

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: P188236

Luminaire Tested: **MPBL-4-LD4-UNV-2DN-STD-40**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P188236
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27391)
Test Lab: INNOVATION CENTER-P2
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: MPBL-4-LD4-UNV-2DN-STD-40
Description:
Light Source: (168) NICHIA ELM 4000K LED
2UT217042A8404A
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 6259.0 lumens
Efficiency: N/A
Efficacy: 90.4 lumens/watt
Spacing Criteria (0/90/45): 1.24 / 1.19 / 1.34
Luminous Opening: Rectangular w/ Sides (W: 4' x L: 0.42' x H: 0.29')
CIE Type: Direct

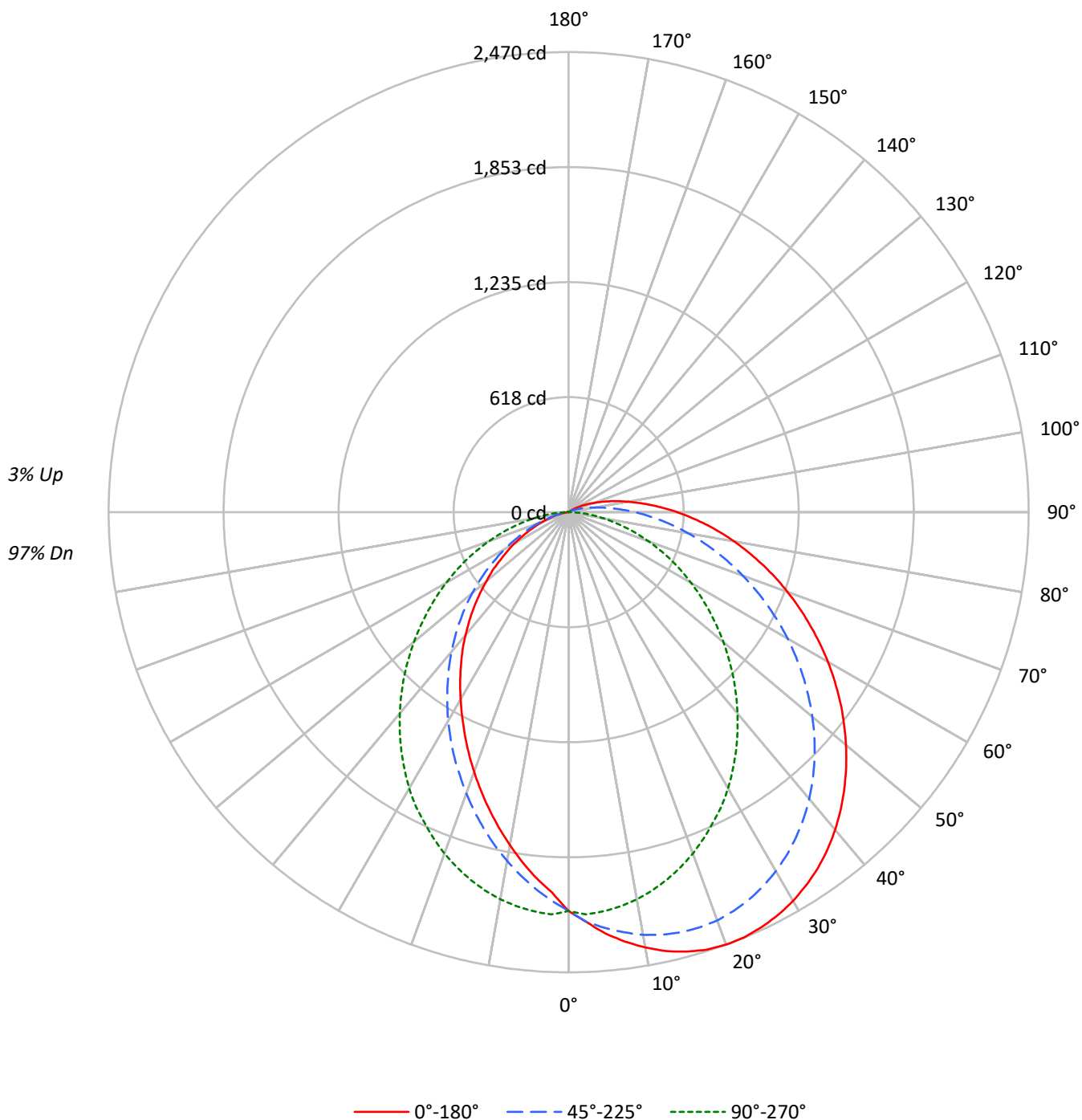
Input Watts (W): 69.2
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
RCR																	
0	118	118	118	118	115	115	115	115	109	109	109	104	104	104	99	99	99
1	107	102	97	93	104	99	95	91	94	91	88	90	87	84	86	83	81
2	97	88	81	75	94	86	80	74	82	77	72	78	74	70	75	71	68
3	88	78	69	62	86	76	68	62	72	66	60	69	63	59	66	61	57
4	81	69	60	53	78	67	59	52	64	57	51	61	55	50	59	54	49
5	74	61	52	45	72	60	51	45	58	50	44	55	49	44	53	47	43
6	69	55	46	40	67	54	46	39	52	44	39	50	43	38	48	42	38
7	64	50	41	35	62	49	41	35	47	40	34	46	39	34	44	38	33
8	59	46	37	31	58	45	37	31	43	36	31	42	35	30	40	34	30
9	56	42	34	28	54	41	33	28	40	33	28	39	32	27	37	31	27
10	52	39	31	26	51	38	31	25	37	30	25	36	29	25	35	29	25

