

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: P188237

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

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P188237
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-LO-40
Description:
Light Source: (168) NICHIA ELM 4000K LED
2UT217042A8404A
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4633.0 lumens
Efficiency: N/A
Efficacy: 93.8 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

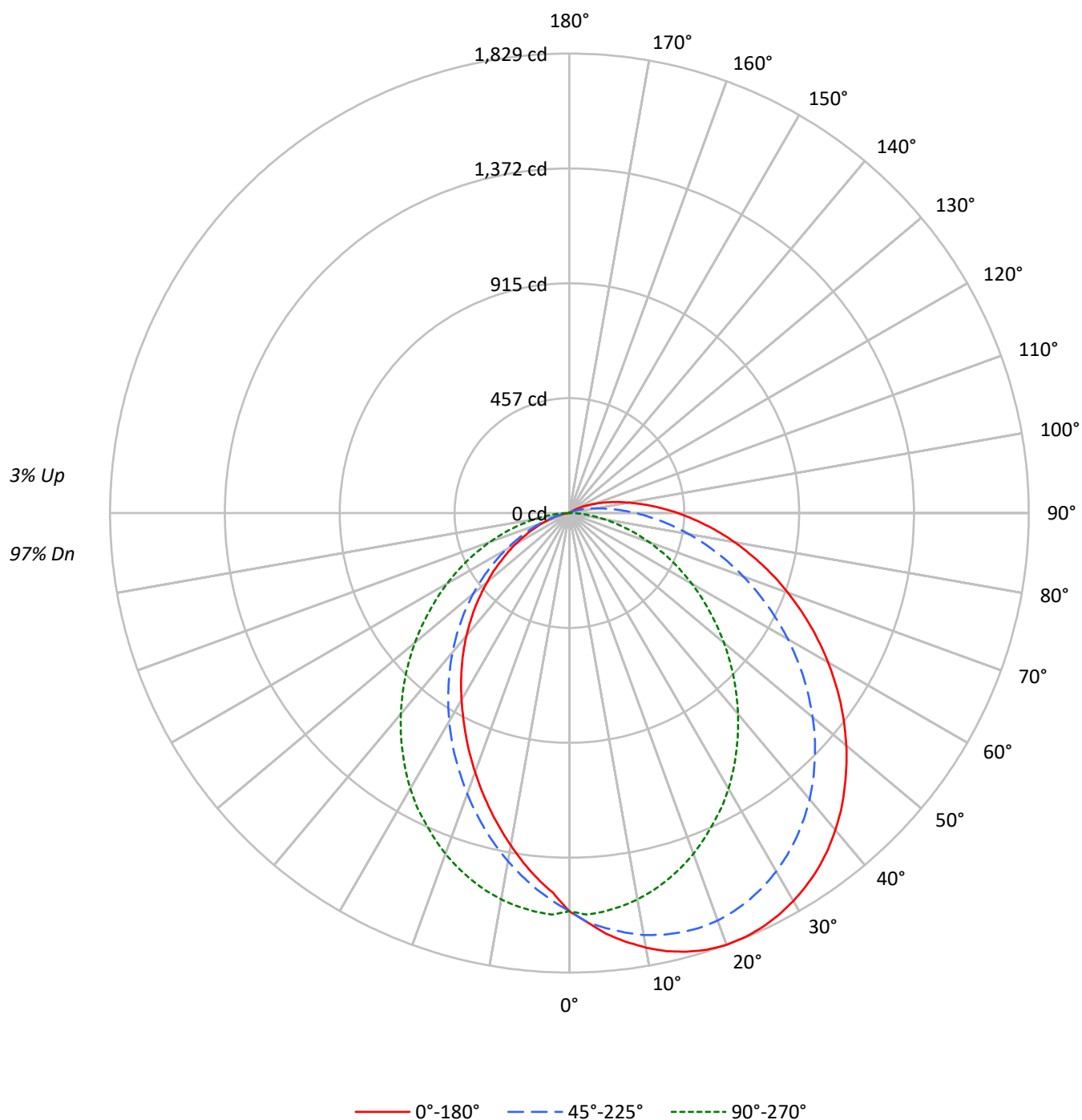
Input Watts (W): 49.4
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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°	10235	10235	10235
5°	10267	10255	8920
10°	10252	10112	7840
15°	10177	9909	6875
20°	10016	9663	6014
25°	9769	9364	5243
30°	9471	9067	4561
35°	9135	8693	3952
40°	8750	8296	3387
45°	8325	7871	2849
50°	7883	7419	2336
55°	7423	6941	1863
60°	6946	6447	1446
65°	6461	5938	1041
70°	5976	5311	698
75°	5485	4549	421
80°	4994	3639	181
85°	4489	2490	65



