

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: P190115

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

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190115  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27872)  
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-CL-BK-UNV-EDC1-CSTG  
Description: TERRAPIN 11" LED SHALLOW CAST WALL MOUNT WITH OPEN CLEAR LENS AND BRONZE RING  
Light Source: (56) NICHIA 5000 NF2L757DRT  
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 450mA OT40W/1

**Summary**

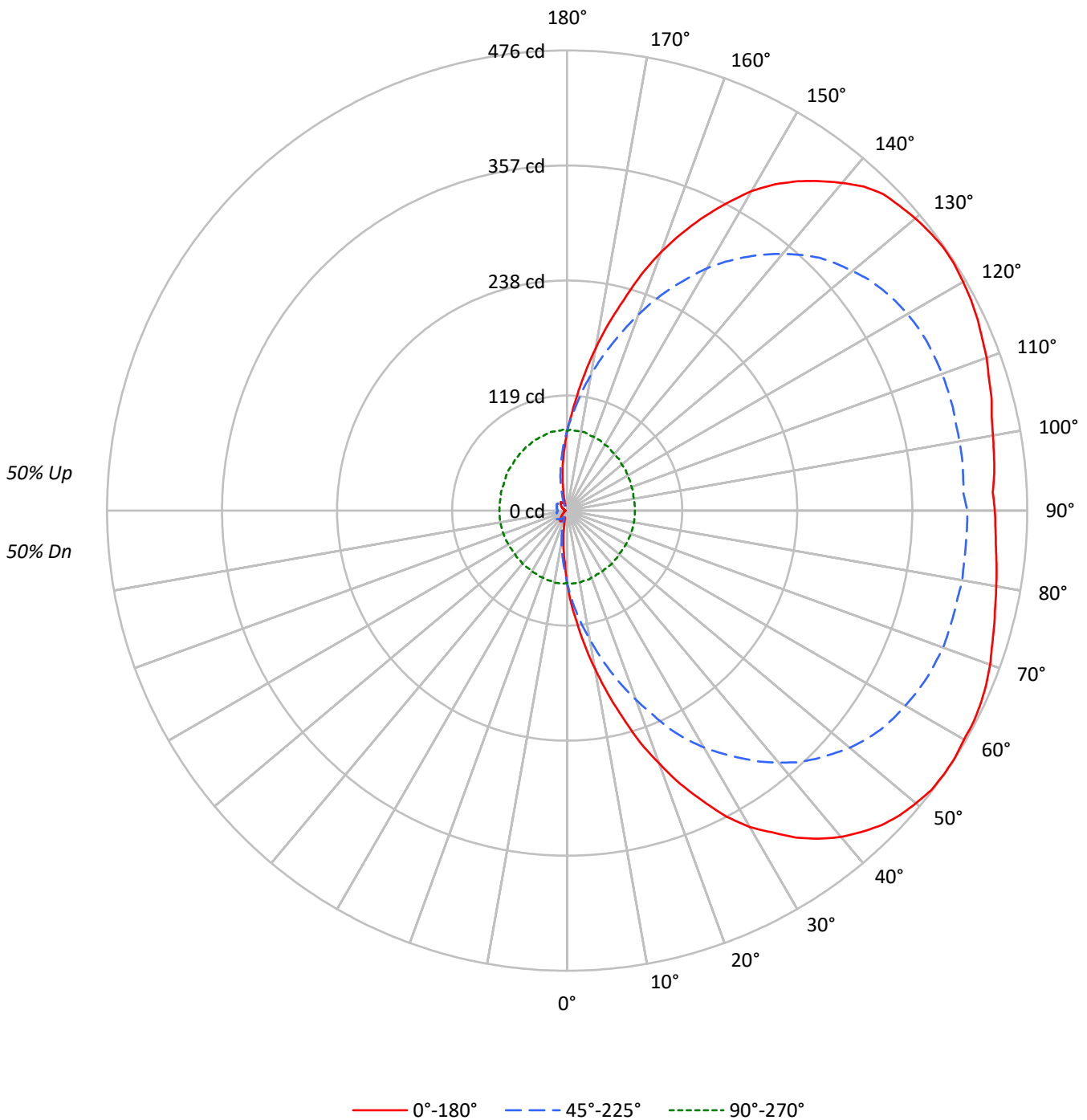
Lumens per Lamp: N/A  
Luminaire Lumens: 2114.0 lumens  
Efficiency: N/A  
Efficacy: 96.5 lumens/watt  
Spacing Criteria (0/90/45): 3.13 / 1.48 / 2.84  
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')  
CIE Type: General Diffuse

Input Watts (W): 21.9  
Input Voltage (V): NR  
Input Current (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