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	13826	13826	13826
5°	13870	13854	12051
10°	13849	13660	10592
15°	13748	13387	9288
20°	13531	13055	8124
25°	13197	12651	7083
30°	12795	12249	6161
35°	12341	11744	5340
40°	11821	11207	4576
45°	11248	10633	3848
50°	10650	10023	3155
55°	10028	9377	2517
60°	9383	8711	1953
65°	8729	8022	1406
70°	8074	7175	943
75°	7410	6145	569
80°	6746	4915	244
85°	6065	3363	87



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	202.3	3.2
10°-20°	575.3	9.2
20°-30°	858.0	13.7
30°-40°	1013.6	16.2
40°-50°	1029.3	16.4
50°-60°	916.6	14.6
60°-70°	714.4	11.4
70°-80°	478.6	7.6
80°-90°	267.6	4.3
90°-100°	128.1	2.0
100°-110°	53.5	0.9
110°-120°	18.0	0.3
120°-130°	3.7	0.1
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	1635.6	26.1
0°-40°	2649.2	42.3
0°-60°	4595.1	73.4
0°-90°	6055.7	96.8
90°-120°	199.6	3.2
90°-150°	203.3	3.2
90°-180°	203.0	3.2
0°-180°	6259.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	2141	2141	2141	2141	2141	
5°	2270	2240	2151	2030	1973	220
15°	2442	2334	2041	1759	1650	692
25°	2456	2293	1836	1451	1318	1133
35°	2332	2129	1566	1133	1009	1459
45°	2094	1867	1249	825	716	1616
55°	1781	1536	920	531	447	1593
65°	1429	1175	607	273	230	1416
75°	1073	819	313	94	82	1135
85°	737	495	83	9	11	635
90°	583	356	2	3	6	320
95°	442	234	2	2	3	337
105°	225	82	3	1	0	243
115°	86	17	4	2	0	89
125°	16	3	5	3	1	15
135°	0	0	0	0	0	0
145°	0	0	0	0	0	0
155°	0	0	0	0	0	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	0



