

Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P382196

Luminaire Tested: **MWL-2-13-31-UNV-L830-EDD**

Issue Date: 12/2/2019

Test Information

Test Method: LM-79-08
Report Number: P382196
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1910-565-25 &
Test Lab: INNOVATION CENTER
Issue Date: 12/2/2019
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: MWL-2-13-31-UNV-L830-EDD
Description: MWL 2FT MEDICAL LED FIXTURE
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

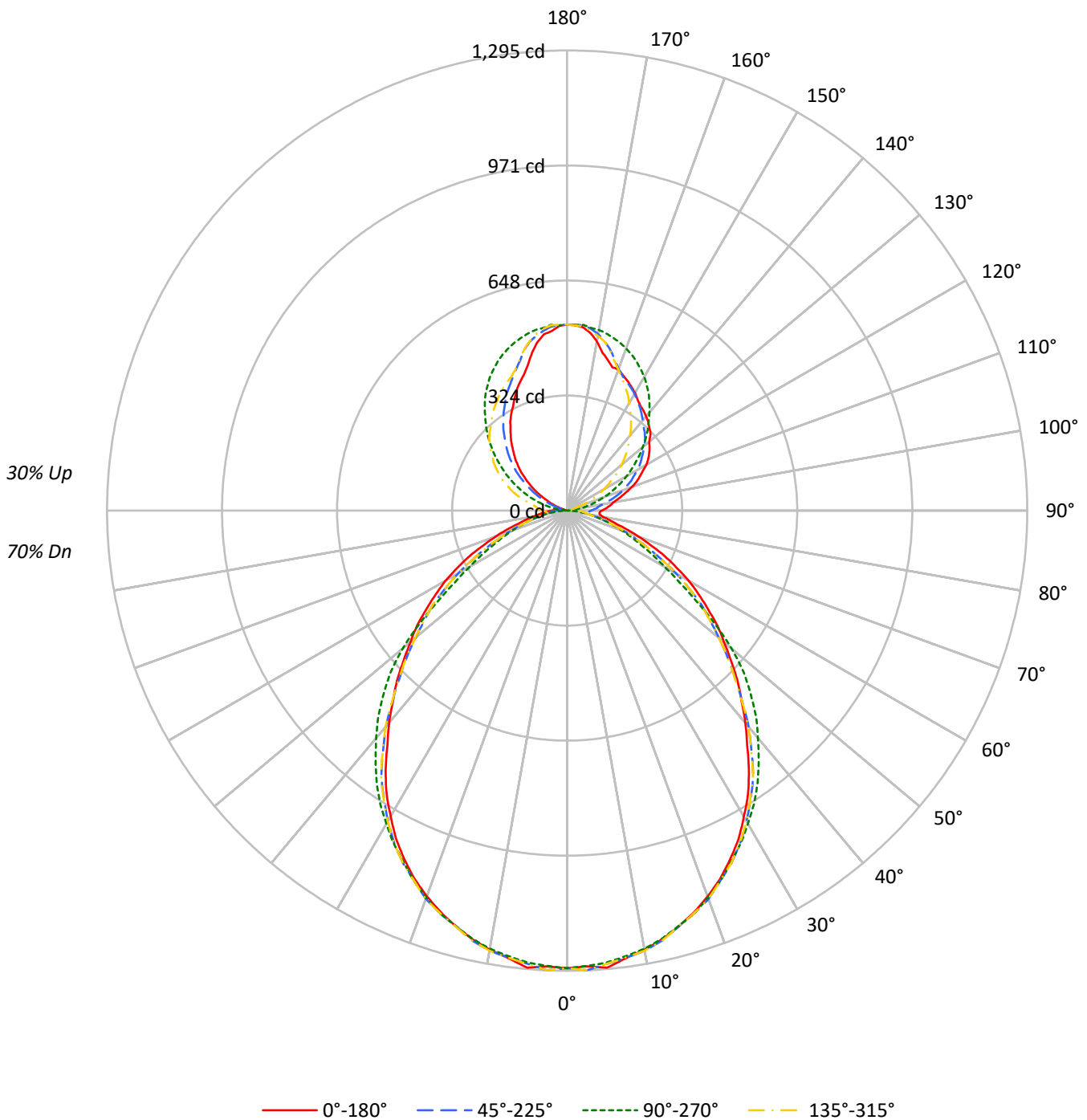
Lumens per Lamp: N/A
Luminaire Lumens: 4186.0 lumens
Efficiency: N/A
Efficacy: 93.6 lumens/watt
Spacing Criteria (0/90/45): 1.16 / 1.18 / 1.25
Luminous Opening: Rectangular w/ Sides (W: 0.42' x L: 2' x H: 0.42')
CIE Type: Semi-Direct