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	149.7	3.2
10°-20°	425.9	9.2
20°-30°	635.1	13.7
30°-40°	750.3	16.2
40°-50°	761.9	16.4
50°-60°	678.5	14.6
60°-70°	528.8	11.4
70°-80°	354.3	7.6
80°-90°	198.0	4.3
90°-100°	94.8	2.0
100°-110°	39.6	0.9
110°-120°	13.3	0.3
120°-130°	2.7	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°	1210.7	26.1
0°-40°	1961.0	42.3
0°-60°	3401.3	73.4
0°-90°	4482.5	96.8
90°-120°	147.7	3.2
90°-150°	150.5	3.2
90°-180°	150.0	3.2
0°-180°	4633.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1585	1585	1585	1585	1585	
5°	1681	1658	1592	1502	1460	163
15°	1808	1728	1511	1302	1221	512
25°	1818	1698	1359	1074	976	839
35°	1727	1576	1159	839	747	1080
45°	1550	1382	925	611	530	1196
55°	1318	1137	681	393	331	1179
65°	1057	870	449	202	170	1048
75°	794	606	232	69	61	840
85°	545	367	62	7	8	470
90°	432	263	2	2	5	237
95°	327	173	1	1	2	250
105°	167	61	2	1	0	180
115°	64	13	3	2	0	66
125°	12	2	4	2	1	11
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°	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7
2.5°	1629.9	1629.9	1631.2	1632.4	1630.5	1632.4	1633.0	1632.4	1634.2	1633.0	1629.3
5°	1680.7	1680.7	1680.1	1678.3	1675.8	1673.4	1673.4	1671.0	1669.8	1667.4	1658.3
7.5°	1721.1	1722.3	1721.1	1718.1	1712.7	1711.5	1710.3	1705.4	1701.8	1695.8	1683.7
10°	1756.2	1757.4	1753.7	1750.7	1745.9	1742.3	1740.5	1734.4	1728.4	1719.3	1705.4
12.5°	1786.4	1785.1	1781.5	1777.3	1771.9	1767.6	1764.6	1756.2	1748.3	1736.8	1719.3
15°	1807.5	1808.1	1806.3	1801.5	1794.2	1789.4	1784.5	1773.7	1762.2	1748.3	1727.8
17.5°	1822.6	1822.6	1819.6	1814.7	1806.9	1800.9	1795.4	1783.9	1770.1	1753.1	1730.2
20°	1828.6	1829.2	1825.6	1819.6	1809.9	1803.3	1797.2	1783.9	1768.8	1751.3	1726.0
22.5°	1827.4	1828.6	1824.4	1816.6	1805.7	1798.4	1791.8	1776.7	1760.4	1742.3	1714.5
25°	1818.4	1819.6	1815.3	1807.5	1796.0	1788.8	1781.5	1765.2	1746.5	1727.2	1697.6
27.5°	1803.9	1804.5	1800.2	1791.8	1780.9	1773.1	1765.8	1748.9	1728.4	1707.2	1675.2
30°	1783.3	1784.5	1780.3	1771.3	1759.2	1751.3	1743.5	1724.8	1703.0	1680.7	1646.9
32.5°	1757.4	1758.6	1753.1	1744.7	1732.0	1724.2	1715.1	1695.2	1671.0	1647.5	1614.2
35°	1726.6	1726.6	1722.3	1712.7	1698.8	1690.9	1681.3	1659.5	1635.4	1610.0	1576.2
