2	6.4	6.6	6.4	6.6	6.8	7.1	7.3	7.5	7.7
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°	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0
2.5°	472.7	470.9	469.1	466.0	463.4	459.7	458.5	457.2	453.3	449.7	447.1
5°	497.8	492.5	484.8	477.7	472.0	464.3	459.9	455.2	448.6	442.7	437.8
7.5°	521.8	512.6	501.8	490.1	478.8	468.0	459.4	451.7	443.1	434.7	428.3
10°	551.6	536.6	519.8	501.8	486.3	471.3	458.8	447.7	435.8	425.5	416.9
12.5°	585.5	561.5	536.8	513.9	494.9	472.7	456.8	442.0	428.1	415.1	405.2
15°	610.9	582.7	555.3	525.1	497.3	471.3	453.3	435.6	420.0	407.2	394.8
17.5°	636.0	605.2	570.3	533.9	501.3	471.3	446.6	427.7	408.5	393.1	381.2
20°	656.7	620.4	579.6	541.4	504.4	470.0	442.2	418.4	397.3	380.7	366.8
22.5°	674.6	630.5	588.0	546.5	504.2	466.5	434.1	409.4	386.0	369.9	354.9
25°	685.8	634.9	592.6	544.7	498.7	460.3	425.0	397.3	374.3	355.4	340.2
27.5°	696.4	634.3	586.4	534.8	492.1	453.9	416.0	386.2	362.2	341.7	326.1
30°	707.0	635.4	575.6	524.7	481.5	441.8	405.2	375.2	349.6	328.7	314.2
32.5°	713.6	634.7	565.7	510.6	464.7	430.8	393.5	362.2	335.8	315.3	301.4
35°	715.4	630.9	554.0	490.1	446.4	412.3	381.2	349.0	321.4	302.2	286.4
37.5°	711.6	624.1	541.2	471.6	424.4	390.4	363.3	335.8	309.3	287.9	274.0
40°	699.5	617.5	525.8	451.7	401.5	369.0	346.8	319.9	293.9	273.8	261.0
42.5°	676.4	604.1	508.8	429.7	377.6	345.2	325.2	303.8	279.5	261.0	248.2
45°	635.8	583.3	491.8	407.6	354.3	320.8	302.7	286.4	264.1	245.8	234.8
47.5°	584.0	555.3	467.4	384.5	329.8	297.4	278.4	265.0	247.6	232.8	222.0
50°	529.5	519.2	442.5	360.7	305.3	273.8	255.7	243.8	232.1	217.4	207.7
52.5°	466.7	477.3	413.4	336.0	280.4	249.6	232.8	224.0	213.6	202.2	194.0
55°	408.5	431.7	379.0	307.8	255.7	226.2	210.1	201.7	195.5	186.5	179.2
57.5°	352.1	381.6	343.3	279.3	231.5	205.7	189.8	180.3	176.4	171.3	165.3
60°	302.9	332.0	304.5	250.7	207.0	182.8	169.1	161.4	157.4	154.1	149.2
62.5°	259.0	288.6	266.5	221.6	183.0	160.9	149.5	142.0	139.1	137.8	133.8
65°	219.6	244.9	229.5	191.1	160.3	140.4	129.6	124.3	121.5	120.8	118.2
67.5°	185.4	205.0	193.1	164.2	139.1	121.0	111.6	106.9	104.5	104.3	102.1
70°	151.9	170.0	161.4	135.8	114.9	101.4	93.5	89.5	88.2	88.0	86.9
72.5°	125.9	137.1	130.7	110.4	95.5	83.6	78.3	74.1	72.5	73.0	72.3
75°	97.0	106.5	102.5	87.7	74.7	66.8	61.9	59.3	58.0	58.6	57.8
77.5°	74.1	80.7	76.7	65.5	57.1	51.1	47.4	45.6	44.3	44.3	43.9
80°	52.7	56.2	54.2	48.1	41.4	36.6	33.7	32.6	32.0	31.7	31.5
82.5°	33.7	36.6	34.2	30.4	26.5	24.0	22.7	21.2	20.7	20.9	20.7
85°	19.0	20.1	19.2	16.5	14.8	13.4	12.6	11.9	11.5	11.7	11.2
87.5°	8.2	8.4	7.7	6.8	6.4	5.7	5.7	5.3	4.9	4.9	4.6
