

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: P382193

Luminaire Tested: **MWL-2-13-23-UNV-L830-EDD**

Issue Date: 12/2/2019

Test Information

Test Method: LM-79-08
Report Number: P382193
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-2-13-23-UNV-L830-EDD
Description: MWL 2FT MEDICAL LED FIXTURE
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

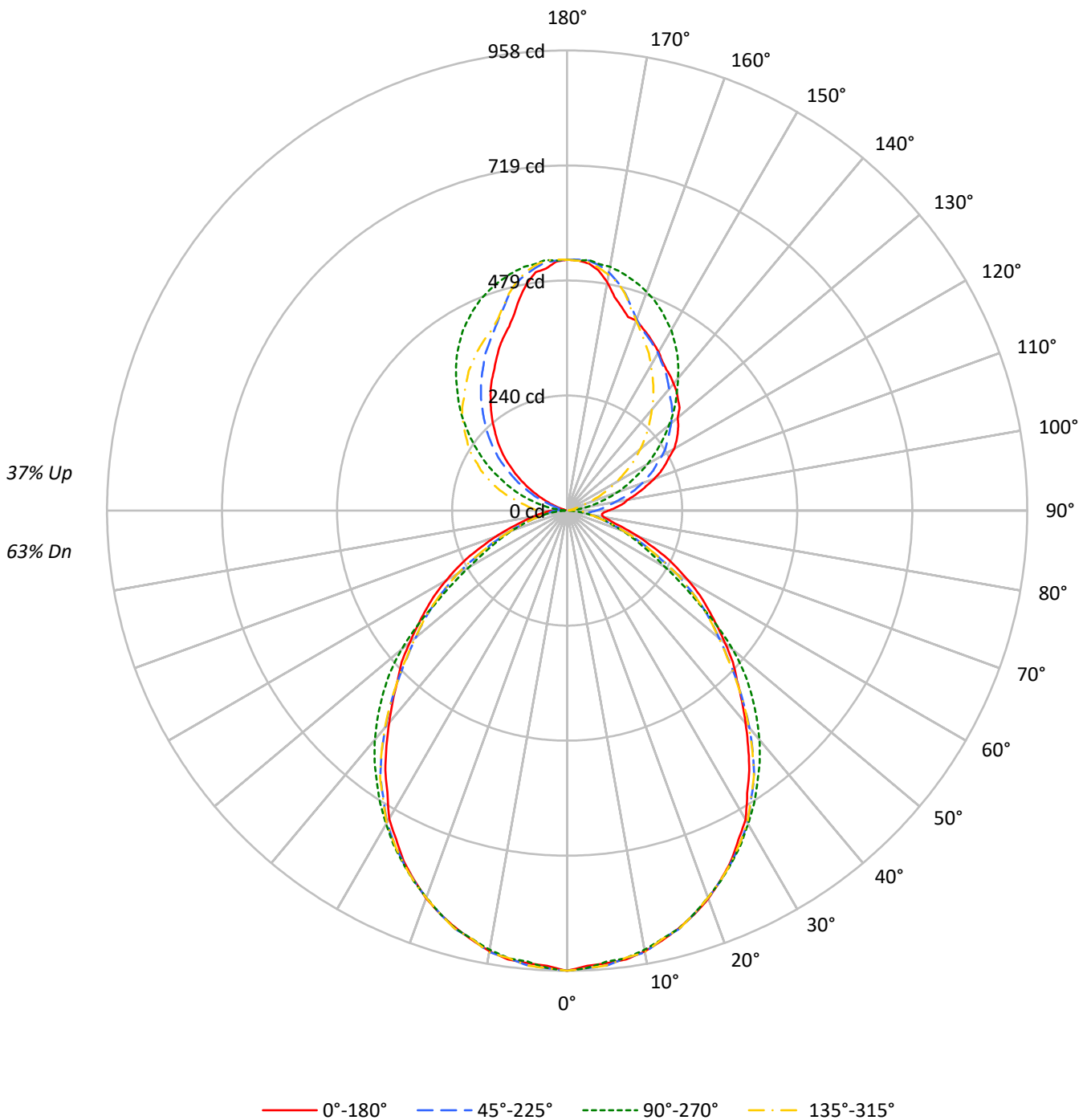
Lumens per Lamp: N/A
Luminaire Lumens: 3422.0 lumens
Efficiency: N/A
Efficacy: 98.9 lumens/watt
Spacing Criteria (0/90/45): 1.16 / 1.18 / 1.25
Luminous Opening: Rectangular w/ Sides (W: 0.42' x L: 2' x H: 0.42')
CIE Type: Semi-Direct

