

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: P392481

Luminaire Tested: **MWL-2-13-31-UNV-L930-EDD**

Issue Date: 12/2/2019

Test Information

Test Method: LM-79-08
Report Number: P392481
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-L930-EDD
Description: MWL 2FT MEDICAL LED FIXTURE
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

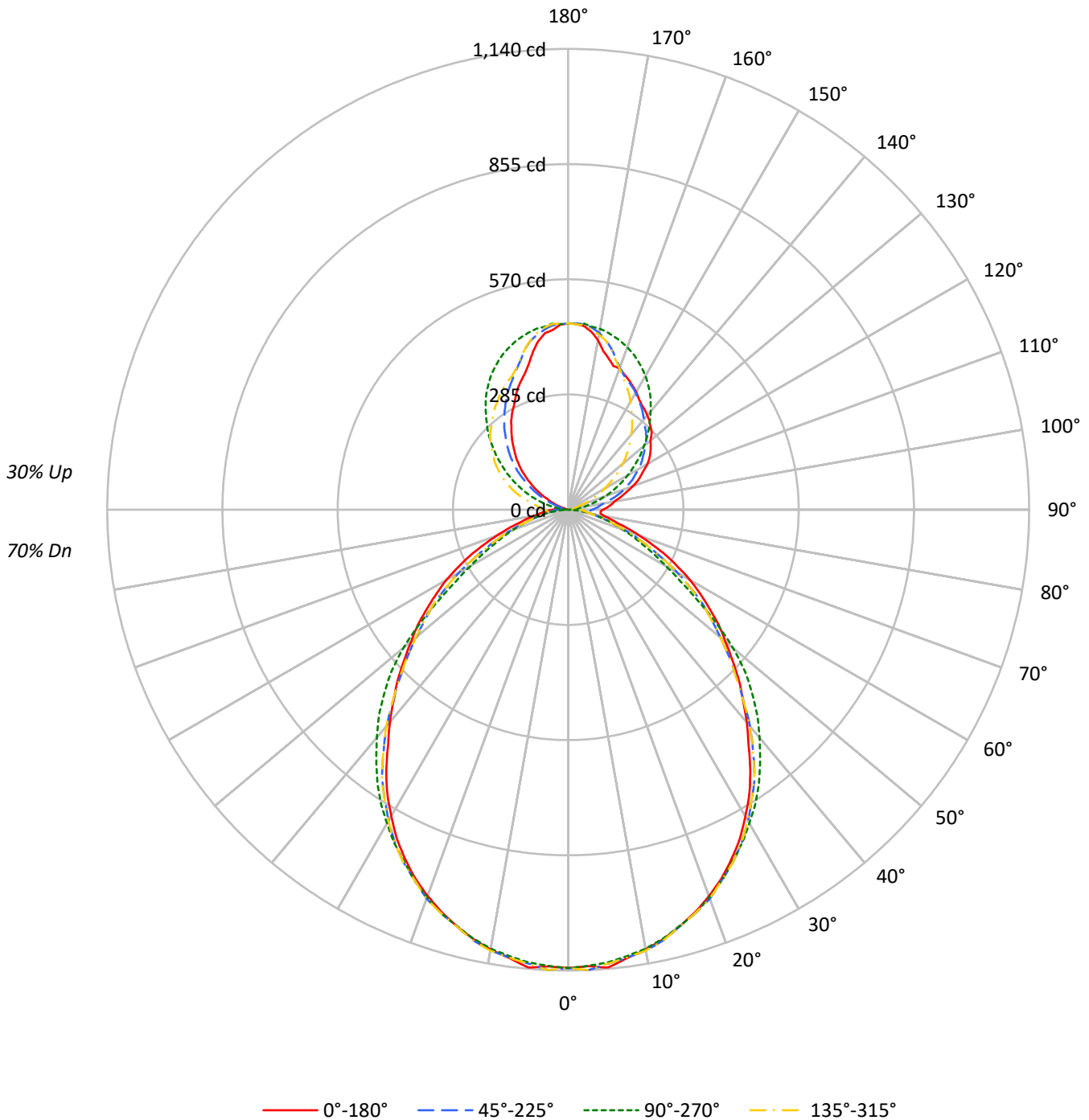
Lumens per Lamp: N/A
Luminaire Lumens: 3685.7 lumens
Efficiency: N/A
Efficacy: 81.6 lumens/watt
Spacing Criteria (0/90/45): 1.16 / 1.18 / 1.25
Luminous Opening: Rectangular w/ Sides (W: 0.42' x L: 2' x H: 0.42')
CIE Type: Semi-Direct

