

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: P190100

Luminaire Tested: **TRF11-LD4-20W-50-CL-BK-UNV-EDC1**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190100  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27863)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: TRF11-LD4-20W-50-CL-BK-UNV-EDC1  
Description: TERRAPIN 11" LED WALL MOUNT WITH OPEN CLEAR LENS AND QUAD LENS COVER  
Light Source: (56) NICHIA 5000  
NF2L757DRT  
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 450mA  
OT40W/1

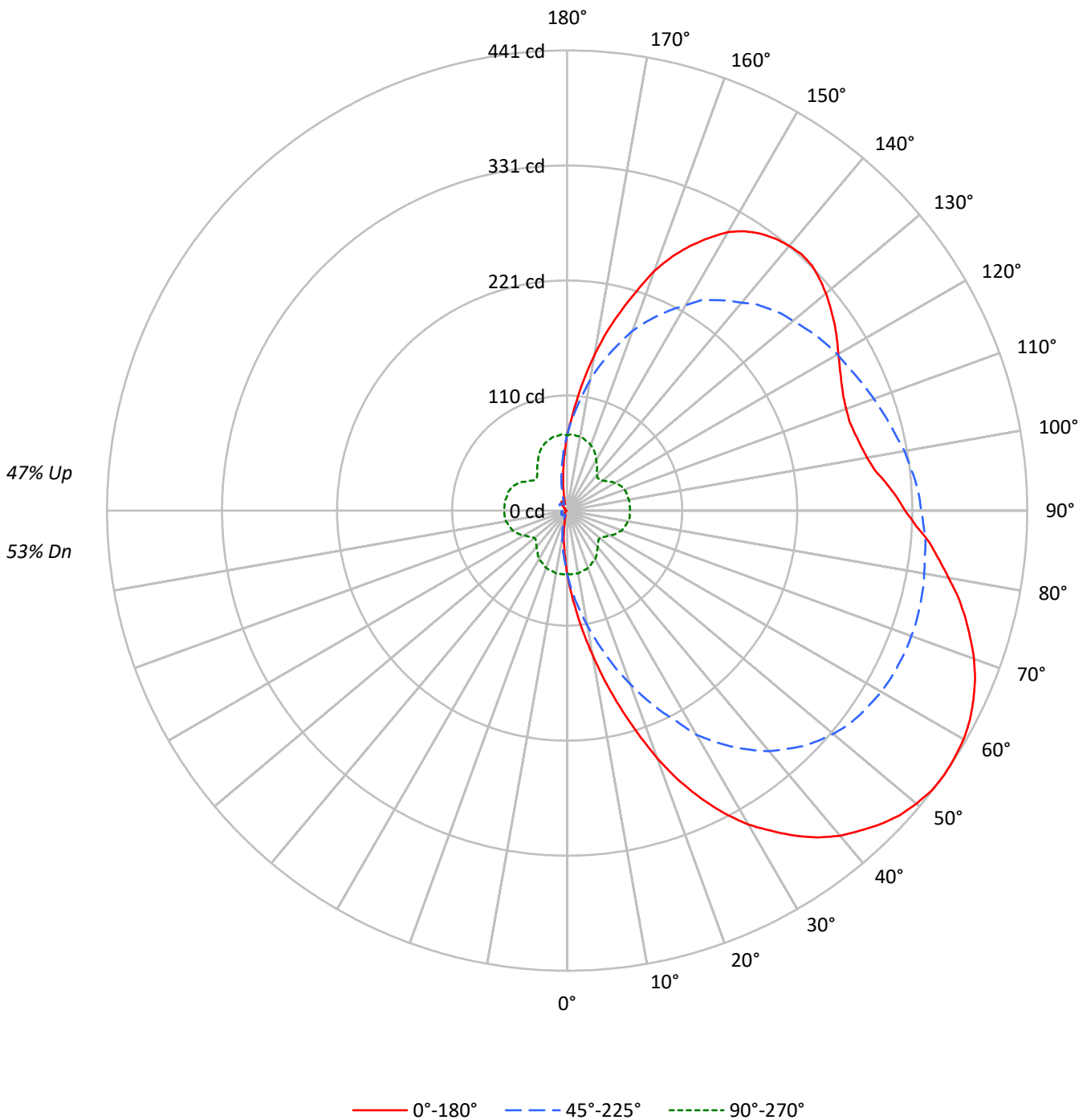
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1670.0 lumens  
Efficiency: N/A  
Efficacy: 75.9 lumens/watt  
Spacing Criteria (0/90/45): 3.33 / 1.31 / 2.9  
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')  
CIE Type: General Diffuse  
  
