

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: P190112

Luminaire Tested: **TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190112  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27871)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG  
Description: TERRAPIN 11" LED SHALLOW CAST WALL MOUNT WITH OPEN OPAL LENS AND BRONZE RING  
Light Source: (56) NICHIA 5000 NF2L757DRT  
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 450mA OT40W/1

**Summary**

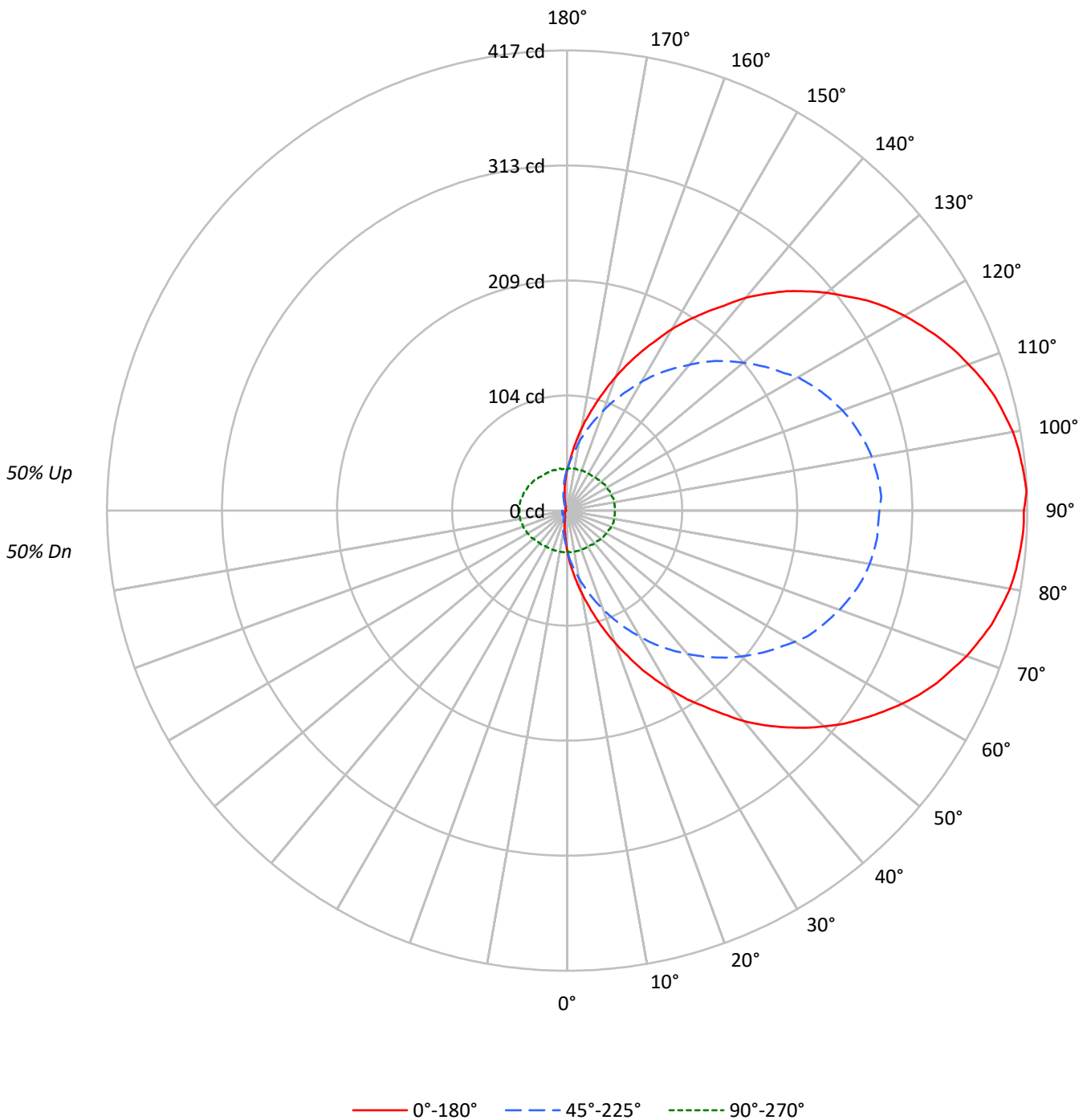
Lumens per Lamp: N/A  
Luminaire Lumens: 1333.0 lumens  
Efficiency: N/A  
Efficacy: 60.9 lumens/watt  
Spacing Criteria (0/90/45): 3.82 / 1.63 / 3.13  
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')  
CIE Type: General Diffuse

