

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 FEU4C459030 F4LC-SQLWW-LI**

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 FEU4C459030 F4LC-SQLWW-LI  
 Description: 4 INCH 4500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 3000K, 90CRI LEDS AND F4LC-SQLWW TRIM WITH LI FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

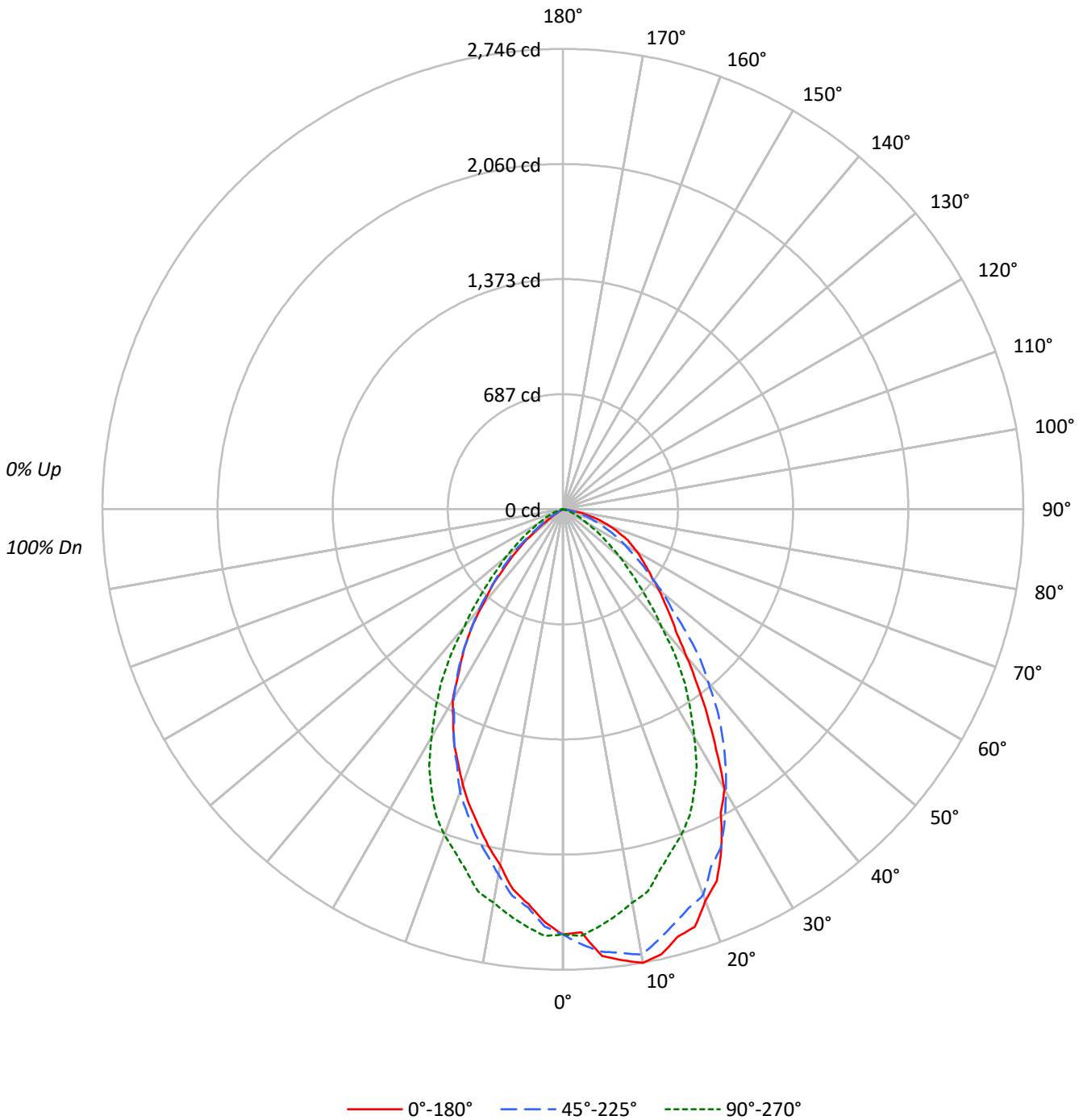
Lumens per Lamp: N/A  
 Luminaire Lumens: 3636.0 lumens  
 Efficiency: N/A  
 Efficacy: 73.3 lumens/watt  
 Spacing Criteria (0/90/45): 1.01 / 1 / 1.06  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

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#

CATALOG NUMBER: FLDSQ4C45D010 FEU4C459030 F4LC-SQLWW-LI

**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	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°	244754	244754	244754
5°	258948	241863	228903
10°	269095	233333	210975
15°	263717	222701	194751
20°	255163	212057	179261
25°	238010	197192	163528
30°	214854	174522	146400
35°	176981	149395	121454
40°	144435	115314	93473
45°	124093	87577	67232
50°	112312	66664	42466
55°	103356	48095	15359
60°	99210	32864	2354
65°	95823	22238	708
70°	85791	15432	875
75°	70311	7941	0
80°	43952	3390	0
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	237.7	6.5
10°-20°	640.3	17.6
20°-30°	855.0	23.5
30°-40°	811.6	22.3
40°-50°	561.0	15.4
50°-60°	310.0	8.5
60°-70°	153.9	4.2
70°-80°	60.6	1.7
80°-90°	5.8	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°	1733.0	47.7
0°-40°	2544.6	70.0
0°-60°	3415.6	93.9
0°-90°	3636.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3636.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	2537	2537	2537	2537	2537	
5°	2674	2649	2497	2384	2363	256
15°	2640	2561	2229	2010	1950	747
25°	2236	2226	1852	1536	1536	1019
35°	1502	1661	1268	1043	1031	941
45°	909	1043	642	526	493	709
55°	614	578	286	146	91	553
65°	420	304	97	3	3	407
75°	189	116	21	0	0	201
85°	0	3	0	0	0	17
90°	0	0	0	0	0	

TEST NUMBER: P#  
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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6
2.5°	2524.4	2594.3	2600.4	2594.3	2603.5	2600.4	2615.7	2600.4	2618.8	2591.4	2597.4
5°	2673.5	2646.1	2703.9	2673.5	2673.5	2670.5	2661.3	2658.2	2670.5	2630.9	2649.2
7.5°	2713.0	2752.6	2804.3	2740.4	2743.4	2743.4	2725.2	2719.1	2719.1	2646.1	2667.4