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8
2.5°	2202.0	2202.0	2203.6	2205.3	2202.8	2205.3	2206.1	2205.3	2207.7	2206.1	2201.2
5°	2270.5	2270.5	2269.7	2267.3	2264.0	2260.7	2260.7	2257.5	2255.8	2252.6	2240.3
7.5°	2325.2	2326.8	2325.2	2321.1	2313.8	2312.1	2310.5	2304.0	2299.1	2290.9	2274.6
10°	2372.5	2374.1	2369.2	2365.2	2358.6	2353.7	2351.3	2343.1	2335.0	2322.7	2304.0
12.5°	2413.3	2411.7	2406.8	2401.1	2393.7	2388.0	2383.9	2372.5	2361.9	2346.4	2322.7
15°	2441.9	2442.7	2440.2	2433.7	2423.9	2417.4	2410.9	2396.2	2380.7	2361.9	2334.2
17.5°	2462.2	2462.2	2458.2	2451.6	2441.0	2432.9	2425.5	2410.0	2391.3	2368.4	2337.4
20°	2470.4	2471.2	2466.3	2458.2	2445.1	2436.1	2428.0	2410.0	2389.6	2366.0	2331.7
22.5°	2468.8	2470.4	2464.7	2454.1	2439.4	2429.6	2420.6	2400.2	2378.2	2353.7	2316.2
25°	2456.5	2458.2	2452.5	2441.9	2426.4	2416.6	2406.8	2384.7	2359.5	2333.3	2293.4
27.5°	2437.0	2437.8	2432.1	2420.6	2406.0	2395.3	2385.6	2362.7	2335.0	2306.4	2263.2
30°	2409.2	2410.9	2405.1	2392.9	2376.6	2366.0	2355.4	2330.1	2300.7	2270.5	2224.8
32.5°	2374.1	2375.8	2368.4	2357.0	2339.9	2329.3	2317.0	2290.1	2257.5	2225.7	2180.8
35°	2332.5	2332.5	2326.8	2313.8	2295.0	2284.4	2271.3	2242.0	2209.3	2175.1	2129.4
37.5°	2282.8	2282.8	2276.2	2263.2	2243.6	2232.2	2219.1	2188.1	2151.4	2118.8	2072.3
40°	2225.7	2226.5	2219.1	2205.3	2185.7	2174.3	2160.4	2131.0	2090.2	2056.8	2009.5
42.5°	2162.8	2162.8	2155.5	2141.6	2121.2	2109.8	2095.1	2064.9	2023.3	1988.2	1940.9
45°	2093.5	2093.5	2087.0	2073.1	2051.1	2040.5	2025.0	1991.5	1951.5	1915.6	1866.7
47.5°	2020.9	2020.1	2010.3	1999.7	1976.0	1965.4	1949.9	1917.3	1875.7	1838.9	1790.0
50°	1944.2	1942.6	1933.6	1921.3	1897.7	1887.1	1871.6	1837.3	1795.7	1757.4	1708.4
52.5°	1863.4	1862.6	1850.4	1838.1	1816.1	1805.5	1789.2	1752.5	1709.2	1672.5	1622.7
55°	1781.0	1778.6	1767.1	1754.9	1731.2	1720.6	1704.3	1667.6	1623.6	1586.0	1536.3
57.5°	1694.5	1692.9	1679.8	1671.7	1643.9	1632.5	1621.1	1582.8	1538.7	1497.1	1447.3
60°	1607.2	1604.8	1591.7	1582.8	1555.8	1544.4	1528.1	1493.8	1449.0	1407.3	1357.6
62.5°	1518.3	1515.9	1502.8	1489.8	1465.3	1458.7	1442.4	1404.9	1354.3	1316.8	1266.2
65°	1428.6	1426.1	1413.1	1400.0	1374.7	1363.3	1347.0	1314.3	1264.6	1225.4	1174.8
67.5°	1338.8	1336.4	1322.5	1308.6	1284.2	1272.7	1256.4	1223.0	1172.4	1134.9	1084.3
70°	1249.9	1248.3	1232.8	1219.7	1195.2	1187.1	1166.7	1132.4	1087.5	1045.9	994.5
72.5°	1161.8	1161.0	1143.8	1130.8	1112.0	1098.1	1079.4	1044.3	998.6	953.7	906.4
75°	1072.8	1074.5	1056.5	1041.8	1024.7	1010.0	992.1	955.4	910.5	868.1	819.1
77.5°	986.4	987.2	974.1	955.4	937.4	922.7	904.8	868.9	824.8	780.8	734.3
80°	901.5	905.6	884.4	869.7	850.9	837.9	818.3	784.0	740.0	701.6	651.9
82.5°	817.5	817.5	804.4	786.5	767.7	753.8	735.1	700.0	661.7	616.0	571.9
85°	736.7	737.5	723.7	709.8	688.6	673.9	656.8	620.9	582.5	539.3	495.2
87.5°	657.6	658.4	645.3	630.7	610.3	595.6	578.4	547.4	506.6	464.2	421.8
90°	583.3	582.5	569.5	556.4	536.0	522.1	505.0	474.8	434.9	394.1	355.7
92.5°	510.7	510.7	497.7	484.6	465.0	450.4	435.7	405.5	367.1	328.8	291.3
95°	442.2	441.4	429.1	416.9	398.1	382.6	369.6	341.0	305.1	269.2	234.2
97.5°	378.6	377.7	366.3	354.1	336.1	323.1	310.0	283.9	250.5	217.8	186.0
100°	322.3	321.4	310.0	299.4	283.1	269.2	258.6	234.2	204.0	174.6	145.2
102.5°	271.7	270.0	260.3	247.2	235.0	222.7	213.8	190.9	164.0	138.7	111.0
105°	225.2	223.5	214.6	203.1	192.5	181.9	172.1	152.6	128.1	106.1	82.4
107.5°	183.6	181.9	173.8	165.6	154.2	145.2	136.2	118.3	97.9	78.3	59.6
110°	146.0	144.4	137.1	130.5	119.9	112.6	105.2	90.6	72.6	57.1	41.6



