

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: P#

Luminaire Tested: **FLDSQ4C45D010 FEU4C459027 F4LC-SQLWW-H**

Issue Date: 12/13/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P#  
 Test Lab: INNOVATION CENTER  
 Issue Date: 12/13/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: FAIL-SAFE  
 Catalog Number: FLDSQ4C45D010 FEU4C459027 F4LC-SQLWW-H  
 Description: 4 INCH 4500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 2700K, 90CRI LEDS AND F4LC-SQLWW TRIM WITH H FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

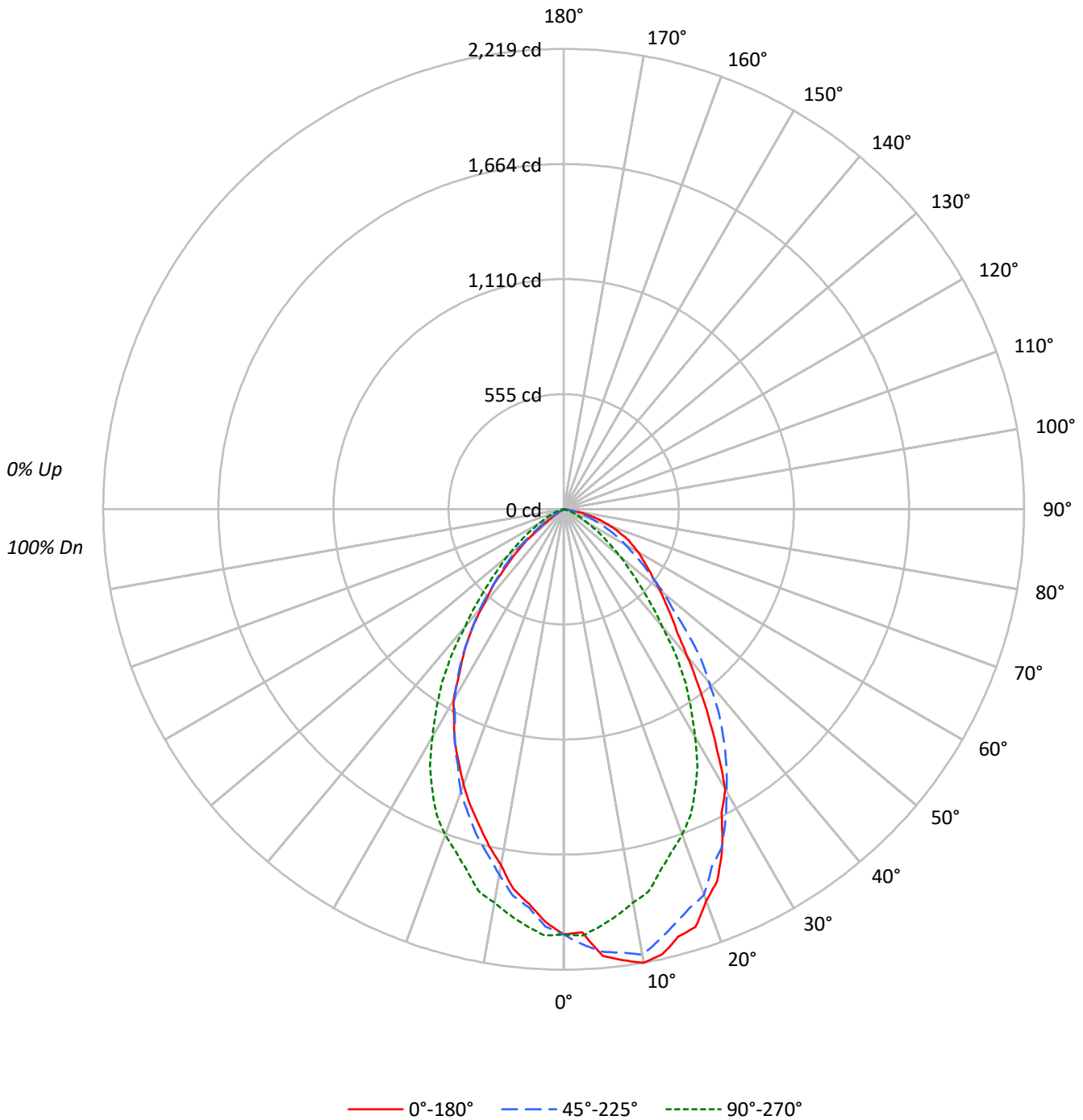
Lumens per Lamp: N/A  
 Luminaire Lumens: 2938.0 lumens  
 Efficiency: N/A  
 Efficacy: 59.2 lumens/watt  
 Spacing Criteria (0/90/45): 1.01 / 1 / 1.06  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