TEST NUMBER: P190115

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

### Luminous Intensity Polar Plot





TEST NUMBER: P190115

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

**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	93	87	81	76	85	79	74	70	66	62	58	53	51	48	42	40	38	32
2	83	73	65	58	75	67	60	54	55	50	45	44	40	36	34	31	28	23
3	74	63	54	46	68	57	49	43	47	41	36	38	33	29	29	25	22	18
4	67	54	45	38	61	50	41	35	41	34	29	33	27	23	25	21	18	14
5	61	48	38	31	56	44	35	29	36	29	24	29	23	19	22	18	15	11
6	56	42	33	26	51	39	30	24	32	25	20	25	20	16	19	15	12	9
7	52	38	29	23	47	35	27	21	29	22	17	23	18	14	18	14	10	8
8	48	34	26	20	43	31	23	18	26	20	15	21	16	12	16	12	9	6
9	44	31	23	17	40	28	21	16	23	17	13	19	14	10	15	11	8	6
10	41	28	20	15	38	26	19	14	21	16	12	17	13	9	13	10	7	5

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

	0°	90°	180°
0°	3007	3007	3007
5°	3683	2809	1315
10°	4366	2627	534
15°	5007	2456	208
20°	5564	2318	148
25°	5964	2205	182
30°	6243	2146	213
35°	6342	2078	198
40°	6368	2055	160
45°	6323	2021	114
50°	6218	2003	86
55°	6084	2026	59
60°	5922	2066	46
65°	5809	2124	46
70°	5688	2202	34
75°	5588	2304	34
80°	5552	2436	34
85°	5571	2605	35



TEST NUMBER: P190115

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

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	7.6	0.4
10°-20°	27.6	1.3
20°-30°	58.1	2.7
30°-40°	95.2	4.5
40°-50°	131.4	6.2
50°-60°	160.9	7.6
60°-70°	181.6	8.6
70°-80°	193.5	9.2
80°-90°	197.9	9.4
90°-100°	197.1	9.3
100°-110°	192.8	9.1
110°-120°	181.9	8.6
120°-130°	162.1	7.7
130°-140°	133.0	6.3
140°-150°	96.7	4.6
150°-160°	59.5	2.8
160°-170°	29.0	1.4
170°-180°	8.2	0.4
0°-30°	93.2	4.4
0°-40°	188.5	8.9
0°-60°	480.8	22.7
0°-90°	1053.8	49.8
90°-120°	571.8	27.0
90°-150°	963.5	45.6
90°-180°	1060.0	50.1
0°-180°	2114.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	75	75	75	75	75	
5°	116	104	76	51	42	13
15°	221	172	75	19	9	65
25°	331	248	73	7	10	154
35°	413	312	72	10	13	259
45°	460	363	71	13	8	355
55°	476	396	70	14	5	426
65°	472	410	70	12	4	468
75°	457	414	70	11	3	484
85°	445	414	70	10	3	365
90°	442	414	70	10	2	242
95°	444	411	70	10	3	363
105°	454	413	71	11	3	480
115°	468	411	72	12	5	464
125°	475	398	74	12	7	425
135°	463	370	76	10	9	357
145°	416	320	77	7	10	261
155°	336	254	80	7	7	156
165°	225	178	82	24	10	66
175°	120	110	83	59	50	13
180°	82	82	82	82	82	