37.5°	1689.7	1689.7	1684.9	1675.2	1660.7	1652.3	1642.6	1619.7	1592.5	1568.3	1533.9
40°	1647.5	1648.1	1642.6	1632.4	1617.9	1609.4	1599.1	1577.4	1547.2	1522.5	1487.4
42.5°	1601.0	1601.0	1595.5	1585.3	1570.2	1561.7	1550.8	1528.5	1497.7	1471.7	1436.7
45°	1549.6	1549.6	1544.8	1534.5	1518.2	1510.4	1498.9	1474.1	1444.5	1418.0	1381.7
47.5°	1495.9	1495.3	1488.0	1480.2	1462.7	1454.8	1443.3	1419.2	1388.4	1361.2	1325.0
50°	1439.1	1437.9	1431.3	1422.2	1404.7	1396.8	1385.4	1360.0	1329.2	1300.8	1264.6
52.5°	1379.3	1378.7	1369.7	1360.6	1344.3	1336.4	1324.4	1297.2	1265.2	1238.0	1201.2
55°	1318.3	1316.5	1308.1	1299.0	1281.5	1273.6	1261.6	1234.4	1201.8	1174.0	1137.2
57.5°	1254.3	1253.1	1243.4	1237.4	1216.9	1208.4	1200.0	1171.6	1139.0	1108.2	1071.3
60°	1189.7	1187.9	1178.2	1171.6	1151.7	1143.2	1131.1	1105.8	1072.5	1041.7	1004.9
62.5°	1123.9	1122.1	1112.4	1102.7	1084.6	1079.8	1067.7	1039.9	1002.5	974.7	937.3
65°	1057.4	1055.6	1046.0	1036.3	1017.6	1009.1	997.1	972.9	936.1	907.1	869.6
67.5°	991.0	989.2	978.9	968.7	950.5	942.1	930.0	905.3	867.8	840.0	802.6
70°	925.2	924.0	912.5	902.8	884.7	878.7	863.6	838.2	805.0	774.2	736.2
72.5°	860.0	859.4	846.7	837.0	823.1	812.9	799.0	773.0	739.2	706.0	670.9
75°	794.1	795.3	782.1	771.2	758.5	747.6	734.4	707.2	674.0	642.6	606.3
77.5°	730.1	730.7	721.1	707.2	693.9	683.0	669.7	643.2	610.6	577.9	543.5
80°	667.3	670.3	654.6	643.8	629.9	620.2	605.7	580.4	547.7	519.4	482.5
82.5°	605.1	605.1	595.5	582.2	568.3	558.0	544.1	518.2	489.8	455.9	423.3
85°	545.3	545.9	535.7	525.4	509.7	498.8	486.1	459.6	431.2	399.2	366.6
87.5°	486.7	487.4	477.7	466.8	451.7	440.9	428.2	405.2	375.0	343.6	312.2
90°	431.8	431.2	421.5	411.9	396.8	386.5	373.8	351.5	321.9	291.7	263.3
92.5°	378.0	378.0	368.4	358.7	344.2	333.4	322.5	300.1	271.8	243.4	215.6
95°	327.3	326.7	317.7	308.6	294.7	283.2	273.6	252.4	225.9	199.3	173.3
97.5°	280.2	279.6	271.2	262.1	248.8	239.1	229.5	210.2	185.4	161.2	137.7
100°	238.5	237.9	229.5	221.6	209.6	199.3	191.4	173.3	151.0	129.2	107.5
102.5°	201.1	199.9	192.6	183.0	173.9	164.9	158.2	141.3	121.4	102.7	82.1
105°	166.7	165.5	158.8	150.4	142.5	134.7	127.4	112.9	94.8	78.5	61.0
107.5°	135.9	134.7	128.6	122.6	114.1	107.5	100.9	87.6	72.5	58.0	44.1
110°	108.1	106.9	101.5	96.6	88.8	83.3	77.9	67.0	53.7	42.3	30.8