Input Watts (W): 34.6
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



TEST NUMBER: P382193
CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

Luminous Intensity Polar Plot





TEST NUMBER: P382193

CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

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	110	110	110	110	103	103	103	103	91	91	91	79	79	79	68	68	68	63
1	101	97	93	90	95	91	88	85	80	78	75	70	68	67	61	60	59	54
2	93	85	79	74	87	80	75	70	71	67	63	62	59	57	54	52	50	46
3	85	75	68	62	79	71	65	60	63	58	54	56	52	49	49	46	43	40
4	78	67	59	53	73	63	56	51	56	51	46	50	46	42	44	41	38	35
5	72	60	52	46	67	57	50	44	51	45	40	45	40	37	40	36	33	30
6	66	54	46	40	62	51	44	39	46	40	36	41	36	33	36	32	30	27
7	61	49	41	36	58	47	39	34	42	36	32	37	33	29	33	29	26	24
8	57	45	37	32	54	43	36	31	38	33	28	34	30	26	31	27	24	22
9	53	41	34	29	50	39	32	28	35	30	26	32	27	24	28	24	22	20
10	50	38	31	26	47	36	29	25	33	27	23	29	25	21	26	22	20	18

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	12374	12374	12374	12374
5°	12042	11237	12042	11237
10°	11785	10349	11785	10349
15°	11398	9495	11384	9495
20°	10984	8637	10971	8637
25°	10473	7867	10458	7867
30°	9888	7123	9868	7123
35°	9096	6406	9081	6406
40°	8294	5711	8273	5711
45°	7559	4965	7542	4965
50°	6908	4132	6888	4132
55°	6224	3068	6212	3068
60°	5524	2227	5517	2227
65°	4719	1669	4719	1669
70°	3788	1231	3795	1231
75°	2878	871	2912	871
80°	2629	535	2394	535
85°	3204	228	2156	228



TEST NUMBER: P382193

CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	90.1	2.6
10°-20°	253.5	7.4
20°-30°	371.9	10.9
30°-40°	421.8	12.3
40°-50°	393.3	11.5
50°-60°	307.4	9.0
60°-70°	190.6	5.6
70°-80°	92.1	2.7
80°-90°	46.5	1.4
90°-100°	47.6	1.4
100°-110°	81.0	2.4
110°-120°	139.1	4.1
120°-130°	189.2	5.5
130°-140°	215.5	6.3
140°-150°	215.0	6.3
150°-160°	187.1	5.5
160°-170°	131.5	3.8
170°-180°	48.9	1.4
0°-30°	715.5	20.9
0°-40°	1137.3	33.2
0°-60°	1838.0	53.7
0°-90°	2167.2	63.3
90°-120°	267.6	7.8
90°-150°	887.2	25.9
90°-180°	1255.0	36.7
0°-180°	3422.0	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	958	958	958	958	958	
5°	946	942	946	942	946	90
15°	900	900	899	900	900	254
25°	806	809	805	809	806	370
35°	661	691	660	691	661	412
45°	500	544	499	544	500	388
55°	359	331	358	331	359	321
65°	223	172	223	172	223	221
75°	102	83	104	83	102	115
85°	73	19	49	19	73	61
90°	86	0	31	0	86	48
95°	108	15	21	15	108	93
105°	158	73	4	73	158	168
115°	225	149	53	149	225	223
125°	281	234	128	234	281	251
135°	326	319	206	319	326	252
145°	359	399	277	399	359	226
155°	401	462	348	462	401	185
165°	438	502	424	502	438	124
175°	516	524	506	524	516	48
180°	522	522	522	522	522	