Input Watts (W): 44.7
Input Voltage (V): NR
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: 25 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	112	112	112	112	106	106	106	106	94	94	94	84	84	84	74	74	74	74	74	74	70	
1	103	98	95	91	97	93	90	87	84	81	79	75	73	71	66	65	64	64	64	64	60	
2	94	87	81	75	89	82	77	72	74	70	66	66	63	60	59	57	55	55	55	55	51	
3	86	77	69	64	81	73	66	61	66	61	56	59	55	52	53	50	47	47	47	47	44	
4	79	68	60	54	75	65	58	52	59	53	49	53	49	45	48	44	41	41	41	41	38	
5	73	61	53	47	69	58	51	46	53	47	42	48	43	39	43	39	36	36	36	36	33	
6	67	55	47	41	64	53	45	40	48	42	37	44	39	35	39	35	32	32	32	32	30	
7	63	50	42	37	59	48	41	35	44	38	33	40	35	31	36	32	29	29	29	29	26	
8	58	46	38	33	55	44	37	32	40	34	30	37	32	28	33	29	26	26	26	26	24	
9	54	42	34	29	52	40	33	28	37	31	27	34	29	25	31	27	24	24	24	24	22	
10	51	39	31	27	48	37	30	26	34	28	24	31	26	23	29	25	21	21	21	21	20	

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	16633	16633	16633	16633
5°	16442	15223	16442	15223
10°	15872	13962	15872	13962
15°	15347	12764	15334	12764
20°	14766	11676	14753	11676
25°	14086	10598	14072	10598
30°	13244	9622	13224	9622
35°	12271	8667	12256	8667
40°	11204	7663	11182	7663
45°	10256	6670	10239	6670
50°	9282	5545	9264	5545
55°	8397	4116	8383	4116
60°	7510	3004	7502	3004
65°	6397	2232	6397	2232
70°	5133	1655	5140	1655
75°	3953	1156	3987	1156
80°	3492	733	3253	733
85°	3984	305	2937	305



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	121.4	2.9
10°-20°	341.8	8.2
20°-30°	501.0	12.0
30°-40°	568.2	13.6
40°-50°	530.1	12.7
50°-60°	415.7	9.9
60°-70°	259.3	6.2
70°-80°	125.1	3.0
80°-90°	60.1	1.4
90°-100°	52.4	1.3
100°-110°	81.6	2.0
110°-120°	139.7	3.3
120°-130°	189.7	4.5
130°-140°	216.2	5.2
140°-150°	215.5	5.1
150°-160°	187.5	4.5
160°-170°	131.7	3.1
170°-180°	49.0	1.2
0°-30°	964.2	23.0
0°-40°	1532.5	36.6
0°-60°	2478.3	59.2
0°-90°	2922.7	69.8
90°-120°	273.7	6.5
90°-150°	895.0	21.4
90°-180°	1263.0	30.2
0°-180°	4186.0	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	1288	1288	1288	1288	1288	
5°	1291	1277	1291	1277	1291	122
15°	1212	1210	1211	1210	1212	341
25°	1084	1090	1083	1090	1084	498
35°	892	934	891	934	892	556
45°	678	730	677	730	678	522
55°	484	444	483	444	484	434
65°	303	230	303	230	303	299
75°	141	110	142	110	141	157
85°	91	26	67	26	91	77
90°	97	1	42	1	97	54
95°	115	16	28	16	115	98
105°	159	73	4	73	159	170
115°	225	150	53	150	225	223
125°	282	234	129	234	282	252
135°	327	320	207	320	327	253
145°	359	400	277	400	359	227
155°	402	462	349	462	402	186
165°	439	503	425	503	439	125
175°	517	524	506	524	517	48
180°	523	523	523	523	523	



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CATALOG NUMBER: MWL-2-13-31-UNV-L830-EDD

