

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: METALUX

Report Number: P192513

Luminaire Tested: **4WSL-LD2-65-UPL15-UNV-L830-CD1-U**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P192513  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P28105)  
Test Lab: INNOVATION CENTER-P2  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: 4WSL-LD2-65-UPL15-UNV-L830-CD1-U  
Description: 4FT Linear Wavestream System, 15% Uplight, L830  
Light Source: (238) 3000K CCT, 80 CRI LEDS  
EL236N0119D830  
Ballast/Driver: OSRAM  
OT85W1202772A0DIML

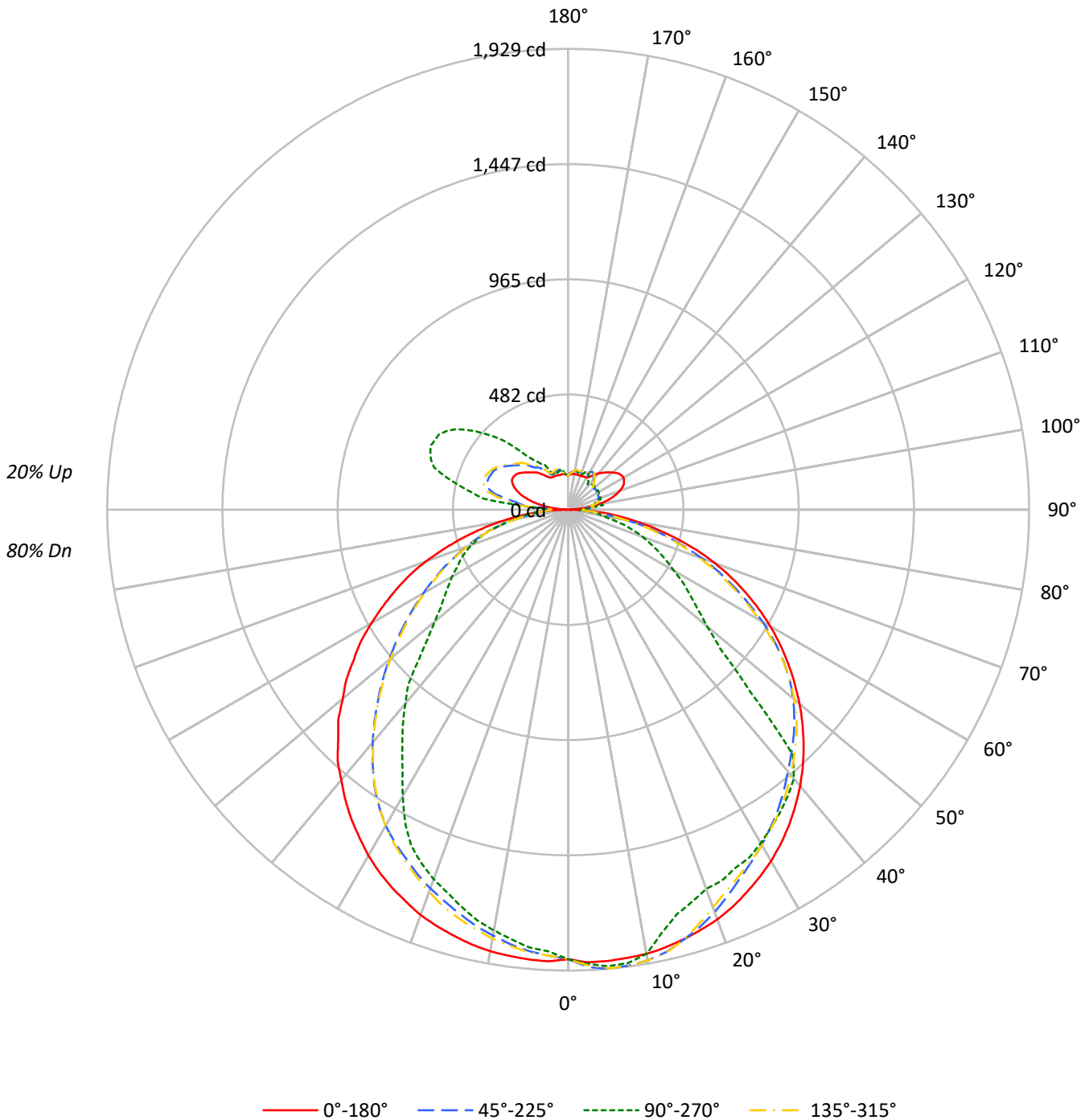
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6658.0 lumens  
Efficiency: N/A  
Efficacy: 107.6 lumens/watt  
Spacing Criteria (0/90/45): 1.32 / 1.19 / 1.35  
Luminous Opening: Rectangular (W 0.5' x L: 3.8' x H: 0')  
CIE Type: Semi-Direct  
  