TEST NUMBER: P382193

CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	958.0	958.0	958.0	958.0	958.0	958.0	958.0	958.0	958.0	958.0	958.0
2.5°	948.5	958.6	953.7	953.1	953.1	952.8	953.7	958.6	948.9	958.6	953.7
5°	945.7	953.0	950.9	950.0	942.5	950.0	950.6	953.0	945.7	953.0	950.6
7.5°	942.4	945.9	939.4	941.6	939.7	941.2	939.0	945.5	942.4	945.5	939.0
10°	931.5	932.8	933.8	929.1	928.2	928.7	933.4	932.1	931.5	932.1	933.4
12.5°	916.4	917.9	913.8	916.6	913.4	916.6	913.8	917.1	915.6	917.1	913.8
15°	899.9	904.8	901.6	898.8	900.3	898.5	901.3	904.1	898.8	904.1	901.3
17.5°	881.2	883.3	880.2	879.8	879.8	879.8	879.8	883.0	880.2	883.0	879.8
20°	859.7	860.4	857.7	856.4	857.0	856.1	857.4	859.6	858.7	859.6	857.4
22.5°	833.3	837.9	834.4	836.8	834.6	836.4	834.0	837.2	832.5	837.2	834.0
25°	806.2	809.0	808.6	812.5	809.4	812.2	807.9	807.9	805.1	807.9	807.9
27.5°	772.6	776.3	780.6	784.0	783.2	783.6	779.8	775.2	771.4	775.2	779.8
30°	742.7	740.8	751.1	753.5	753.3	752.8	750.0	739.7	741.2	739.7	750.0
32.5°	697.8	703.4	712.8	723.6	723.8	722.9	711.7	702.0	696.4	702.0	711.7
35°	661.0	664.8	678.8	690.9	690.7	689.8	677.7	663.7	659.9	663.7	677.7
37.5°	619.0	620.0	634.9	655.4	658.4	654.3	633.8	618.8	617.9	618.8	633.8
40°	577.9	577.0	590.1	614.0	622.9	613.2	588.6	575.5	576.4	575.5	588.6
42.5°	538.7	535.0	543.9	574.8	583.7	574.0	542.8	533.5	537.2	533.5	542.8
45°	500.0	495.4	498.2	526.2	543.6	525.4	496.7	494.2	498.9	494.2	496.7
47.5°	468.3	456.1	453.3	477.2	500.6	476.9	451.8	455.0	467.2	455.0	451.8
50°	429.1	422.5	413.2	430.6	450.7	429.8	411.7	421.0	427.9	421.0	411.7
52.5°	392.6	389.8	376.4	383.9	392.8	383.1	375.3	388.3	391.5	388.3	375.3
55°	358.6	354.0	339.0	336.8	330.8	336.0	337.9	352.8	357.9	352.8	337.9
57.5°	326.9	320.3	299.8	292.0	281.3	291.2	298.7	319.2	326.1	319.2	298.7
60°	291.0	285.4	263.9	243.9	235.5	243.6	263.2	284.7	290.6	284.7	263.2
62.5°	257.4	248.1	221.9	202.9	200.6	202.5	221.2	247.3	257.0	247.3	221.2
65°	223.4	209.4	187.0	168.3	171.7	167.9	186.6	209.0	223.4	209.0	186.6
67.5°	187.0	174.8	155.2	138.0	145.5	138.0	154.8	174.5	187.0	174.5	154.8
70°	157.7	142.7	126.8	113.8	122.2	113.8	126.8	143.1	158.0	143.1	126.8
72.5°	127.8	114.7	101.6	93.2	99.4	92.8	101.6	115.1	128.5	115.1	101.6
75°	102.5	90.4	79.8	73.2	82.6	73.2	80.1	90.8	103.7	90.8	80.1
77.5°	87.7	74.2	60.1	58.3	65.7	58.3	60.5	73.0	86.3	73.0	60.5
80°	77.1	67.2	47.3	43.3	48.0	43.3	46.5	61.3	70.2	61.3	46.5
82.5°	72.9	65.8	44.2	31.2	34.0	31.2	39.8	52.7	58.9	52.7	39.8
85°	73.1	69.5	45.8	23.9	19.1	23.2	35.0	47.0	49.2	47.0	35.0
87.5°	78.0	77.4	51.7	23.8	4.7	18.7	30.7	42.1	40.1	42.1	30.7
90°	85.8	85.8	60.3	26.0	0.4	12.0	23.9	34.0	30.6	34.0	23.9
92.5°	97.3	95.7	69.3	30.8	5.9	5.4	18.9	27.6	25.2	27.6	18.9
95°	108.0	105.7	78.5	39.2	14.8	2.4	12.3	20.4	20.7	20.4	12.3
97.5°	119.5	115.7	88.2	52.5	27.1	5.3	6.9	14.6	16.4	14.6	6.9
100°	127.3	124.1	101.1	68.3	41.0	13.1	3.5	8.6	11.4	8.6	3.5
102.5°	142.6	137.3	116.1	83.4	56.1	23.7	6.4	4.9	5.8	4.9	6.4
105°	158.4	153.3	134.1	99.2	73.4	38.1	15.3	5.3	3.5	5.3	15.3
107.5°	174.3	170.5	150.4	115.3	91.8	54.6	27.8	14.6	9.4	14.6	27.8
110°	192.7	188.2	166.1	131.6	111.0	72.3	42.1	26.3	20.5	26.3	42.1