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7
2.5°	95.9	95.0	94.0	93.1	93.1	93.1	93.1	92.2	91.3	90.4	89.4
5°	116.2	116.2	115.2	114.3	115.2	113.4	112.5	110.6	108.8	106.0	104.2
7.5°	141.1	140.1	138.3	137.4	135.5	134.6	133.7	130.9	128.2	122.6	119.9
10°	166.0	165.0	162.3	161.3	158.6	157.7	155.8	151.2	146.6	141.1	135.5
12.5°	193.6	191.8	189.9	187.2	183.5	182.5	179.8	174.3	167.8	160.4	153.0
15°	221.3	220.3	218.5	214.8	210.2	209.3	206.5	198.2	189.9	180.7	171.5
17.5°	251.7	252.6	248.9	245.2	238.8	236.9	229.6	222.2	212.1	201.0	189.9
20°	278.4	279.4	274.7	271.1	263.7	261.8	256.3	248.0	235.1	221.3	208.4
22.5°	306.1	306.1	301.5	296.9	289.5	286.7	280.3	271.1	258.2	244.3	226.8
25°	331.0	329.1	327.3	321.8	314.4	310.7	304.2	293.2	279.4	264.6	248.0
27.5°	356.8	354.0	351.3	345.7	337.4	333.8	327.3	316.2	300.6	284.9	266.4
30°	378.0	375.2	372.5	366.9	357.7	354.0	347.6	335.6	319.9	301.5	283.0
32.5°	394.6	394.6	390.9	385.4	376.2	371.6	366.0	353.1	336.5	319.0	297.8
35°	413.0	411.2	407.5	402.0	393.7	388.1	382.6	369.7	353.1	334.7	312.5
37.5°	427.8	426.9	423.2	417.7	409.4	404.7	398.3	385.4	368.8	349.4	327.3
40°	440.7	439.8	436.1	430.6	422.3	416.7	411.2	398.3	381.7	363.3	340.2
42.5°	450.8	449.9	447.2	441.6	433.3	428.7	422.3	409.4	393.7	375.2	353.1
45°	460.1	459.1	456.4	450.8	442.5	437.9	433.3	420.4	405.7	386.3	363.3
47.5°	466.5	465.6	462.8	457.3	449.9	445.3	440.7	428.7	414.0	395.5	372.5
50°	471.1	470.2	467.4	462.8	455.5	450.8	447.2	435.2	421.3	403.8	381.7
52.5°	474.8	473.9	470.2	466.5	459.1	455.5	450.8	440.7	426.9	409.4	389.1
55°	475.7	474.8	472.0	468.4	461.9	458.2	453.6	444.4	431.5	415.8	395.5
57.5°	475.7	474.8	472.0	468.4	462.8	459.1	455.5	446.2	434.2	419.5	400.1
60°	473.9	473.9	471.1	467.4	461.9	458.2	455.5	447.2	436.1	422.3	403.8
62.5°	473.9	473.0	470.2	466.5	461.9	458.2	455.5	447.2	437.9	424.1	407.5
65°	472.0	471.1	468.4	464.7	460.1	457.3	454.5	447.2	437.9	425.9	410.3
67.5°	469.3	468.4	465.6	462.8	458.2	455.5	452.7	446.2	437.9	426.9	412.1
70°	465.6	465.6	462.8	460.1	455.5	453.6	450.8	444.4	437.0	426.9	414.0
72.5°	461.0	461.0	459.1	456.4	452.7	449.9	448.1	442.5	436.1	426.9	414.0
75°	457.3	457.3	455.5	452.7	449.0	447.2	444.4	439.8	434.2	425.9	414.0
77.5°	453.6	452.7	451.8	449.0	445.3	443.5	441.6	437.9	432.4	425.0	414.0
80°	450.8	449.9	448.1	445.3	443.5	440.7	439.8	436.1	431.5	425.0	414.9
82.5°	448.1	448.1	445.3	443.5	439.8	437.9	437.0	434.2	429.6	424.1	414.0
85°	445.3	444.4	443.5	440.7	437.9	436.1	435.2	432.4	428.7	423.2	414.0
87.5°	443.5	443.5	441.6	438.9	437.0	435.2	434.2	431.5	427.8	422.3	414.0
90°	442.5	442.5	440.7	438.9	436.1	435.2	434.2	431.5	427.8	422.3	414.0
92.5°	440.7	440.7	437.9	436.1	434.2	433.3	431.5	429.6	425.9	419.5	410.3
95°	443.5	441.6	439.8	437.9	435.2	434.2	433.3	430.6	425.9	420.4	411.2
97.5°	445.3	444.4	442.5	439.8	437.9	436.1	435.2	432.4	427.8	421.3	412.1
100°	447.2	447.2	445.3	443.5	440.7	438.9	437.0	433.3	429.6	423.2	412.1
102.5°	449.9	449.9	448.1	445.3	442.5	441.6	439.8	436.1	430.6	423.2	412.1
105°	454.5	452.7	451.8	449.0	446.2	444.4	442.5	437.0	432.4	424.1	413.0
107.5°	457.3	456.4	454.5	451.8	449.0	447.2	445.3	440.7	433.3	425.0	413.0
110°	461.9	461.0	459.1	456.4	452.7	450.8	448.1	442.5	435.2	425.9	413.0