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°	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0	455.0
2.5°	445.5	444.0	441.8	438.5	435.8	431.7	431.7	432.3	432.3	432.1	431.7
5°	433.9	430.6	426.6	422.0	417.1	412.3	411.4	409.6	408.3	407.4	406.3
7.5°	422.0	416.4	410.9	404.5	399.0	394.4	391.1	388.2	386.5	384.5	382.9
10°	409.8	402.6	395.7	388.9	381.4	375.4	371.7	369.0	367.1	365.3	364.4
12.5°	395.5	386.9	379.2	372.8	364.4	358.2	354.7	353.8	351.4	347.2	345.0
15°	381.6	373.9	364.9	354.9	351.0	343.5	339.3	337.3	336.0	333.1	332.2
17.5°	370.1	359.8	349.4	342.1	334.9	328.9	326.5	323.9	322.1	319.4	318.8
20°	355.8	346.8	337.5	329.6	321.9	315.3	313.3	311.5	309.7	308.6	307.8
22.5°	341.3	332.2	325.0	317.7	309.3	305.6	303.3	301.4	300.3	299.6	298.7
25°	327.8	319.9	311.3	304.7	298.1	295.2	293.9	292.8	291.9	290.8	290.6
27.5°	315.9	307.1	299.8	293.4	288.6	286.2	284.6	283.9	283.9	284.4	284.6
30°	302.2	294.3	288.6	283.3	278.9	276.7	276.5	276.5	277.3	277.6	278.0
32.5°	289.7	283.5	277.8	272.7	269.6	268.3	269.4	269.4	270.1	270.7	271.6
35°	277.6	271.8	267.4	263.0	260.1	260.8	261.2	261.7	262.8	264.1	265.0
37.5°	266.1	260.8	256.2	252.6	250.9	252.2	253.3	254.2	255.5	256.6	257.5
40°	253.5	249.8	245.4	242.3	242.7	243.4	244.3	245.4	246.5	247.1	248.0
42.5°	241.8	237.9	234.8	232.4	233.0	233.9	234.3	234.8	236.1	237.4	237.9
45°	229.9	226.8	223.8	222.2	222.7	223.1	223.5	224.2	225.3	226.2	226.4
47.5°	216.5	214.3	212.3	210.5	211.4	211.2	211.9	213.2	213.6	214.1	215.4
50°	203.7	201.7	199.3	198.9	198.9	198.9	199.1	200.8	200.8	201.7	202.6
52.5°	189.6	188.5	187.2	186.3	185.8	185.8	186.9	187.6	188.0	189.4	190.3
55°	175.7	174.4	173.1	172.4	172.0	172.4	174.2	174.6	175.7	176.4	177.0
57.5°	161.2	160.3	159.2	158.7	158.7	158.9	160.3	161.4	161.6	163.8	164.7
60°	146.8	145.3	144.4	144.4	144.0	145.9	145.5	147.7	148.1	149.5	151.0
62.5°	132.1	129.8	129.6	129.6	130.5	130.7	131.6	132.3	133.6	135.4	136.5
65°	116.0	114.9	116.4	116.2	115.7	117.1	117.1	118.2	119.5	121.0	123.5
67.5°	101.0	100.1	100.5	100.3	101.0	101.9	102.5	103.4	104.9	106.7	108.2
70°	85.8	86.4	85.3	86.2	86.9	87.1	87.5	88.8	90.6	91.7	93.5
72.5°	71.0	70.8	71.2	71.4	72.1	72.5	73.0	74.5	76.5	77.4	78.7
75°	56.9	56.7	57.3	57.3	58.4	58.9	59.3	60.0	61.7	63.1	64.2
77.5°	44.1	44.3	44.1	45.0	44.5	44.8	46.1	46.7	47.0	49.8	50.3
80°	31.3	31.7	32.0	32.2	32.4	32.0	33.5	34.2	34.2	35.7	36.8
82.5°	20.3	20.5	21.2	21.4	21.4	22.0	21.8	22.3	22.9	23.4	24.9
85°	11.2	11.9	12.1	11.9	12.1	11.7	12.3	12.6	12.8	12.8	12.8
87.5°	4.4	4.6	4.4	4.6	4.4	4.6	4.6	4.2	4.2	4.9	4.0