Input Watts (W): 21.9  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): 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	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	92	85	79	74	84	78	73	68	65	61	57	52	49	46	41	38	36	30
2	82	72	63	56	74	65	58	52	54	48	43	43	38	34	33	29	26	21
3	73	61	52	44	66	56	47	41	46	39	34	36	31	27	27	23	20	16
4	66	53	43	36	60	48	40	33	39	33	27	31	26	21	23	19	16	12
5	60	47	37	30	55	42	34	27	35	28	22	27	22	18	20	16	13	9
6	55	41	32	25	50	38	29	23	31	24	19	24	19	15	18	14	11	8
7	51	37	28	21	46	34	25	20	27	21	16	22	17	13	16	12	9	6
8	47	33	24	18	43	30	22	17	25	18	14	20	15	11	15	11	8	5
9	44	30	22	16	40	27	20	15	23	16	12	18	13	9	14	10	7	5
10	41	27	19	14	37	25	18	13	21	15	11	16	12	8	13	9	6	4

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

	0°	90°	180°
0°	1449	1449	1449
5°	1724	1405	672
10°	1989	1314	339
15°	2274	1243	167
20°	2560	1187	110
25°	2841	1145	83
30°	3092	1114	76
35°	3328	1093	71
40°	3596	1106	53
45°	3814	1102	51
50°	4015	1132	37
55°	4197	1174	36
60°	4377	1223	22
65°	4550	1257	22
70°	4709	1332	22
75°	4867	1423	22
80°	5019	1505	22
85°	5156	1609	11