Input Watts (W): 22  
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	0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	108	108	108	108	100	100	100	100	85	85	85	71	71	71	59	59	59	53
1	94	87	81	76	86	80	75	70	67	63	60	55	52	49	44	42	40	35
2	83	73	65	58	76	67	60	54	56	50	45	46	41	38	36	33	30	25
3	75	63	53	46	68	58	49	43	48	41	36	39	34	30	30	27	23	19
4	68	54	45	38	61	50	41	35	41	35	29	34	28	24	26	22	19	15
5	62	48	38	31	56	44	35	29	36	30	24	29	24	20	23	19	15	12
6	56	42	33	26	51	39	30	24	32	26	20	26	21	17	20	16	13	10
7	52	38	29	23	47	35	27	21	29	22	17	24	18	14	18	14	11	8
8	48	34	25	19	44	31	23	18	26	20	15	21	16	12	17	13	10	7
9	44	31	23	17	41	28	21	16	24	18	13	19	14	11	15	11	8	6
10	41	28	20	15	38	26	19	14	22	16	12	18	13	9	14	10	7	5

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

	0°	90°	180°
0°	2424	2424	2424
5°	3008	2271	1068
10°	3696	2123	431
15°	4396	1949	165
20°	5048	1834	92
25°	5488	1684	83
30°	5740	1586	91
35°	5840	1425	84
40°	5878	1303	66
45°	5841	1196	49
50°	5766	1172	36
55°	5645	1266	23
60°	5482	1397	11
65°	5288	1575	11
70°	5070	1746	22
75°	4826	1890	22
80°	4572	2061	22
85°	4359	2237	11



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	6.2	0.4
10°-20°	23.1	1.4
20°-30°	49.8	3.0
30°-40°	81.6	4.9
40°-50°	111.7	6.7
50°-60°	136.8	8.2
60°-70°	154.1	9.2
70°-80°	162.1	9.7
80°-90°	160.6	9.6
90°-100°	152.6	9.1
100°-110°	141.0	8.4
110°-120°	128.1	7.7
120°-130°	113.2	6.8
130°-140°	95.0	5.7
140°-150°	73.4	4.4
150°-160°	48.7	2.9
160°-170°	24.9	1.5
170°-180°	7.2	0.4
0°-30°	79.1	4.7
0°-40°	160.8	9.6
0°-60°	409.2	24.5
0°-90°	886.1	53.1
90°-120°	421.6	25.2
90°-150°	703.2	42.1
90°-180°	784.0	46.9
0°-180°	1670.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	60	60	60	60	60	
5°	95	85	61	41	34	10
15°	194	143	59	16	7	57
25°	305	212	56	6	5	142
35°	380	276	49	5	6	239
45°	425	319	42	6	4	329
55°	441	342	44	6	2	395
65°	430	350	52	6	1	425
75°	395	350	58	6	2	417
85°	348	345	60	5	1	289
90°	324	339	60	5	1	178
95°	306	335	60	5	1	247
105°	286	320	59	6	1	303
115°	290	306	56	6	1	289
125°	313	292	48	8	3	280
135°	332	274	43	9	5	256
145°	324	246	50	8	9	203
155°	280	206	62	6	8	130
165°	197	155	69	18	8	57
175°	106	98	73	49	41	12
180°	72	72	72	72	72	