TEST NUMBER: P382193

CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
112.5°	210.3	207.0	180.9	148.5	130.8	91.4	59.8	41.0	35.5	41.0	59.8
115°	224.9	222.1	197.8	164.3	149.2	113.2	79.3	58.4	52.7	58.4	79.3
117.5°	239.2	238.8	210.3	180.5	171.3	132.7	97.3	76.6	69.6	76.6	97.3
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°	269.7	267.9	243.3	213.1	213.1	175.2	137.3	115.5	108.2	115.5	137.3
125°	281.1	280.5	254.3	228.5	234.4	194.7	158.6	136.5	128.4	136.5	158.6
127.5°	291.5	292.6	268.6	245.4	256.2	214.5	179.6	155.3	146.8	155.3	179.6
130°	300.3	304.0	282.2	260.9	276.7	236.3	198.4	174.1	168.6	174.1	198.4
132.5°	317.5	315.4	296.2	276.7	298.9	256.2	218.3	192.9	186.6	192.9	218.3
135°	326.4	327.2	308.4	290.4	319.4	276.0	237.0	212.0	205.7	212.0	237.0
137.5°	337.1	334.9	317.9	306.9	338.6	295.1	255.4	232.2	222.3	232.2	255.4
140°	344.8	344.4	330.4	321.7	359.2	313.9	274.2	250.6	241.4	250.6	274.2
142.5°	352.9	355.1	342.9	337.8	379.7	333.8	294.4	268.6	259.8	268.6	294.4
145°	359.4	364.1	356.4	358.1	399.3	355.8	313.0	286.9	277.3	286.9	313.0
147.5°	368.5	374.8	365.6	373.4	416.2	376.3	330.7	304.9	296.4	304.9	330.7
150°	381.1	384.0	378.5	392.3	433.5	397.1	348.7	322.2	313.7	322.2	348.7
152.5°	391.0	394.7	388.4	414.0	447.1	416.9	368.5	339.1	329.2	339.1	368.5
155°	401.3	402.8	398.3	434.9	461.5	436.4	384.4	357.9	348.4	357.9	384.4
157.5°	410.8	413.8	407.8	450.8	474.0	453.3	401.5	376.7	368.2	376.7	401.5
160°	421.2	421.2	423.2	469.2	484.3	468.1	420.7	397.3	385.5	397.3	420.7
162.5°	422.3	429.2	444.2	482.1	494.2	481.0	441.2	412.0	401.7	412.0	441.2
165°	438.5	443.8	467.7	493.5	501.9	492.4	466.6	435.3	424.1	435.3	466.6
167.5°	455.4	467.7	486.9	506.4	509.3	503.0	486.1	464.5	454.3	464.5	486.1
170°	482.1	493.5	503.0	511.1	515.2	511.5	498.3	487.6	480.6	487.6	498.3
172.5°	503.8	511.1	514.8	519.9	517.4	515.9	509.3	504.1	500.5	504.1	509.3
175°	516.5	518.9	522.2	521.2	523.5	519.5	518.9	521.4	505.5	521.4	518.9
177.5°	521.2	524.8	522.9	520.6	520.9	520.2	520.7	522.2	519.0	522.2	520.7
180°	522.2	522.2	522.2	522.2	522.2	522.2	522.2	522.2	522.2	522.2	522.2