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	113.4	112.6	106.9	100.4	92.2	85.7	79.1	66.9	52.2	39.2	27.7
115°	86.5	84.8	80.8	75.9	67.7	63.6	57.9	47.3	35.9	25.3	17.1
117.5°	62.8	61.2	58.7	54.7	48.1	44.9	40.8	32.6	22.8	16.3	9.8
120°	43.2	43.2	40.0	36.7	31.8	29.4	26.1	19.6	13.1	8.2	4.1
122.5°	27.7	27.7	25.3	22.8	18.8	17.1	14.7	10.6	6.5	3.3	3.3
125°	16.3	15.5	13.9	12.2	9.8	9.0	7.3	4.9	2.4	3.3	3.3
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8
2.5°	2183.2	2176.7	2172.6	2167.7	2165.3	2164.5	2163.6	2164.5	2166.1	2161.2	2149.8
5°	2220.8	2208.5	2197.9	2187.3	2182.4	2179.1	2172.6	2166.1	2162.0	2150.6	2133.5
7.5°	2249.3	2233.0	2218.3	2201.2	2193.8	2186.5	2174.3	2162.0	2151.4	2133.5	2111.4
10°	2273.0	2250.1	2229.7	2208.5	2197.9	2187.3	2168.5	2150.6	2133.5	2109.8	2081.2
12.5°	2287.7	2259.9	2233.0	2206.1	2193.8	2180.0	2155.5	2131.0	2108.2	2078.8	2046.2
15°	2295.0	2261.5	2229.7	2197.9	2181.6	2165.3	2135.1	2104.9	2076.4	2041.3	2002.1
17.5°	2295.0	2255.8	2218.3	2181.6	2164.5	2144.9	2109.0	2074.7	2039.6	1998.0	1957.2
20°	2286.0	2242.0	2201.2	2159.6	2139.2	2117.1	2076.4	2035.6	1997.2	1949.9	1902.6
22.5°	2269.7	2221.6	2176.7	2131.0	2107.4	2082.9	2036.4	1989.9	1947.4	1895.2	1843.8
25°	2244.4	2191.4	2141.6	2092.7	2069.0	2041.3	1991.5	1942.6	1892.8	1835.7	1781.0
27.5°	2212.6	2157.9	2101.6	2050.2	2023.3	1993.1	1940.1	1887.1	1834.0	1778.6	1714.9
30°	2174.3	2113.9	2056.8	2001.3	1972.7	1940.9	1883.0	1826.7	1769.6	1711.7	1643.9
32.5°	2127.7	2068.2	2005.4	1946.6	1916.4	1883.0	1819.4	1763.1	1701.1	1639.9	1570.5
35°	2074.7	2011.9	1948.3	1887.1	1855.3	1820.2	1754.1	1691.3	1629.3	1565.6	1494.6
37.5°	2016.0	1953.2	1886.3	1822.6	1790.0	1752.5	1683.9	1622.7	1554.2	1488.9	1421.2
40°	1952.3	1892.8	1819.4	1754.1	1719.8	1682.3	1609.7	1546.9	1476.7	1410.6	1342.1
42.5°	1882.2	1822.6	1747.6	1681.5	1647.2	1607.2	1533.8	1469.4	1397.6	1329.8	1261.3