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7
2.5°	1283.7	1291.0	1294.6	1281.8	1282.7	1281.5	1294.6	1291.0	1284.1	1291.0	1294.6
5°	1291.2	1281.7	1280.6	1279.6	1276.8	1279.6	1280.2	1281.7	1291.2	1281.7	1280.2
7.5°	1270.1	1275.5	1269.0	1267.5	1264.7	1267.1	1268.6	1275.1	1270.1	1275.1	1268.6
10°	1254.6	1258.7	1257.8	1251.2	1252.2	1250.9	1257.4	1258.0	1254.6	1258.0	1257.4
12.5°	1235.7	1239.1	1238.7	1231.3	1233.7	1231.3	1238.7	1238.3	1235.0	1238.3	1238.7
15°	1211.7	1212.0	1211.6	1208.8	1210.3	1208.5	1211.3	1211.3	1210.7	1211.3	1211.3
17.5°	1185.6	1188.7	1188.3	1188.9	1188.9	1188.9	1187.9	1188.3	1184.6	1188.3	1187.9
20°	1155.7	1161.0	1163.1	1158.0	1158.6	1157.7	1162.7	1160.3	1154.7	1160.3	1162.7
22.5°	1122.7	1123.7	1126.7	1119.7	1127.8	1119.4	1126.3	1122.9	1122.0	1122.9	1126.3
25°	1084.4	1085.4	1094.3	1090.8	1090.4	1090.4	1093.6	1084.3	1083.3	1084.3	1093.6
27.5°	1043.4	1043.4	1055.1	1051.9	1056.8	1051.6	1054.4	1042.2	1042.2	1042.2	1054.4
30°	994.8	1003.2	1009.7	1023.4	1017.6	1022.6	1008.6	1002.1	993.3	1002.1	1008.6
32.5°	947.2	951.8	961.2	971.1	978.7	970.3	960.0	950.3	945.7	950.3	960.0
35°	891.7	891.7	913.2	930.9	934.5	929.8	912.0	890.6	890.6	890.6	912.0
37.5°	831.9	833.8	852.5	879.5	885.3	878.4	851.3	832.7	830.8	832.7	851.3
40°	780.6	776.8	794.6	829.7	835.8	828.9	793.1	775.3	779.1	775.3	793.1
42.5°	726.4	720.8	729.7	772.7	787.3	772.0	728.6	719.3	724.9	719.3	728.6
45°	678.4	667.2	669.0	709.2	730.3	708.5	667.6	666.1	677.3	666.1	667.6
47.5°	625.2	621.4	613.9	640.7	674.3	640.3	612.5	620.3	624.0	620.3	612.5
50°	576.6	569.1	557.9	580.0	604.8	579.2	556.4	567.6	575.5	567.6	556.4
52.5°	533.6	527.1	506.2	519.2	524.5	518.5	505.1	525.6	532.5	525.6	505.1
55°	483.8	482.8	461.3	455.4	443.8	454.6	460.2	481.7	483.0	481.7	460.2
57.5°	438.9	437.1	406.2	395.6	373.7	394.9	405.1	435.9	438.2	435.9	405.1
60°	395.6	389.1	355.4	328.9	317.7	328.5	354.7	388.3	395.2	388.3	354.7
62.5°	347.0	343.3	302.2	273.8	271.6	273.4	301.5	342.6	346.7	342.6	301.5
65°	302.8	288.8	254.2	228.1	229.6	227.7	253.8	288.4	302.8	288.4	253.8
67.5°	255.1	241.1	211.2	187.5	195.0	187.5	210.9	240.8	255.1	240.8	210.9
70°	213.7	195.0	172.6	153.0	164.2	153.0	172.6	195.4	214.0	195.4	172.6
72.5°	175.4	155.8	139.0	125.0	134.9	124.6	139.0	156.1	176.1	156.1	139.0
75°	140.8	123.1	107.8	100.3	109.6	100.3	108.1	123.5	142.0	123.5	108.1
77.5°	121.3	101.2	81.6	77.9	89.1	77.9	82.0	100.1	119.9	100.1	82.0
80°	102.4	89.6	64.1	58.3	65.7	58.3	63.3	83.7	95.4	83.7	63.3
82.5°	93.5	85.5	58.2	41.5	45.2	41.5	53.8	72.3	79.5	72.3	53.8
85°	90.9	86.3	57.0	32.3	25.6	31.6	46.2	63.8	67.0	63.8	46.2
87.5°	92.0	91.4	61.1	30.4	7.5	25.2	40.1	56.1	54.1	56.1	40.1
90°	97.0	98.0	67.8	30.6	1.3	16.6	31.4	46.1	41.8	46.1	31.4
92.5°	107.6	106.0	75.8	33.6	6.8	8.2	25.4	37.9	35.5	37.9	25.4
95°	115.4	113.2	84.1	39.2	15.7	2.4	17.9	27.8	28.2	27.8	17.9
97.5°	125.0	121.3	90.0	52.5	27.1	5.3	8.8	20.2	22.0	20.2	8.8
100°	131.0	127.9	101.0	68.3	41.0	13.1	3.5	12.3	15.1	12.3	3.5
102.5°	145.4	138.2	116.1	83.4	56.1	23.7	6.4	5.8	8.6	5.8	6.4
105°	159.3	154.2	134.1	99.2	73.4	38.1	15.3	6.3	4.5	6.3	15.3
107.5°	175.2	171.5	151.3	115.3	91.8	54.6	28.8	15.5	10.4	15.5	28.8
110°	193.6	189.1	167.1	131.6	110.9	72.3	43.1	27.3	21.4	27.3	43.1



