

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: P190085

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

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190085  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27858)  
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  
Description: TERRAPIN 11" LED 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

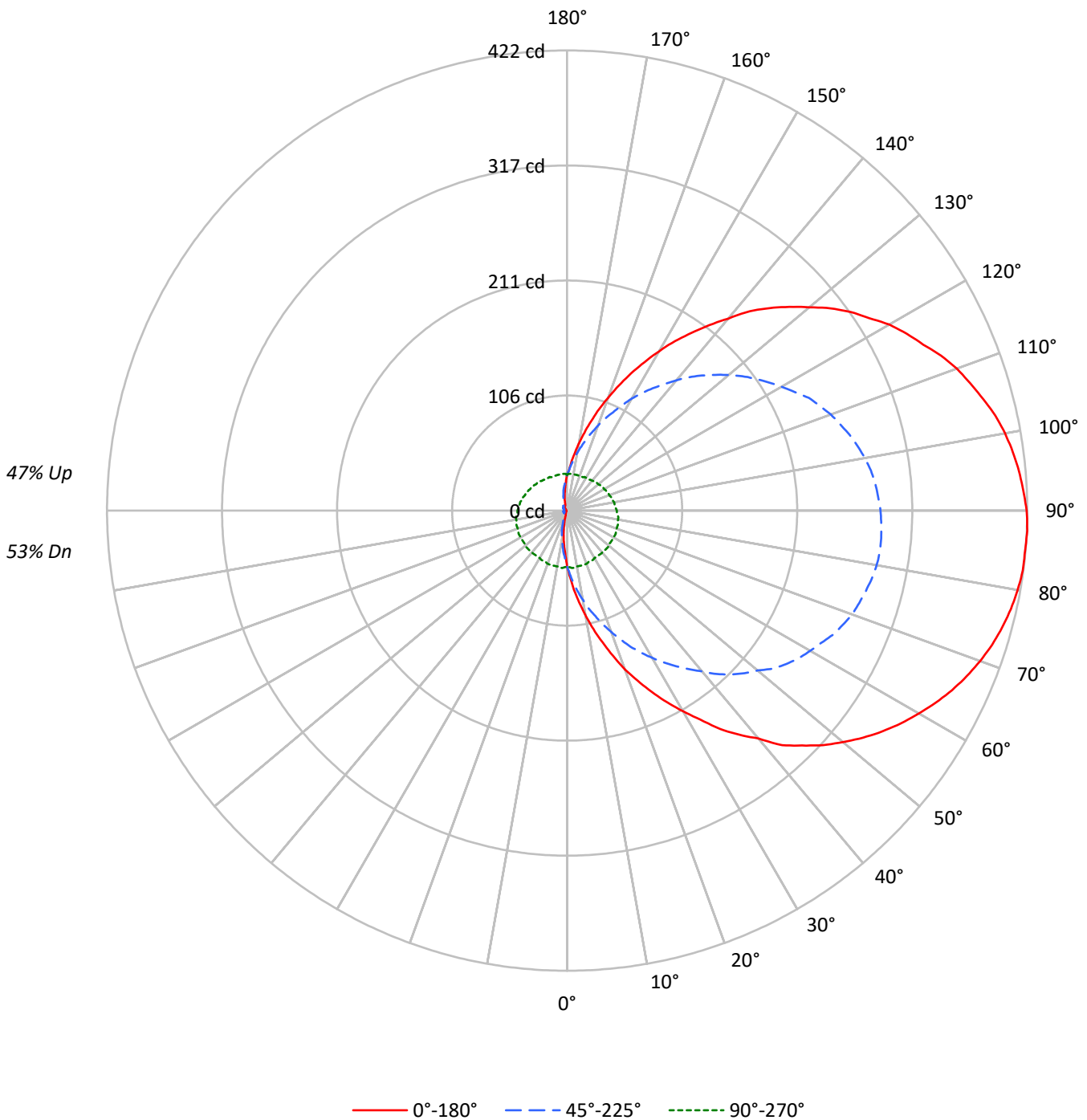
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1358.0 lumens  
Efficiency: N/A  
Efficacy: 61.7 lumens/watt  
Spacing Criteria (0/90/45): 3.31 / 1.51 / 2.75  
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