45°	1807.1	1745.9	1673.3	1604.8	1569.7	1529.7	1455.5	1386.1	1316.0	1249.1	1180.5
47.5°	1729.6	1665.2	1595.8	1524.8	1490.6	1449.8	1376.3	1306.2	1234.4	1166.7	1099.8
50°	1648.0	1582.8	1514.2	1443.2	1408.2	1368.2	1293.9	1223.8	1151.2	1084.3	1018.2
52.5°	1563.2	1500.4	1427.7	1358.4	1324.1	1284.2	1213.2	1142.2	1068.0	1001.9	937.4
55°	1475.9	1413.9	1342.1	1272.7	1239.3	1199.3	1130.0	1055.7	984.7	919.5	857.5
57.5°	1387.8	1324.9	1257.2	1185.4	1152.0	1117.7	1044.3	974.1	902.3	839.5	778.3
60°	1298.0	1235.2	1169.1	1098.1	1065.5	1027.2	960.3	890.9	820.7	759.6	700.8
62.5°	1212.4	1152.0	1081.0	1015.7	979.0	945.6	877.0	809.3	740.0	681.2	624.1
65°	1116.9	1062.2	989.6	924.4	893.4	860.7	794.6	728.6	660.8	607.0	549.1
67.5°	1027.2	973.3	905.6	842.8	808.5	776.7	711.4	648.6	586.6	528.7	477.3
70°	939.0	885.2	815.0	758.7	724.5	694.3	630.7	572.7	508.3	456.1	406.3
72.5°	852.6	798.7	729.4	677.2	641.3	614.3	554.0	492.8	435.7	384.3	333.7
75°	766.9	713.1	646.2	595.6	561.3	536.0	476.5	417.7	363.9	313.3	266.8
77.5°	682.1	629.8	568.7	516.4	487.9	458.5	406.3	345.9	296.2	247.2	204.0
80°	599.7	549.1	492.8	440.6	409.6	385.1	335.3	278.2	229.3	186.8	146.9
82.5°	521.3	473.2	414.5	366.3	340.2	313.3	265.2	216.2	170.5	132.2	96.3
85°	447.1	398.1	345.9	301.1	270.9	251.3	203.1	157.5	118.3	83.2	51.4
87.5°	377.7	331.2	278.2	236.6	210.5	190.1	148.5	106.1	71.8	39.2	13.9
90°	310.8	266.0	217.8	177.9	155.0	136.2	97.1	59.6	27.7	2.4	1.6
92.5°	248.0	208.0	163.2	126.5	106.9	89.7	56.3	26.9	4.9	1.6	1.6
95°	194.2	155.8	119.1	88.1	72.6	57.1	30.2	9.8	1.6	1.6	1.6
97.5°	150.9	116.7	84.8	58.7	45.7	33.5	13.9	3.3	2.4	2.4	2.4
100°	115.0	84.8	57.9	36.7	26.9	17.9	5.7	2.4	2.4	2.4	2.4
102.5°	85.7	58.7	37.5	22.0	14.7	9.0	2.4	2.4	2.4	2.4	2.4
105°	59.6	40.0	23.7	12.2	7.3	4.1	2.4	2.4	3.3	3.3	3.3
107.5°	42.4	26.1	13.9	5.7	3.3	3.3	3.3	3.3	3.3	3.3	3.3
110°	27.7	15.5	7.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3