TEST NUMBER: P190100

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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
2.5°	76.6	75.7	74.8	74.8	74.8	74.8	73.9	74.8	73.9	73.0	72.1
5°	94.9	94.9	93.9	93.9	93.0	92.1	91.2	90.3	88.5	86.6	84.8
7.5°	116.7	115.8	114.9	114.0	112.2	111.3	109.4	107.6	104.9	101.2	97.6
10°	140.5	138.6	137.7	135.9	133.2	131.3	129.5	125.9	121.3	116.7	112.2
12.5°	166.9	164.2	162.3	160.5	156.9	154.1	151.4	146.8	141.4	134.1	126.8
15°	194.3	192.4	189.7	187.0	183.3	179.7	176.9	170.6	162.3	153.2	143.2
17.5°	222.5	221.6	218.0	214.3	208.9	205.2	201.6	193.4	183.3	171.5	160.5
20°	252.6	251.7	248.1	243.5	236.2	231.7	225.3	216.2	204.3	190.6	176.9
22.5°	280.0	277.3	274.5	269.1	261.8	256.3	251.7	240.8	225.3	209.8	194.3
25°	304.6	302.8	299.2	293.7	286.4	280.0	275.4	263.6	249.0	230.8	211.6
27.5°	327.4	325.6	322.9	316.5	307.4	302.8	297.3	284.6	268.1	250.8	228.0
30°	347.5	346.6	342.9	336.6	328.3	322.0	317.4	304.6	288.2	269.1	248.1
32.5°	363.9	363.0	360.3	353.9	344.8	340.2	333.8	321.0	303.7	284.6	262.7
35°	380.3	379.4	375.8	368.5	360.3	354.8	349.3	335.6	319.2	299.2	276.4
37.5°	394.9	394.0	388.5	383.1	374.0	369.4	363.0	348.4	332.0	312.8	289.1
40°	406.8	405.0	401.3	394.9	385.8	381.2	374.9	361.2	344.8	323.8	301.0
42.5°	415.9	415.9	411.3	405.0	396.8	391.3	385.8	371.2	353.9	333.8	310.1
45°	425.0	424.1	419.6	414.1	405.0	400.4	394.0	380.3	363.9	342.9	319.2
47.5°	432.3	430.5	426.9	420.5	412.3	406.8	401.3	387.6	371.2	351.1	326.5
50°	436.9	436.0	431.4	425.0	417.7	412.3	405.9	393.1	376.7	356.6	332.9
52.5°	440.5	438.7	435.1	429.6	421.4	416.8	410.4	397.7	381.2	361.2	338.4
55°	441.4	439.6	436.9	431.4	423.2	418.6	413.2	399.5	384.0	364.8	342.0
57.5°	440.5	439.6	436.0	430.5	422.3	417.7	413.2	400.4	385.8	367.6	344.8
60°	438.7	437.8	433.2	427.8	421.4	416.8	412.3	400.4	385.8	368.5	347.5
62.5°	435.1	434.1	430.5	424.1	417.7	414.1	408.6	398.6	384.9	369.4	349.3
65°	429.6	428.7	425.0	419.6	414.1	409.5	405.9	395.8	384.0	368.5	350.2
67.5°	423.2	422.3	418.6	414.1	408.6	405.0	401.3	392.2	382.2	368.5	351.1
70°	415.0	414.1	410.4	405.9	401.3	398.6	394.9	386.7	378.5	366.7	351.1
72.5°	405.0	405.0	401.3	397.7	394.0	390.4	387.6	381.2	374.9	363.9	351.1
75°	394.9	394.0	392.2	388.5	384.9	382.2	380.3	375.8	369.4	362.1	350.2
77.5°	384.0	383.1	380.3	378.5	375.8	374.0	373.0	369.4	364.8	358.4	349.3
80°	371.2	371.2	369.4	367.6	365.7	364.8	363.9	362.1	360.3	355.7	347.5
82.5°	359.4	359.4	357.5	356.6	355.7	355.7	355.7	354.8	354.8	352.1	345.7
85°	348.4	347.5	346.6	345.7	345.7	346.6	346.6	348.4	349.3	349.3	344.8
87.5°	334.7	335.6	334.7	334.7	335.6	337.5	338.4	341.1	342.9	344.8	342.0
90°	323.8	323.8	323.8	324.7	326.5	328.3	330.2	333.8	337.5	340.2	339.3
92.5°	315.6	315.6	315.6	316.5	319.2	322.0	323.8	329.3	333.8	337.5	337.5
95°	306.5	306.5	307.4	308.3	311.9	314.7	317.4	323.8	328.3	333.8	334.7
97.5°	297.3	298.2	299.2	301.0	305.5	308.3	311.0	318.3	323.8	329.3	331.1
100°	291.9	291.9	292.8	296.4	300.1	302.8	306.5	313.8	320.1	325.6	328.3
102.5°	288.2	288.2	289.1	291.9	296.4	299.2	301.9	310.1	316.5	322.0	323.8
105°	285.5	285.5	286.4	289.1	293.7	296.4	300.1	307.4	313.8	318.3	320.1
107.5°	283.7	284.6	285.5	288.2	292.8	295.5	299.2	304.6	311.0	315.6	316.5
110°	284.6	285.5	286.4	289.1	293.7	296.4	299.2	304.6	310.1	313.8	312.8