Input Watts (W): 61.9  
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





TEST NUMBER: P192513

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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	114	114	114	114	109	109	109	109	100	100	100	91	91	91	83	83	83	80
1	104	99	95	91	99	95	91	88	87	84	81	80	77	75	73	71	70	66
2	94	86	80	74	90	83	77	72	76	71	67	70	66	62	64	61	58	55
3	86	76	68	62	82	73	66	60	67	61	56	61	57	53	56	53	49	46
4	79	67	59	52	75	64	57	51	59	53	48	55	49	45	50	46	42	40
5	72	60	51	45	69	58	50	44	53	46	41	49	43	39	45	41	37	34
6	67	54	45	39	64	52	44	38	48	41	36	44	39	34	41	36	32	30
7	62	49	40	34	59	47	39	33	44	37	32	40	35	30	38	33	29	26
8	58	44	36	30	55	43	35	30	40	33	28	37	31	27	34	29	26	24
9	54	41	33	27	51	39	32	27	37	30	26	34	28	24	32	27	23	21
10	50	37	30	25	48	36	29	24	34	27	23	32	26	22	30	25	21	19

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

	0°	90°	180°	270°
0°	10658	10658	10658	10658
5°	10785	10907	10748	10466
10°	10860	10860	10798	10288
15°	10920	10287	10831	10097
20°	11003	10183	10886	9923
25°	11044	10342	10909	9708
30°	11106	10541	10936	9057
35°	11144	10696	10935	8366
40°	11166	10862	10926	7843
45°	11162	8635	10902	7061
50°	11137	6663	10851	6415
55°	11094	6144	10816	6229
60°	11062	5800	10768	6363
65°	10973	5617	10684	6660
70°	10805	5474	10518	7119
75°	10307	5201	9975	7565
80°	9654	4721	9373	7540
85°	9685	6175	8983	8983



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	179.0	2.7
10°-20°	508.1	7.6
20°-30°	767.8	11.5
30°-40°	924.1	13.9
40°-50°	939.8	14.1
50°-60°	818.0	12.3
60°-70°	638.1	9.6
70°-80°	394.4	5.9
80°-90°	138.8	2.1
90°-100°	130.7	2.0
100°-110°	253.0	3.8
110°-120°	276.8	4.2
120°-130°	242.7	3.6
130°-140°	181.8	2.7
140°-150°	124.5	1.9
150°-160°	79.3	1.2
160°-170°	46.3	0.7
170°-180°	14.9	0.2
0°-30°	1454.9	21.9
0°-40°	2379.0	35.7
0°-60°	4136.7	62.1
0°-90°	5308.0	79.7
90°-120°	660.5	9.9
90°-150°	1209.5	18.2
90°-180°	1350.0	20.3
0°-180°	6658.0	100.0