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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CATALOG NUMBER: S123DRP-S340D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	455.0	455.0	455.0	455.0
2.5°	430.1	429.9	431.4	430.3
5°	405.0	405.6	403.4	403.4
7.5°	382.3	381.4	381.6	380.1
10°	361.8	360.4	360.0	360.2
12.5°	344.8	344.8	341.3	341.3
15°	332.2	328.0	327.6	328.9
17.5°	318.3	315.9	316.1	315.7
20°	307.8	306.4	306.2	304.7
22.5°	298.1	297.8	298.1	296.3
25°	290.3	291.4	290.6	290.6
27.5°	285.1	285.1	284.4	284.4
30°	278.9	278.7	279.1	279.1
32.5°	272.7	273.1	273.1	273.4
35°	266.3	266.5	267.2	266.8
37.5°	257.9	259.0	258.8	259.3
40°	248.2	248.9	248.7	248.7
42.5°	238.3	238.8	238.1	237.7
45°	227.3	226.8	227.5	226.6
47.5°	215.2	215.4	215.6	216.5
50°	203.0	204.4	204.4	204.1
52.5°	191.1	191.6	192.7	192.7
55°	178.8	179.2	179.7	179.9
57.5°	166.2	166.0	166.9	167.1
60°	152.8	152.8	154.5	155.2
62.5°	138.4	139.3	141.1	139.8
65°	124.6	126.3	126.1	127.0
67.5°	110.0	111.1	112.9	112.9
70°	95.2	96.3	97.2	97.9
72.5°	80.9	81.3	83.8	82.5
75°	65.7	67.2	68.6	67.9
77.5°	51.1	53.1	53.6	52.9
80°	38.4	38.1	39.5	39.2
82.5°	25.6	25.4	25.8	26.0
85°	13.7	14.3	13.4	13.2
87.5°	4.0	4.0	3.7	3.5
90°	0.0	0.0	0.0	0.0



TEST NUMBER: P242471  
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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	16.32	17.87	16.68	18.18	18.50	16.87	18.43	17.24	18.74	19.05
	3H	17.86	19.26	18.24	19.59	19.95	18.20	19.60	18.58	19.93	20.29
	4H	18.43	19.74	18.83	20.09	20.47	18.66	19.98	19.06	20.33	20.70
	6H	18.83	20.04	19.24	20.41	20.80	18.96	20.17	19.37	20.54	20.93
	8H	18.94	20.10	19.37	20.49	20.89	19.03	20.19	19.46	20.58	20.98
	12H	19.01	20.12	19.44	20.50	20.93	19.07	20.17	19.50	20.56	20.99
4H	2H	17.47	18.78	17.87	19.13	19.51	17.63	18.95	18.03	19.30	19.67
	3H	19.06	20.16	19.47	20.56	20.96	19.44	20.53	19.85	20.93	21.33
	4H	19.68	20.67	20.12	21.09	21.52	20.01	20.99	20.44	21.41	21.84
	6H	20.16	21.01	20.61	21.46	21.92	20.37	21.23	20.83	21.67	22.13
	8H	20.30	21.10	20.76	21.54	22.01	20.46	21.26	20.92	21.70	22.17
	12H	20.39	21.11	20.87	21.58	22.05	20.51	21.23	20.99	21.71	22.18
8H	4H	20.17	20.97	20.63	21.41	21.88	20.31	21.11	20.77	21.56	22.02
	6H	20.72	21.38	21.21	21.87	22.35	20.82	21.48	21.32	21.97	22.45
	8H	20.91	21.50	21.42	22.01	22.50	20.97	21.56	21.48	22.07	22.56
	12H	21.05	21.58	21.56	22.07	22.63	21.06	21.59	21.57	22.08	22.64
12H	4H	20.22	20.94	20.70	21.42	21.89	20.32	21.04	20.80	21.52	21.99
	6H	20.79	21.39	21.31	21.90	22.39	20.85	21.45	21.37	21.96	22.45
	8H	21.03	21.56	21.54	22.05	22.61	21.06	21.58	21.57	22.08	22.64