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	3.7	0.3
10°-20°	13.2	1.0
20°-30°	27.9	2.1
30°-40°	48.1	3.6
40°-50°	72.3	5.4
50°-60°	97.1	7.3
60°-70°	119.6	9.0
70°-80°	136.8	10.3
80°-90°	145.8	10.9
90°-100°	146.6	11.0
100°-110°	137.4	10.3
110°-120°	120.3	9.0
120°-130°	97.9	7.3
130°-140°	72.9	5.5
140°-150°	48.4	3.6
150°-160°	28.1	2.1
160°-170°	13.3	1.0
170°-180°	3.7	0.3
0°-30°	44.8	3.4
0°-40°	92.9	7.0
0°-60°	262.3	19.7
0°-90°	664.5	49.8
90°-120°	404.2	30.3
90°-150°	623.4	46.8
90°-180°	669.0	50.2
0°-180°	1333.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	36	36	36	36	36	
5°	54	49	38	26	21	6
15°	100	78	38	13	7	29
25°	158	113	38	6	5	74
35°	217	151	38	6	5	137
45°	278	188	39	6	4	215
55°	328	222	41	5	3	295
65°	370	252	42	5	2	366
75°	398	272	43	5	2	420
85°	412	282	43	5	1	336
90°	414	283	43	4	1	227
95°	415	284	43	5	1	338
105°	401	274	43	4	1	423
115°	372	254	42	4	2	368
125°	332	225	42	4	2	297
135°	281	192	40	4	2	218
145°	219	154	39	4	3	139
155°	159	115	39	5	3	74
165°	100	79	38	13	6	29
175°	53	49	38	28	23	6
180°	37	37	37	37	37	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
2.5°	45.2	44.3	44.3	44.3	44.3	44.3	44.3	43.3	43.3	43.3	42.4
5°	54.4	53.5	53.5	53.5	52.6	52.6	52.6	51.6	50.7	49.8	48.9
7.5°	64.5	63.6	63.6	63.6	62.7	61.8	61.8	59.9	59.0	57.2	55.3
10°	75.6	74.7	73.8	72.8	72.8	71.9	71.0	69.1	67.3	65.5	62.7
12.5°	87.6	87.6	85.7	84.8	83.9	83.0	82.1	79.3	76.5	73.8	70.1
15°	100.5	100.5	99.6	97.7	95.9	95.0	93.1	90.3	86.7	83.0	78.4
17.5°	114.3	114.3	112.5	110.6	108.8	106.9	105.1	101.4	96.8	92.2	86.7
20°	128.1	127.2	126.3	123.5	120.8	118.9	117.1	112.5	107.9	101.4	95.0
22.5°	142.0	142.0	140.1	137.4	133.7	130.9	129.1	123.5	118.0	111.6	104.2
25°	157.7	156.7	154.9	151.2	148.4	144.7	142.9	136.4	130.0	121.7	113.4
27.5°	172.4	171.5	169.6	165.9	161.3	158.6	155.8	148.4	141.1	131.8	122.6
30°	187.2	187.2	184.4	180.7	175.2	172.4	168.7	161.3	153.0	142.9	131.8
32.5°	202.8	201.9	198.2	194.5	189.0	185.3	181.6	174.2	164.1	153.0	142.0
35°	216.7	216.7	213.0	208.4	202.8	199.1	195.4	186.2	175.2	163.2	151.2
37.5°	232.3	231.4	227.7	223.1	216.7	213.0	208.4	198.2	187.2	174.2	160.4
40°	248.9	248.0	245.2	239.7	230.5	225.9	222.2	211.1	198.2	184.4	169.6
42.5°	263.7	262.8	259.1	253.5	246.2	241.5	234.2	223.1	209.3	195.4	178.9
45°	277.5	276.6	272.9	267.4	259.1	254.5	248.9	236.0	220.3	204.7	188.1
47.5°	291.3	290.4	285.8	280.3	272.0	266.4	261.8	248.0	231.4	214.8	197.3
50°	304.2	303.3	298.7	293.2	284.0	278.4	272.9	259.1	244.3	225.0	205.6
52.5°	317.1	316.2	311.6	304.2	295.9	290.4	284.0	270.1	253.5	235.1	213.9
55°	328.2	326.4	322.7	316.2	306.1	300.5	295.0	280.3	262.8	244.3	222.2
57.5°	339.3	337.4	333.7	326.4	317.1	310.7	304.2	289.5	272.0	252.6	229.6
60°	350.3	348.5	343.9	336.5	326.4	320.8	314.4	298.7	280.3	260.0	237.9
62.5°	360.5	358.6	354.0	345.7	336.5	330.1	322.7	307.0	288.6	268.3	246.2
65°	369.7	367.9	363.2	355.9	344.8	338.3	331.0	315.3	295.9	274.7	251.7
67.5°	377.1	376.1	370.6	363.2	353.1	345.7	338.3	321.8	302.4	281.2	257.2
70°	385.4	383.5	378.9	370.6	360.5	353.1	345.7	329.1	308.8	287.6	262.8
72.5°	391.8	390.0	384.4	377.1	366.0	359.6	351.3	334.7	314.4	292.3	267.4
75°	398.3	396.4	390.9	383.5	371.5	365.1	356.8	340.2	319.9	296.9	272.0
77.5°	402.9	401.0	396.4	388.1	376.1	369.7	362.3	344.8	323.6	300.5	275.7
80°	407.5	405.6	400.1	391.8	380.8	373.4	366.0	347.6	327.3	304.2	278.4
82.5°	410.3	408.4	402.9	394.6	383.5	376.1	368.8	350.3	329.1	306.1	280.3
85°	412.1	410.3	404.7	397.4	385.4	378.0	370.6	352.2	331.9	307.9	282.1
87.5°	413.9	412.1	406.6	398.3	386.3	378.9	371.5	353.1	332.8	308.8	282.1
90°	413.9	412.1	407.5	398.3	387.2	379.8	372.5	354.0	332.8	309.8	283.0
92.5°	416.7	414.9	409.3	401.0	389.1	382.6	374.3	355.9	334.7	311.6	284.9
95°	414.9	413.9	408.4	400.1	388.1	380.8	372.5	354.9	333.7	310.7	284.0
97.5°	413.0	411.2	405.6	397.4	385.4	378.9	370.6	353.1	331.9	307.9	282.1
100°	410.3	407.5	402.9	393.7	382.6	375.2	367.9	349.4	329.1	306.1	280.3
102.5°	405.6	402.9	398.3	390.0	378.9	371.5	364.2	346.6	326.4	302.4	277.5
105°	401.0	398.3	392.7	384.4	374.3	366.9	359.6	342.0	321.8	298.7	273.8
107.5°	394.6	392.7	388.1	379.8	368.8	361.4	354.9	337.4	317.1	295.0	270.1
110°	387.2	385.4	380.8	372.5	362.3	355.9	348.5	331.9	311.6	289.5	265.5