Input Watts (W): 45.147
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	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	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	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	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	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	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	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	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	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	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	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	21	21	21	20		

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	14645	14645	14645	14645
5°	14477	13404	14477	13404
10°	13976	12294	13976	12294
15°	13513	11239	13501	11239
20°	13002	10280	12990	10280
25°	12403	9332	12390	9332
30°	11661	8472	11644	8472
35°	10804	7631	10791	7631
40°	9864	6747	9846	6747
45°	9030	5873	9016	5873
50°	8173	4882	8157	4882
55°	7394	3624	7381	3624
60°	6612	2645	6606	2645
65°	5632	1965	5632	1965
70°	4520	1457	4525	1457
75°	3481	1018	3510	1018
80°	3076	644	2864	644
85°	3506	268	2586	268



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	106.9	2.9
10°-20°	300.9	8.2
20°-30°	441.2	12.0
30°-40°	500.3	13.6
40°-50°	466.7	12.7
50°-60°	366.0	9.9
60°-70°	228.3	6.2
70°-80°	110.1	3.0
80°-90°	52.9	1.4
90°-100°	46.1	1.3
100°-110°	71.9	1.9
110°-120°	123.0	3.3
120°-130°	167.0	4.5
130°-140°	190.3	5.2
140°-150°	189.7	5.1
150°-160°	165.1	4.5
160°-170°	116.0	3.1
170°-180°	43.2	1.2
0°-30°	849.0	23.0
0°-40°	1349.3	36.6
0°-60°	2182.1	59.2
0°-90°	2573.4	69.8
90°-120°	241.0	6.5
90°-150°	788.0	21.4
90°-180°	1112.0	30.2
0°-180°	3685.7	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	1134	1134	1134	1134	1134	
5°	1137	1124	1137	1124	1137	107
15°	1067	1066	1066	1066	1067	301
25°	955	960	954	960	955	439
35°	785	823	784	823	785	490
45°	597	643	596	643	597	460
55°	426	391	425	391	426	382
65°	267	202	267	202	267	263
75°	124	96	125	96	124	138
85°	80	22	59	22	80	68
90°	85	1	37	1	85	47
95°	102	14	25	14	102	86
105°	140	65	4	65	140	149
115°	198	132	46	132	198	196
125°	248	206	114	206	248	222
135°	288	282	182	282	288	222
145°	316	352	244	352	316	200
155°	354	407	308	407	354	163
165°	387	443	374	443	387	110
175°	456	462	446	462	456	42
180°	461	461	461	461	461	