TEST NUMBER: P190085

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

### 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	93	86	80	75	85	79	74	69	66	62	58	54	51	48	43	41	38	33
2	82	72	64	57	75	66	59	52	55	49	44	44	40	36	35	31	28	23
3	74	62	52	45	67	56	48	41	47	40	34	37	32	28	29	25	22	17
4	67	53	44	36	61	49	40	33	40	33	28	32	27	23	25	21	17	13
5	61	47	37	30	55	43	34	28	35	28	23	28	23	19	22	18	14	11
6	56	42	32	25	51	38	30	23	31	25	19	25	20	16	20	15	12	9
7	51	37	28	22	47	34	26	20	28	21	17	23	17	13	18	13	10	7
8	47	33	25	19	43	31	23	17	25	19	14	21	15	11	16	12	9	6
9	44	30	22	16	40	28	20	15	23	17	13	19	14	10	15	11	8	5
10	41	28	20	14	37	25	18	13	21	15	11	17	12	9	14	10	7	5

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

	0°	90°	180°
0°	2057	2057	2057
5°	2314	1966	1011
10°	2567	1807	479
15°	2828	1709	186
20°	3100	1633	72
25°	3304	1548	49
30°	3512	1480	45
35°	3754	1451	41
40°	3942	1435	26
45°	4188	1429	12
50°	4358	1435	12
55°	4514	1425	12
60°	4651	1453	11
65°	4794	1494	11
70°	4926	1517	11
75°	5049	1588	11
80°	5168	1647	22
85°	5273	1728	11



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	5.1	0.4
10°-20°	17.0	1.3
20°-30°	33.6	2.5
30°-40°	55.2	4.1
40°-50°	81.0	6.0
50°-60°	105.9	7.8
60°-70°	127.3	9.4
70°-80°	142.8	10.5
80°-90°	149.3	11.0
90°-100°	146.5	10.8
100°-110°	134.7	9.9
110°-120°	115.8	8.5
120°-130°	92.5	6.8
130°-140°	67.5	5.0
140°-150°	43.9	3.2
150°-160°	24.9	1.8
160°-170°	11.6	0.9
170°-180°	3.3	0.2
0°-30°	55.7	4.1
0°-40°	111.0	8.2
0°-60°	297.8	21.9
0°-90°	717.2	52.8
90°-120°	397.0	29.2
90°-150°	600.9	44.3
90°-180°	641.0	47.2
0°-180°	1358.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	51	51	51	51	51	
5°	73	67	53	38	32	8
15°	125	100	52	18	8	36
25°	183	138	51	6	3	86
35°	244	174	50	4	3	154
45°	305	213	50	4	1	236
55°	353	245	49	4	1	316
65°	390	269	49	4	1	386
75°	413	284	48	4	1	437
85°	422	289	46	3	1	344
90°	422	287	46	3	1	231
95°	416	284	45	3	1	338
105°	395	268	43	3	1	418
115°	360	244	40	4	1	358
125°	318	211	38	5	2	284
135°	263	175	36	5	3	203
145°	199	137	35	6	4	126
155°	139	99	34	6	5	65
165°	85	68	34	14	7	25
175°	45	42	34	25	21	5
180°	33	33	33	33	33	