TEST NUMBER: P188236

CATALOG NUMBER: MPBL-4-LD4-UNV-2DN-STD-40

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	17.1	8.2	3.3	3.3	3.3	3.3	3.3	3.3	4.1	4.1	4.1
115°	9.8	4.1	3.3	3.3	3.3	3.3	4.1	4.1	4.1	4.1	4.1
117.5°	4.9	3.3	3.3	4.1	4.1	4.1	4.1	4.9	4.9	4.9	4.9
120°	3.3	3.3	3.3	4.1	4.1	4.1	4.1	4.9	4.9	4.9	4.9
122.5°	3.3	3.3	4.1	4.1	4.1	4.1	4.9	4.9	4.9	4.9	4.9
125°	3.3	4.1	4.1	4.1	4.1	4.9	4.9	4.9	4.9	4.9	4.9
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P188236

CATALOG NUMBER: MPBL-4-LD4-UNV-2DN-STD-40

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8
2.5°	2135.1	2118.8	2109.0	2103.3	2100.8	2095.1	2090.2	2085.3	2087.0	2087.8	2082.1
5°	2113.1	2091.9	2075.5	2066.6	2061.7	2051.1	2041.3	2033.1	2029.8	2025.8	2016.0
7.5°	2083.7	2057.6	2035.6	2025.0	2017.6	2001.3	1987.4	1974.4	1967.0	1959.7	1946.6
10°	2049.4	2017.6	1990.7	1977.6	1967.0	1946.6	1928.7	1912.4	1900.9	1890.3	1874.8
12.5°	2007.8	1970.3	1939.3	1923.0	1911.5	1889.5	1865.0	1845.5	1831.6	1817.7	1799.0
15°	1960.5	1918.1	1883.8	1865.0	1848.7	1825.9	1798.1	1776.1	1759.0	1743.5	1722.3
17.5°	1907.5	1861.8	1824.3	1802.2	1785.9	1759.0	1728.0	1700.2	1683.1	1662.7	1643.9
20°	1850.4	1800.6	1760.6	1742.7	1718.2	1688.0	1655.4	1626.0	1606.4	1584.4	1563.2
22.5°	1788.4	1735.3	1692.9	1673.3	1647.2	1615.4	1580.3	1550.1	1527.3	1503.6	1481.6
25°	1723.1	1666.8	1621.1	1600.7	1573.8	1540.3	1502.8	1471.0	1451.4	1422.0	1400.0
27.5°	1653.7	1595.8	1547.7	1525.6	1497.9	1459.6	1425.3	1392.7	1372.3	1346.2	1320.9
30°	1577.9	1521.6	1472.6	1449.8	1421.2	1382.1	1347.8	1314.3	1293.1	1262.9	1242.5
32.5°	1502.8	1446.5	1395.1	1372.3	1344.5	1304.6	1269.5	1235.2	1213.2	1186.3	1164.2
35°	1427.7	1365.7	1317.6	1293.9	1265.4	1227.0	1187.9	1156.9	1133.2	1107.1	1086.7
37.5°	1349.4	1292.3	1239.3	1216.4	1187.9	1148.7	1110.4	1078.6	1055.7	1029.6	1009.2
40°	1269.5	1213.2	1161.0	1138.1	1109.6	1070.4	1032.9	1001.9	977.4	952.9	933.3
42.5°	1190.3	1134.9	1083.5	1060.6	1032.1	992.9	955.4	928.4	901.5	881.1	857.5
45°	1111.2	1053.3	1005.1	983.1	953.7	917.0	879.5	851.8	824.8	805.2	779.1