10°	2746.5	2722.1	2749.5	2725.2	2746.5	2743.4	2755.6	2716.0	2743.4	2700.9	2697.8
12.5°	2719.1	2709.9	2746.5	2707.0	2694.8	2697.8	2682.6	2673.5	2682.6	2633.9	2630.9
15°	2640.0	2649.2	2703.9	2661.3	2655.2	2649.2	2630.9	2600.4	2624.9	2557.9	2561.0
17.5°	2612.7	2597.4	2606.6	2570.0	2579.2	2573.1	2570.0	2542.8	2536.6	2494.0	2494.0
20°	2485.0	2518.3	2518.3	2494.0	2494.0	2491.0	2451.5	2475.8	2448.4	2436.2	2448.4
22.5°	2396.7	2399.8	2399.8	2378.4	2381.5	2369.4	2348.0	2332.8	2348.0	2332.8	2308.5
25°	2235.6	2241.6	2278.1	2238.5	2232.5	2244.6	2226.4	2217.2	2214.2	2177.8	2226.4
27.5°	2040.9	2101.6	2098.6	2083.4	2101.6	2077.3	2068.3	2071.2	2080.4	2077.3	2089.5
30°	1928.4	1937.4	1946.6	1934.4	1937.4	1928.4	1928.4	1931.3	1955.7	1946.6	1943.5
32.5°	1700.2	1730.6	1755.0	1755.0	1758.0	1767.1	1764.0	1827.9	1843.2	1812.8	1806.7
35°	1502.5	1523.8	1545.0	1548.1	1587.7	1590.7	1593.8	1612.0	1654.5	1663.7	1660.6
37.5°	1314.0	1335.2	1341.3	1368.7	1390.0	1411.2	1435.6	1459.9	1496.4	1526.8	1511.7
40°	1146.7	1155.7	1171.0	1183.1	1225.7	1225.7	1237.8	1286.6	1326.1	1350.4	1347.3
42.5°	1006.8	1009.8	1021.9	1043.2	1082.8	1073.6	1082.8	1116.3	1174.0	1177.1	1210.5
45°	909.4	906.3	915.5	918.5	942.9	955.1	961.1	985.5	1034.1	1040.1	1043.2
47.5°	821.3	818.2	833.4	839.5	848.5	860.7	860.7	863.8	882.0	897.3	885.1
50°	748.2	748.2	748.2	754.3	769.5	766.4	769.5	781.7	790.7	784.7	781.7
52.5°	669.1	681.2	690.4	693.5	696.5	696.5	699.6	693.5	690.4	681.2	663.0
55°	614.4	626.5	626.5	626.5	626.5	638.7	623.6	626.5	626.5	602.2	577.9
57.5°	559.7	571.8	580.9	568.8	580.9	568.8	562.7	559.7	553.5	529.2	492.7
60°	514.1	520.1	517.0	514.1	520.1	511.0	504.9	492.7	486.6	453.2	428.9
62.5°	462.3	465.3	468.4	462.3	456.3	453.2	441.0	422.8	410.6	383.2	361.9
65°	419.7	410.6	407.5	404.5	398.5	389.3	380.2	358.9	349.7	325.4	304.1
67.5°	355.8	352.8	358.9	349.7	334.6	334.6	325.4	307.2	285.9	270.7	249.4
70°	304.1	301.1	295.0	285.9	282.9	270.7	270.7	249.4	243.3	215.9	197.7
72.5°	249.4	249.4	240.2	231.2	222.0	215.9	212.9	197.7	188.6	173.4	158.1
75°	188.6	188.6	185.5	176.4	170.3	164.2	161.2	149.1	139.9	124.8	115.6
77.5°	133.8	133.8	121.7	115.6	118.6	112.5	106.4	103.4	100.3	91.3	79.1
80°	79.1	76.0	67.0	69.9	67.0	67.0	63.9	60.8	54.7	48.6	42.5
82.5°	21.3	24.3	24.3	24.3	27.4	21.3	21.3	21.3	24.3	24.3	15.3
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	3.1	3.1