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1
2.5°	61.1	61.1	61.1	61.1	60.2	60.2	60.2	60.2	59.3	59.3	58.4
5°	73.0	72.1	73.0	72.1	71.2	71.2	70.2	70.2	69.3	68.4	66.6
7.5°	84.8	84.8	83.9	83.0	82.1	82.1	81.2	80.3	78.5	76.6	74.8
10°	97.6	96.7	96.7	95.8	94.0	93.0	92.1	90.3	87.6	85.8	83.0
12.5°	111.3	110.4	110.4	108.6	106.7	104.9	104.0	101.3	98.5	94.9	92.1
15°	125.0	125.0	124.1	122.2	119.5	118.6	116.8	114.0	109.5	105.8	100.3
17.5°	139.6	138.7	138.7	135.9	133.2	131.4	129.5	125.9	120.4	114.9	109.5
20°	155.1	154.2	152.3	149.6	146.9	145.0	142.3	137.7	132.3	125.9	118.6
22.5°	168.8	167.9	166.9	163.3	159.6	157.8	155.1	149.6	143.2	135.9	127.7
25°	183.4	183.4	180.6	177.9	174.2	171.5	167.9	161.5	155.1	146.0	137.7
27.5°	198.0	198.0	195.2	192.5	187.0	185.2	181.5	174.2	166.9	156.0	146.9
30°	212.6	212.6	210.7	207.1	201.6	198.0	194.3	186.1	177.9	166.9	156.0
32.5°	227.1	226.2	224.4	219.8	214.4	210.7	207.1	198.9	188.8	177.0	165.1
35°	244.5	243.6	239.9	235.4	228.1	223.5	219.8	210.7	199.8	187.0	174.2
37.5°	259.1	257.3	254.5	250.0	243.6	238.1	232.6	222.6	210.7	198.0	183.4
40°	272.8	271.8	269.1	263.6	256.3	251.8	247.2	236.3	221.7	207.1	192.5
42.5°	291.9	290.1	287.4	281.0	273.7	269.1	263.6	251.8	238.1	220.8	203.4
45°	304.7	303.8	300.1	293.7	285.5	280.1	274.6	262.7	248.1	230.8	212.6
47.5°	318.4	316.5	312.9	306.5	298.3	292.8	286.4	273.7	259.1	241.7	220.8
50°	330.2	329.3	324.8	318.4	310.2	303.8	297.4	283.7	269.1	250.9	228.1
52.5°	342.1	340.3	336.6	329.3	320.2	314.7	308.3	293.7	277.3	258.2	238.1
55°	353.0	351.2	346.7	339.4	330.2	323.8	317.5	302.9	285.5	266.4	245.4
57.5°	363.1	361.2	356.7	349.4	339.4	333.9	326.6	311.1	293.7	272.8	251.8
60°	372.2	370.4	365.8	359.4	348.5	342.1	334.8	319.3	301.0	280.1	257.3
62.5°	381.3	379.5	374.9	367.6	356.7	350.3	343.0	327.5	308.3	286.4	262.7
65°	389.5	387.7	383.1	374.9	364.9	357.6	350.3	333.9	314.7	292.8	269.1
67.5°	396.8	395.0	390.4	382.2	371.3	364.0	356.7	340.3	320.2	297.4	273.7
70°	403.2	401.4	396.8	388.6	377.7	370.4	363.1	345.7	324.8	302.0	278.2
72.5°	408.7	406.9	402.3	394.1	382.2	374.9	367.6	350.3	329.3	305.6	281.0
75°	413.2	411.4	405.9	397.7	385.9	379.5	371.3	353.9	333.0	309.2	283.7
77.5°	416.9	416.0	410.5	401.4	390.4	383.1	374.9	356.7	335.7	312.0	286.4
80°	419.6	418.7	413.2	404.1	392.3	385.0	377.7	359.4	338.4	313.8	288.3
82.5°	421.5	419.6	414.2	405.9	394.1	386.8	378.6	360.3	339.4	314.7	289.2
85°	421.5	420.5	415.1	405.9	394.1	387.7	378.6	360.3	339.4	314.7	289.2
87.5°	422.4	419.6	415.1	405.9	394.1	386.8	378.6	360.3	339.4	314.7	288.3
90°	421.5	418.7	414.2	405.0	393.2	385.9	377.7	359.4	337.5	313.8	287.4
92.5°	418.7	416.9	411.4	403.2	391.4	384.1	375.8	357.6	336.6	312.0	285.5
95°	416.0	415.1	409.6	400.5	388.6	381.3	374.0	355.8	333.9	310.2	283.7
97.5°	412.3	410.5	405.0	396.8	385.0	378.6	370.4	352.1	331.1	306.5	281.0
100°	407.8	405.9	400.5	392.3	380.4	374.0	365.8	347.6	326.6	302.9	277.3
102.5°	402.3	400.5	395.0	386.8	374.9	368.5	360.3	342.1	322.0	298.3	272.8
105°	395.0	393.2	387.7	380.4	368.5	362.2	353.9	336.6	316.5	292.8	268.2
107.5°	387.7	386.8	381.3	373.1	362.2	354.9	347.6	330.2	310.2	287.4	262.7
110°	380.4	377.7	373.1	365.8	353.9	347.6	340.3	322.9	303.8	281.0	257.3



