

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: P382214

Luminaire Tested: **MWL-2-18-23-UNV-L830-EDD**

Issue Date: 12/2/2019

**Test Information**

Test Method: LM-79-08  
Report Number: P382214  
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-2-18-23-UNV-L830-EDD  
Description: MWL 2FT MEDICAL LED FIXTURE  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

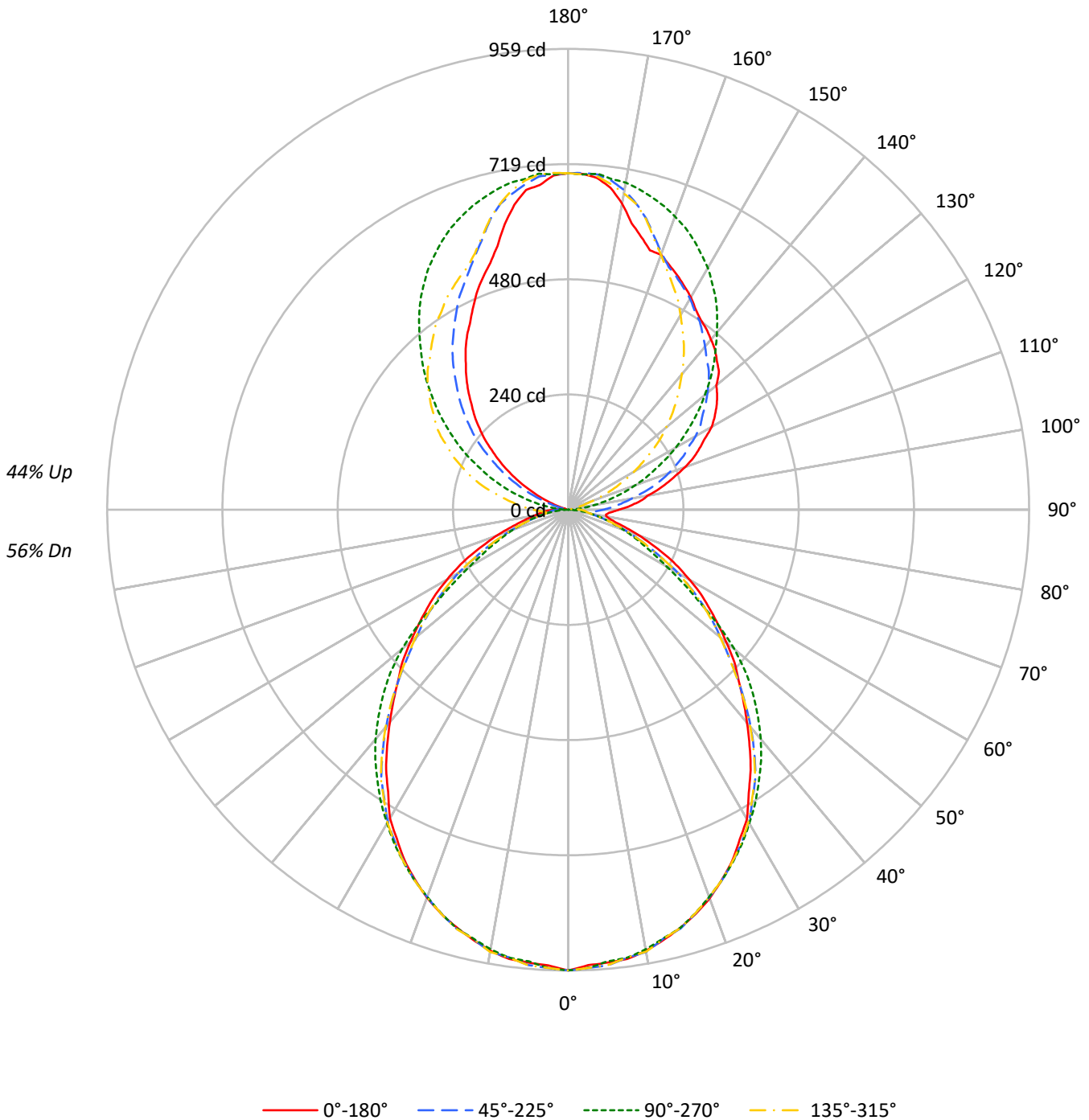
Lumens per Lamp: N/A  
Luminaire Lumens: 3850.0 lumens  
Efficiency: N/A  
Efficacy: 98.0 lumens/watt  
Spacing Criteria (0/90/45): 1.16 / 1.18 / 1.25  
Luminous Opening: Rectangular w/ Sides (W: 0.42' x L: 2' x H: 0.42')  
CIE Type: General Diffuse