**CANDELA DISTRIBUTION:**

	0°	90°	180°	270°	360°	Flux
0°	1881	1881	1881	1881	1881	
5°	1896	1918	1890	1840	1896	181
15°	1862	1754	1847	1722	1862	526
25°	1767	1654	1745	1553	1767	815
35°	1611	1546	1581	1210	1611	1008
45°	1393	1078	1361	881	1393	1075
55°	1123	622	1095	631	1123	1004
65°	819	419	797	497	819	809
75°	471	238	456	346	471	499
85°	149	95	138	138	149	149
90°	2	60	2	95	2	11
95°	58	99	45	199	58	60
105°	186	123	179	529	186	194
115°	257	140	257	635	257	252
125°	261	147	261	585	261	232
135°	220	147	220	428	220	171
145°	173	147	177	255	173	110
155°	153	177	151	175	153	71
165°	151	160	149	162	151	43
175°	149	156	149	151	149	14
180°	145	145	145	145	145	



TEST NUMBER: P192513

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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3
2.5°	1896.4	1887.8	1915.9	1918.0	1902.9	1909.4	1909.4	1885.6	1892.1	1864.0	1868.3
5°	1896.4	1898.6	1928.8	1926.7	1918.0	1920.2	1926.7	1896.4	1889.9	1851.1	1855.4
7.5°	1892.1	1902.9	1924.5	1922.3	1913.7	1915.9	1926.7	1900.7	1883.5	1838.1	1835.9
10°	1887.8	1898.6	1915.9	1905.1	1887.8	1894.3	1915.9	1898.6	1877.0	1823.0	1810.0
12.5°	1877.0	1887.8	1896.4	1842.4	1812.2	1838.1	1898.6	1887.8	1864.0	1801.4	1784.1
15°	1861.9	1874.8	1864.0	1788.4	1753.9	1777.6	1864.0	1872.7	1846.7	1773.3	1751.7
17.5°	1844.6	1859.7	1831.6	1747.4	1721.5	1732.3	1818.7	1853.2	1827.3	1745.2	1719.3
20°	1825.1	1842.4	1792.7	1704.2	1689.1	1697.7	1771.1	1831.6	1805.7	1715.0	1686.9
22.5°	1799.2	1818.7	1747.4	1673.9	1680.4	1673.9	1727.9	1803.5	1775.5	1682.6	1650.2
25°	1766.8	1788.4	1702.0	1648.0	1654.5	1652.3	1691.2	1766.8	1745.2	1643.7	1609.1
27.5°	1734.4	1756.0	1661.0	1630.7	1641.5	1628.6	1656.7	1727.9	1710.7	1602.7	1570.3
30°	1697.7	1721.5	1619.9	1600.5	1611.3	1602.7	1622.1	1689.1	1671.8	1559.5	1527.1
32.5°	1656.7	1680.4	1576.7	1563.8	1578.9	1568.1	1581.1	1645.9	1626.4	1511.9	1473.1
35°	1611.3	1635.1	1531.4	1531.4	1546.5	1533.5	1540.0	1602.7	1581.1	1464.4	1412.6
37.5°	1561.6	1587.5	1481.7	1492.5	1509.8	1496.8	1496.8	1557.3	1531.4	1412.6	1343.5
40°	1509.8	1537.9	1429.9	1453.6	1468.8	1453.6	1449.3	1509.8	1477.4	1360.8	1272.2
42.5°	1453.6	1483.9	1382.4	1410.4	1391.0	1410.4	1399.6	1460.1	1427.7	1304.6	1198.8
45°	1393.2	1432.0	1334.8	1317.6	1077.8	1304.6	1350.0	1408.3	1360.8	1250.6	1125.3
47.5°	1330.5	1371.6	1283.0	1157.7	866.1	1144.8	1296.0	1352.1	1304.6	1192.3	1051.9
50°	1263.6	1311.1	1229.0	1019.5	756.0	1006.5	1235.5	1293.8	1231.2	1129.6	978.4
52.5°	1194.4	1246.3	1168.5	900.7	682.5	887.7	1170.7	1231.2	1170.7	1062.7	907.2
55°	1123.2	1177.2	1097.2	790.5	622.1	788.4	1095.1	1164.2	1095.1	995.7	835.9
57.5°	1051.9	1112.4	1021.6	710.6	570.2	699.8	1010.8	1095.1	1030.3	926.6	766.8
60°	976.3	1032.4	939.6	624.2	511.9	622.1	926.6	1023.8	950.4	855.3	699.8
62.5°	898.5	961.2	851.0	548.6	464.4	546.5	835.9	943.9	872.6	781.9	635.0
65°	818.6	879.1	766.8	488.1	419.0	483.8	751.7	861.8	797.0	708.5	574.5
67.5°	736.5	792.7	682.5	429.8	373.7	425.5	665.3	775.4	719.3	632.9	509.7
70°	652.3	704.1	596.1	373.7	330.5	371.5	581.0	686.9	635.0	555.1	451.4
72.5°	563.7	611.3	505.4	319.7	285.1	317.5	492.5	596.1	542.1	473.0	399.6
75°	470.9	516.2	421.2	265.7	237.6	263.5	408.2	498.9	455.7	397.4	339.1
77.5°	382.3	427.7	334.8	205.2	181.4	200.9	319.7	408.2	371.5	321.8	276.5
80°	295.9	332.6	246.2	153.4	144.7	153.4	239.8	313.2	287.3	252.7	216.0
82.5°	218.2	239.8	166.3	125.3	125.3	125.3	162.0	222.5	211.7	187.9	164.2
85°	149.0	149.0	112.3	95.0	95.0	95.0	110.2	131.8	138.2	125.3	125.3
87.5°	62.6	64.8	58.3	51.8	49.7	51.8	56.2	54.0	54.0	60.5	75.6
90°	2.2	28.1	47.5	58.3	60.5	56.2	43.2	25.9	2.2	36.7	67.0
92.5°	15.1	60.5	56.2	73.4	75.6	69.1	58.3	47.5	8.6	67.0	71.3
95°	58.3	71.3	110.2	112.3	99.4	95.0	108.0	67.0	45.4	90.7	181.4
97.5°	92.9	108.0	99.4	129.6	146.9	129.6	103.7	103.7	86.4	140.4	211.7
100°	127.4	114.5	101.5	112.3	129.6	114.5	97.2	114.5	121.0	164.2	259.2
102.5°	159.8	127.4	127.4	110.2	112.3	108.0	123.1	125.3	151.2	185.8	319.7
105°	185.8	131.8	133.9	125.3	123.1	125.3	133.9	133.9	179.3	205.2	347.7
107.5°	209.5	136.1	131.8	138.2	140.4	138.2	131.8	136.1	205.2	218.2	354.2
110°	229.0	138.2	133.9	138.2	144.7	138.2	133.9	140.4	226.8	231.1	358.5