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CATALOG NUMBER: MWL-2-13-31-UNV-L830-EDD

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
112.5°	211.2	207.9	181.8	149.4	130.8	92.4	60.7	41.9	36.4	41.9	60.7
115°	224.9	223.0	198.7	165.2	150.2	114.1	80.2	59.3	52.7	59.3	80.2
117.5°	239.2	238.8	211.2	181.5	172.2	133.6	98.2	76.6	69.6	76.6	98.2
120°	257.2	254.3	228.5	197.6	193.2	154.2	118.1	96.5	89.5	96.5	118.1
122.5°	270.6	267.9	243.3	213.1	213.1	175.2	137.3	115.5	109.2	115.5	137.3
125°	282.0	281.4	255.2	228.5	234.4	194.7	159.5	137.5	129.3	137.5	159.5
127.5°	292.4	293.5	269.5	246.4	257.1	215.5	180.5	156.2	147.7	156.2	180.5
130°	301.2	304.9	283.2	261.9	277.6	237.2	199.3	175.0	169.5	175.0	199.3
132.5°	318.5	316.3	297.2	277.6	299.8	257.1	219.2	193.8	187.5	193.8	219.2
135°	327.3	328.1	309.3	291.3	320.3	276.9	238.0	212.9	206.7	212.9	238.0
137.5°	338.0	335.8	318.8	307.8	339.5	296.0	256.4	233.1	223.2	233.1	256.4
140°	345.7	345.4	331.3	322.6	360.1	314.8	275.1	251.5	242.3	251.5	275.1
142.5°	353.9	356.0	343.9	338.7	380.7	334.7	295.3	269.5	260.7	269.5	295.3
145°	359.4	365.1	356.4	359.0	400.2	356.7	312.9	287.8	277.3	287.8	312.9
147.5°	369.5	375.7	366.6	373.4	417.1	376.3	331.6	305.9	297.4	305.9	331.6
150°	382.0	385.0	379.4	393.2	434.4	398.0	349.7	323.1	314.6	323.1	349.7
152.5°	392.0	395.6	389.3	414.9	448.0	417.8	369.5	340.0	330.1	340.0	369.5
155°	402.2	403.7	399.2	435.9	462.4	437.3	385.3	358.8	349.3	358.8	385.3
157.5°	411.8	414.7	408.7	451.7	474.9	454.2	402.4	377.6	369.1	377.6	402.4
160°	422.1	422.1	424.1	470.1	485.2	469.0	421.6	398.2	386.4	398.2	421.6
162.5°	423.2	430.2	445.1	483.0	495.2	481.9	442.1	412.9	402.6	412.9	442.1
165°	439.4	444.7	468.6	494.4	502.8	493.3	467.5	436.2	425.0	436.2	467.5
167.5°	456.3	468.6	487.8	507.3	510.2	503.9	487.0	465.4	455.2	465.4	487.0
170°	483.0	494.4	503.9	512.1	516.1	512.4	499.2	488.5	481.5	488.5	499.2
172.5°	503.7	512.1	515.7	520.8	518.3	516.8	510.2	505.1	500.5	505.1	510.2
175°	517.4	519.8	523.1	522.1	524.4	520.4	519.8	522.3	506.4	522.3	519.8
177.5°	522.1	524.8	523.8	521.5	521.8	521.1	521.6	522.1	519.9	522.1	521.6
180°	523.1	523.1	523.1	523.1	523.1	523.1	523.1	523.1	523.1	523.1	523.1



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CATALOG NUMBER: MWL-2-13-31-UNV-L830-EDD