Input Watts (W): 49.6  
 Input Voltage (V):  
 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

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	GONIO 1 IN0055	4/22/2021	10/22/2021
Power Meter	XITRON 2801 IN0197	12/1/2020	12/1/2021
AC Power Source	CHROMA 61505 IN0196	12/1/2020	12/1/2021
DC Power Supply	AGILENT E3634A IN0198	11/30/2020	11/30/2021
Room Thermometer	ONSET IN0143	12/1/2020	12/1/2021

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### Luminous Intensity Polar Plot



TEST NUMBER: P#

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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	119	119	119	119	116	116	116	116	111	111	111		106	106	106		102	102	102	100
1	112	108	105	102	109	106	103	101	102	100	98		98	96	95		95	93	92	90
2	104	98	93	89	102	96	92	88	93	89	86		90	87	84		87	84	82	80
3	97	89	83	78	95	88	82	77	85	80	76		82	78	75		80	77	74	72
4	91	81	74	69	89	80	74	69	78	72	68		76	71	67		74	70	66	64
5	85	75	67	62	83	74	67	62	72	66	61		70	65	60		68	64	60	58
6	80	69	61	56	78	68	61	56	66	60	55		65	59	55		63	58	54	53
7	75	63	56	51	73	63	56	51	61	55	50		60	54	50		59	54	50	48
8	70	59	52	47	69	58	51	46	57	51	46		56	50	46		55	50	46	44
9	66	55	48	43	65	54	47	43	53	47	43		52	46	42		51	46	42	41
10	62	51	44	40	61	51	44	40	50	44	39		49	43	39		48	43	39	38