TEST NUMBER: P382193

CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	958.0	958.0	958.0	958.0	958.0	958.0
2.5°	952.8	953.1	953.1	953.7	958.6	948.5
5°	950.0	942.5	950.0	950.9	953.0	945.7
7.5°	941.2	939.7	941.6	939.4	945.9	942.4
10°	928.7	928.2	929.1	933.8	932.8	931.5
12.5°	916.6	913.4	916.6	913.8	917.9	916.4
15°	898.5	900.3	898.8	901.6	904.8	899.9
17.5°	879.8	879.8	879.8	880.2	883.3	881.2
20°	856.1	857.0	856.4	857.7	860.4	859.7
22.5°	836.4	834.6	836.8	834.4	837.9	833.3
25°	812.2	809.4	812.5	808.6	809.0	806.2
27.5°	783.6	783.2	784.0	780.6	776.3	772.6
30°	752.8	753.3	753.5	751.1	740.8	742.7
32.5°	722.9	723.8	723.6	712.8	703.4	697.8
35°	689.8	690.7	690.9	678.8	664.8	661.0
37.5°	654.3	658.4	655.4	634.9	620.0	619.0
40°	613.2	622.9	614.0	590.1	577.0	577.9
42.5°	574.0	583.7	574.8	543.9	535.0	538.7
45°	525.4	543.6	526.2	498.2	495.4	500.0
47.5°	476.9	500.6	477.2	453.3	456.1	468.3
50°	429.8	450.7	430.6	413.2	422.5	429.1
52.5°	383.1	392.8	383.9	376.4	389.8	392.6
55°	336.0	330.8	336.8	339.0	354.0	358.6
57.5°	291.2	281.3	292.0	299.8	320.3	326.9
60°	243.6	235.5	243.9	263.9	285.4	291.0
62.5°	202.5	200.6	202.9	221.9	248.1	257.4
65°	167.9	171.7	168.3	187.0	209.4	223.4
67.5°	138.0	145.5	138.0	155.2	174.8	187.0
70°	113.8	122.2	113.8	126.8	142.7	157.7
72.5°	92.8	99.4	93.2	101.6	114.7	127.8
75°	73.2	82.6	73.2	79.8	90.4	102.5
77.5°	58.3	65.7	58.3	60.1	74.2	87.7
80°	43.3	48.0	43.3	47.3	67.2	77.1
82.5°	31.2	34.0	31.2	44.2	65.8	72.9
85°	23.2	19.1	23.9	45.8	69.5	73.1
87.5°	18.7	4.7	23.8	51.7	77.4	78.0
90°	12.0	0.4	26.0	60.3	85.8	85.8
92.5°	5.4	5.9	30.8	69.3	95.7	97.3
95°	2.4	14.8	39.2	78.5	105.7	108.0
97.5°	5.3	27.1	52.5	88.2	115.7	119.5
100°	13.1	41.0	68.3	101.1	124.1	127.3
102.5°	23.7	56.1	83.4	116.1	137.3	142.6
105°	38.1	73.4	99.2	134.1	153.3	158.4
107.5°	54.6	91.8	115.3	150.4	170.5	174.3
110°	72.3	111.0	131.6	166.1	188.2	192.7



TEST NUMBER: P382193

CATALOG NUMBER: MWL-2-13-23-UNV-L830-EDD

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
112.5°	91.4	130.8	148.5	180.9	207.0	210.3
115°	113.2	149.2	164.3	197.8	222.1	224.9
117.5°	132.7	171.3	180.5	210.3	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	269.7
125°	194.7	234.4	228.5	254.3	280.5	281.1
127.5°	214.5	256.2	245.4	268.6	292.6	291.5
130°	236.3	276.7	260.9	282.2	304.0	300.3
132.5°	256.2	298.9	276.7	296.2	315.4	317.5
135°	276.0	319.4	290.4	308.4	327.2	326.4
137.5°	295.1	338.6	306.9	317.9	334.9	337.1
140°	313.9	359.2	321.7	330.4	344.4	344.8
142.5°	333.8	379.7	337.8	342.9	355.1	352.9
145°	355.8	399.3	358.1	356.4	364.1	359.4
147.5°	376.3	416.2	373.4	365.6	374.8	368.5
150°	397.1	433.5	392.3	378.5	384.0	381.1
152.5°	416.9	447.1	414.0	388.4	394.7	391.0
155°	436.4	461.5	434.9	398.3	402.8	401.3
157.5°	453.3	474.0	450.8	407.8	413.8	410.8
160°	468.1	484.3	469.2	423.2	421.2	421.2
162.5°	481.0	494.2	482.1	444.2	429.2	422.3
165°	492.4	501.9	493.5	467.7	443.8	438.5
167.5°	503.0	509.3	506.4	486.9	467.7	455.4
170°	511.5	515.2	511.1	503.0	493.5	482.1
172.5°	515.9	517.4	519.9	514.8	511.1	503.8
175°	519.5	523.5	521.2	522.2	518.9	516.5
177.5°	520.2	520.9	520.6	522.9	524.8	521.2
180°	522.2	522.2	522.2	522.2	522.2	522.2

(END OF REPORT)