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8
2.5°	1130.3	1136.7	1139.9	1128.6	1129.4	1128.4	1139.9	1136.7	1130.7	1136.7	1139.9
5°	1136.9	1128.5	1127.6	1126.7	1124.2	1126.7	1127.2	1128.5	1136.9	1128.5	1127.2
7.5°	1118.3	1123.1	1117.4	1116.0	1113.6	1115.7	1117.0	1122.7	1118.3	1122.7	1117.0
10°	1104.7	1108.3	1107.5	1101.7	1102.6	1101.4	1107.1	1107.7	1104.7	1107.7	1107.1
12.5°	1088.0	1091.0	1090.7	1084.2	1086.3	1084.2	1090.7	1090.3	1087.4	1090.3	1090.7
15°	1066.9	1067.2	1066.8	1064.3	1065.7	1064.1	1066.5	1066.5	1066.0	1066.5	1066.5
17.5°	1043.9	1046.7	1046.3	1046.8	1046.8	1046.8	1045.9	1046.3	1043.0	1046.3	1045.9
20°	1017.6	1022.3	1024.1	1019.6	1020.1	1019.4	1023.8	1021.6	1016.7	1021.6	1023.8
22.5°	988.5	989.4	992.1	985.9	993.0	985.6	991.7	988.7	987.9	988.7	991.7
25°	954.8	955.7	963.5	960.4	960.1	960.1	962.9	954.7	953.8	954.7	962.9
27.5°	918.7	918.7	929.0	926.2	930.5	925.9	928.4	917.7	917.7	917.7	928.4
30°	875.9	883.3	889.0	901.1	896.0	900.4	888.1	882.3	874.6	882.3	888.1
32.5°	834.0	838.1	846.3	855.1	861.7	854.3	845.3	836.7	832.7	836.7	845.3
35°	785.1	785.1	804.1	819.7	822.8	818.7	803.0	784.2	784.2	784.2	803.0
37.5°	732.5	734.2	750.6	774.4	779.5	773.4	749.6	733.2	731.5	733.2	749.6
40°	687.3	684.0	699.6	730.6	735.9	729.8	698.3	682.7	686.0	682.7	698.3
42.5°	639.6	634.7	642.5	680.4	693.2	679.7	641.5	633.3	638.3	633.3	641.5
45°	597.3	587.5	589.1	624.5	643.0	623.8	587.8	586.5	596.4	586.5	587.8
47.5°	550.5	547.1	540.5	564.1	593.7	563.8	539.3	546.2	549.4	546.2	539.3
50°	507.7	501.1	491.2	510.7	532.5	510.0	489.9	499.8	506.7	499.8	489.9
52.5°	469.8	464.1	445.7	457.2	461.8	456.5	444.7	462.8	468.9	462.8	444.7
55°	426.0	425.1	406.2	401.0	390.8	400.3	405.2	424.1	425.3	424.1	405.2
57.5°	386.5	384.9	357.7	348.3	329.0	347.7	356.7	383.8	385.8	383.8	356.7
60°	348.3	342.6	312.9	289.6	279.7	289.2	312.3	341.9	348.0	341.9	312.3
62.5°	305.5	302.3	266.1	241.1	239.1	240.7	265.5	301.7	305.3	301.7	265.5
65°	266.6	254.3	223.8	200.8	202.2	200.5	223.5	253.9	266.6	253.9	223.5
67.5°	224.6	212.3	186.0	165.1	171.7	165.1	185.7	212.0	224.6	212.0	185.7
70°	188.2	171.7	152.0	134.7	144.6	134.7	152.0	172.0	188.4	172.0	152.0
72.5°	154.4	137.2	122.4	110.1	118.8	109.7	122.4	137.4	155.1	137.4	122.4
75°	124.0	108.4	94.9	88.3	96.5	88.3	95.2	108.7	125.0	108.7	95.2
77.5°	106.8	89.1	71.8	68.6	78.5	68.6	72.2	88.1	105.6	88.1	72.2
80°	90.2	78.9	56.4	51.3	57.8	51.3	55.7	73.7	84.0	73.7	55.7
82.5°	82.3	75.3	51.2	36.5	39.8	36.5	47.4	63.7	70.0	63.7	47.4
85°	80.0	76.0	50.2	28.4	22.5	27.8	40.7	56.2	59.0	56.2	40.7
87.5°	81.0	80.5	53.8	26.8	6.6	22.2	35.3	49.4	47.6	49.4	35.3
90°	85.4	86.3	59.7	26.9	1.1	14.6	27.6	40.6	36.8	40.6	27.6
92.5°	94.7	93.3	66.7	29.6	6.0	7.2	22.4	33.4	31.3	33.4	22.4
95°	101.6	99.7	74.1	34.5	13.8	2.1	15.8	24.5	24.8	24.5	15.8
97.5°	110.1	106.8	79.2	46.2	23.9	4.7	7.7	17.8	19.4	17.8	7.7
100°	115.3	112.6	88.9	60.1	36.1	11.5	3.1	10.8	13.3	10.8	3.1
102.5°	128.0	121.7	102.2	73.4	49.4	20.9	5.6	5.1	7.6	5.1	5.6
105°	140.3	135.8	118.1	87.3	64.6	33.5	13.5	5.5	4.0	5.5	13.5
107.5°	154.3	151.0	133.2	101.5	80.8	48.1	25.4	13.6	9.2	13.6	25.4
110°	170.5	166.5	147.1	115.9	97.6	63.7	37.9	24.0	18.8	24.0	37.9