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	83.9	83.3	79.1	74.3	68.2	63.4	58.6	49.5	38.7	29.0	20.5
115°	64.0	62.8	59.8	56.2	50.1	47.1	42.9	35.0	26.6	18.7	12.7
117.5°	46.5	45.3	43.5	40.5	35.6	33.2	30.2	24.2	16.9	12.1	7.2
120°	32.0	32.0	29.6	27.2	23.6	21.7	19.3	14.5	9.7	6.0	3.0
122.5°	20.5	20.5	18.7	16.9	13.9	12.7	10.9	7.9	4.8	2.4	2.4
125°	12.1	11.5	10.3	9.1	7.2	6.6	5.4	3.6	1.8	2.4	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



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7
2.5°	1616.1	1611.2	1608.2	1604.6	1602.8	1602.2	1601.6	1602.2	1603.4	1599.8	1591.3
5°	1643.8	1634.8	1626.9	1619.1	1615.5	1613.0	1608.2	1603.4	1600.4	1591.9	1579.2
7.5°	1665.0	1652.9	1642.0	1629.3	1623.9	1618.5	1609.4	1600.4	1592.5	1579.2	1562.9
10°	1682.5	1665.6	1650.5	1634.8	1626.9	1619.1	1605.2	1591.9	1579.2	1561.7	1540.6
12.5°	1693.4	1672.8	1652.9	1633.0	1623.9	1613.6	1595.5	1577.4	1560.5	1538.8	1514.6
15°	1698.8	1674.0	1650.5	1626.9	1614.8	1602.8	1580.4	1558.1	1536.9	1511.0	1482.0
17.5°	1698.8	1669.8	1642.0	1614.8	1602.2	1587.7	1561.1	1535.7	1509.8	1479.0	1448.8
20°	1692.1	1659.5	1629.3	1598.5	1583.4	1567.1	1536.9	1506.7	1478.4	1443.3	1408.3
22.5°	1680.1	1644.4	1611.2	1577.4	1559.9	1541.8	1507.4	1472.9	1441.5	1402.9	1364.8
25°	1661.3	1622.1	1585.3	1549.0	1531.5	1511.0	1474.1	1437.9	1401.1	1358.8	1318.3
27.5°	1637.8	1597.3	1555.7	1517.6	1497.7	1475.3	1436.1	1396.8	1357.6	1316.5	1269.4
30°	1609.4	1564.7	1522.5	1481.4	1460.2	1436.7	1393.8	1352.1	1309.9	1267.0	1216.9
32.5°	1575.0	1530.9	1484.4	1440.9	1418.6	1393.8	1346.7	1305.0	1259.1	1213.9	1162.5
35°	1535.7	1489.2	1442.1	1396.8	1373.3	1347.3	1298.4	1251.9	1206.0	1158.9	1106.4
37.5°	1492.3	1445.8	1396.2	1349.1	1325.0	1297.2	1246.5	1201.2	1150.4	1102.1	1052.0
40°	1445.1	1401.1	1346.7	1298.4	1273.0	1245.3	1191.5	1145.0	1093.1	1044.2	993.4
42.5°	1393.2	1349.1	1293.6	1244.7	1219.3	1189.7	1135.3	1087.6	1034.5	984.4	933.6
45°	1337.7	1292.4	1238.6	1187.9	1161.9	1132.3	1077.4	1026.0	974.1	924.6	873.9
47.5°	1280.3	1232.6	1181.2	1128.7	1103.3	1073.1	1018.8	966.9	913.7	863.6	814.1
50°	1219.9	1171.6	1120.9	1068.3	1042.3	1012.8	957.8	905.9	852.1	802.6	753.7
52.5°	1157.1	1110.6	1056.8	1005.5	980.1	950.5	898.0	845.5	790.5	741.6	693.9
55°	1092.5	1046.6	993.4	942.1	917.3	887.7	836.4	781.5	728.9	680.6	634.7
57.5°	1027.2	980.7	930.6	877.5	852.7	827.4	773.0	721.1	667.9	621.4	576.1
60°	960.8	914.3	865.4	812.9	788.7	760.3	710.8	659.5	607.5	562.2	518.8
62.5°	897.4	852.7	800.2	751.9	724.7	699.9	649.2	599.1	547.7	504.3	462.0
65°	826.7	786.3	732.5	684.2	661.3	637.1	588.2	539.3	489.2	449.3	406.4
67.5°	760.3	720.5	670.3	623.8	598.5	574.9	526.6	480.1	434.2	391.3	353.3
70°	695.1	655.2	603.3	561.6	536.3	513.9	466.8	423.9	376.2	337.6	300.7
72.5°	631.1	591.2	539.9	501.2	474.7	454.7	410.1	364.8	322.5	284.4	247.0
75°	567.7	527.8	478.3	440.9	415.5	396.8	352.7	309.2	269.3	231.9	197.5
77.5°	504.9	466.2	420.9	382.3	361.1	339.4	300.7	256.1	219.2	183.0	151.0
80°	443.9	406.4	364.8	326.1	303.2	285.0	248.2	205.9	169.7	138.3	108.7
82.5°	385.9	350.3	306.8	271.2	251.8	231.9	196.3	160.0	126.2	97.8	71.3
85°	330.9	294.7	256.1	222.8	200.5	186.0	150.4	116.6	87.6	61.6	38.0
87.5°	279.6	245.2	205.9	175.1	155.8	140.7	109.9	78.5	53.1	29.0	10.3
90°	230.1	196.9	161.2	131.7	114.7	100.9	71.9	44.1	20.5	1.8	1.2
92.5°	183.6	154.0	120.8	93.6	79.1	66.4	41.7	19.9	3.6	1.2	1.2
95°	143.7	115.3	88.2	65.2	53.7	42.3	22.3	7.2	1.2	1.2	1.2
97.5°	111.7	86.4	62.8	43.5	33.8	24.8	10.3	2.4	1.8	1.8	1.8
100°	85.2	62.8	42.9	27.2	19.9	13.3	4.2	1.8	1.8	1.8	1.8
102.5°	63.4	43.5	27.8	16.3	10.9	6.6	1.8	1.8	1.8	1.8	1.8
105°	44.1	29.6	17.5	9.1	5.4	3.0	1.8	1.8	2.4	2.4	2.4
107.5°	31.4	19.3	10.3	4.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4
110°	20.5	11.5	5.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4