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	464.7	463.7	461.9	459.1	454.5	452.7	449.9	444.4	436.1	425.9	412.1
115°	468.4	467.4	465.6	461.9	457.3	455.5	452.7	446.2	437.0	425.9	411.2
117.5°	471.1	470.2	468.4	464.7	460.1	457.3	453.6	447.2	437.9	425.0	409.4
120°	473.0	472.0	470.2	466.5	461.0	457.3	454.5	447.2	436.1	423.2	406.6
122.5°	474.8	473.0	471.1	466.5	461.9	458.2	454.5	446.2	435.2	421.3	402.9
125°	474.8	473.9	471.1	466.5	461.0	457.3	453.6	444.4	432.4	416.7	398.3
127.5°	473.0	472.0	469.3	464.7	459.1	455.5	450.8	440.7	427.8	412.1	392.8
130°	470.2	469.3	466.5	461.9	455.5	450.8	447.2	436.1	423.2	405.7	385.4
132.5°	466.5	465.6	462.8	457.3	450.8	447.2	442.5	430.6	416.7	398.3	378.0
135°	462.8	461.0	457.3	452.7	446.2	440.7	436.1	424.1	409.4	390.9	369.7
137.5°	454.5	451.8	449.0	444.4	437.0	431.5	426.9	414.9	399.2	379.8	358.6
140°	442.5	441.6	437.9	432.4	425.0	420.4	414.9	402.0	386.3	366.9	346.7
142.5°	429.6	428.7	425.0	419.5	411.2	406.6	402.0	389.1	372.5	354.0	333.8
145°	415.8	414.9	410.3	405.7	397.4	392.8	387.2	374.3	358.6	339.3	319.9
147.5°	400.1	399.2	395.5	390.0	381.7	376.2	371.6	358.6	343.0	324.5	305.2
150°	381.7	378.9	375.2	370.6	362.3	357.7	354.0	340.2	324.5	307.9	289.5
152.5°	358.6	356.8	353.1	348.5	341.1	335.6	331.9	319.9	304.2	288.6	271.1
155°	335.6	333.8	330.1	326.4	318.1	313.5	310.7	297.8	284.9	270.1	253.5
157.5°	310.7	308.9	307.0	301.5	295.0	290.4	286.7	276.6	263.7	249.9	235.1
160°	284.9	282.1	279.4	276.6	270.1	265.5	262.8	253.5	241.6	227.7	215.7
162.5°	256.3	254.5	251.7	248.9	244.3	239.7	236.0	226.8	217.6	206.5	196.4
165°	225.0	223.1	221.3	219.4	214.8	211.1	208.4	202.8	195.5	186.2	177.9
167.5°	198.2	196.4	195.5	192.7	189.9	186.2	185.3	179.8	174.3	166.9	160.4
170°	170.6	169.6	168.7	166.9	164.1	162.3	160.4	156.7	154.0	147.5	142.9
172.5°	144.7	143.8	142.9	142.0	140.1	138.3	137.4	134.6	132.8	129.1	126.3
175°	119.9	118.9	118.9	118.0	118.0	116.2	116.2	114.3	113.4	110.6	109.7
177.5°	98.7	97.7	98.7	97.7	97.7	96.8	97.7	96.8	96.8	96.8	95.9
180°	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7
2.5°	88.5	87.6	85.7	84.8	83.9	83.0	81.1	79.3	77.4	75.6	73.8
5°	101.4	98.7	95.9	93.1	91.3	89.4	86.7	83.0	79.3	75.6	72.8
7.5°	115.2	111.6	106.0	101.4	98.7	95.9	91.3	85.7	81.1	75.6	71.0
10°	129.1	123.5	116.2	109.7	106.0	102.3	95.9	88.5	82.1	75.6	69.1
12.5°	145.7	135.5	127.2	118.0	113.4	108.8	100.5	91.3	83.0	74.7	67.3
15°	161.3	150.3	139.2	128.2	121.7	117.1	106.0	95.0	83.9	74.7	65.5
17.5°	177.9	164.1	150.3	137.4	130.0	123.5	110.6	97.7	85.7	74.7	64.5
20°	194.5	177.9	162.3	146.6	138.3	130.0	115.2	100.5	86.7	73.8	62.7
22.5°	210.2	191.8	174.3	155.8	146.6	137.4	119.9	103.3	87.6	73.8	60.8
25°	226.8	206.5	186.2	166.0	154.9	144.7	124.5	106.0	88.5	72.8	59.0
27.5°	246.2	221.3	199.1	176.1	164.1	152.1	130.0	108.8	90.4	72.8	58.1
30°	260.9	236.0	210.2	185.3	172.4	159.5	134.6	111.6	91.3	72.8	56.2
32.5°	275.7	249.9	222.2	194.5	179.8	166.0	140.1	114.3	92.2	71.9	55.3
35°	289.5	262.8	234.2	202.8	188.1	173.3	144.7	117.1	93.1	71.9	54.4
37.5°	303.3	275.7	245.2	212.1	196.4	179.8	149.4	119.9	94.0	71.9	52.6
40°	315.3	286.7	256.3	221.3	203.8	186.2	154.0	122.6	95.0	71.9	51.6
42.5°	326.4	297.8	265.5	228.6	211.1	192.7	157.7	124.5	95.9	71.0	50.7
45°	338.4	307.9	274.7	239.7	217.6	199.1	162.3	127.2	96.8	71.0	49.8
47.5°	347.6	317.2	283.0	247.1	225.0	205.6	166.0	130.0	97.7	71.0	48.9
50°	355.9	325.5	291.3	253.5	231.4	211.1	170.6	131.8	98.7	70.1	47.9
52.5°	364.2	333.8	299.6	260.9	239.7	216.7	174.3	133.7	99.6	70.1	47.0
55°	370.6	341.1	306.1	267.4	245.2	221.3	177.9	136.5	100.5	70.1	46.1
57.5°	376.2	346.7	312.5	272.0	249.9	225.9	181.6	138.3	100.5	70.1	45.2
60°	380.8	352.2	317.2	277.5	255.4	230.5	184.4	140.1	101.4	70.1	45.2
62.5°	385.4	356.8	322.7	283.0	260.0	236.0	188.1	142.0	102.3	70.1	44.3
65°	389.1	361.4	327.3	287.7	264.6	241.6	190.8	143.8	103.3	70.1	44.3
67.5°	392.8	366.0	331.9	291.3	269.2	245.2	193.6	145.7	103.3	70.1	44.3
70°	394.6	368.8	335.6	295.0	272.0	248.9	196.4	146.6	104.2	70.1	43.3
72.5°	396.4	371.6	338.4	298.7	275.7	251.7	198.2	148.4	105.1	70.1	43.3
75°	397.4	372.5	341.1	300.6	277.5	253.5	200.1	149.4	105.1	70.1	43.3
77.5°	398.3	374.3	342.0	302.4	279.4	255.4	201.9	150.3	106.0	70.1	42.4
80°	399.2	376.2	343.9	304.2	281.2	257.2	202.8	151.2	106.0	70.1	42.4
82.5°	399.2	376.2	344.8	305.2	282.1	258.2	203.8	151.2	106.0	70.1	42.4
85°	398.3	377.1	344.8	306.1	283.0	258.2	204.7	152.1	106.0	70.1	42.4
87.5°	399.2	377.1	346.7	307.0	284.0	259.1	204.7	152.1	106.0	70.1	42.4
90°	399.2	378.0	346.7	307.9	284.0	260.0	205.6	153.0	106.9	70.1	42.4
92.5°	396.4	374.3	343.9	305.2	282.1	258.2	203.8	152.1	106.9	70.1	43.3
95°	396.4	374.3	343.9	305.2	282.1	258.2	203.8	152.1	106.9	70.1	43.3
97.5°	396.4	374.3	343.9	304.2	281.2	257.2	203.8	152.1	106.9	70.1	43.3
100°	397.4	373.4	343.0	303.3	280.3	256.3	202.8	152.1	106.9	70.1	43.3
102.5°	397.4	373.4	342.0	302.4	279.4	255.4	201.9	151.2	106.9	70.1	43.3
105°	396.4	372.5	340.2	300.6	278.4	254.5	201.0	150.3	106.9	71.0	44.3
107.5°	395.5	370.6	338.4	298.7	275.7	252.6	200.1	149.4	106.0	71.0	44.3
110°	394.6	368.8	336.5	296.0	273.8	249.9	198.2	149.4	106.0	71.0	45.2





TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	391.8	366.0	332.8	292.3	270.1	246.2	195.5	147.5	106.0	71.0	45.2
115°	390.0	364.2	330.1	289.5	267.4	243.4	193.6	146.6	106.0	71.9	46.1
117.5°	388.1	360.5	326.4	285.8	263.7	239.7	190.8	145.7	105.1	71.9	47.0
120°	383.5	355.9	321.8	281.2	259.1	236.0	188.1	143.8	105.1	72.8	47.9
122.5°	379.8	350.3	316.2	276.6	255.4	232.3	185.3	142.0	104.2	72.8	48.9
125°	374.3	344.8	310.7	271.1	249.9	226.8	182.5	141.1	104.2	73.8	48.9
127.5°	367.9	338.4	304.2	264.6	244.3	221.3	178.9	138.3	103.3	73.8	49.8
130°	360.5	330.1	296.9	258.2	237.9	216.7	175.2	136.5	103.3	73.8	50.7
132.5°	352.2	322.7	288.6	251.7	231.4	211.1	171.5	134.6	102.3	74.7	52.6
135°	343.9	314.4	281.2	244.3	224.0	205.6	167.8	132.8	102.3	75.6	53.5
137.5°	332.8	303.3	272.0	235.1	216.7	199.1	164.1	130.9	101.4	75.6	54.4
140°	320.8	292.3	260.9	225.9	209.3	192.7	159.5	128.2	100.5	76.5	56.2
142.5°	308.9	280.3	251.7	216.7	201.9	186.2	154.9	125.4	99.6	76.5	57.2
145°	296.0	269.2	239.7	209.3	194.5	179.8	151.2	123.5	99.6	77.4	59.0
147.5°	282.1	256.3	228.6	200.1	187.2	173.3	146.6	121.7	98.7	78.4	60.8
150°	267.4	243.4	216.7	190.8	178.9	166.0	142.0	118.9	97.7	78.4	62.7
152.5°	250.8	226.8	205.6	181.6	170.6	158.6	137.4	116.2	96.8	79.3	63.6
155°	234.2	213.0	193.6	172.4	162.3	152.1	131.8	113.4	95.9	80.2	65.5
157.5°	217.6	199.1	181.6	162.3	154.0	144.7	127.2	110.6	95.0	80.2	67.3
160°	201.0	185.3	169.6	153.0	145.7	138.3	122.6	107.9	94.0	81.1	69.1
162.5°	184.4	170.6	157.7	143.8	137.4	130.9	117.1	105.1	93.1	81.1	71.0
165°	167.8	156.7	145.7	133.7	129.1	123.5	112.5	102.3	92.2	82.1	72.8
167.5°	152.1	142.9	134.6	125.4	121.7	117.1	107.9	99.6	91.3	83.0	74.7
170°	136.5	130.0	123.5	116.2	113.4	109.7	102.3	95.9	89.4	83.0	76.5
172.5°	121.7	116.2	112.5	106.9	105.1	102.3	97.7	93.1	87.6	83.0	78.4
175°	106.9	104.2	101.4	97.7	96.8	95.0	92.2	89.4	86.7	83.0	80.2
177.5°	94.0	93.1	92.2	90.4	90.4	89.4	87.6	86.7	85.7	83.9	82.1
180°	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7
2.5°	71.9	71.0	69.1	67.3	67.3	65.5	63.6	61.8	60.8	59.9	58.1
5°	69.1	66.4	63.6	61.8	60.8	57.2	55.3	52.6	50.7	47.9	47.0
7.5°	66.4	62.7	58.1	56.2	54.4	50.7	47.0	44.3	41.5	38.7	36.9
10°	63.6	58.1	53.5	50.7	47.9	44.3	40.6	36.9	33.2	30.4	27.7
12.5°	59.9	54.4	47.9	45.2	42.4	37.8	33.2	29.5	25.8	22.1	20.3