TEST NUMBER: P190100

CATALOG NUMBER: TRF11-LD4-20W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	286.4	287.3	288.2	291.0	294.6	297.3	300.1	304.6	309.2	311.0	309.2
115°	290.0	291.0	291.9	294.6	298.2	300.1	301.9	305.5	308.3	309.2	305.5
117.5°	294.6	295.5	296.4	299.2	301.9	302.8	304.6	307.4	309.2	307.4	301.9
120°	300.1	300.1	301.0	303.7	305.5	307.4	308.3	309.2	309.2	305.5	299.2
122.5°	306.5	306.5	307.4	308.3	310.1	310.1	311.0	310.1	308.3	303.7	295.5
125°	312.8	312.8	312.8	313.8	313.8	313.8	313.8	311.9	309.2	301.9	291.9
127.5°	318.3	318.3	318.3	318.3	317.4	317.4	316.5	312.8	308.3	299.2	287.3
130°	323.8	323.8	322.9	322.0	320.1	319.2	317.4	313.8	306.5	297.3	282.7
132.5°	328.3	328.3	326.5	324.7	322.9	321.0	319.2	313.8	304.6	293.7	279.1
135°	332.0	331.1	329.3	327.4	323.8	322.0	319.2	311.9	302.8	290.0	273.6
137.5°	332.9	332.9	330.2	328.3	323.8	321.0	318.3	310.1	299.2	285.5	268.1
140°	331.1	330.2	328.3	325.6	320.1	317.4	313.8	304.6	292.8	278.2	259.9
142.5°	328.3	327.4	325.6	322.0	316.5	312.8	308.3	299.2	286.4	271.8	253.6
145°	323.8	322.9	320.1	316.5	311.0	307.4	302.8	292.8	280.0	263.6	246.3
147.5°	317.4	316.5	313.8	310.1	303.7	299.2	294.6	284.6	271.8	256.3	239.0
150°	308.3	306.5	303.7	299.2	293.7	289.1	284.6	274.5	260.9	246.3	227.1
152.5°	294.6	293.7	291.0	286.4	280.9	276.4	271.8	261.8	249.0	233.5	217.1
155°	280.0	278.2	276.4	271.8	266.3	261.8	257.2	248.1	236.2	220.7	206.1
157.5°	263.6	261.8	259.9	255.4	250.8	246.3	242.6	232.6	220.7	208.9	195.2
160°	244.4	242.6	240.8	236.2	229.8	227.1	222.5	215.2	205.2	194.3	183.3
162.5°	219.8	218.9	217.1	213.4	209.8	207.0	203.4	196.1	187.9	179.7	168.7
165°	197.0	196.1	195.2	191.5	188.8	187.0	183.3	177.9	170.6	163.3	155.1
167.5°	175.1	174.2	173.3	170.6	168.7	166.0	163.3	159.6	153.2	147.8	141.4
170°	151.4	151.4	150.5	148.7	146.8	145.9	143.2	140.5	135.9	131.3	126.8
172.5°	128.6	127.7	127.7	125.9	125.9	125.0	123.1	121.3	117.7	114.9	111.3
175°	105.8	105.8	105.8	104.9	104.9	104.9	103.1	102.2	100.3	99.4	97.6
177.5°	86.6	85.7	86.6	86.6	86.6	86.6	85.7	85.7	85.7	84.8	84.8
180°	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
2.5°	71.1	70.2	69.3	68.4	67.5	66.6	65.7	63.8	62.9	61.1	60.2
5°	83.0	80.3	77.5	74.8	73.9	72.1	70.2	66.6	63.8	61.1	58.4
7.5°	93.9	90.3	86.6	82.1	80.3	77.5	73.9	69.3	65.7	61.1	57.5
10°	106.7	100.3	94.9	89.4	85.7	83.0	77.5	72.1	65.7	61.1	55.6
12.5°	119.5	112.2	104.0	96.7	93.0	88.5	81.2	73.9	66.6	60.2	53.8
15°	134.1	124.0	114.0	104.0	99.4	93.9	84.8	75.7	67.5	59.3	52.0
17.5°	148.7	135.9	124.0	112.2	105.8	99.4	88.5	78.4	68.4	59.3	51.1
20°	163.3	148.7	133.2	118.6	112.2	104.9	92.1	79.4	68.4	58.4	49.3
22.5°	177.9	160.5	143.2	125.9	117.7	109.4	94.9	81.2	68.4	57.5	47.4
25°	192.4	172.4	152.3	133.2	124.0	114.9	97.6	82.1	68.4	55.6	45.6
27.5°	207.0	185.2	162.3	139.5	129.5	119.5	100.3	83.0	68.4	54.7	43.8
30°	221.6	197.0	171.5	146.8	135.0	123.1	102.2	83.9	67.5	53.8	42.0
32.5°	236.2	208.0	179.7	153.2	139.5	126.8	104.0	83.9	66.6	52.0	39.2
35°	249.9	218.9	188.8	158.7	144.1	130.4	104.9	83.0	64.8	49.3	37.4
37.5°	261.8	230.8	197.0	164.2	148.7	133.2	105.8	82.1	62.9	47.4	35.6
40°	272.7	241.7	204.3	169.6	152.3	135.9	106.7	81.2	61.1	45.6	32.8
42.5°	281.8	249.9	211.6	175.1	156.9	138.6	106.7	80.3	59.3	43.8	31.0
45°	290.0	258.1	218.9	179.7	160.5	142.3	107.6	80.3	58.4	42.0	30.1
47.5°	298.2	265.4	225.3	185.2	165.1	145.9	109.4	80.3	58.4	41.0	29.2
50°	304.6	271.8	232.6	190.6	169.6	149.6	112.2	81.2	58.4	41.0	29.2
52.5°	310.1	277.3	239.9	196.1	175.1	153.2	114.9	83.9	59.3	42.0	30.1
55°	314.7	282.7	245.3	201.6	180.6	158.7	118.6	86.6	62.0	43.8	30.1
57.5°	318.3	287.3	250.8	207.0	185.2	164.2	123.1	90.3	64.8	45.6	31.0
60°	322.0	291.9	256.3	212.5	190.6	169.6	128.6	94.9	68.4	47.4	31.9
62.5°	324.7	295.5	260.9	218.0	197.0	175.1	133.2	98.5	71.1	50.2	32.8
65°	327.4	299.2	266.3	224.4	202.5	181.5	139.5	104.0	74.8	52.0	33.7
67.5°	329.3	302.8	270.9	231.7	208.9	187.0	145.0	108.5	78.4	53.8	34.7
70°	331.1	306.5	275.4	238.1	215.2	193.4	150.5	113.1	81.2	55.6	34.7
72.5°	332.9	310.1	280.0	243.5	220.7	198.8	156.0	116.7	83.9	56.5	35.6
75°	333.8	311.9	283.7	249.0	226.2	204.3	160.5	120.4	85.7	57.5	35.6
77.5°	334.7	314.7	287.3	253.6	230.8	209.8	165.1	124.0	88.5	58.4	35.6
80°	335.6	316.5	291.0	257.2	237.1	213.4	168.7	126.8	89.4	59.3	35.6
82.5°	335.6	318.3	293.7	260.9	240.8	217.1	172.4	128.6	91.2	60.2	35.6
85°	335.6	320.1	296.4	263.6	244.4	220.7	174.2	130.4	92.1	60.2	35.6
87.5°	334.7	320.1	298.2	266.3	246.3	222.5	176.9	132.3	93.0	60.2	34.7
90°	332.9	320.1	299.2	267.2	248.1	224.4	177.9	133.2	93.0	60.2	34.7
92.5°	332.9	319.2	298.2	267.2	247.2	223.5	177.9	132.3	93.0	60.2	34.7
95°	330.2	317.4	296.4	266.3	246.3	223.5	177.9	132.3	93.0	60.2	34.7
97.5°	326.5	314.7	293.7	263.6	244.4	221.6	176.9	132.3	93.0	60.2	34.7
100°	323.8	311.9	291.9	261.8	242.6	219.8	176.0	131.3	92.1	60.2	34.7
102.5°	320.1	308.3	287.3	258.1	239.0	217.1	173.3	130.4	92.1	59.3	34.7
105°	316.5	302.8	282.7	253.6	233.5	213.4	170.6	128.6	90.3	59.3	35.6
107.5°	311.9	298.2	277.3	248.1	228.0	208.9	166.9	125.9	89.4	59.3	35.6
110°	306.5	292.8	271.8	242.6	222.5	203.4	163.3	123.1	87.6	58.4	35.6