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

	0°	90°	180°
0°	197764	197764	197764
5°	209231	195429	184959
10°	217441	188538	170481
15°	213091	179947	157361
20°	206174	171344	144853
25°	192316	159344	132132
30°	173608	141019	118290
35°	143010	120724	98144
40°	116699	93183	75537
45°	100268	70766	54323
50°	90757	53875	34315
55°	83506	38860	12415
60°	80163	26554	1891
65°	77421	17968	571
70°	69316	12469	705
75°	56815	6412	0
80°	35507	2723	0
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	192.0	6.5
10°-20°	517.4	17.6
20°-30°	690.9	23.5
30°-40°	655.8	22.3
40°-50°	453.3	15.4
50°-60°	250.5	8.5
60°-70°	124.4	4.2
70°-80°	49.0	1.7
80°-90°	4.7	0.2
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
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°	1400.3	47.7
0°-40°	2056.1	70.0
0°-60°	2759.9	93.9
0°-90°	2938.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2938.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	2050	2050	2050	2050	2050	
5°	2160	2141	2018	1927	1910	207
15°	2133	2069	1801	1624	1575	603
25°	1806	1799	1497	1241	1241	824
35°	1214	1342	1025	843	833	761
45°	735	843	519	425	398	573
55°	496	467	231	118	74	447
65°	339	246	79	2	2	329
75°	152	93	17	0	0	162
85°	0	2	0	0	0	14
90°	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°	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6
2.5°	2039.8	2096.3	2101.2	2096.3	2103.7	2101.2	2113.5	2101.2	2116.1	2093.9	2098.8
5°	2160.2	2138.1	2184.8	2160.2	2160.2	2157.8	2150.4	2147.9	2157.8	2125.9	2140.6
7.5°	2192.2	2224.2	2266.0	2214.4	2216.8	2216.8	2202.0	2197.1	2197.1	2138.1	2155.3
10°	2219.3	2199.5	2221.7	2202.0	2219.3	2216.8	2226.6	2194.6	2216.8	2182.4	2179.9
12.5°	2197.1	2189.7	2219.3	2187.3	2177.5	2179.9	2167.7	2160.2	2167.7	2128.3	2125.9
15°	2133.2	2140.6	2184.8	2150.4	2145.5	2140.6	2125.9	2101.2	2121.0	2066.9	2069.4
17.5°	2111.1	2098.8	2106.2	2076.7	2084.1	2079.2	2076.7	2054.6	2049.6	2015.2	2015.2
20°	2007.9	2034.9	2034.9	2015.2	2015.2	2012.8	1980.9	2000.5	1978.4	1968.5	1978.4
22.5°	1936.6	1939.1	1939.1	1921.8	1924.3	1914.5	1897.3	1885.0	1897.3	1885.0	1865.3
25°	1806.4	1811.3	1840.8	1808.8	1803.9	1813.7	1799.0	1791.6	1789.2	1759.7	1799.0
27.5°	1649.1	1698.2	1695.8	1683.4	1698.2	1678.5	1671.2	1673.6	1681.0	1678.5	1688.4
30°	1558.2	1565.5	1572.9	1563.1	1565.5	1558.2	1558.2	1560.6	1580.2	1572.9	1570.4
32.5°	1373.8	1398.3	1418.1	1418.1	1420.5	1427.9	1425.4	1477.0	1489.3	1464.8	1459.9
35°	1214.1	1231.3	1248.4	1250.9	1282.9	1285.3	1287.8	1302.5	1336.9	1344.3	1341.8
37.5°	1061.7	1078.9	1083.8	1105.9	1123.2	1140.3	1160.0	1179.7	1209.1	1233.7	1221.5
40°	926.5	933.9	946.2	956.0	990.4	990.4	1000.2	1039.6	1071.6	1091.2	1088.7
42.5°	813.5	815.9	825.7	843.0	874.9	867.5	874.9	902.0	948.6	951.1	978.2
45°	734.8	732.3	739.8	742.2	761.9	771.7	776.6	796.3	835.6	840.5	843.0
47.5°	663.6	661.1	673.4	678.3	685.6	695.5	695.5	698.0	712.7	725.0	715.2
50°	604.6	604.6	604.6	609.5	621.8	619.3	621.8	631.6	638.9	634.0	631.6
52.5°	540.6	550.5	557.9	560.4	562.8	562.8	565.3	560.4	557.9	550.5	535.7