Input Watts (W): 39.3  
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	0
RCR																		
0	109	109	109	109	101	101	101	101	87	87	87	74	74	74	62	62	62	56
1	100	95	91	88	92	89	86	83	77	74	72	66	64	62	55	54	53	48
2	91	84	78	73	85	78	73	69	68	64	60	58	55	53	49	47	45	41
3	83	74	67	61	77	69	63	58	60	55	51	52	48	45	44	41	39	35
4	77	66	58	52	71	62	55	50	54	48	44	47	42	39	40	37	34	31
5	70	59	51	45	65	55	48	43	48	43	38	42	38	34	36	33	30	27
6	65	53	45	39	60	50	43	37	44	38	34	38	34	30	33	29	27	24
7	60	48	40	35	56	45	38	33	40	34	30	35	30	27	30	27	24	21
8	56	44	36	31	52	41	34	29	36	31	27	32	27	24	28	24	21	19
9	52	40	33	28	49	38	31	26	34	28	24	29	25	22	26	22	19	17
10	49	37	30	25	46	35	28	24	31	26	22	27	23	20	24	20	18	16

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

	0°	90°	180°	270°
0°	12383	12383	12383	12383
5°	12046	11247	12046	11247
10°	11792	10357	11792	10357
15°	11410	9500	11391	9500
20°	10998	8640	10979	8640
25°	10483	7870	10463	7870
30°	9899	7127	9872	7127
35°	9107	6410	9086	6410
40°	8306	5716	8277	5716
45°	7569	4969	7547	4969
50°	6917	4136	6893	4136
55°	6232	3071	6217	3071
60°	5532	2231	5524	2231
65°	4726	1671	4726	1671
70°	3792	1234	3804	1234
75°	2886	871	2926	871
80°	2748	536	2428	536
85°	3660	228	2253	228



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	90.1	2.3
10°-20°	253.7	6.6
20°-30°	372.2	9.7
30°-40°	422.1	11.0
40°-50°	393.7	10.2
50°-60°	307.8	8.0
60°-70°	190.9	5.0
70°-80°	92.5	2.4
80°-90°	49.9	1.3
90°-100°	59.8	1.6
100°-110°	108.2	2.8
110°-120°	186.3	4.8
120°-130°	253.4	6.6
130°-140°	288.7	7.5
140°-150°	288.1	7.5
150°-160°	250.8	6.5
160°-170°	176.3	4.6
170°-180°	65.6	1.7
0°-30°	716.0	18.6
0°-40°	1138.1	29.6
0°-60°	1839.6	47.8
0°-90°	2172.8	56.4
90°-120°	354.2	9.2
90°-150°	1184.4	30.8
90°-180°	1677.0	43.6
0°-180°	3850.0	100.0

**CANDELA DISTRIBUTION:**

	0°	90°	180°	270°	360°	Flux
0°	959	959	959	959	959	
5°	946	943	946	943	946	90
15°	901	901	899	901	901	254
25°	807	810	806	810	807	371
35°	662	691	660	691	662	413
45°	501	544	499	544	501	388
55°	359	331	358	331	359	322
65°	224	172	224	172	224	221
75°	103	83	104	83	103	116
85°	84	19	51	19	84	68
90°	106	0	32	0	106	58
95°	138	20	21	20	138	119
105°	212	98	4	98	212	224
115°	301	200	70	200	301	299
125°	377	314	172	314	377	337
135°	438	428	276	428	438	338
145°	482	535	371	535	482	303
155°	538	619	467	619	538	248
165°	588	673	568	673	588	167
175°	693	702	678	702	693	65
180°	700	700	700	700	700	