87.5°	3.1	6.1	12.2	12.2	12.2	12.2	12.2	9.2	9.2	9.2	6.1
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°	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6
2.5°	2567.1	2564.0	2567.1	2545.7	2594.3	2557.9	2551.8	2545.7	2567.1	2545.7	2515.3
5°	2621.8	2591.4	2582.2	2573.1	2600.4	2557.9	2548.8	2551.8	2536.6	2497.1	2500.1
7.5°	2640.0	2612.7	2585.3	2527.5	2551.8	2542.8	2518.3	2500.1	2475.8	2442.3	2436.2
10°	2646.1	2615.7	2576.1	2557.9	2521.4	2509.3	2500.1	2469.7	2439.3	2381.5	2366.3
12.5°	2627.8	2591.4	2542.8	2527.5	2500.1	2460.5	2439.3	2408.8	2381.5	2335.9	2302.4
15°	2548.8	2518.3	2503.2	2451.5	2439.3	2414.9	2372.4	2329.8	2290.3	2229.4	2211.1
17.5°	2457.6	2445.4	2430.1	2390.6	2387.6	2363.3	2323.7	2287.2	2235.6	2141.2	2110.8
20°	2363.3	2363.3	2314.6	2299.4	2329.8	2281.1	2250.7	2217.2	2110.8	2065.2	2010.5
22.5°	2293.4	2259.9	2232.5	2208.2	2211.1	2180.7	2138.2	2071.2	2031.7	1977.0	1913.1
25°	2156.4	2168.6	2107.8	2098.6	2107.8	2037.8	2016.5	1961.7	1903.9	1852.2	1803.6
27.5°	2071.2	2037.8	1998.3	1964.8	1964.8	1937.4	1876.6	1864.5	1776.2	1727.6	1666.7
30°	1943.5	1919.2	1885.7	1837.1	1831.0	1809.7	1761.1	1730.6	1639.4	1566.4	1532.9
32.5°	1782.3	1773.2	1745.8	1691.1	1672.9	1648.5	1587.7	1536.0	1493.4	1411.2	1371.8
35°	1666.7	1633.3	1575.5	1529.9	1514.6	1472.1	1423.4	1386.9	1341.3	1268.3	1216.6
37.5°	1493.4	1459.9	1405.1	1350.4	1350.4	1307.9	1240.9	1204.5	1140.6	1097.9	1055.4
40°	1341.3	1298.7	1244.0	1180.2	1171.0	1110.1	1082.8	1021.9	982.4	915.5	909.4
42.5°	1171.0	1131.4	1082.8	1034.1	997.6	967.2	897.3	851.6	809.1	775.6	766.4
45°	1015.8	964.1	921.6	860.7	824.2	787.8	742.1	711.7	678.3	641.8	620.5
47.5°	882.0	839.5	778.6	723.9	687.4	669.1	617.4	584.0	556.6	532.3	517.0
50°	745.2	693.5	660.0	599.1	593.1	550.5	508.0	480.6	465.3	444.1	422.8
52.5°	641.8	593.1	547.4	501.9	477.5	462.3	422.8	395.4	374.2	358.9	346.8
55°	541.3	498.8	462.3	416.7	401.4	380.2	334.6	328.5	307.2	285.9	270.7
57.5°	465.3	425.8	383.2	352.8	325.4	310.3	273.7	249.4	237.2	219.0	203.8
60°	395.4	352.8	319.3	282.9	270.7	249.4	222.0	200.8	185.5	170.3	155.1
62.5°	331.5	295.0	258.6	228.1	209.8	197.7	176.4	158.1	143.0	130.8	118.6
65°	273.7	240.2	209.8	179.5	170.3	155.1	139.9	124.8	112.5	97.4	85.2
67.5°	225.1	194.7	164.2	143.0	133.8	127.7	109.5	94.3	85.2	76.0	63.9
70°	176.4	155.1	130.8	112.5	103.4	94.3	82.1	73.0	60.8	54.7	45.6