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
112.5°	186.0	183.1	160.1	131.5	115.2	81.4	53.4	36.9	32.1	36.9	53.4
115°	198.0	196.4	175.0	145.5	132.3	100.5	70.6	52.2	46.4	52.2	70.6
117.5°	210.6	210.3	186.0	159.8	151.6	117.6	86.5	67.4	61.3	67.4	86.5
120°	226.5	223.9	201.2	174.0	170.1	135.8	104.0	85.0	78.8	85.0	104.0
122.5°	238.3	235.9	214.2	187.6	187.6	154.3	120.9	101.7	96.2	101.7	120.9
125°	248.3	247.8	224.7	201.2	206.4	171.4	140.4	121.1	113.8	121.1	140.4
127.5°	257.5	258.4	237.3	217.0	226.4	189.7	158.9	137.5	130.0	137.5	158.9
130°	265.2	268.5	249.4	230.6	244.4	208.9	175.5	154.1	149.2	154.1	175.5
132.5°	280.4	278.5	261.7	244.4	264.0	226.4	193.0	170.6	165.1	170.6	193.0
135°	288.2	288.9	272.3	256.5	282.0	243.8	209.6	187.5	182.0	187.5	209.6
137.5°	297.6	295.7	280.7	271.0	298.9	260.6	225.8	205.2	196.5	205.2	225.8
140°	304.4	304.1	291.7	284.0	317.1	277.2	242.2	221.4	213.3	221.4	242.2
142.5°	311.6	313.5	302.8	298.2	335.2	294.7	260.0	237.3	229.5	237.3	260.0
145°	316.5	321.5	313.8	316.1	352.4	314.1	275.5	253.4	244.2	253.4	275.5
147.5°	325.3	330.8	322.8	328.8	367.3	331.3	292.0	269.3	261.9	269.3	292.0
150°	336.4	339.0	334.1	346.2	382.5	350.4	307.9	284.5	277.0	284.5	307.9
152.5°	345.2	348.3	342.8	365.3	394.5	367.9	325.3	299.4	290.7	299.4	325.3
155°	354.1	355.5	351.5	383.8	407.1	385.0	339.3	315.9	307.6	315.9	339.3
157.5°	362.6	365.1	359.9	397.7	418.1	399.9	354.3	332.5	325.0	332.5	354.3
160°	371.7	371.7	373.4	413.9	427.2	413.0	371.2	350.6	340.2	350.6	371.2
162.5°	372.6	378.8	391.9	425.3	436.0	424.3	389.3	363.6	354.5	363.6	389.3
165°	386.9	391.6	412.6	435.3	442.7	434.4	411.6	384.1	374.2	384.1	411.6
167.5°	401.8	412.6	429.5	446.7	449.2	443.7	428.8	409.8	400.8	409.8	428.8
170°	425.3	435.3	443.7	450.9	454.4	451.2	439.5	430.1	424.0	430.1	439.5
172.5°	443.5	450.9	454.1	458.6	456.4	455.0	449.2	444.7	440.7	444.7	449.2
175°	455.6	457.7	460.6	459.7	461.7	458.2	457.7	459.9	445.9	459.9	457.7
177.5°	459.7	462.1	461.2	459.2	459.4	458.8	459.3	459.7	457.8	459.7	459.3
180°	460.6	460.6	460.6	460.6	460.6	460.6	460.6	460.6	460.6	460.6	460.6