TEST NUMBER: P382214

CATALOG NUMBER: MWL-2-18-23-UNV-L830-EDD

**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	958.7	958.7	958.7	958.7	958.7	958.7	958.7	958.7	958.7	958.7	958.7
2.5°	948.8	959.2	954.5	954.2	954.2	953.6	954.5	959.2	949.3	959.2	954.5
5°	946.0	953.6	951.7	950.8	943.3	950.8	951.3	953.6	946.0	953.6	951.3
7.5°	942.8	946.6	940.1	942.4	940.5	941.9	939.6	946.1	942.8	946.1	939.6
10°	932.1	933.5	934.5	929.8	928.9	929.3	934.0	932.5	932.1	932.5	934.0
12.5°	917.2	918.6	914.4	917.2	913.8	917.2	914.4	917.6	916.3	917.6	914.4
15°	900.9	905.5	902.2	899.4	900.8	898.9	901.7	904.5	899.4	904.5	901.7
17.5°	882.3	884.0	880.8	880.2	880.2	880.2	880.2	883.6	880.8	883.6	880.2
20°	860.8	861.2	858.4	856.9	857.3	856.4	857.8	860.2	859.3	860.2	857.8
22.5°	834.1	838.7	835.0	837.3	834.9	836.8	834.5	837.8	833.1	837.8	834.5
25°	807.0	809.8	809.3	813.0	809.7	812.5	808.3	808.3	805.5	808.3	808.3
27.5°	773.4	777.1	781.3	784.6	783.6	784.0	780.3	775.6	771.9	775.6	780.3
30°	743.5	741.6	751.9	754.2	753.7	753.2	750.4	740.1	741.5	740.1	750.4
32.5°	698.7	704.3	713.6	724.4	724.3	723.3	712.1	702.3	696.7	702.3	712.1
35°	661.8	665.5	679.5	691.7	691.1	690.2	678.0	664.0	660.3	664.0	678.0
37.5°	619.8	620.7	635.6	656.2	658.9	654.7	634.1	619.2	618.3	619.2	634.1
40°	578.7	577.7	590.8	614.6	623.4	613.6	588.9	575.8	576.7	575.8	588.9
42.5°	539.5	535.7	544.6	575.4	584.2	574.4	543.1	533.8	537.5	533.8	543.1
45°	500.7	496.0	498.8	526.9	544.0	525.8	496.9	494.5	499.2	494.5	496.9
47.5°	469.0	456.8	454.0	477.7	501.1	477.3	452.1	455.3	467.5	455.3	452.1
50°	429.7	423.2	413.9	431.0	451.1	430.1	411.9	421.2	428.2	421.2	411.9
52.5°	393.3	390.5	376.9	384.4	393.2	383.4	375.5	388.6	391.8	388.6	375.5
55°	359.1	354.5	339.5	337.2	331.1	336.3	338.1	353.1	358.2	353.1	338.1
57.5°	327.4	320.9	300.3	292.4	281.6	291.4	298.9	319.5	326.5	319.5	298.9
60°	291.4	285.8	264.4	244.3	235.9	243.8	263.4	284.9	291.0	284.9	263.4
62.5°	257.8	248.5	222.3	203.2	200.9	202.7	221.4	247.6	257.4	247.6	221.4
65°	223.7	209.7	187.3	168.6	171.9	168.2	186.9	209.3	223.7	209.3	186.9
67.5°	187.3	175.2	155.6	138.3	145.8	138.3	155.1	174.7	187.3	174.7	155.1
70°	157.9	143.0	127.1	114.0	122.4	114.0	127.1	143.4	158.4	143.4	127.1
72.5°	128.0	115.0	101.9	93.5	99.5	92.9	101.9	115.4	129.0	115.4	101.9
75°	102.8	90.7	79.8	73.3	82.6	73.3	80.4	91.1	104.2	91.1	80.4
77.5°	89.0	74.9	60.2	58.4	65.8	58.4	60.8	73.4	87.0	73.4	60.8
80°	80.6	69.7	47.7	43.4	48.1	43.4	46.8	61.7	71.2	61.7	46.8
82.5°	79.4	71.2	46.2	31.3	34.1	31.3	40.2	53.4	60.6	53.4	40.2
85°	83.5	78.5	50.5	24.4	19.1	23.4	36.2	48.4	51.4	48.4	36.2
87.5°	92.8	91.2	60.1	26.2	4.7	19.2	32.0	43.8	41.9	43.8	32.0
90°	105.5	104.4	73.3	31.0	0.5	12.2	24.4	34.7	31.5	34.7	24.4
92.5°	122.6	119.5	86.9	39.8	7.9	5.7	19.2	28.1	25.8	28.1	19.2
95°	138.1	135.2	101.6	52.3	19.8	2.9	12.7	20.6	21.1	20.6	12.7
97.5°	155.2	150.9	116.8	70.1	36.0	6.8	7.7	15.0	16.9	15.0	7.7
100°	168.0	164.6	135.3	91.3	54.8	17.3	4.4	9.5	12.3	9.5	4.4
102.5°	190.5	183.7	155.6	111.6	75.0	31.6	8.3	5.8	6.7	5.8	8.3
105°	212.3	205.4	179.8	132.8	98.2	50.8	20.2	6.8	4.4	6.8	20.2
107.5°	233.5	228.6	201.5	154.5	123.0	73.0	37.0	19.2	12.3	19.2	37.0
110°	258.3	252.3	222.7	176.3	148.7	96.7	56.2	35.0	27.1	35.0	56.2