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	371.3	369.5	364.9	357.6	345.7	339.4	332.1	315.6	296.5	273.7	250.9
115°	360.3	359.4	354.9	347.6	336.6	330.2	322.9	307.4	288.3	266.4	244.5
117.5°	351.2	349.4	344.8	337.5	326.6	320.2	313.8	298.3	280.1	259.1	235.4
120°	341.2	338.4	334.8	327.5	317.5	312.0	303.8	289.2	270.9	250.9	227.1
122.5°	328.4	326.6	322.9	315.6	306.5	300.1	293.7	279.1	261.8	241.7	218.9
125°	317.5	315.6	311.1	304.7	294.7	289.2	282.8	268.2	251.8	232.6	210.7
127.5°	304.7	302.0	298.3	291.9	282.8	278.2	270.9	257.3	241.7	221.7	202.5
130°	290.1	289.2	284.6	279.1	270.9	265.5	259.1	246.3	229.0	211.6	193.4
132.5°	276.4	275.5	271.8	266.4	257.3	252.7	246.3	233.5	218.0	201.6	184.3
135°	262.7	261.8	258.2	252.7	244.5	239.9	232.6	220.8	207.1	191.6	175.1
137.5°	248.1	247.2	243.6	238.1	229.0	224.4	218.9	208.9	195.2	180.6	166.0
140°	229.9	229.0	226.2	221.7	214.4	209.8	205.3	195.2	183.4	170.6	156.0
142.5°	214.4	213.5	210.7	206.2	199.8	196.1	191.6	182.4	171.5	159.6	146.0
145°	198.9	198.9	195.2	191.6	186.1	182.4	177.9	169.7	159.6	148.7	136.8
147.5°	184.3	183.4	180.6	177.0	172.4	168.8	165.1	157.8	147.8	138.7	127.7
150°	168.8	168.8	166.0	163.3	158.7	155.1	152.3	145.0	136.8	127.7	118.6
152.5°	153.3	153.3	151.4	147.8	144.1	141.4	138.7	132.3	125.0	117.7	108.6
155°	138.7	137.7	136.8	134.1	130.5	127.7	125.9	120.4	114.0	106.7	99.4
157.5°	124.1	124.1	123.2	120.4	117.7	115.9	113.1	109.5	103.1	97.6	91.2
160°	110.4	110.4	109.5	107.6	105.8	103.1	101.3	98.5	93.0	88.5	83.0
162.5°	97.6	97.6	96.7	94.9	93.0	91.2	89.4	86.7	83.0	78.5	74.8
165°	84.8	84.8	83.9	83.0	81.2	80.3	79.4	76.6	73.9	70.2	67.5
167.5°	73.0	73.0	73.0	72.1	71.2	70.2	69.3	67.5	64.8	62.9	60.2
170°	62.9	62.9	62.9	62.0	61.1	61.1	60.2	59.3	57.5	55.6	53.8
172.5°	52.9	53.8	52.9	52.9	52.0	52.0	52.0	51.1	49.3	48.3	47.4
175°	44.7	44.7	44.7	43.8	43.8	43.8	43.8	43.8	42.9	42.0	42.0
177.5°	36.5	37.4	37.4	37.4	37.4	36.5	37.4	37.4	36.5	36.5	36.5
180°	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1
2.5°	58.4	58.4	57.5	56.6	56.6	55.6	54.7	53.8	52.9	52.0	51.1
5°	65.7	64.8	62.9	61.1	60.2	60.2	57.5	56.6	54.7	52.9	51.1
7.5°	73.0	70.2	68.4	65.7	64.8	62.9	60.2	57.5	55.6	52.9	50.2
10°	80.3	76.6	73.0	70.2	68.4	66.6	62.9	59.3	55.6	52.0	49.3
12.5°	87.6	83.9	79.4	74.8	72.1	70.2	65.7	61.1	56.6	52.0	48.3
15°	95.8	91.2	84.8	79.4	76.6	73.9	68.4	62.9	57.5	52.0	47.4
17.5°	104.0	97.6	91.2	83.9	81.2	77.5	71.2	64.8	58.4	52.0	46.5
20°	111.3	104.9	96.7	88.5	84.8	81.2	73.0	65.7	58.4	52.0	45.6