72.5°	136.9	118.6	97.4	82.1	76.0	69.9	57.8	48.6	42.5	36.5	30.4
75°	97.4	82.1	69.9	54.7	51.7	48.6	39.6	33.5	27.4	21.3	18.2
77.5°	67.0	54.7	42.5	36.5	33.5	27.4	24.3	18.2	15.3	12.2	9.2
80°	36.5	27.4	21.3	18.2	15.3	12.2	12.2	9.2	6.1	6.1	3.1
82.5°	12.2	9.2	6.1	3.1	3.1	3.1	3.1	3.1	3.1	0.0	3.1
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°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	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°	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6
2.5°	2533.6	2500.1	2509.3	2509.3	2503.2	2503.2	2497.1	2487.9	2491.0	2472.7	2433.2
5°	2506.2	2463.6	2457.6	2463.6	2439.3	2433.2	2421.1	2439.3	2384.5	2405.8	2381.5
7.5°	2427.2	2387.6	2378.4	2399.8	2369.4	2351.0	2348.0	2372.4	2323.7	2299.4	2272.0
10°	2338.9	2323.7	2296.3	2281.1	2272.0	2275.0	2250.7	2220.3	2211.1	2205.1	2180.7
12.5°	2259.9	2226.4	2202.1	2183.8	2177.8	2177.8	2138.2	2132.1	2104.7	2098.6	2062.2
15°	2165.5	2126.1	2110.8	2086.5	2065.2	2077.3	2031.7	2019.5	2010.5	1970.9	1977.0
17.5°	2083.4	2040.9	2004.4	1989.1	1970.9	1952.7	1910.0	1919.2	1897.9	1897.9	1843.2
20°	1977.0	1931.3	1903.9	1873.6	1873.6	1849.2	1818.9	1821.8	1794.4	1767.1	1718.4
22.5°	1864.5	1815.8	1782.3	1770.1	1739.7	1733.7	1697.2	1688.0	1651.6	1654.5	1612.0
25°	1745.8	1697.2	1651.6	1654.5	1627.2	1615.1	1593.8	1551.2	1536.0	1517.7	1505.6
27.5°	1605.9	1572.4	1532.9	1529.9	1478.2	1481.2	1453.9	1441.7	1405.1	1414.3	1386.9
30°	1478.2	1429.6	1393.0	1383.9	1362.6	1356.5	1314.0	1295.6	1301.8	1277.4	1262.3
32.5°	1347.3	1274.4	1259.2	1240.9	1228.8	1213.5	1183.1	1195.3	1167.9	1174.0	1149.7
35°	1174.0	1143.6	1104.0	1104.0	1091.9	1079.7	1058.5	1070.7	1043.2	1031.1	1006.8
37.5°	1028.0	1000.7	961.1	973.3	952.0	933.7	915.5	918.5	894.2	891.2	866.8
40°	869.9	854.6	827.3	827.3	812.1	812.1	802.9	793.8	778.6	760.4	733.0
42.5°	720.8	708.6	696.5	699.6	678.3	696.5	672.2	687.4	638.7	635.7	617.4
45°	611.3	584.0	587.0	574.8	562.7	568.8	547.4	553.5	526.2	520.1	501.9
47.5°	495.8	486.6	468.4	462.3	462.3	453.2	444.1	441.0	428.9	413.6	389.3
50°	407.5	374.2	368.0	358.9	352.8	352.8	340.7	322.4	325.4	310.3	285.9
52.5°	319.3	291.9	279.8	276.8	264.7	258.6	243.3	231.2	222.0	215.9	200.8
55°	246.3	222.0	206.9	206.9	188.6	188.6	167.3	158.1	146.0	133.8	124.8
57.5°	185.5	173.4	158.1	146.0	139.9	124.8	112.5	97.4	88.2	69.9	57.8