TEST NUMBER: P190100

CATALOG NUMBER: TRF11-LD4-20W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	301.0	286.4	265.4	234.4	216.2	197.0	157.8	119.5	85.7	57.5	35.6
115°	296.4	280.0	258.1	226.2	208.9	190.6	152.3	115.8	83.0	56.5	35.6
117.5°	291.9	274.5	250.8	218.9	201.6	183.3	145.9	111.3	80.3	54.7	34.7
120°	287.3	268.1	244.4	211.6	193.4	176.0	139.5	105.8	76.6	52.9	34.7
122.5°	280.9	261.8	235.3	204.3	186.1	168.7	133.2	100.3	73.0	51.1	33.7
125°	276.4	254.5	227.1	196.1	178.8	161.4	126.8	95.8	69.3	48.3	32.8
127.5°	270.0	248.1	219.8	187.9	170.6	154.1	120.4	90.3	65.7	46.5	31.9
130°	265.4	241.7	212.5	180.6	164.2	146.8	114.9	85.7	62.9	44.7	31.0
132.5°	259.0	233.5	205.2	174.2	157.8	141.4	110.4	82.1	60.2	42.9	30.1
135°	253.6	226.2	198.8	167.8	151.4	136.8	106.7	80.3	58.4	42.9	30.1
137.5°	247.2	219.8	192.4	163.3	146.8	132.3	104.0	78.4	58.4	42.9	31.0
140°	239.9	212.5	186.1	157.8	143.2	128.6	102.2	78.4	59.3	44.7	32.8
142.5°	230.8	206.1	180.6	154.1	139.5	126.8	101.2	79.4	61.1	46.5	34.7
145°	223.5	200.7	176.0	150.5	137.7	125.9	102.2	81.2	63.8	50.2	38.3
147.5°	217.1	195.2	171.5	147.8	135.9	125.0	103.1	83.0	66.6	52.9	41.0
150°	208.9	187.9	166.9	145.0	134.1	124.0	104.0	85.7	69.3	55.6	43.8
152.5°	199.7	180.6	161.4	142.3	132.3	122.2	104.0	87.6	72.1	59.3	47.4
155°	190.6	173.3	156.0	137.7	129.5	120.4	104.0	88.5	74.8	62.0	50.2
157.5°	180.6	166.0	149.6	134.1	125.9	118.6	104.0	89.4	76.6	64.8	52.9
160°	169.6	156.9	143.2	129.5	122.2	115.8	102.2	89.4	77.5	66.6	55.6
162.5°	158.7	146.8	135.0	123.1	116.7	111.3	100.3	88.5	78.4	68.4	58.4
165°	145.9	135.9	126.8	116.7	111.3	106.7	97.6	87.6	78.4	69.3	61.1
167.5°	134.1	126.8	118.6	110.4	105.8	102.2	93.9	85.7	78.4	71.1	63.8
170°	121.3	114.9	109.4	103.1	99.4	96.7	90.3	83.9	77.5	72.1	65.7
172.5°	107.6	103.1	99.4	94.9	93.0	90.3	85.7	81.2	76.6	72.1	67.5
175°	94.9	92.1	90.3	87.6	85.7	84.8	82.1	78.4	75.7	73.0	70.2
177.5°	83.0	82.1	81.2	80.3	79.4	78.4	77.5	75.7	74.8	73.0	72.1
180°	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1