TEST NUMBER: P188237

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

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	12.7	6.0	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0
115°	7.2	3.0	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0
117.5°	3.6	2.4	2.4	3.0	3.0	3.0	3.0	3.6	3.6	3.6	3.6
120°	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.6	3.6	3.6	3.6
122.5°	2.4	2.4	3.0	3.0	3.0	3.0	3.6	3.6	3.6	3.6	3.6
125°	2.4	3.0	3.0	3.0	3.0	3.6	3.6	3.6	3.6	3.6	3.6
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: P188237

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7
2.5°	1580.4	1568.3	1561.1	1556.9	1555.1	1550.8	1547.2	1543.6	1544.8	1545.4	1541.2
5°	1564.1	1548.4	1536.3	1529.7	1526.1	1518.2	1511.0	1504.9	1502.5	1499.5	1492.3
7.5°	1542.4	1523.1	1506.7	1498.9	1493.5	1481.4	1471.1	1461.5	1456.0	1450.6	1440.9
10°	1517.0	1493.5	1473.5	1463.9	1456.0	1440.9	1427.6	1415.6	1407.1	1399.3	1387.8
12.5°	1486.2	1458.4	1435.5	1423.4	1415.0	1398.6	1380.5	1366.0	1355.8	1345.5	1331.6
15°	1451.2	1419.8	1394.4	1380.5	1368.5	1351.5	1331.0	1314.7	1302.0	1290.5	1274.8
17.5°	1411.9	1378.1	1350.3	1334.0	1322.0	1302.0	1279.1	1258.5	1245.9	1230.8	1216.9
20°	1369.7	1332.8	1303.2	1289.9	1271.8	1249.5	1225.3	1203.6	1189.1	1172.8	1157.1
22.5°	1323.8	1284.5	1253.1	1238.6	1219.3	1195.7	1169.8	1147.4	1130.5	1113.0	1096.7
25°	1275.5	1233.8	1200.0	1184.9	1164.9	1140.2	1112.4	1088.8	1074.4	1052.6	1036.3
27.5°	1224.1	1181.2	1145.6	1129.3	1108.8	1080.4	1055.0	1030.9	1015.8	996.4	977.7
30°	1168.0	1126.3	1090.1	1073.1	1052.0	1023.0	997.7	972.9	957.2	934.8	919.8
32.5°	1112.4	1070.7	1032.7	1015.8	995.2	965.6	939.7	914.3	898.0	878.1	861.8
35°	1056.8	1010.9	975.3	957.8	936.7	908.3	879.3	856.3	838.8	819.5	804.4
37.5°	998.9	956.6	917.3	900.4	879.3	850.3	821.9	798.4	781.5	762.1	747.0
40°	939.7	898.0	859.4	842.5	821.3	792.3	764.5	741.6	723.5	705.4	690.9
42.5°	881.1	840.0	802.0	785.1	763.9	735.0	707.2	687.2	667.3	652.2	634.7
45°	822.5	779.6	744.0	727.7	706.0	678.8	651.0	630.5	610.6	596.1	576.7