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	379.8	378.0	373.4	365.1	354.9	348.5	341.1	324.5	305.2	284.0	260.0
115°	371.5	369.7	365.1	356.8	347.6	340.2	333.7	317.1	298.7	276.6	254.5
117.5°	362.3	360.5	355.9	348.5	338.3	332.8	325.4	309.8	291.3	270.1	248.0
120°	353.1	351.3	346.6	339.3	329.1	323.6	317.1	301.5	284.0	263.7	241.5
122.5°	343.0	341.1	336.5	330.1	319.9	313.5	307.9	292.3	275.7	255.4	232.3
125°	331.9	329.1	325.4	318.1	308.8	303.3	296.9	283.0	265.5	247.1	225.0
127.5°	319.0	318.1	313.5	306.1	297.8	292.3	286.7	272.9	256.3	236.9	216.7
130°	307.0	306.1	301.5	295.0	286.7	281.2	275.7	262.8	247.1	227.7	208.4
132.5°	294.1	293.2	288.6	283.0	274.7	269.2	263.7	251.7	234.2	218.5	200.1
135°	281.2	279.3	275.7	270.1	261.8	257.2	252.6	239.7	223.1	208.4	191.8
137.5°	266.4	265.5	261.8	255.4	248.9	244.3	238.8	225.9	212.0	198.2	182.5
140°	251.7	250.8	247.1	242.5	232.3	228.6	224.0	213.9	201.0	187.2	172.4
142.5°	234.2	233.2	230.5	225.0	219.4	214.8	210.2	201.0	189.0	177.0	163.2
145°	219.4	218.5	215.7	211.1	204.7	201.9	197.3	188.1	177.9	166.9	154.0
147.5°	204.7	203.7	201.0	197.3	191.8	189.0	184.4	176.1	166.9	155.8	144.7
150°	189.9	189.0	186.2	182.5	177.9	174.2	171.5	164.1	154.9	145.7	134.6
152.5°	173.3	173.3	171.5	167.8	163.2	161.3	157.7	151.2	142.9	134.6	124.5
155°	158.6	158.6	156.7	153.0	149.4	147.5	144.7	138.3	131.8	123.5	115.2
157.5°	143.8	143.8	142.0	139.2	135.5	133.7	131.8	126.3	119.9	113.4	106.0
160°	129.1	129.1	128.1	125.4	122.6	120.8	118.9	114.3	109.7	103.3	96.8
162.5°	114.3	114.3	113.4	111.6	108.8	107.9	106.0	102.3	97.7	93.1	87.6
165°	100.5	100.5	99.6	97.7	95.9	95.0	94.0	90.3	87.6	83.9	79.3
167.5°	87.6	87.6	86.7	85.7	83.9	83.9	83.0	80.2	77.4	74.7	71.0
170°	75.6	75.6	74.7	73.8	72.8	71.9	71.9	70.1	68.2	66.4	63.6
172.5°	63.6	63.6	63.6	62.7	61.8	61.8	61.8	59.9	59.0	58.1	55.3
175°	52.6	52.6	52.6	52.6	51.6	51.6	51.6	50.7	50.7	49.8	48.9
177.5°	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	42.4
180°	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
2.5°	42.4	42.4	41.5	40.6	40.6	40.6	39.6	38.7	38.7	37.8	36.9
5°	47.9	47.0	45.2	44.3	43.3	43.3	41.5	40.6	38.7	37.8	36.0
7.5°	53.5	52.6	49.8	47.9	47.0	46.1	44.3	41.5	39.6	37.8	36.0
10°	59.9	57.2	54.4	51.6	50.7	48.9	46.1	43.3	40.6	37.8	35.0
12.5°	66.4	63.6	59.0	55.3	53.5	51.6	47.9	44.3	40.6	37.8	34.1
15°	73.8	70.1	64.5	59.9	57.2	55.3	50.7	46.1	41.5	37.8	34.1
17.5°	81.1	75.6	70.1	64.5	60.8	58.1	52.6	47.0	42.4	37.8	33.2
20°	88.5	82.1	75.6	68.2	65.5	61.8	55.3	48.9	43.3	37.8	32.3
22.5°	96.8	88.5	81.1	72.8	69.1	64.5	57.2	49.8	43.3	37.8	32.3
25°	104.2	95.9	86.7	77.4	72.8	68.2	59.9	51.6	44.3	37.8	31.3
27.5°	112.5	102.3	92.2	82.1	76.5	71.9	62.7	53.5	45.2	37.8	31.3
30°	120.8	109.7	97.7	86.7	81.1	75.6	64.5	55.3	46.1	37.8	30.4
32.5°	129.1	117.1	104.2	91.3	84.8	79.3	67.3	56.2	47.0	37.8	30.4
35°	137.4	123.5	109.7	95.9	89.4	83.0	70.1	58.1	47.0	37.8	30.4
37.5°	145.7	130.9	115.2	100.5	93.1	85.7	71.9	59.9	47.9	38.7	29.5
40°	154.0	138.3	121.7	105.1	97.7	89.4	74.7	60.8	48.9	38.7	29.5
42.5°	162.3	144.7	127.2	110.6	101.4	93.1	77.4	62.7	49.8	38.7	29.5
45°	170.6	152.1	133.7	114.3	106.0	96.8	80.2	64.5	50.7	38.7	29.5
47.5°	178.9	158.6	139.2	118.9	109.7	100.5	82.1	66.4	51.6	39.6	29.5
50°	186.2	165.0	144.7	123.5	113.4	103.3	84.8	68.2	52.6	39.6	28.6
52.5°	193.6	171.5	149.4	128.1	117.1	106.9	87.6	69.1	53.5	40.6	29.5
55°	200.1	177.9	154.9	131.8	120.8	109.7	89.4	71.0	54.4	40.6	28.6
57.5°	206.5	183.5	159.5	135.5	124.5	112.5	91.3	71.9	55.3	40.6	28.6
60°	213.0	189.0	164.1	139.2	127.2	116.2	94.0	73.8	56.2	41.5	29.5
62.5°	219.4	194.5	168.7	142.9	130.9	118.0	95.9	74.7	57.2	41.5	28.6
65°	225.0	199.1	172.4	146.6	133.7	120.8	97.7	76.5	57.2	41.5	28.6
67.5°	229.6	203.7	176.1	149.4	136.4	123.5	99.6	77.4	58.1	42.4	29.5
70°	236.0	207.4	179.8	152.1	139.2	125.4	100.5	78.4	59.0	42.4	29.5
72.5°	239.7	211.1	183.5	154.9	141.1	128.1	102.3	79.3	59.0	42.4	29.5
75°	245.2	214.8	186.2	156.7	142.9	130.0	103.3	80.2	59.9	43.3	29.5
77.5°	248.0	217.6	188.1	158.6	144.7	130.9	104.2	81.1	59.9	43.3	29.5
80°	250.8	219.4	189.9	160.4	146.6	132.8	106.0	82.1	60.8	43.3	29.5
82.5°	252.6	221.3	191.8	161.3	147.5	132.8	106.0	82.1	60.8	43.3	29.5
85°	253.5	223.1	192.7	162.3	148.4	133.7	106.9	82.1	60.8	43.3	29.5
87.5°	254.5	223.1	193.6	163.2	148.4	134.6	106.9	82.1	60.8	43.3	29.5
90°	255.4	224.0	193.6	163.2	148.4	134.6	106.9	83.0	60.8	43.3	29.5
92.5°	256.3	225.0	194.5	164.1	149.4	135.5	107.9	83.0	61.8	43.3	29.5
95°	256.3	224.0	193.6	164.1	149.4	134.6	107.9	83.0	61.8	43.3	29.5
97.5°	254.5	223.1	192.7	163.2	148.4	134.6	106.9	83.0	60.8	43.3	29.5
100°	252.6	221.3	191.8	161.3	147.5	133.7	106.0	82.1	60.8	43.3	29.5
102.5°	249.8	219.4	189.9	160.4	145.7	131.8	105.1	81.1	60.8	43.3	29.5
105°	246.2	216.7	187.2	158.6	144.7	130.9	104.2	81.1	59.9	43.3	29.5
107.5°	243.4	213.0	184.4	155.8	142.9	129.1	103.3	80.2	59.9	42.4	29.5
110°	237.9	209.3	181.6	154.0	140.1	127.2	101.4	79.3	59.0	42.4	29.5