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	1287.7	1287.7	1287.7	1287.7	1287.7	1287.7
2.5°	1281.5	1282.7	1281.8	1294.6	1291.0	1283.7
5°	1279.6	1276.8	1279.6	1280.6	1281.7	1291.2
7.5°	1267.1	1264.7	1267.5	1269.0	1275.5	1270.1
10°	1250.9	1252.2	1251.2	1257.8	1258.7	1254.6
12.5°	1231.3	1233.7	1231.3	1238.7	1239.1	1235.7
15°	1208.5	1210.3	1208.8	1211.6	1212.0	1211.7
17.5°	1188.9	1188.9	1188.9	1188.3	1188.7	1185.6
20°	1157.7	1158.6	1158.0	1163.1	1161.0	1155.7
22.5°	1119.4	1127.8	1119.7	1126.7	1123.7	1122.7
25°	1090.4	1090.4	1090.8	1094.3	1085.4	1084.4
27.5°	1051.6	1056.8	1051.9	1055.1	1043.4	1043.4
30°	1022.6	1017.6	1023.4	1009.7	1003.2	994.8
32.5°	970.3	978.7	971.1	961.2	951.8	947.2
35°	929.8	934.5	930.9	913.2	891.7	891.7
37.5°	878.4	885.3	879.5	852.5	833.8	831.9
40°	828.9	835.8	829.7	794.6	776.8	780.6
42.5°	772.0	787.3	772.7	729.7	720.8	726.4
45°	708.5	730.3	709.2	669.0	667.2	678.4
47.5°	640.3	674.3	640.7	613.9	621.4	625.2
50°	579.2	604.8	580.0	557.9	569.1	576.6
52.5°	518.5	524.5	519.2	506.2	527.1	533.6
55°	454.6	443.8	455.4	461.3	482.8	483.8
57.5°	394.9	373.7	395.6	406.2	437.1	438.9
60°	328.5	317.7	328.9	355.4	389.1	395.6
62.5°	273.4	271.6	273.8	302.2	343.3	347.0
65°	227.7	229.6	228.1	254.2	288.8	302.8
67.5°	187.5	195.0	187.5	211.2	241.1	255.1
70°	153.0	164.2	153.0	172.6	195.0	213.7
72.5°	124.6	134.9	125.0	139.0	155.8	175.4
75°	100.3	109.6	100.3	107.8	123.1	140.8
77.5°	77.9	89.1	77.9	81.6	101.2	121.3
80°	58.3	65.7	58.3	64.1	89.6	102.4
82.5°	41.5	45.2	41.5	58.2	85.5	93.5
85°	31.6	25.6	32.3	57.0	86.3	90.9
87.5°	25.2	7.5	30.4	61.1	91.4	92.0
90°	16.6	1.3	30.6	67.8	98.0	97.0
92.5°	8.2	6.8	33.6	75.8	106.0	107.6
95°	2.4	15.7	39.2	84.1	113.2	115.4
97.5°	5.3	27.1	52.5	90.0	121.3	125.0
100°	13.1	41.0	68.3	101.0	127.9	131.0
102.5°	23.7	56.1	83.4	116.1	138.2	145.4
105°	38.1	73.4	99.2	134.1	154.2	159.3
107.5°	54.6	91.8	115.3	151.3	171.5	175.2
110°	72.3	110.9	131.6	167.1	189.1	193.6



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CATALOG NUMBER: MWL-2-13-31-UNV-L830-EDD

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
112.5°	92.4	130.8	149.4	181.8	207.9	211.2
115°	114.1	150.2	165.2	198.7	223.0	224.9
117.5°	133.6	172.2	181.5	211.2	238.8	239.2
120°	154.2	193.2	197.6	228.5	254.3	257.2
122.5°	175.2	213.1	213.1	243.3	267.9	270.6
125°	194.7	234.4	228.5	255.2	281.4	282.0
127.5°	215.5	257.1	246.4	269.5	293.5	292.4
130°	237.2	277.6	261.9	283.2	304.9	301.2
132.5°	257.1	299.8	277.6	297.2	316.3	318.5
135°	276.9	320.3	291.3	309.3	328.1	327.3
137.5°	296.0	339.5	307.8	318.8	335.8	338.0
140°	314.8	360.1	322.6	331.3	345.4	345.7
142.5°	334.7	380.7	338.7	343.9	356.0	353.9
145°	356.7	400.2	359.0	356.4	365.1	359.4
147.5°	376.3	417.1	373.4	366.6	375.7	369.5
150°	398.0	434.4	393.2	379.4	385.0	382.0
152.5°	417.8	448.0	414.9	389.3	395.6	392.0
155°	437.3	462.4	435.9	399.2	403.7	402.2
157.5°	454.2	474.9	451.7	408.7	414.7	411.8
160°	469.0	485.2	470.1	424.1	422.1	422.1
162.5°	481.9	495.2	483.0	445.1	430.2	423.2
165°	493.3	502.8	494.4	468.6	444.7	439.4
167.5°	503.9	510.2	507.3	487.8	468.6	456.3
170°	512.4	516.1	512.1	503.9	494.4	483.0
172.5°	516.8	518.3	520.8	515.7	512.1	503.7
175°	520.4	524.4	522.1	523.1	519.8	517.4
177.5°	521.1	521.8	521.5	523.8	524.8	522.1
180°	523.1	523.1	523.1	523.1	523.1	523.1

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