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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°	246.2	140.4	138.2	136.1	142.6	136.1	138.2	144.7	244.1	237.6	358.5
115°	257.0	142.6	138.2	138.2	140.4	138.2	140.4	146.9	257.0	239.8	354.2
117.5°	263.5	146.9	140.4	142.6	144.7	142.6	140.4	151.2	265.7	248.4	352.1
120°	267.8	162.0	140.4	144.7	146.9	144.7	140.4	164.2	267.8	252.7	343.4
122.5°	265.7	168.5	142.6	144.7	149.0	144.7	142.6	170.6	265.7	250.6	332.6
125°	261.4	175.0	142.6	142.6	146.9	144.7	144.7	175.0	261.4	246.2	317.5
127.5°	252.7	190.1	142.6	144.7	144.7	144.7	144.7	187.9	252.7	248.4	302.4
130°	241.9	200.9	138.2	146.9	144.7	149.0	142.6	200.9	241.9	241.9	289.4
132.5°	231.1	205.2	138.2	146.9	146.9	149.0	140.4	205.2	231.1	233.3	276.5
135°	220.3	209.5	146.9	144.7	146.9	146.9	149.0	209.5	220.3	224.6	267.8
137.5°	209.5	211.7	157.7	138.2	144.7	140.4	162.0	211.7	211.7	211.7	254.9
140°	198.7	209.5	166.3	133.9	136.1	138.2	170.6	211.7	203.0	205.2	233.3
142.5°	185.8	203.0	172.8	144.7	133.9	149.0	177.1	209.5	190.1	198.7	222.5
145°	172.8	196.6	185.8	159.8	146.9	166.3	192.2	203.0	177.1	194.4	216.0
147.5°	162.0	185.8	187.9	168.5	162.0	175.0	194.4	194.4	164.2	185.8	200.9
150°	155.5	175.0	181.4	175.0	168.5	183.6	190.1	179.3	155.5	179.3	187.9
152.5°	153.4	166.3	166.3	183.6	181.4	192.2	175.0	170.6	151.2	172.8	170.6
155°	153.4	164.2	159.8	168.5	177.1	177.1	166.3	166.3	151.2	172.8	162.0
157.5°	151.2	166.3	159.8	157.7	162.0	166.3	166.3	168.5	151.2	168.5	162.0
160°	151.2	168.5	162.0	155.5	157.7	164.2	168.5	168.5	151.2	168.5	164.2
162.5°	151.2	164.2	164.2	157.7	157.7	166.3	168.5	166.3	151.2	164.2	168.5
165°	151.2	164.2	166.3	162.0	159.8	170.6	168.5	162.0	149.0	162.0	170.6
167.5°	151.2	159.8	168.5	164.2	164.2	170.6	170.6	159.8	149.0	155.5	170.6
170°	151.2	157.7	166.3	164.2	166.3	172.8	166.3	157.7	151.2	153.4	164.2
172.5°	151.2	153.4	162.0	164.2	164.2	168.5	162.0	153.4	151.2	149.0	157.7
175°	149.0	153.4	157.7	157.7	155.5	162.0	155.5	151.2	149.0	146.9	151.2
177.5°	146.9	149.0	153.4	153.4	149.0	153.4	149.0	146.9	146.9	144.7	149.0
180°	144.7	144.7	144.7	144.7	144.7	144.7	144.7	144.7	144.7	144.7	144.7