TEST NUMBER: P190112

CATALOG NUMBER: TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	232.3	205.6	177.9	151.2	138.3	125.4	100.5	78.4	59.0	42.4	29.5
115°	226.8	201.0	174.2	148.4	135.5	122.6	98.6	77.4	58.1	42.4	29.5
117.5°	221.3	196.4	170.6	144.7	132.8	120.8	96.8	76.5	57.2	41.5	29.5
120°	215.7	191.8	166.9	142.0	130.0	118.0	95.0	74.7	57.2	41.5	29.5
122.5°	209.3	186.2	162.3	138.3	126.3	115.2	93.1	73.8	56.2	41.5	29.5
125°	202.8	180.7	157.7	134.6	123.5	112.5	91.3	71.9	55.3	41.5	29.5
127.5°	195.4	174.2	152.1	130.0	119.9	108.8	89.4	71.0	54.4	40.6	29.5
130°	188.1	167.8	147.5	126.3	116.2	106.0	86.7	69.1	53.5	40.6	29.5
132.5°	180.7	161.3	142.0	121.7	112.5	102.3	84.8	68.2	53.5	40.6	29.5
135°	173.3	154.9	136.4	117.1	107.9	99.6	82.1	66.4	52.6	39.6	29.5
137.5°	165.0	148.4	130.0	112.5	104.2	95.9	79.3	64.5	51.6	39.6	29.5
140°	156.7	140.1	124.5	107.9	99.6	92.2	76.5	62.7	50.7	39.6	30.4
142.5°	148.4	133.7	118.0	103.3	95.9	88.5	74.7	60.8	49.8	38.7	30.4
145°	140.1	126.3	112.5	98.6	91.3	84.8	71.9	59.9	48.9	38.7	30.4
147.5°	132.8	119.9	106.0	94.0	87.6	81.1	69.1	58.1	47.9	38.7	31.3
150°	123.5	112.5	100.5	88.5	83.0	77.4	66.4	56.2	47.0	38.7	31.3
152.5°	115.2	105.1	94.0	83.9	79.3	73.8	63.6	54.4	46.1	38.7	31.3
155°	106.9	97.7	88.5	79.3	74.7	70.1	61.8	53.5	45.2	38.7	32.3
157.5°	98.6	90.3	83.0	74.7	71.0	66.4	59.0	51.6	44.3	38.7	32.3
160°	90.3	83.9	76.5	70.1	66.4	62.7	56.2	49.8	44.3	38.7	33.2
162.5°	83.0	77.4	71.0	65.5	62.7	59.0	53.5	48.9	43.3	38.7	34.1
165°	75.6	70.1	65.5	60.8	59.0	56.2	50.7	47.0	42.4	37.8	34.1
167.5°	68.2	64.5	60.8	57.2	55.3	52.6	48.9	45.2	41.5	38.7	35.0
170°	60.8	58.1	55.3	52.6	50.7	49.8	47.0	44.3	40.6	38.7	36.0
172.5°	54.4	52.6	50.7	48.9	47.9	46.1	44.3	42.4	40.6	37.8	36.0
175°	47.9	47.0	46.1	44.3	44.3	43.3	42.4	40.6	39.6	37.8	36.9
177.5°	42.4	41.5	41.5	41.5	40.6	40.6	39.6	39.6	38.7	38.7	37.8
180°	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9