15°	58.1	50.7	43.3	40.6	37.8	32.3	26.7	23.0	19.4	16.6	14.8
17.5°	55.3	47.0	39.6	36.0	33.2	26.7	22.1	17.5	14.8	12.0	10.1
20°	52.6	43.3	35.0	32.3	28.6	22.1	17.5	13.8	11.1	9.2	8.3
22.5°	49.8	40.6	31.3	27.7	24.0	17.5	13.8	10.1	8.3	7.4	7.4
25°	47.0	37.8	27.7	24.0	20.3	14.8	11.1	8.3	7.4	7.4	8.3
27.5°	45.2	35.0	24.9	21.2	17.5	12.9	9.2	7.4	7.4	8.3	9.2
30°	43.3	32.3	22.1	18.4	14.8	10.1	7.4	7.4	8.3	9.2	10.1
32.5°	41.5	29.5	19.4	15.7	12.9	9.2	7.4	8.3	9.2	10.1	11.1
35°	39.6	27.7	17.5	13.8	11.1	8.3	7.4	8.3	10.1	11.1	12.0
37.5°	37.8	24.9	15.7	12.0	10.1	7.4	8.3	9.2	11.1	12.0	12.9
40°	36.0	23.0	13.8	11.1	9.2	7.4	9.2	10.1	12.0	12.9	12.9
42.5°	35.0	21.2	12.9	10.1	8.3	7.4	9.2	11.1	12.0	12.9	12.9
45°	33.2	20.3	12.0	9.2	7.4	8.3	10.1	12.0	12.9	12.9	12.9
47.5°	32.3	18.4	10.1	8.3	7.4	9.2	11.1	12.9	12.9	12.9	12.0
50°	31.3	17.5	10.1	8.3	7.4	9.2	12.0	12.9	13.8	12.9	12.0
52.5°	29.5	16.6	9.2	7.4	8.3	10.1	12.0	13.8	13.8	12.9	11.1
55°	28.6	15.7	8.3	7.4	8.3	11.1	12.9	13.8	13.8	12.0	11.1
57.5°	27.7	14.8	8.3	7.4	8.3	11.1	12.9	13.8	12.9	12.0	10.1
60°	26.7	13.8	8.3	8.3	9.2	12.0	13.8	13.8	12.9	11.1	9.2
62.5°	26.7	13.8	8.3	8.3	9.2	12.0	13.8	13.8	12.9	11.1	9.2
65°	25.8	12.9	8.3	8.3	10.1	12.0	13.8	13.8	12.0	10.1	8.3
67.5°	24.9	12.9	8.3	9.2	10.1	12.9	13.8	13.8	12.0	10.1	8.3
70°	24.9	12.0	8.3	9.2	10.1	12.9	13.8	13.8	12.0	9.2	8.3
72.5°	24.0	12.0	8.3	9.2	10.1	12.9	13.8	12.9	11.1	9.2	7.4
75°	24.0	12.0	8.3	9.2	11.1	12.9	13.8	12.9	11.1	9.2	7.4
77.5°	24.0	12.0	8.3	9.2	11.1	13.8	13.8	12.9	11.1	8.3	7.4
80°	24.0	11.1	8.3	9.2	11.1	13.8	13.8	12.9	11.1	8.3	7.4
82.5°	24.0	12.0	8.3	10.1	11.1	13.8	13.8	12.9	10.1	8.3	6.5
85°	23.0	11.1	8.3	9.2	11.1	13.8	13.8	12.0	10.1	8.3	6.5
87.5°	23.0	11.1	8.3	9.2	11.1	12.9	13.8	12.0	10.1	8.3	6.5
90°	23.0	11.1	8.3	9.2	11.1	12.9	13.8	12.0	10.1	7.4	6.5
92.5°	24.0	12.0	8.3	9.2	11.1	12.9	13.8	12.0	10.1	8.3	6.5
95°	24.0	12.0	8.3	9.2	11.1	12.9	13.8	12.9	10.1	8.3	7.4
97.5°	24.0	12.0	8.3	9.2	10.1	12.9	13.8	12.0	10.1	8.3	7.4
100°	24.0	12.0	8.3	8.3	10.1	12.0	12.9	12.0	11.1	8.3	7.4
102.5°	24.9	12.0	7.4	8.3	10.1	12.0	12.9	12.9	11.1	9.2	7.4
105°	24.9	12.0	7.4	8.3	9.2	12.0	12.9	12.9	11.1	9.2	7.4
107.5°	24.9	12.0	7.4	7.4	9.2	11.1	12.9	12.0	11.1	9.2	8.3
110°	25.8	12.9	7.4	7.4	8.3	11.1	12.9	12.9	11.1	10.1	8.3