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CATALOG NUMBER: MWL-2-18-23-UNV-L830-EDD

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
112.5°	282.0	277.5	242.5	199.0	175.3	122.4	79.9	54.8	47.3	54.8	79.9
115°	301.2	297.8	265.2	220.3	200.0	151.6	106.2	78.0	70.0	78.0	106.2
117.5°	320.5	319.9	282.0	241.9	229.6	177.8	130.4	102.2	92.7	102.2	130.4
120°	344.7	340.7	306.1	264.6	258.8	206.4	157.9	128.8	119.4	128.8	157.9
122.5°	361.5	359.0	325.9	285.4	285.4	234.5	183.7	154.5	144.6	154.5	183.7
125°	376.8	375.8	340.7	306.1	314.0	260.7	212.3	182.7	171.8	182.7	212.3
127.5°	390.6	392.1	360.0	328.9	343.2	287.3	240.5	207.9	196.5	207.9	240.5
130°	402.5	407.4	378.3	349.6	370.8	316.5	265.7	233.1	225.6	233.1	265.7
132.5°	425.6	422.7	397.1	370.8	400.5	343.2	292.3	258.2	249.8	258.2	292.3
135°	437.5	438.5	413.3	389.1	428.2	369.9	317.5	283.9	275.5	283.9	317.5
137.5°	451.9	448.9	426.2	411.3	453.8	395.6	342.1	311.1	297.7	311.1	342.1
140°	462.2	461.8	443.0	431.1	481.5	420.8	367.4	335.8	323.4	335.8	367.4
142.5°	473.1	476.1	459.7	452.8	509.1	447.4	394.5	360.0	348.1	360.0	394.5
145°	481.5	487.8	477.5	480.0	535.4	477.1	419.2	384.2	371.3	384.2	419.2
147.5°	493.8	502.2	489.8	500.2	558.0	504.2	442.9	408.4	397.0	408.4	442.9
150°	510.6	514.5	507.2	525.9	581.3	532.4	467.1	431.5	420.2	431.5	467.1
152.5°	523.9	528.8	520.4	555.1	599.5	559.1	493.8	454.3	440.9	454.3	493.8
155°	537.8	539.7	533.8	583.3	618.8	585.2	515.0	479.4	466.6	479.4	515.0
157.5°	550.6	554.5	546.7	604.5	635.6	607.9	538.2	504.6	493.3	504.6	538.2
160°	564.4	564.4	567.5	629.2	649.5	627.7	564.0	532.3	516.5	532.3	564.0
162.5°	565.9	575.3	595.6	646.5	662.7	645.0	591.7	552.1	538.2	552.1	591.7
165°	587.6	595.1	627.2	661.8	673.1	660.3	625.7	583.7	568.4	583.7	625.7
167.5°	610.3	627.2	652.9	679.1	683.0	674.6	651.9	622.8	608.8	622.8	651.9
170°	646.5	661.8	674.6	685.5	690.9	686.0	668.2	653.9	644.5	653.9	668.2
172.5°	675.6	685.5	690.5	697.4	693.9	691.9	683.0	676.1	671.1	676.1	683.0
175°	693.0	695.9	700.3	698.8	701.8	696.3	695.9	699.3	678.1	699.3	695.9
177.5°	699.3	703.7	701.3	697.7	698.3	697.3	698.3	700.3	696.4	700.3	698.3
180°	700.3	700.3	700.3	700.3	700.3	700.3	700.3	700.3	700.3	700.3	700.3