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**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
0°	1881.3	1881.3	1881.3	1881.3	1881.3	1881.3
2.5°	1866.2	1851.1	1855.4	1868.3	1866.2	1896.4
5°	1846.7	1840.3	1840.3	1859.7	1857.5	1896.4
7.5°	1825.1	1814.3	1820.8	1842.4	1848.9	1892.1
10°	1797.1	1788.4	1790.6	1823.0	1833.8	1887.8
12.5°	1769.0	1760.3	1766.8	1797.1	1812.2	1877.0
15°	1736.6	1721.5	1738.7	1771.1	1790.6	1861.9
17.5°	1697.7	1680.4	1697.7	1740.9	1764.7	1844.6
20°	1663.1	1645.9	1656.7	1702.0	1734.4	1825.1
22.5°	1624.3	1602.7	1611.3	1661.0	1702.0	1799.2
25°	1581.1	1553.0	1565.9	1619.9	1665.3	1766.8
27.5°	1524.9	1477.4	1509.8	1576.7	1619.9	1734.4
30°	1447.2	1384.5	1436.4	1529.2	1578.9	1697.7
32.5°	1356.4	1289.5	1345.6	1470.9	1531.4	1656.7
35°	1267.9	1209.6	1261.4	1410.4	1483.9	1611.3
37.5°	1190.1	1136.1	1183.6	1341.3	1432.0	1561.6
40°	1110.2	1060.5	1108.0	1267.9	1380.2	1509.8
42.5°	1036.8	989.2	1034.6	1194.4	1324.0	1453.6
45°	959.0	881.3	954.7	1118.8	1263.6	1393.2
47.5°	876.9	794.9	870.5	1045.4	1203.1	1330.5
50°	801.3	727.9	797.0	969.8	1138.3	1263.6
52.5°	734.4	671.7	732.2	894.2	1071.3	1194.4
55°	671.7	630.7	673.9	825.1	1008.7	1123.2
57.5°	622.1	594.0	624.2	758.1	939.6	1051.9
60°	578.9	561.6	581.0	691.2	866.1	976.3
62.5°	531.3	524.9	531.3	626.4	794.9	898.5
65°	490.3	496.8	490.3	568.1	719.3	818.6
67.5°	451.4	466.5	453.6	505.4	643.7	736.5
70°	408.2	429.8	410.4	449.3	565.9	652.3
72.5°	362.9	388.8	362.9	395.3	483.8	563.7
75°	315.3	345.6	317.5	336.9	406.1	470.9
77.5°	263.5	283.0	267.8	274.3	330.5	382.3
80°	209.5	231.1	211.7	216.0	261.4	295.9
82.5°	175.0	190.1	177.1	164.2	194.4	218.2
85°	129.6	138.2	133.9	127.4	133.9	149.0
87.5°	79.9	84.2	79.9	79.9	69.1	62.6
90°	88.6	95.0	88.6	69.1	38.9	2.2
92.5°	90.7	99.4	90.7	75.6	73.4	15.1
95°	203.0	198.7	216.0	196.6	112.3	58.3
97.5°	315.3	360.7	326.1	235.4	151.2	92.9
100°	362.9	406.1	378.0	293.8	172.8	127.4
102.5°	419.0	466.5	436.3	343.4	194.4	159.8
105°	488.1	529.2	503.3	362.9	213.8	185.8
107.5°	524.9	587.5	535.7	371.5	226.8	209.5
110°	544.3	611.3	561.6	373.7	237.6	229.0