TEST NUMBER: P190100

CATALOG NUMBER: TRF11-LD4-20W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
2.5°	58.4	57.5	55.6	54.7	54.7	52.9	52.0	51.1	49.3	48.3	47.4
5°	56.5	53.8	51.1	50.2	48.3	46.5	44.7	42.9	41.0	39.2	37.4
7.5°	53.8	50.2	46.5	44.7	43.8	40.1	38.3	35.6	32.8	31.0	30.1
10°	51.1	46.5	42.0	40.1	38.3	34.7	31.9	29.2	26.5	24.6	21.9
12.5°	48.3	42.9	38.3	35.6	33.7	30.1	26.5	23.7	21.0	18.2	16.4
15°	45.6	40.1	34.7	31.9	29.2	25.5	21.9	18.2	15.5	13.7	11.9
17.5°	42.9	36.5	31.0	28.3	25.5	21.9	17.3	14.6	11.9	10.0	8.2
20°	41.0	33.7	27.4	24.6	22.8	18.2	13.7	10.9	9.1	7.3	6.4
22.5°	38.3	31.0	24.6	21.9	19.2	14.6	10.9	8.2	6.4	5.5	4.6
25°	36.5	28.3	21.9	19.2	16.4	11.9	9.1	6.4	5.5	4.6	4.6
27.5°	33.7	26.5	19.2	16.4	13.7	10.0	7.3	5.5	4.6	4.6	4.6
30°	31.9	23.7	17.3	14.6	11.9	8.2	5.5	4.6	4.6	4.6	4.6
32.5°	30.1	21.9	15.5	12.8	10.9	7.3	4.6	4.6	4.6	4.6	5.5
35°	27.4	20.1	13.7	10.9	9.1	6.4	4.6	4.6	4.6	5.5	5.5
37.5°	25.5	18.2	12.8	10.0	8.2	4.6	4.6	4.6	4.6	5.5	5.5
40°	23.7	17.3	11.9	9.1	7.3	4.6	4.6	4.6	5.5	5.5	5.5
42.5°	22.8	16.4	10.9	8.2	6.4	4.6	4.6	5.5	5.5	5.5	5.5
45°	21.9	15.5	10.0	7.3	5.5	4.6	4.6	5.5	5.5	6.4	5.5
47.5°	21.0	14.6	9.1	6.4	4.6	4.6	5.5	5.5	6.4	6.4	5.5
50°	21.0	13.7	8.2	6.4	4.6	4.6	5.5	6.4	6.4	6.4	5.5
52.5°	21.0	13.7	7.3	5.5	4.6	5.5	5.5	6.4	6.4	5.5	5.5
55°	21.0	12.8	7.3	5.5	4.6	5.5	6.4	6.4	6.4	5.5	4.6
57.5°	21.0	11.9	6.4	5.5	4.6	5.5	6.4	6.4	6.4	5.5	4.6
60°	20.1	10.9	6.4	4.6	5.5	6.4	6.4	6.4	6.4	5.5	4.6
62.5°	20.1	10.9	5.5	5.5	5.5	6.4	6.4	6.4	5.5	5.5	3.6
65°	20.1	10.0	5.5	5.5	5.5	6.4	7.3	6.4	5.5	4.6	3.6
67.5°	20.1	10.0	5.5	5.5	5.5	6.4	7.3	6.4	5.5	4.6	3.6
70°	20.1	9.1	5.5	5.5	6.4	6.4	7.3	6.4	5.5	4.6	3.6
72.5°	19.2	9.1	5.5	5.5	6.4	7.3	7.3	6.4	5.5	4.6	3.6
75°	19.2	9.1	5.5	5.5	6.4	7.3	7.3	6.4	5.5	4.6	2.7
77.5°	18.2	8.2	5.5	5.5	6.4	7.3	7.3	6.4	5.5	3.6	2.7
80°	18.2	8.2	5.5	5.5	6.4	7.3	7.3	6.4	5.5	3.6	2.7
82.5°	18.2	8.2	5.5	6.4	6.4	7.3	7.3	6.4	4.6	3.6	2.7
85°	18.2	8.2	5.5	5.5	6.4	7.3	7.3	6.4	4.6	3.6	2.7
87.5°	17.3	8.2	5.5	5.5	6.4	7.3	7.3	5.5	4.6	3.6	2.7
90°	17.3	7.3	5.5	5.5	6.4	7.3	7.3	5.5	4.6	2.7	1.8
92.5°	17.3	8.2	5.5	6.4	6.4	7.3	7.3	6.4	4.6	3.6	2.7
95°	18.2	8.2	5.5	6.4	6.4	7.3	7.3	6.4	4.6	3.6	2.7
97.5°	18.2	8.2	5.5	6.4	6.4	7.3	7.3	6.4	4.6	3.6	2.7
100°	18.2	8.2	5.5	6.4	7.3	7.3	7.3	6.4	5.5	3.6	2.7
102.5°	18.2	8.2	5.5	6.4	6.4	7.3	7.3	6.4	5.5	3.6	2.7
105°	18.2	9.1	5.5	6.4	6.4	7.3	7.3	6.4	5.5	3.6	2.7
107.5°	19.2	9.1	5.5	5.5	6.4	7.3	8.2	7.3	5.5	3.6	2.7
110°	19.2	9.1	5.5	5.5	6.4	7.3	8.2	7.3	5.5	4.6	3.6