TEST NUMBER: P190112

CATALOG NUMBER: TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
2.5°	36.0	35.0	34.1	34.1	33.2	33.2	32.3	31.3	30.4	30.4	29.5
5°	35.0	33.2	32.3	31.3	30.4	29.5	28.6	27.7	25.8	25.8	24.9
7.5°	34.1	32.3	30.4	29.5	28.6	26.7	24.9	24.0	22.1	21.2	20.3
10°	32.3	30.4	27.7	26.7	25.8	24.0	22.1	20.3	19.4	17.5	16.6
12.5°	31.3	28.6	25.8	24.9	23.0	21.2	19.4	17.5	15.7	14.8	12.9
15°	30.4	26.7	24.0	23.0	21.2	19.4	16.6	14.8	12.9	12.0	11.1
17.5°	29.5	25.8	22.1	21.2	19.4	16.6	14.8	12.9	11.1	9.2	8.3
20°	27.7	24.0	21.2	19.4	17.5	14.8	12.9	10.1	9.2	7.4	6.5
22.5°	26.7	23.0	19.4	17.5	15.7	12.9	10.1	8.3	7.4	6.5	5.5
25°	25.8	22.1	17.5	15.7	13.8	11.1	9.2	7.4	6.5	5.5	5.5
27.5°	24.9	20.3	16.6	14.8	12.9	10.1	7.4	6.5	5.5	5.5	5.5
30°	24.9	19.4	15.7	12.9	12.0	9.2	6.5	6.5	5.5	5.5	5.5
32.5°	24.0	18.4	13.8	12.0	10.1	7.4	6.5	6.5	5.5	5.5	5.5
35°	23.0	17.5	12.9	11.1	9.2	6.5	6.5	5.5	5.5	5.5	5.5
37.5°	23.0	16.6	12.0	10.1	8.3	6.5	5.5	5.5	5.5	5.5	4.6
40°	22.1	16.6	11.1	9.2	8.3	6.5	5.5	5.5	5.5	5.5	4.6
42.5°	22.1	15.7	11.1	8.3	7.4	6.5	5.5	5.5	5.5	5.5	4.6
45°	21.2	14.8	10.1	8.3	6.5	6.5	5.5	5.5	5.5	4.6	4.6
47.5°	21.2	14.8	9.2	7.4	6.5	6.5	5.5	5.5	5.5	4.6	4.6
50°	20.3	13.8	9.2	7.4	6.5	6.5	5.5	5.5	5.5	4.6	4.6
52.5°	20.3	13.8	8.3	6.5	6.5	6.5	5.5	5.5	5.5	4.6	4.6
55°	20.3	12.9	8.3	6.5	6.5	6.5	5.5	5.5	4.6	4.6	4.6
57.5°	19.4	12.9	7.4	6.5	6.5	6.5	5.5	5.5	4.6	4.6	4.6
60°	19.4	12.0	7.4	6.5	6.5	6.5	5.5	5.5	4.6	4.6	4.6
62.5°	19.4	12.0	7.4	6.5	6.5	6.5	5.5	5.5	4.6	4.6	3.7
65°	19.4	12.0	6.5	6.5	6.5	5.5	5.5	5.5	4.6	4.6	3.7
67.5°	19.4	11.1	6.5	6.5	6.5	6.5	5.5	5.5	4.6	4.6	3.7
70°	19.4	11.1	6.5	6.5	6.5	6.5	5.5	5.5	4.6	4.6	3.7
72.5°	18.4	11.1	6.5	6.5	6.5	6.5	5.5	5.5	4.6	4.6	3.7
75°	18.4	11.1	6.5	6.5	6.5	6.5	5.5	5.5	4.6	4.6	3.7
77.5°	18.4	11.1	6.5	6.5	6.5	5.5	5.5	5.5	4.6	4.6	3.7
80°	18.4	11.1	6.5	6.5	6.5	6.5	5.5	5.5	4.6	4.6	3.7
82.5°	18.4	10.1	6.5	6.5	6.5	5.5	5.5	5.5	4.6	3.7	3.7
85°	18.4	10.1	6.5	6.5	5.5	5.5	5.5	4.6	4.6	3.7	3.7
87.5°	18.4	10.1	6.5	6.5	5.5	5.5	5.5	4.6	4.6	3.7	2.8
90°	18.4	10.1	6.5	5.5	5.5	5.5	4.6	4.6	3.7	3.7	2.8
92.5°	18.4	10.1	6.5	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7
95°	18.4	10.1	5.5	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7
97.5°	18.4	10.1	5.5	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7
100°	18.4	10.1	5.5	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7
102.5°	18.4	10.1	5.5	5.5	5.5	5.5	4.6	4.6	3.7	3.7	2.8
105°	18.4	10.1	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	2.8
107.5°	18.4	10.1	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	2.8
110°	18.4	11.1	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	2.8