60°	139.9	127.7	112.5	103.4	97.4	82.1	67.0	54.7	33.5	27.4	24.3
62.5°	103.4	91.3	76.0	69.9	63.9	51.7	36.5	18.2	9.2	9.2	9.2
65°	76.0	60.8	48.6	42.5	36.5	27.4	12.2	6.1	3.1	3.1	3.1
67.5°	51.7	39.6	27.4	24.3	18.2	9.2	3.1	3.1	3.1	3.1	3.1
70°	33.5	24.3	12.2	9.2	6.1	3.1	3.1	3.1	3.1	3.1	3.1
72.5°	21.3	12.2	6.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75°	12.2	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	6.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80°	3.1	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	3.1	3.1	3.1
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 FEU4C459030 F4LC-SQLWW-LI

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6	2536.6
2.5°	2475.8	2454.5	2466.6	2439.3	2451.5	2472.7	2457.6	2463.6
5°	2390.6	2378.4	2363.3	2323.7	2354.1	2378.4	2366.3	2363.3
7.5°	2299.4	2256.8	2278.1	2265.9	2259.9	2284.2	2256.8	2287.2
10°	2205.1	2174.7	2171.7	2150.4	2150.4	2168.6	2171.7	2153.3
12.5°	2065.2	2050.0	2050.0	2046.9	2043.8	2062.2	2065.2	2056.1
15°	1964.8	1958.8	1943.5	1940.5	1922.3	1949.6	1952.7	1949.6
17.5°	1843.2	1846.1	1831.0	1831.0	1843.2	1852.2	1827.9	1852.2
20°	1761.1	1745.8	1739.7	1712.3	1727.6	1742.8	1742.8	1745.8
22.5°	1642.4	1618.1	1627.2	1612.0	1602.8	1624.1	1624.1	1633.3
25°	1508.6	1508.6	1514.6	1505.6	1511.7	1523.8	1514.6	1536.0
27.5°	1380.8	1393.0	1393.0	1380.8	1386.9	1423.4	1438.6	1414.3
30°	1262.3	1265.2	1274.4	1268.3	1286.6	1298.7	1295.6	1314.0
32.5°	1128.4	1143.6	1149.7	1140.6	1146.7	1174.0	1158.8	1155.7
35°	1025.0	997.6	994.6	997.6	1009.8	1015.8	1009.8	1031.1
37.5°	875.9	866.8	854.6	857.7	866.8	879.0	885.1	900.3
40°	733.0	720.8	720.8	717.8	708.6	742.1	742.1	742.1
42.5°	608.3	605.2	590.1	590.1	602.2	611.3	605.2	626.5
45°	498.8	486.6	477.5	477.5	486.6	486.6	495.8	492.7
47.5°	392.4	380.2	383.2	374.2	383.2	395.4	380.2	383.2
50°	295.0	295.0	289.0	295.0	291.9	295.0	289.0	282.9
52.5°	200.8	228.1	231.2	219.0	191.6	167.3	152.0	164.2
55°	115.6	103.4	103.4	100.3	94.3	91.3	82.1	91.3
57.5°	57.8	51.7	51.7	51.7	48.6	45.6	39.6	39.6
60°	24.3	21.3	21.3	18.2	15.3	12.2	9.2	12.2
62.5°	9.2	6.1	6.1	6.1	6.1	6.1	6.1	6.1
65°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
67.5°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
70°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
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)