47.5°	1032.9	975.8	928.4	905.6	877.0	841.1	804.4	775.9	749.8	731.0	705.7
50°	953.7	898.3	850.9	828.9	799.5	766.1	730.2	700.8	675.5	656.8	632.3
52.5°	876.2	819.1	774.2	751.4	723.7	691.8	653.5	627.4	602.9	583.3	561.3
55°	799.5	742.4	697.6	676.3	648.6	618.4	580.9	554.8	531.1	512.4	492.8
57.5°	721.2	664.9	621.7	600.5	573.5	544.2	507.5	483.8	461.0	443.8	426.7
60°	643.7	589.9	547.4	527.9	501.8	473.2	438.1	415.3	394.1	379.4	363.9
62.5°	571.9	523.0	475.6	456.1	430.8	404.7	371.2	350.0	331.2	318.2	305.9
65°	496.0	449.5	407.1	387.5	363.9	334.5	308.4	289.6	273.3	262.7	252.1
67.5°	424.2	378.6	338.6	320.6	297.8	274.9	252.1	233.3	219.5	211.3	202.3
70°	354.1	312.5	274.1	257.0	237.4	217.8	198.3	182.8	171.3	163.2	157.5
72.5°	288.8	248.0	213.8	198.3	182.8	166.4	150.1	138.7	128.9	123.2	119.1
75°	224.4	188.5	157.5	146.9	134.6	120.7	108.5	101.2	93.8	91.4	88.1
77.5°	165.6	133.8	111.8	101.2	93.0	82.4	74.2	70.2	65.3	62.8	60.4
80°	113.4	88.1	71.0	63.6	58.7	53.0	48.1	44.1	40.8	38.3	36.7
82.5°	67.7	49.8	40.0	35.9	33.5	29.4	26.1	23.7	21.2	20.4	19.6
85°	31.0	22.0	16.3	14.7	13.9	12.2	10.6	9.8	9.0	9.0	9.8
87.5°	7.3	4.1	4.1	4.1	4.1	4.9	4.9	5.7	6.5	6.5	7.3
90°	2.4	2.4	3.3	3.3	3.3	3.3	3.3	4.1	3.3	3.3	3.3
92.5°	1.6	1.6	1.6	1.6	1.6	2.4	2.4	2.4	2.4	2.4	2.4
95°	1.6	1.6	1.6	1.6	1.6	0.8	1.6	1.6	1.6	1.6	1.6
97.5°	2.4	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8
100°	2.4	2.4	2.4	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8
102.5°	2.4	2.4	2.4	2.4	2.4	1.6	1.6	1.6	0.8	0.8	0.8
105°	3.3	3.3	2.4	2.4	2.4	2.4	1.6	1.6	0.8	0.8	0.8
107.5°	3.3	3.3	3.3	3.3	2.4	2.4	2.4	1.6	1.6	0.8	0.8
110°	3.3	3.3	3.3	3.3	3.3	2.4	2.4	1.6	1.6	1.6	0.8



TEST NUMBER: P188236

CATALOG NUMBER: MPBL-4-LD4-UNV-2DN-STD-40

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	4.1	3.3	3.3	3.3	3.3	3.3	2.4	2.4	1.6	1.6	0.8
115°	4.1	4.1	4.1	4.1	3.3	3.3	3.3	2.4	2.4	1.6	1.6
117.5°	4.9	4.9	4.1	4.1	4.1	4.1	3.3	3.3	3.3	2.4	2.4
120°	4.9	4.9	4.9	4.1	4.1	4.1	4.1	3.3	3.3	2.4	2.4
122.5°	4.9	4.9	4.9	4.9	4.1	4.1	4.1	3.3	3.3	3.3	2.4
125°	4.9	4.9	4.9	4.9	4.9	4.1	4.1	4.1	3.3	3.3	2.4
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P188236