TEST NUMBER: P190112

CATALOG NUMBER: TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	18.4	11.1	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	2.8
115°	19.4	11.1	6.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	3.7
117.5°	19.4	12.0	6.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	3.7
120°	19.4	12.0	6.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	3.7
122.5°	19.4	12.0	7.4	5.5	5.5	4.6	4.6	4.6	3.7	3.7	3.7
125°	20.3	12.9	7.4	5.5	5.5	4.6	4.6	4.6	3.7	3.7	3.7
127.5°	20.3	12.9	8.3	5.5	4.6	4.6	4.6	4.6	3.7	3.7	3.7
130°	20.3	13.8	8.3	6.5	4.6	4.6	4.6	4.6	3.7	3.7	3.7
132.5°	21.2	13.8	9.2	6.5	5.5	4.6	4.6	3.7	3.7	3.7	3.7
135°	21.2	14.8	9.2	7.4	5.5	4.6	4.6	3.7	3.7	3.7	3.7
137.5°	22.1	14.8	10.1	8.3	6.5	4.6	4.6	3.7	3.7	3.7	3.7
140°	22.1	15.7	11.1	8.3	6.5	4.6	4.6	3.7	3.7	3.7	3.7
142.5°	23.0	16.6	12.0	9.2	8.3	5.5	4.6	3.7	3.7	3.7	3.7
145°	23.0	17.5	12.9	10.1	8.3	5.5	4.6	3.7	3.7	3.7	3.7
147.5°	24.0	18.4	13.8	12.0	10.1	6.5	4.6	3.7	3.7	3.7	3.7
150°	24.9	19.4	14.8	12.9	11.1	8.3	5.5	3.7	3.7	3.7	3.7
152.5°	25.8	20.3	15.7	13.8	12.0	9.2	6.5	4.6	3.7	3.7	3.7
155°	26.7	22.1	17.5	15.7	13.8	11.1	8.3	6.5	4.6	3.7	3.7
157.5°	27.7	23.0	19.4	17.5	15.7	12.9	10.1	7.4	6.5	4.6	3.7
160°	28.6	24.0	20.3	19.4	17.5	14.8	12.0	10.1	8.3	6.5	5.5
162.5°	29.5	25.8	22.1	21.2	19.4	16.6	13.8	12.0	10.1	8.3	7.4
165°	30.4	27.7	24.0	23.0	21.2	19.4	16.6	14.8	12.9	11.1	10.1
167.5°	32.3	28.6	26.7	24.9	24.0	21.2	19.4	17.5	15.7	14.8	12.9
170°	33.2	30.4	28.6	27.7	26.7	24.0	22.1	21.2	19.4	17.5	16.6
172.5°	34.1	32.3	30.4	29.5	28.6	27.7	25.8	24.9	23.0	22.1	21.2
175°	36.0	34.1	33.2	32.3	32.3	30.4	29.5	28.6	27.7	25.8	25.8
177.5°	36.9	36.0	36.0	35.0	35.0	34.1	33.2	33.2	32.3	31.3	31.3
180°	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9