TEST NUMBER: P382214

CATALOG NUMBER: MWL-2-18-23-UNV-L830-EDD

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
0°	958.7	958.7	958.7	958.7	958.7	958.7
2.5°	953.6	954.2	954.2	954.5	959.2	948.8
5°	950.8	943.3	950.8	951.7	953.6	946.0
7.5°	941.9	940.5	942.4	940.1	946.6	942.8
10°	929.3	928.9	929.8	934.5	933.5	932.1
12.5°	917.2	913.8	917.2	914.4	918.6	917.2
15°	898.9	900.8	899.4	902.2	905.5	900.9
17.5°	880.2	880.2	880.2	880.8	884.0	882.3
20°	856.4	857.3	856.9	858.4	861.2	860.8
22.5°	836.8	834.9	837.3	835.0	838.7	834.1
25°	812.5	809.7	813.0	809.3	809.8	807.0
27.5°	784.0	783.6	784.6	781.3	777.1	773.4
30°	753.2	753.7	754.2	751.9	741.6	743.5
32.5°	723.3	724.3	724.4	713.6	704.3	698.7
35°	690.2	691.1	691.7	679.5	665.5	661.8
37.5°	654.7	658.9	656.2	635.6	620.7	619.8
40°	613.6	623.4	614.6	590.8	577.7	578.7
42.5°	574.4	584.2	575.4	544.6	535.7	539.5
45°	525.8	544.0	526.9	498.8	496.0	500.7
47.5°	477.3	501.1	477.7	454.0	456.8	469.0
50°	430.1	451.1	431.0	413.9	423.2	429.7
52.5°	383.4	393.2	384.4	376.9	390.5	393.3
55°	336.3	331.1	337.2	339.5	354.5	359.1
57.5°	291.4	281.6	292.4	300.3	320.9	327.4
60°	243.8	235.9	244.3	264.4	285.8	291.4
62.5°	202.7	200.9	203.2	222.3	248.5	257.8
65°	168.2	171.9	168.6	187.3	209.7	223.7
67.5°	138.3	145.8	138.3	155.6	175.2	187.3
70°	114.0	122.4	114.0	127.1	143.0	157.9
72.5°	92.9	99.5	93.5	101.9	115.0	128.0
75°	73.3	82.6	73.3	79.8	90.7	102.8
77.5°	58.4	65.8	58.4	60.2	74.9	89.0
80°	43.4	48.1	43.4	47.7	69.7	80.6
82.5°	31.3	34.1	31.3	46.2	71.2	79.4
85°	23.4	19.1	24.4	50.5	78.5	83.5
87.5°	19.2	4.7	26.2	60.1	91.2	92.8
90°	12.2	0.5	31.0	73.3	104.4	105.5
92.5°	5.7	7.9	39.8	86.9	119.5	122.6
95°	2.9	19.8	52.3	101.6	135.2	138.1
97.5°	6.8	36.0	70.1	116.8	150.9	155.2
100°	17.3	54.8	91.3	135.3	164.6	168.0
102.5°	31.6	75.0	111.6	155.6	183.7	190.5
105°	50.8	98.2	132.8	179.8	205.4	212.3
107.5°	73.0	123.0	154.5	201.5	228.6	233.5
110°	96.7	148.7	176.3	222.7	252.3	258.3





TEST NUMBER: P382214

CATALOG NUMBER: MWL-2-18-23-UNV-L830-EDD

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
112.5°	122.4	175.3	199.0	242.5	277.5	282.0
115°	151.6	200.0	220.3	265.2	297.8	301.2
117.5°	177.8	229.6	241.9	282.0	319.9	320.5
120°	206.4	258.8	264.6	306.1	340.7	344.7
122.5°	234.5	285.4	285.4	325.9	359.0	361.5
125°	260.7	314.0	306.1	340.7	375.8	376.8
127.5°	287.3	343.2	328.9	360.0	392.1	390.6
130°	316.5	370.8	349.6	378.3	407.4	402.5
132.5°	343.2	400.5	370.8	397.1	422.7	425.6
135°	369.9	428.2	389.1	413.3	438.5	437.5
137.5°	395.6	453.8	411.3	426.2	448.9	451.9
140°	420.8	481.5	431.1	443.0	461.8	462.2
142.5°	447.4	509.1	452.8	459.7	476.1	473.1
145°	477.1	535.4	480.0	477.5	487.8	481.5
147.5°	504.2	558.0	500.2	489.8	502.2	493.8
150°	532.4	581.3	525.9	507.2	514.5	510.6
152.5°	559.1	599.5	555.1	520.4	528.8	523.9
155°	585.2	618.8	583.3	533.8	539.7	537.8
157.5°	607.9	635.6	604.5	546.7	554.5	550.6
160°	627.7	649.5	629.2	567.5	564.4	564.4
162.5°	645.0	662.7	646.5	595.6	575.3	565.9
165°	660.3	673.1	661.8	627.2	595.1	587.6
167.5°	674.6	683.0	679.1	652.9	627.2	610.3
170°	686.0	690.9	685.5	674.6	661.8	646.5
172.5°	691.9	693.9	697.4	690.5	685.5	675.6
175°	696.3	701.8	698.8	700.3	695.9	693.0
177.5°	697.3	698.3	697.7	701.3	703.7	699.3
180°	700.3	700.3	700.3	700.3	700.3	700.3

(END OF REPORT)