TEST NUMBER: P190100

CATALOG NUMBER: TRF11-LD4-20W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	20.1	10.0	5.5	5.5	6.4	7.3	8.2	7.3	6.4	4.6	3.6
115°	20.1	10.0	6.4	6.4	6.4	7.3	8.2	8.2	6.4	5.5	3.6
117.5°	21.0	10.9	6.4	6.4	6.4	8.2	8.2	8.2	7.3	5.5	4.6
120°	21.0	11.9	6.4	6.4	6.4	8.2	8.2	8.2	7.3	6.4	4.6
122.5°	21.0	11.9	7.3	6.4	6.4	7.3	8.2	9.1	8.2	6.4	5.5
125°	21.0	12.8	7.3	6.4	6.4	7.3	8.2	9.1	8.2	7.3	6.4
127.5°	21.0	13.7	8.2	6.4	6.4	7.3	8.2	9.1	9.1	8.2	6.4
130°	21.0	14.6	9.1	7.3	6.4	7.3	8.2	9.1	9.1	8.2	7.3
132.5°	21.0	14.6	10.0	7.3	6.4	6.4	7.3	9.1	9.1	9.1	8.2
135°	21.9	15.5	10.9	8.2	6.4	6.4	7.3	8.2	9.1	9.1	9.1
137.5°	22.8	16.4	10.9	9.1	7.3	6.4	7.3	8.2	9.1	9.1	9.1
140°	24.6	17.3	11.9	10.0	8.2	6.4	6.4	7.3	8.2	9.1	9.1
142.5°	26.5	19.2	13.7	10.9	9.1	6.4	6.4	7.3	8.2	9.1	10.0
145°	28.3	21.0	14.6	12.8	10.0	7.3	6.4	7.3	8.2	9.1	9.1
147.5°	31.0	23.7	16.4	13.7	11.9	8.2	6.4	6.4	7.3	8.2	9.1
150°	33.7	26.5	19.2	15.5	13.7	9.1	7.3	6.4	6.4	7.3	8.2
152.5°	37.4	29.2	21.9	18.2	15.5	10.9	8.2	6.4	6.4	6.4	7.3
155°	40.1	31.9	24.6	21.0	18.2	13.7	10.0	8.2	6.4	6.4	6.4
157.5°	43.8	35.6	28.3	24.6	21.9	16.4	12.8	10.0	8.2	7.3	6.4
160°	46.5	38.3	31.9	28.3	25.5	20.1	15.5	12.8	10.0	8.2	7.3
162.5°	50.2	42.0	35.6	32.8	30.1	24.6	20.1	16.4	13.7	10.9	10.0
165°	53.8	46.5	40.1	37.4	34.7	30.1	25.5	21.0	18.2	15.5	13.7
167.5°	56.5	51.1	44.7	42.0	40.1	35.6	31.0	27.4	24.6	21.9	19.2
170°	60.2	54.7	50.2	47.4	45.6	42.0	37.4	34.7	31.9	29.2	26.5
172.5°	63.8	59.3	55.6	53.8	52.0	48.3	44.7	42.0	40.1	37.4	35.6
175°	66.6	63.8	61.1	60.2	58.4	56.5	53.8	52.0	49.3	48.3	46.5
177.5°	70.2	68.4	67.5	66.6	65.7	64.8	62.9	62.0	61.1	60.2	59.3
180°	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1