55°	496.4	506.3	506.3	506.3	506.3	516.1	503.9	506.3	506.3	486.6	467.0
57.5°	452.3	462.1	469.4	459.6	469.4	459.6	454.7	452.3	447.2	427.6	398.1
60°	415.4	420.3	417.8	415.4	420.3	412.9	408.0	398.1	393.2	366.2	346.5
62.5°	373.6	376.0	378.5	373.6	368.7	366.2	356.4	341.6	331.8	309.7	292.4
65°	339.1	331.8	329.3	326.9	322.0	314.6	307.2	290.0	282.6	263.0	245.7
67.5°	287.5	285.1	290.0	282.6	270.4	270.4	263.0	248.2	231.0	218.8	201.5
70°	245.7	243.3	238.4	231.0	228.6	218.8	218.8	201.5	196.6	174.5	159.7
72.5°	201.5	201.5	194.1	186.8	179.4	174.5	172.1	159.7	152.4	140.1	127.8
75°	152.4	152.4	149.9	142.5	137.6	132.7	130.3	120.5	113.0	100.8	93.4
77.5°	108.1	108.1	98.3	93.4	95.8	90.9	86.0	83.6	81.1	73.8	63.9
80°	63.9	61.4	54.1	56.5	54.1	54.1	51.6	49.1	44.2	39.3	34.4
82.5°	17.2	19.6	19.6	19.6	22.1	17.2	17.2	17.2	19.6	19.6	12.3
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	2.5
87.5°	2.5	4.9	9.8	9.8	9.8	9.8	9.8	7.4	7.4	7.4	4.9
90°	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°	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6
2.5°	2074.3	2071.8	2074.3	2057.0	2096.3	2066.9	2061.9	2057.0	2074.3	2057.0	2032.5
5°	2118.5	2093.9	2086.5	2079.2	2101.2	2066.9	2059.5	2061.9	2049.6	2017.7	2020.2
7.5°	2133.2	2111.1	2089.0	2042.3	2061.9	2054.6	2034.9	2020.2	2000.5	1973.5	1968.5
10°	2138.1	2113.5	2081.6	2066.9	2037.4	2027.6	2020.2	1995.6	1971.0	1924.3	1912.0
12.5°	2123.4	2093.9	2054.6	2042.3	2020.2	1988.2	1971.0	1946.4	1924.3	1887.5	1860.4
15°	2059.5	2034.9	2022.7	1980.9	1971.0	1951.3	1916.9	1882.6	1850.6	1801.4	1786.7
17.5°	1985.8	1976.0	1963.6	1931.7	1929.3	1909.6	1877.7	1848.1	1806.4	1730.1	1705.6
20°	1909.6	1909.6	1870.2	1858.0	1882.6	1843.2	1818.6	1791.6	1705.6	1668.7	1624.5
22.5°	1853.1	1826.0	1803.9	1784.3	1786.7	1762.1	1727.7	1673.6	1641.7	1597.5	1545.9
25°	1742.5	1752.3	1703.2	1695.8	1703.2	1646.6	1629.4	1585.1	1538.4	1496.7	1457.4
27.5°	1673.6	1646.6	1614.7	1587.6	1587.6	1565.5	1516.4	1506.6	1435.2	1395.9	1346.7
30°	1570.4	1550.8	1523.7	1484.4	1479.5	1462.3	1423.0	1398.3	1324.7	1265.7	1238.6
32.5°	1440.1	1432.8	1410.7	1366.5	1351.7	1332.0	1282.9	1241.1	1206.7	1140.3	1108.4
35°	1346.7	1319.8	1273.1	1236.2	1223.9	1189.5	1150.1	1120.7	1083.8	1024.9	983.1
37.5°	1206.7	1179.7	1135.4	1091.2	1091.2	1056.8	1002.7	973.2	921.6	887.2	852.8
40°	1083.8	1049.4	1005.2	953.6	946.2	897.0	874.9	825.7	793.8	739.8	734.8
42.5°	946.2	914.2	874.9	835.6	806.1	781.5	725.0	688.1	653.8	626.7	619.3
45°	820.8	779.0	744.7	695.5	666.0	636.5	599.7	575.1	548.1	518.6	501.4
47.5°	712.7	678.3	629.1	584.9	555.5	540.6	498.9	471.9	449.7	430.1	417.8
50°	602.2	560.4	533.3	484.1	479.2	444.8	410.5	388.3	376.0	358.9	341.6
52.5°	518.6	479.2	442.3	405.6	385.8	373.6	341.6	319.5	302.3	290.0	280.2
55°	437.4	403.0	373.6	336.7	324.4	307.2	270.4	265.5	248.2	231.0	218.8
57.5°	376.0	344.0	309.7	285.1	263.0	250.7	221.2	201.5	191.7	177.0	164.6
60°	319.5	285.1	258.0	228.6	218.8	201.5	179.4	162.2	149.9	137.6	125.4
62.5°	267.9	238.4	208.9	184.3	169.6	159.7	142.5	127.8	115.5	105.7	95.8
65°	221.2	194.1	169.6	145.0	137.6	125.4	113.0	100.8	90.9	78.7	68.8