47.5°	764.5	722.3	687.2	670.3	649.2	622.6	595.5	574.3	555.0	541.1	522.4
50°	706.0	664.9	629.9	613.6	591.8	567.1	540.5	518.8	500.0	486.1	468.0
52.5°	648.6	606.3	573.1	556.2	535.7	512.1	483.7	464.4	446.3	431.8	415.5
55°	591.8	549.6	516.3	500.6	480.1	457.8	430.0	410.7	393.1	379.3	364.8
57.5°	533.9	492.2	460.2	444.5	424.5	402.8	375.6	358.1	341.2	328.5	315.8
60°	476.5	436.6	405.2	390.7	371.4	350.3	324.3	307.4	291.7	280.8	269.3
62.5°	423.3	387.1	352.1	337.6	318.9	299.5	274.8	259.1	245.2	235.5	226.5
65°	367.2	332.8	301.3	286.9	269.3	247.6	228.3	214.4	202.3	194.5	186.6
67.5°	314.0	280.2	250.6	237.3	220.4	203.5	186.6	172.7	162.5	156.4	149.8
70°	262.1	231.3	202.9	190.2	175.7	161.2	146.7	135.3	126.8	120.8	116.6
72.5°	213.8	183.6	158.2	146.7	135.3	123.2	111.1	102.7	95.4	91.2	88.2
75°	166.1	139.5	116.6	108.7	99.6	89.4	80.3	74.9	69.4	67.6	65.2
77.5°	122.6	99.0	82.7	74.9	68.8	61.0	55.0	51.9	48.3	46.5	44.7
80°	83.9	65.2	52.5	47.1	43.5	39.3	35.6	32.6	30.2	28.4	27.2
82.5°	50.1	36.8	29.6	26.6	24.8	21.7	19.3	17.5	15.7	15.1	14.5
85°	22.9	16.3	12.1	10.9	10.3	9.1	7.9	7.2	6.6	6.6	7.2
87.5°	5.4	3.0	3.0	3.0	3.0	3.6	3.6	4.2	4.8	4.8	5.4
90°	1.8	1.8	2.4	2.4	2.4	2.4	2.4	3.0	2.4	2.4	2.4
92.5°	1.2	1.2	1.2	1.2	1.2	1.8	1.8	1.8	1.8	1.8	1.8
95°	1.2	1.2	1.2	1.2	1.2	0.6	1.2	1.2	1.2	1.2	1.2
97.5°	1.8	1.2	1.2	1.2	1.2	1.2	0.6	0.6	0.6	0.6	0.6
100°	1.8	1.8	1.8	1.2	1.2	1.2	1.2	0.6	0.6	0.6	0.6
102.5°	1.8	1.8	1.8	1.8	1.8	1.2	1.2	1.2	0.6	0.6	0.6
105°	2.4	2.4	1.8	1.8	1.8	1.8	1.2	1.2	0.6	0.6	0.6
107.5°	2.4	2.4	2.4	2.4	1.8	1.8	1.8	1.2	1.2	0.6	0.6
110°	2.4	2.4	2.4	2.4	2.4	1.8	1.8	1.2	1.2	1.2	0.6



TEST NUMBER: P188237

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	3.0	2.4	2.4	2.4	2.4	2.4	1.8	1.8	1.2	1.2	0.6
115°	3.0	3.0	3.0	3.0	2.4	2.4	2.4	1.8	1.8	1.2	1.2
117.5°	3.6	3.6	3.0	3.0	3.0	3.0	2.4	2.4	2.4	1.8	1.8
120°	3.6	3.6	3.6	3.0	3.0	3.0	3.0	2.4	2.4	1.8	1.8
122.5°	3.6	3.6	3.6	3.6	3.0	3.0	3.0	2.4	2.4	2.4	1.8
125°	3.6	3.6	3.6	3.6	3.6	3.0	3.0	3.0	2.4	2.4	1.8
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: P188237