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	25.8	12.9	7.4	7.4	8.3	10.1	12.0	12.0	11.1	10.1	8.3
115°	26.7	13.8	7.4	7.4	8.3	10.1	12.0	12.9	12.0	11.1	9.2
117.5°	28.6	14.8	8.3	7.4	7.4	10.1	12.0	12.9	12.0	11.1	10.1
120°	28.6	15.7	8.3	7.4	7.4	9.2	11.1	12.9	12.0	11.1	10.1
122.5°	30.4	16.6	8.3	7.4	7.4	9.2	11.1	12.0	12.9	12.0	11.1
125°	31.3	17.5	9.2	7.4	7.4	8.3	10.1	12.0	12.0	12.0	11.1
127.5°	32.3	18.4	10.1	7.4	6.5	8.3	10.1	11.1	12.0	12.0	11.1
130°	33.2	19.4	11.1	8.3	7.4	7.4	9.2	10.1	11.1	12.0	11.1
132.5°	35.0	21.2	12.0	8.3	7.4	7.4	8.3	10.1	11.1	11.1	11.1
135°	36.0	23.0	12.9	9.2	7.4	6.5	7.4	9.2	10.1	11.1	11.1
137.5°	37.8	24.0	13.8	11.1	8.3	6.5	7.4	8.3	9.2	10.1	11.1
140°	39.6	26.7	15.7	12.0	9.2	6.5	6.5	7.4	8.3	10.1	10.1
142.5°	41.5	28.6	18.4	13.8	11.1	6.5	6.5	7.4	8.3	9.2	9.2
145°	44.3	31.3	20.3	15.7	12.9	8.3	6.5	6.5	7.4	8.3	9.2
147.5°	46.1	33.2	23.0	18.4	14.8	10.1	6.5	5.5	6.5	7.4	8.3
150°	47.9	36.0	25.8	21.2	17.5	12.0	8.3	6.5	5.5	6.5	7.4
152.5°	50.7	38.7	29.5	24.9	20.3	14.8	10.1	7.4	5.5	5.5	6.5
155°	52.6	42.4	32.3	28.6	24.9	17.5	12.9	9.2	7.4	5.5	5.5
157.5°	55.3	45.2	36.9	32.3	28.6	21.2	16.6	12.0	9.2	7.4	6.5
160°	59.0	48.9	40.6	36.9	33.2	26.7	20.3	16.6	12.9	10.1	8.3
162.5°	61.8	52.6	45.2	41.5	37.8	32.3	25.8	21.2	17.5	14.8	12.0
165°	64.5	57.2	49.8	47.0	43.3	37.8	32.3	27.7	24.0	20.3	17.5
167.5°	67.3	60.8	55.3	51.6	48.9	44.3	39.6	35.0	31.3	27.7	24.9
170°	71.0	65.5	59.9	58.1	55.3	50.7	47.0	43.3	39.6	36.9	34.1
172.5°	73.8	69.1	65.5	63.6	61.8	58.1	54.4	51.6	48.9	46.1	44.3
175°	76.5	73.8	71.0	69.1	68.2	65.5	63.6	61.8	59.0	56.2	55.3
177.5°	80.2	79.3	77.4	76.5	75.6	74.7	73.8	71.9	71.0	69.1	68.2
180°	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7
2.5°	57.2	56.2	55.3	55.3	55.3	54.4	53.5	53.5
5°	45.2	43.3	43.3	43.3	42.4	41.5	40.6	41.5
7.5°	35.0	33.2	32.3	32.3	31.3	30.4	29.5	30.4
10°	25.8	24.0	23.0	22.1	21.2	20.3	20.3	20.3
12.5°	17.5	16.6	15.7	14.8	13.8	13.8	12.9	12.9
15°	12.9	12.0	11.1	10.1	10.1	9.2	9.2	9.2
17.5°	9.2	8.3	8.3	7.4	7.4	7.4	7.4	7.4
20°	7.4	7.4	7.4	7.4	7.4	7.4	8.3	7.4
22.5°	7.4	8.3	8.3	8.3	9.2	9.2	9.2	9.2
25°	8.3	9.2	9.2	10.1	10.1	10.1	10.1	10.1
27.5°	10.1	10.1	11.1	11.1	11.1	12.0	12.0	12.0
30°	11.1	12.0	12.0	12.0	12.0	12.9	12.9	12.9
32.5°	12.0	12.0	12.9	12.9	12.9	12.9	12.9	12.9
35°	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
37.5°	12.9	12.9	12.9	12.9	12.0	12.0	12.0	12.0
40°	12.9	12.9	12.0	12.0	12.0	11.1	11.1	11.1
42.5°	12.9	12.0	11.1	11.1	10.1	10.1	10.1	9.2
45°	12.0	11.1	11.1	10.1	9.2	9.2	8.3	8.3
47.5°	11.1	10.1	10.1	9.2	8.3	7.4	7.4	7.4
50°	11.1	9.2	9.2	8.3	7.4	7.4	6.5	6.5
52.5°	10.1	8.3	8.3	7.4	6.5	6.5	5.5	5.5
55°	9.2	8.3	7.4	6.5	5.5	5.5	4.6	4.6
57.5°	8.3	7.4	6.5	5.5	5.5	4.6	4.6	4.6
60°	8.3	6.5	6.5	5.5	4.6	4.6	3.7	3.7
62.5°	7.4	6.5	5.5	5.5	4.6	3.7	3.7	3.7
65°	7.4	5.5	5.5	4.6	4.6	3.7	3.7	3.7
67.5°	6.5	5.5	5.5	4.6	3.7	3.7	2.8	2.8
70°	6.5	5.5	4.6	4.6	3.7	3.7	2.8	2.8
72.5°	6.5	5.5	4.6	4.6	3.7	2.8	2.8	2.8
75°	6.5	4.6	4.6	4.6	3.7	2.8	2.8	2.8
77.5°	5.5	4.6	4.6	4.6	3.7	2.8	2.8	2.8
80°	5.5	4.6	4.6	4.6	3.7	2.8	2.8	2.8
82.5°	5.5	4.6	4.6	3.7	3.7	2.8	2.8	2.8
85°	5.5	4.6	3.7	3.7	2.8	2.8	2.8	2.8
87.5°	5.5	3.7	3.7	3.7	2.8	2.8	2.8	2.8
90°	5.5	3.7	3.7	3.7	2.8	2.8	1.8	1.8
92.5°	5.5	4.6	4.6	3.7	3.7	2.8	2.8	2.8
95°	5.5	4.6	4.6	4.6	3.7	2.8	2.8	2.8
97.5°	5.5	4.6	4.6	4.6	3.7	2.8	2.8	2.8
100°	6.5	5.5	4.6	4.6	3.7	2.8	2.8	2.8
102.5°	6.5	5.5	4.6	4.6	3.7	3.7	2.8	2.8
105°	6.5	5.5	5.5	4.6	3.7	3.7	2.8	2.8
107.5°	6.5	5.5	5.5	4.6	4.6	3.7	3.7	2.8
110°	7.4	6.5	5.5	5.5	4.6	3.7	3.7	3.7