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**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
112.5°	559.4	624.2	572.4	373.7	241.9	246.2
115°	559.4	635.0	572.4	367.2	248.4	257.0
117.5°	559.4	628.5	572.4	360.7	257.0	263.5
120°	540.0	626.4	557.3	352.1	259.2	267.8
122.5°	524.9	609.1	535.7	341.3	259.2	265.7
125°	496.8	585.3	509.7	328.3	254.9	261.4
127.5°	466.5	550.8	477.3	313.2	257.0	252.7
130°	438.5	511.9	444.9	298.1	248.4	241.9
132.5°	401.7	468.7	408.2	287.3	239.8	231.1
135°	367.2	427.7	375.8	278.6	229.0	220.3
137.5°	330.5	384.5	339.1	261.4	218.2	209.5
140°	287.3	330.5	295.9	241.9	211.7	198.7
142.5°	259.2	283.0	267.8	233.3	203.0	185.8
145°	241.9	254.9	248.4	224.6	198.7	172.8
147.5°	224.6	237.6	231.1	207.4	187.9	162.0
150°	218.2	218.2	226.8	192.2	181.4	155.5
152.5°	194.4	211.7	203.0	175.0	177.1	153.4
155°	166.3	175.0	175.0	168.5	177.1	153.4
157.5°	155.5	162.0	164.2	168.5	172.8	151.2
160°	155.5	157.7	164.2	170.6	170.6	151.2
162.5°	159.8	157.7	168.5	175.0	166.3	151.2
165°	164.2	162.0	172.8	177.1	162.0	151.2
167.5°	168.5	168.5	177.1	175.0	157.7	151.2
170°	168.5	172.8	177.1	168.5	155.5	151.2
172.5°	162.0	164.2	168.5	157.7	149.0	151.2
175°	153.4	151.2	157.7	151.2	149.0	149.0
177.5°	149.0	142.6	149.0	146.9	144.7	146.9
180°	144.7	144.7	144.7	144.7	144.7	144.7

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