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7	1584.7
2.5°	1533.9	1531.5	1527.9	1526.7	1522.5	1518.8	1513.4	1512.2
5°	1482.6	1478.4	1474.1	1471.7	1467.5	1465.7	1460.9	1460.2
7.5°	1429.4	1424.0	1419.2	1416.8	1412.5	1409.5	1404.1	1403.5
10°	1375.1	1365.4	1362.4	1359.4	1352.8	1348.5	1343.7	1343.1
12.5°	1320.1	1306.3	1302.6	1299.0	1292.4	1291.2	1283.3	1282.7
15°	1259.8	1248.9	1244.7	1241.6	1233.8	1231.4	1222.9	1221.1
17.5°	1203.6	1189.7	1184.9	1181.8	1172.8	1170.4	1161.9	1159.5
20°	1143.2	1129.3	1123.3	1120.2	1110.6	1108.2	1101.5	1097.9
22.5°	1081.6	1067.7	1060.5	1058.6	1049.0	1046.6	1040.5	1036.9
25°	1018.2	1007.3	1000.1	998.3	988.6	986.2	979.5	975.9
27.5°	962.6	948.1	943.9	939.1	929.4	927.0	919.8	916.1
30°	904.7	890.2	885.3	881.1	872.0	866.6	862.4	858.8
32.5°	846.7	834.6	831.0	826.7	818.9	810.4	806.2	802.6
35°	789.9	774.8	773.6	767.6	762.7	755.5	747.6	747.0
37.5°	733.1	721.7	718.0	714.4	707.8	700.5	692.7	692.7
40°	677.0	666.1	662.5	656.4	652.2	645.0	638.3	637.7
42.5°	620.8	610.6	608.1	603.9	597.3	590.6	586.4	583.4
45°	566.5	556.2	553.2	549.6	543.5	536.9	529.6	530.2
47.5°	509.7	501.8	499.4	495.8	488.0	484.9	479.5	477.7
50°	456.6	449.3	446.9	443.3	436.6	431.2	428.8	426.4
52.5°	405.8	398.0	396.2	392.5	387.1	382.9	379.9	382.3
55°	356.3	349.1	347.2	344.2	340.6	335.8	332.8	330.9
57.5°	308.0	302.6	300.7	295.3	293.5	289.9	287.5	289.9
60°	263.3	257.9	256.7	251.8	250.0	247.0	245.2	247.6
62.5°	221.0	216.2	215.0	210.8	210.2	207.1	204.7	207.7
65°	181.8	177.5	176.9	172.7	172.7	169.7	167.9	170.3
67.5°	145.5	142.5	141.9	138.3	138.3	135.9	134.7	137.1
70°	113.5	109.9	110.5	107.5	108.7	107.5	106.3	108.1
72.5°	87.0	86.4	85.8	83.3	83.9	82.7	81.5	83.3
75°	64.0	63.4	62.8	61.0	61.0	59.8	59.2	61.0
77.5°	43.5	42.9	42.3	40.5	41.1	39.9	39.3	40.5
80°	26.6	26.0	26.0	24.2	24.8	24.2	22.9	24.2
82.5°	13.3	13.3	12.7	12.1	12.1	11.5	11.5	12.1
85°	7.2	7.2	7.2	7.9	7.9	7.9	7.9	7.9
87.5°	5.4	5.4	5.4	5.4	5.4	5.4	6.0	6.0
90°	2.4	3.0	3.0	3.0	3.6	4.2	4.8	4.8
92.5°	2.4	2.4	2.4	3.0	3.0	3.6	3.6	3.6
95°	1.2	1.8	1.8	1.8	1.8	1.8	1.8	2.4
97.5°	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
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°	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107.5°	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
110°	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P188237

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0
115°	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0
117.5°	1.2	1.2	1.2	1.2	0.6	0.6	0.6	0.0
120°	1.2	1.2	1.2	1.2	0.6	0.6	0.6	0.0
122.5°	1.8	1.2	1.2	1.2	1.2	0.6	0.6	0.6
125°	1.8	1.2	1.2	1.2	1.2	0.6	0.6	0.6
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)