TEST NUMBER: P190100

CATALOG NUMBER: TRF11-LD4-20W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
2.5°	46.5	45.6	45.6	44.7	44.7	44.7	43.8	44.7
5°	36.5	35.6	35.6	34.7	34.7	32.8	32.8	33.7
7.5°	28.3	26.5	26.5	25.5	25.5	24.6	23.7	24.6
10°	21.0	19.2	19.2	18.2	17.3	16.4	16.4	16.4
12.5°	14.6	13.7	12.8	12.8	11.9	10.9	10.9	10.9
15°	10.0	9.1	9.1	8.2	8.2	7.3	7.3	7.3
17.5°	7.3	6.4	5.5	5.5	5.5	4.6	4.6	4.6
20°	5.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
22.5°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
25°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
27.5°	4.6	4.6	5.5	5.5	5.5	5.5	5.5	5.5
30°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
32.5°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
35°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
37.5°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
40°	5.5	5.5	5.5	5.5	5.5	4.6	4.6	4.6
42.5°	5.5	5.5	5.5	4.6	4.6	4.6	4.6	4.6
45°	5.5	5.5	4.6	4.6	4.6	3.6	3.6	3.6
47.5°	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7
50°	4.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
52.5°	4.6	3.6	3.6	3.6	2.7	2.7	1.8	1.8
55°	4.6	3.6	2.7	2.7	2.7	1.8	1.8	1.8
57.5°	3.6	2.7	2.7	2.7	1.8	1.8	1.8	1.8
60°	3.6	2.7	2.7	1.8	1.8	1.8	0.9	0.9
62.5°	3.6	2.7	1.8	1.8	1.8	1.8	0.9	0.9
65°	2.7	2.7	1.8	1.8	1.8	1.8	0.9	0.9
67.5°	2.7	1.8	1.8	1.8	1.8	1.8	0.9	0.9
70°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
72.5°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
75°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
77.5°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
80°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
82.5°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
85°	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
87.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
90°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
92.5°	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
95°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
97.5°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
100°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
102.5°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
105°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
107.5°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
110°	2.7	1.8	1.8	0.9	0.9	0.9	0.9	0.9



TEST NUMBER: P190100

CATALOG NUMBER: TRF11-LD4-20W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	2.7	1.8	1.8	1.8	0.9	0.9	0.9	0.9
115°	2.7	2.7	1.8	1.8	1.8	1.8	0.9	0.9
117.5°	3.6	2.7	2.7	2.7	1.8	1.8	1.8	1.8
120°	3.6	3.6	2.7	2.7	1.8	1.8	1.8	1.8
122.5°	4.6	3.6	3.6	2.7	2.7	2.7	1.8	1.8
125°	4.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
127.5°	5.5	4.6	4.6	3.6	3.6	2.7	2.7	2.7
130°	6.4	5.5	5.5	4.6	3.6	3.6	3.6	3.6
132.5°	7.3	6.4	5.5	5.5	4.6	4.6	4.6	3.6
135°	8.2	7.3	6.4	6.4	5.5	5.5	4.6	4.6
137.5°	9.1	8.2	8.2	7.3	6.4	6.4	6.4	6.4
140°	9.1	9.1	8.2	8.2	8.2	7.3	7.3	7.3
142.5°	10.0	9.1	9.1	9.1	9.1	8.2	8.2	8.2
145°	10.0	10.0	10.0	10.0	10.0	9.1	9.1	9.1
147.5°	9.1	10.0	10.0	10.0	10.0	10.0	10.0	10.0
150°	9.1	9.1	9.1	10.0	10.0	10.0	10.0	10.0
152.5°	8.2	8.2	9.1	9.1	9.1	9.1	9.1	9.1
155°	7.3	7.3	7.3	8.2	8.2	8.2	8.2	8.2
157.5°	6.4	6.4	6.4	7.3	7.3	7.3	7.3	7.3
160°	7.3	6.4	6.4	6.4	6.4	6.4	6.4	6.4
162.5°	8.2	8.2	7.3	7.3	6.4	6.4	6.4	6.4
165°	11.9	10.9	10.0	10.0	9.1	9.1	8.2	8.2
167.5°	17.3	15.5	15.5	14.6	13.7	12.8	12.8	12.8
170°	24.6	23.7	22.8	21.9	21.0	20.1	20.1	20.1
172.5°	33.7	32.8	31.9	31.0	30.1	29.2	29.2	29.2
175°	44.7	43.8	43.8	42.9	41.0	41.0	41.0	41.0
177.5°	58.4	57.5	57.5	56.5	55.6	55.6	55.6	54.7
180°	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1

(END OF REPORT)