67.5°	181.9	157.3	132.7	115.5	108.1	103.2	88.5	76.2	68.8	61.4	51.6
70°	142.5	125.4	105.7	90.9	83.6	76.2	66.3	59.0	49.1	44.2	36.9
72.5°	110.6	95.8	78.7	66.3	61.4	56.5	46.7	39.3	34.4	29.5	24.6
75°	78.7	66.3	56.5	44.2	41.8	39.3	32.0	27.1	22.1	17.2	14.7
77.5°	54.1	44.2	34.4	29.5	27.1	22.1	19.6	14.7	12.3	9.8	7.4
80°	29.5	22.1	17.2	14.7	12.3	9.8	9.8	7.4	4.9	4.9	2.5
82.5°	9.8	7.4	4.9	2.5	2.5	2.5	2.5	2.5	2.5	0.0	2.5
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.0	0.0	0.0
90°	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):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6
2.5°	2047.2	2020.2	2027.6	2027.6	2022.7	2022.7	2017.7	2010.3	2012.8	1998.0	1966.1
5°	2025.1	1990.7	1985.8	1990.7	1971.0	1966.1	1956.3	1971.0	1926.8	1944.0	1924.3
7.5°	1961.2	1929.3	1921.8	1939.1	1914.5	1899.7	1897.3	1916.9	1877.7	1858.0	1835.9
10°	1889.9	1877.7	1855.5	1843.2	1835.9	1838.3	1818.6	1794.1	1786.7	1781.8	1762.1
12.5°	1826.0	1799.0	1779.3	1764.6	1759.7	1759.7	1727.7	1722.8	1700.7	1695.8	1666.3
15°	1749.8	1717.9	1705.6	1685.9	1668.7	1678.5	1641.7	1631.8	1624.5	1592.6	1597.5
17.5°	1683.4	1649.1	1619.6	1607.3	1592.6	1577.8	1543.4	1550.8	1533.5	1533.5	1489.3
20°	1597.5	1560.6	1538.4	1513.9	1513.9	1494.2	1469.7	1472.1	1450.0	1427.9	1388.5
22.5°	1506.6	1467.2	1440.1	1430.3	1405.8	1400.8	1371.4	1364.0	1334.5	1336.9	1302.5
25°	1410.7	1371.4	1334.5	1336.9	1314.9	1305.0	1287.8	1253.4	1241.1	1226.4	1216.6
27.5°	1297.6	1270.6	1238.6	1236.2	1194.4	1196.8	1174.8	1165.0	1135.4	1142.8	1120.7
30°	1194.4	1155.1	1125.6	1118.3	1101.0	1096.1	1061.7	1046.9	1051.9	1032.2	1019.9
32.5°	1088.7	1029.8	1017.4	1002.7	992.9	980.6	956.0	965.8	943.7	948.6	929.0
35°	948.6	924.0	892.1	892.1	882.3	872.4	855.3	865.1	843.0	833.2	813.5
37.5°	830.6	808.6	776.6	786.5	769.2	754.5	739.8	742.2	722.5	720.1	700.4
40°	702.9	690.6	668.5	668.5	656.2	656.2	648.8	641.4	629.1	614.4	592.2
42.5°	582.4	572.6	562.8	565.3	548.1	562.8	543.1	555.5	516.1	513.7	498.9
45°	493.9	471.9	474.3	464.5	454.7	459.6	442.3	447.2	425.2	420.3	405.6
47.5°	400.6	393.2	378.5	373.6	373.6	366.2	358.9	356.4	346.5	334.2	314.6
50°	329.3	302.3	297.3	290.0	285.1	285.1	275.3	260.5	263.0	250.7	231.0
52.5°	258.0	235.9	226.1	223.7	213.8	208.9	196.6	186.8	179.4	174.5	162.2
55°	199.0	179.4	167.2	167.2	152.4	152.4	135.2	127.8	117.9	108.1	100.8
57.5°	149.9	140.1	127.8	117.9	113.0	100.8	90.9	78.7	71.3	56.5	46.7
60°	113.0	103.2	90.9	83.6	78.7	66.3	54.1	44.2	27.1	22.1	19.6
62.5°	83.6	73.8	61.4	56.5	51.6	41.8	29.5	14.7	7.4	7.4	7.4
65°	61.4	49.1	39.3	34.4	29.5	22.1	9.8	4.9	2.5	2.5	2.5
67.5°	41.8	32.0	22.1	19.6	14.7	7.4	2.5	2.5	2.5	2.5	2.5
70°	27.1	19.6	9.8	7.4	4.9	2.5	2.5	2.5	2.5	2.5	2.5
72.5°	17.2	9.8	4.9	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75°	9.8	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	4.9	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80°	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	2.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P#  
 CATALOG NUMBER: FLDSQ4C45D010 FEU4C459027 F4LC-SQLWW-H