TEST NUMBER: P190115

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

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	7.4	6.5	5.5	5.5	4.6	4.6	3.7	3.7
115°	8.3	6.5	6.5	6.5	5.5	5.5	4.6	4.6
117.5°	8.3	7.4	7.4	6.5	6.5	5.5	5.5	5.5
120°	9.2	8.3	7.4	7.4	6.5	6.5	5.5	5.5
122.5°	9.2	8.3	8.3	7.4	7.4	6.5	6.5	6.5
125°	10.1	9.2	8.3	8.3	7.4	7.4	7.4	7.4
127.5°	10.1	9.2	9.2	9.2	8.3	7.4	7.4	7.4
130°	11.1	10.1	10.1	9.2	9.2	8.3	8.3	8.3
132.5°	11.1	10.1	10.1	10.1	9.2	9.2	9.2	9.2
135°	11.1	11.1	11.1	10.1	10.1	10.1	9.2	9.2
137.5°	11.1	11.1	11.1	11.1	10.1	10.1	10.1	10.1
140°	11.1	11.1	11.1	11.1	11.1	11.1	10.1	10.1
142.5°	10.1	10.1	11.1	11.1	11.1	11.1	10.1	11.1
145°	9.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1
147.5°	8.3	9.2	9.2	9.2	10.1	10.1	10.1	10.1
150°	7.4	8.3	8.3	8.3	8.3	9.2	9.2	9.2
152.5°	6.5	7.4	7.4	7.4	7.4	8.3	8.3	8.3
155°	6.5	6.5	6.5	6.5	6.5	7.4	7.4	7.4
157.5°	5.5	5.5	5.5	5.5	5.5	6.5	6.5	6.5
160°	7.4	6.5	5.5	5.5	5.5	5.5	5.5	5.5
162.5°	10.1	9.2	8.3	8.3	7.4	6.5	6.5	6.5
165°	15.7	13.8	12.9	12.9	11.1	11.1	10.1	10.1
167.5°	23.0	20.3	20.3	19.4	17.5	17.5	16.6	16.6
170°	32.3	29.5	28.6	28.6	26.7	25.8	25.8	24.9
172.5°	42.4	40.6	39.6	39.6	37.8	37.8	36.9	36.0
175°	54.4	52.6	51.6	51.6	49.8	49.8	48.9	49.8
177.5°	68.2	66.4	66.4	66.4	65.5	65.5	64.5	63.6
180°	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1

(END OF REPORT)