CATALOG NUMBER: MPBL-4-LD4-UNV-2DN-STD-40

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8	2140.8
2.5°	2072.3	2069.0	2064.1	2062.5	2056.8	2051.9	2044.5	2042.9
5°	2002.9	1997.2	1991.5	1988.2	1982.5	1980.1	1973.6	1972.7
7.5°	1931.1	1923.8	1917.3	1914.0	1908.3	1904.2	1896.9	1896.0
10°	1857.7	1844.6	1840.6	1836.5	1827.5	1821.8	1815.3	1814.5
12.5°	1783.5	1764.7	1759.8	1754.9	1745.9	1744.3	1733.7	1732.9
15°	1701.9	1687.2	1681.5	1677.4	1666.8	1663.5	1652.1	1649.7
17.5°	1626.0	1607.2	1600.7	1596.6	1584.4	1581.1	1569.7	1566.4
20°	1544.4	1525.6	1517.5	1513.4	1500.4	1497.1	1488.1	1483.2
22.5°	1461.2	1442.4	1432.6	1430.2	1417.1	1413.9	1405.7	1400.8
25°	1375.5	1360.8	1351.1	1348.6	1335.6	1332.3	1323.3	1318.4
27.5°	1300.5	1280.9	1275.2	1268.7	1255.6	1252.3	1242.5	1237.7
30°	1222.2	1202.6	1196.0	1190.3	1178.1	1170.8	1165.0	1160.1
32.5°	1143.8	1127.5	1122.6	1116.9	1106.3	1094.9	1089.2	1084.3
35°	1067.1	1046.7	1045.1	1037.0	1030.4	1020.6	1010.0	1009.2
37.5°	990.4	974.9	970.1	965.2	956.2	946.4	935.8	935.8
40°	914.6	899.9	895.0	886.8	881.1	871.3	862.4	861.5
42.5°	838.7	824.8	821.6	815.9	806.9	797.9	792.2	788.1
45°	765.3	751.4	747.3	742.4	734.3	725.3	715.5	716.3
47.5°	688.6	678.0	674.7	669.8	659.2	655.1	647.8	645.3
50°	616.8	607.0	603.7	598.8	589.9	582.5	579.3	576.0
52.5°	548.3	537.6	535.2	530.3	523.0	517.3	513.2	516.4
55°	481.4	471.6	469.1	465.0	460.1	453.6	449.5	447.1
57.5°	416.1	408.7	406.3	399.0	396.5	391.6	388.3	391.6
60°	355.7	348.4	346.7	340.2	337.8	333.7	331.2	334.5
62.5°	298.6	292.1	290.4	284.7	283.9	279.8	276.6	280.7
65°	245.6	239.9	239.0	233.3	233.3	229.3	226.8	230.1
67.5°	196.6	192.5	191.7	186.8	186.8	183.6	181.9	185.2
70°	153.4	148.5	149.3	145.2	146.9	145.2	143.6	146.0
72.5°	117.5	116.7	115.9	112.6	113.4	111.8	110.1	112.6
75°	86.5	85.7	84.8	82.4	82.4	80.8	80.0	82.4
77.5°	58.7	57.9	57.1	54.7	55.5	53.8	53.0	54.7
80°	35.9	35.1	35.1	32.6	33.5	32.6	31.0	32.6
82.5°	17.9	17.9	17.1	16.3	16.3	15.5	15.5	16.3
85°	9.8	9.8	9.8	10.6	10.6	10.6	10.6	10.6
87.5°	7.3	7.3	7.3	7.3	7.3	7.3	8.2	8.2
90°	3.3	4.1	4.1	4.1	4.9	5.7	6.5	6.5
92.5°	3.3	3.3	3.3	4.1	4.1	4.9	4.9	4.9
95°	1.6	2.4	2.4	2.4	2.4	2.4	2.4	3.3
97.5°	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
100°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105°	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107.5°	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0
110°	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P188236

CATALOG NUMBER: MPBL-4-LD4-UNV-2DN-STD-40

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0
115°	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0
117.5°	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.0
120°	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.0
122.5°	2.4	1.6	1.6	1.6	1.6	0.8	0.8	0.8
125°	2.4	1.6	1.6	1.6	1.6	0.8	0.8	0.8
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)