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6	2049.6
2.5°	2000.5	1983.3	1993.1	1971.0	1980.9	1998.0	1985.8	1990.7
5°	1931.7	1921.8	1909.6	1877.7	1902.2	1921.8	1912.0	1909.6
7.5°	1858.0	1823.5	1840.8	1831.0	1826.0	1845.7	1823.5	1848.1
10°	1781.8	1757.2	1754.8	1737.6	1737.6	1752.3	1754.8	1740.0
12.5°	1668.7	1656.5	1656.5	1654.0	1651.5	1666.3	1668.7	1661.4
15°	1587.6	1582.7	1570.4	1568.0	1553.3	1575.3	1577.8	1575.3
17.5°	1489.3	1491.7	1479.5	1479.5	1489.3	1496.7	1477.0	1496.7
20°	1423.0	1410.7	1405.8	1383.6	1395.9	1408.3	1408.3	1410.7
22.5°	1327.1	1307.5	1314.9	1302.5	1295.1	1312.4	1312.4	1319.8
25°	1219.0	1219.0	1223.9	1216.6	1221.5	1231.3	1223.9	1241.1
27.5°	1115.7	1125.6	1125.6	1115.7	1120.7	1150.1	1162.4	1142.8
30°	1019.9	1022.4	1029.8	1024.9	1039.6	1049.4	1046.9	1061.7
32.5°	911.8	924.0	929.0	921.6	926.5	948.6	936.4	933.9
35°	828.2	806.1	803.7	806.1	815.9	820.8	815.9	833.2
37.5°	707.8	700.4	690.6	693.1	700.4	710.3	715.2	727.4
40°	592.2	582.4	582.4	580.0	572.6	599.7	599.7	599.7
42.5°	491.5	489.0	476.8	476.8	486.6	493.9	489.0	506.3
45°	403.0	393.2	385.8	385.8	393.2	393.2	400.6	398.1
47.5°	317.1	307.2	309.7	302.3	309.7	319.5	307.2	309.7
50°	238.4	238.4	233.5	238.4	235.9	238.4	233.5	228.6
52.5°	162.2	184.3	186.8	177.0	154.8	135.2	122.9	132.7
55°	93.4	83.6	83.6	81.1	76.2	73.8	66.3	73.8
57.5°	46.7	41.8	41.8	41.8	39.3	36.9	32.0	32.0
60°	19.6	17.2	17.2	14.7	12.3	9.8	7.4	9.8
62.5°	7.4	4.9	4.9	4.9	4.9	4.9	4.9	4.9
65°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
67.5°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
70°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
72.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)