TEST NUMBER: P392481

CATALOG NUMBER: MWL-2-13-31-UNV-L930-EDD

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	1133.8	1133.8	1133.8	1133.8	1133.8	1133.8
2.5°	1128.4	1129.4	1128.6	1139.9	1136.7	1130.3
5°	1126.7	1124.2	1126.7	1127.6	1128.5	1136.9
7.5°	1115.7	1113.6	1116.0	1117.4	1123.1	1118.3
10°	1101.4	1102.6	1101.7	1107.5	1108.3	1104.7
12.5°	1084.2	1086.3	1084.2	1090.7	1091.0	1088.0
15°	1064.1	1065.7	1064.3	1066.8	1067.2	1066.9
17.5°	1046.8	1046.8	1046.8	1046.3	1046.7	1043.9
20°	1019.4	1020.1	1019.6	1024.1	1022.3	1017.6
22.5°	985.6	993.0	985.9	992.1	989.4	988.5
25°	960.1	960.1	960.4	963.5	955.7	954.8
27.5°	925.9	930.5	926.2	929.0	918.7	918.7
30°	900.4	896.0	901.1	889.0	883.3	875.9
32.5°	854.3	861.7	855.1	846.3	838.1	834.0
35°	818.7	822.8	819.7	804.1	785.1	785.1
37.5°	773.4	779.5	774.4	750.6	734.2	732.5
40°	729.8	735.9	730.6	699.6	684.0	687.3
42.5°	679.7	693.2	680.4	642.5	634.7	639.6
45°	623.8	643.0	624.5	589.1	587.5	597.3
47.5°	563.8	593.7	564.1	540.5	547.1	550.5
50°	510.0	532.5	510.7	491.2	501.1	507.7
52.5°	456.5	461.8	457.2	445.7	464.1	469.8
55°	400.3	390.8	401.0	406.2	425.1	426.0
57.5°	347.7	329.0	348.3	357.7	384.9	386.5
60°	289.2	279.7	289.6	312.9	342.6	348.3
62.5°	240.7	239.1	241.1	266.1	302.3	305.5
65°	200.5	202.2	200.8	223.8	254.3	266.6
67.5°	165.1	171.7	165.1	186.0	212.3	224.6
70°	134.7	144.6	134.7	152.0	171.7	188.2
72.5°	109.7	118.8	110.1	122.4	137.2	154.4
75°	88.3	96.5	88.3	94.9	108.4	124.0
77.5°	68.6	78.5	68.6	71.8	89.1	106.8
80°	51.3	57.8	51.3	56.4	78.9	90.2
82.5°	36.5	39.8	36.5	51.2	75.3	82.3
85°	27.8	22.5	28.4	50.2	76.0	80.0
87.5°	22.2	6.6	26.8	53.8	80.5	81.0
90°	14.6	1.1	26.9	59.7	86.3	85.4
92.5°	7.2	6.0	29.6	66.7	93.3	94.7
95°	2.1	13.8	34.5	74.1	99.7	101.6
97.5°	4.7	23.9	46.2	79.2	106.8	110.1
100°	11.5	36.1	60.1	88.9	112.6	115.3
102.5°	20.9	49.4	73.4	102.2	121.7	128.0
105°	33.5	64.6	87.3	118.1	135.8	140.3
107.5°	48.1	80.8	101.5	133.2	151.0	154.3
110°	63.7	97.6	115.9	147.1	166.5	170.5



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CATALOG NUMBER: MWL-2-13-31-UNV-L930-EDD

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
112.5°	81.4	115.2	131.5	160.1	183.1	186.0
115°	100.5	132.3	145.5	175.0	196.4	198.0
117.5°	117.6	151.6	159.8	186.0	210.3	210.6
120°	135.8	170.1	174.0	201.2	223.9	226.5
122.5°	154.3	187.6	187.6	214.2	235.9	238.3
125°	171.4	206.4	201.2	224.7	247.8	248.3
127.5°	189.7	226.4	217.0	237.3	258.4	257.5
130°	208.9	244.4	230.6	249.4	268.5	265.2
132.5°	226.4	264.0	244.4	261.7	278.5	280.4
135°	243.8	282.0	256.5	272.3	288.9	288.2
137.5°	260.6	298.9	271.0	280.7	295.7	297.6
140°	277.2	317.1	284.0	291.7	304.1	304.4
142.5°	294.7	335.2	298.2	302.8	313.5	311.6
145°	314.1	352.4	316.1	313.8	321.5	316.5
147.5°	331.3	367.3	328.8	322.8	330.8	325.3
150°	350.4	382.5	346.2	334.1	339.0	336.4
152.5°	367.9	394.5	365.3	342.8	348.3	345.2
155°	385.0	407.1	383.8	351.5	355.5	354.1
157.5°	399.9	418.1	397.7	359.9	365.1	362.6
160°	413.0	427.2	413.9	373.4	371.7	371.7
162.5°	424.3	436.0	425.3	391.9	378.8	372.6
165°	434.4	442.7	435.3	412.6	391.6	386.9
167.5°	443.7	449.2	446.7	429.5	412.6	401.8
170°	451.2	454.4	450.9	443.7	435.3	425.3
172.5°	455.0	456.4	458.6	454.1	450.9	443.5
175°	458.2	461.7	459.7	460.6	457.7	455.6
177.5°	458.8	459.4	459.2	461.2	462.1	459.7
180°	460.6	460.6	460.6	460.6	460.6	460.6

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