TEST NUMBER: P190112

CATALOG NUMBER: TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
2.5°	28.6	28.6	27.7	27.7	27.7	26.7	26.7	26.7
5°	24.0	23.0	23.0	22.1	22.1	21.2	21.2	21.2
7.5°	19.4	18.4	18.4	18.4	17.5	16.6	16.6	16.6
10°	15.7	14.8	14.8	13.8	13.8	12.9	12.9	12.9
12.5°	12.0	11.1	11.1	11.1	10.1	10.1	9.2	9.2
15°	9.2	9.2	8.3	8.3	7.4	7.4	7.4	7.4
17.5°	7.4	6.5	6.5	6.5	5.5	5.5	5.5	5.5
20°	6.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
22.5°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
25°	5.5	5.5	5.5	5.5	5.5	5.5	4.6	4.6
27.5°	5.5	5.5	5.5	4.6	4.6	4.6	4.6	4.6
30°	5.5	5.5	4.6	4.6	4.6	4.6	4.6	4.6
32.5°	5.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
35°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
37.5°	4.6	4.6	4.6	4.6	4.6	3.7	3.7	3.7
40°	4.6	4.6	4.6	4.6	3.7	3.7	3.7	3.7
42.5°	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7
45°	4.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7
47.5°	4.6	3.7	3.7	3.7	3.7	3.7	2.8	2.8
50°	3.7	3.7	3.7	3.7	3.7	2.8	2.8	2.8
52.5°	3.7	3.7	3.7	3.7	2.8	2.8	2.8	2.8
55°	3.7	3.7	3.7	2.8	2.8	2.8	2.8	2.8
57.5°	3.7	3.7	2.8	2.8	2.8	2.8	1.8	1.8
60°	3.7	3.7	2.8	2.8	2.8	2.8	1.8	1.8
62.5°	3.7	3.7	2.8	2.8	2.8	1.8	1.8	1.8
65°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
67.5°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
70°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
72.5°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
75°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
77.5°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
80°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
82.5°	2.8	2.8	2.8	1.8	1.8	1.8	1.8	1.8
85°	2.8	2.8	1.8	1.8	1.8	1.8	0.9	0.9
87.5°	2.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
90°	2.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
92.5°	2.8	2.8	1.8	1.8	1.8	0.9	0.9	0.9
95°	2.8	2.8	1.8	1.8	1.8	1.8	0.9	0.9
97.5°	2.8	2.8	1.8	1.8	1.8	0.9	0.9	0.9
100°	2.8	2.8	1.8	1.8	1.8	0.9	0.9	0.9
102.5°	2.8	2.8	1.8	1.8	1.8	0.9	0.9	0.9
105°	2.8	2.8	1.8	1.8	1.8	1.8	0.9	0.9
107.5°	2.8	2.8	1.8	1.8	1.8	1.8	0.9	0.9
110°	2.8	2.8	1.8	1.8	1.8	0.9	0.9	0.9



TEST NUMBER: P190112

CATALOG NUMBER: TRR11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	2.8	2.8	1.8	1.8	1.8	1.8	1.8	0.9
115°	2.8	2.8	2.8	1.8	1.8	1.8	1.8	1.8
117.5°	2.8	2.8	2.8	2.8	1.8	1.8	1.8	1.8
120°	2.8	2.8	2.8	2.8	1.8	1.8	1.8	1.8
122.5°	2.8	2.8	2.8	2.8	1.8	1.8	1.8	1.8
125°	2.8	2.8	2.8	2.8	1.8	1.8	1.8	1.8
127.5°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
130°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
132.5°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
135°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
137.5°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
140°	2.8	2.8	2.8	2.8	2.8	2.8	1.8	1.8
142.5°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
145°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
147.5°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
150°	3.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8
152.5°	3.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8
155°	3.7	3.7	2.8	2.8	2.8	2.8	2.8	2.8
157.5°	3.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8
160°	4.6	3.7	3.7	3.7	2.8	2.8	2.8	2.8
162.5°	6.5	5.5	5.5	4.6	4.6	3.7	3.7	3.7
165°	9.2	8.3	7.4	7.4	6.5	6.5	6.5	6.5
167.5°	12.0	11.1	11.1	10.1	10.1	9.2	9.2	9.2
170°	15.7	14.8	14.8	13.8	13.8	12.9	12.9	12.9
172.5°	20.3	19.4	18.4	18.4	18.4	17.5	17.5	17.5
175°	24.9	24.0	24.0	24.0	23.0	23.0	23.0	23.0
177.5°	30.4	30.4	29.5	29.5	29.5	29.5	28.6	29.5
180°	36.9	36.9	36.9	36.9	36.9	36.9	36.9	36.9

(END OF REPORT)