22.5°	119.5	111.3	102.2	93.0	89.4	84.8	75.7	66.6	59.3	51.1	43.8
25°	127.7	118.6	107.6	98.5	93.0	88.5	77.5	68.4	59.3	51.1	42.9
27.5°	135.9	125.9	114.0	103.1	97.6	91.2	80.3	70.2	60.2	51.1	42.0
30°	144.1	132.3	120.4	107.6	101.3	94.9	83.0	71.2	60.2	50.2	41.1
32.5°	152.3	139.6	125.9	112.2	104.9	98.5	84.8	73.0	61.1	50.2	41.1
35°	160.6	146.0	131.4	115.9	108.6	101.3	87.6	73.9	61.1	50.2	40.1
37.5°	167.9	153.3	136.8	120.4	113.1	104.9	89.4	75.7	62.0	50.2	39.2
40°	176.1	159.6	142.3	125.0	116.8	108.6	92.1	76.6	62.9	50.2	38.3
42.5°	187.0	167.9	149.6	131.4	121.3	112.2	94.9	78.5	63.9	50.2	38.3
45°	194.3	174.2	155.1	135.0	125.0	115.9	97.6	79.4	63.9	50.2	37.4
47.5°	201.6	180.6	159.6	138.7	128.6	118.6	99.4	81.2	64.8	50.2	37.4
50°	208.0	186.1	165.1	143.2	132.3	121.3	101.3	82.1	64.8	50.2	36.5
52.5°	214.4	191.6	168.8	146.0	135.0	124.1	103.1	83.0	64.8	49.3	36.5
55°	220.8	197.0	173.3	149.6	137.7	126.8	104.9	83.9	65.7	49.3	35.6
57.5°	226.2	201.6	177.0	152.3	140.5	128.6	105.8	84.8	65.7	49.3	35.6
60°	232.6	206.2	180.6	155.1	142.3	130.5	106.7	84.8	65.7	49.3	34.7
62.5°	237.2	209.8	184.3	157.8	145.0	132.3	108.6	85.8	65.7	49.3	34.7
65°	243.6	214.4	187.0	160.6	146.9	134.1	109.5	86.7	66.6	49.3	33.8
67.5°	247.2	217.1	189.7	162.4	148.7	135.0	110.4	86.7	66.6	48.3	33.8
70°	250.9	220.8	192.5	164.2	150.5	136.8	111.3	87.6	66.6	48.3	33.8
72.5°	253.6	222.6	194.3	166.0	151.4	137.7	111.3	87.6	66.6	48.3	32.8
75°	256.3	225.3	196.1	166.9	152.3	138.7	112.2	87.6	66.6	48.3	32.8
77.5°	258.2	227.1	197.0	167.9	153.3	138.7	112.2	87.6	65.7	47.4	32.8
80°	260.0	228.1	198.0	167.9	153.3	139.6	112.2	87.6	65.7	47.4	31.9
82.5°	260.9	228.1	198.0	167.9	153.3	138.7	112.2	86.7	65.7	47.4	31.9
85°	260.0	229.0	198.0	167.9	152.3	138.7	111.3	86.7	64.8	46.5	31.0
87.5°	260.0	227.1	197.0	166.9	152.3	137.7	110.4	85.8	63.9	45.6	31.0
90°	259.1	226.2	196.1	166.0	151.4	136.8	110.4	84.8	63.9	45.6	30.1
92.5°	257.3	224.4	194.3	165.1	149.6	135.9	108.6	83.9	62.9	44.7	30.1
95°	255.4	222.6	193.4	163.3	148.7	135.0	107.6	83.9	62.0	44.7	30.1
97.5°	252.7	220.8	191.6	161.5	146.9	133.2	106.7	82.1	62.0	43.8	30.1
100°	249.0	218.0	188.8	159.6	145.0	131.4	104.9	81.2	61.1	43.8	29.2
102.5°	245.4	214.4	185.2	156.9	142.3	129.5	104.0	80.3	60.2	42.9	29.2
105°	240.8	210.7	182.4	154.2	140.5	126.8	102.2	78.5	59.3	42.9	29.2
107.5°	235.4	206.2	178.8	151.4	137.7	124.1	100.3	77.5	58.4	42.0	28.3
110°	229.0	201.6	174.2	147.8	135.0	121.3	97.6	76.6	57.5	41.1	28.3





TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	222.6	197.0	170.6	144.1	131.4	118.6	95.8	74.8	56.6	41.1	28.3
115°	217.1	191.6	166.0	140.5	127.7	115.9	94.0	73.0	55.6	40.1	28.3
117.5°	210.7	186.1	161.5	136.8	125.0	113.1	91.2	72.1	54.7	40.1	28.3
120°	203.4	179.7	156.0	132.3	120.4	109.5	89.4	70.2	52.9	39.2	28.3
122.5°	197.0	173.3	151.4	128.6	117.7	106.7	86.7	68.4	52.0	39.2	27.4
125°	189.7	166.9	146.0	124.1	113.1	103.1	83.9	66.6	51.1	38.3	27.4
127.5°	182.4	160.6	140.5	119.5	109.5	99.4	81.2	64.8	50.2	38.3	27.4
130°	174.2	154.2	134.1	114.9	105.8	95.8	78.5	62.9	49.3	37.4	27.4
132.5°	166.0	146.9	128.6	110.4	101.3	93.0	76.6	61.1	48.3	37.4	27.4
135°	157.8	140.5	123.2	105.8	96.7	89.4	73.9	60.2	47.4	36.5	27.4
137.5°	149.6	133.2	116.8	101.3	93.0	85.8	71.2	57.5	46.5	36.5	27.4
140°	141.4	125.9	110.4	95.8	88.5	81.2	68.4	55.6	45.6	35.6	27.4
142.5°	132.3	118.6	104.9	91.2	83.9	77.5	65.7	53.8	43.8	35.6	27.4
145°	124.1	111.3	98.5	86.7	80.3	73.9	62.9	52.9	42.9	34.7	28.3
147.5°	115.9	104.9	93.0	82.1	75.7	70.2	60.2	51.1	42.9	34.7	28.3
150°	107.6	97.6	87.6	77.5	72.1	67.5	58.4	49.3	42.0	34.7	28.3
152.5°	99.4	90.3	81.2	72.1	67.5	63.9	55.6	47.4	40.1	34.7	28.3
155°	92.1	83.9	75.7	68.4	63.9	60.2	52.9	46.5	40.1	33.8	29.2
157.5°	84.8	77.5	71.2	63.9	60.2	57.5	51.1	44.7	39.2	33.8	29.2
160°	77.5	71.2	65.7	60.2	56.6	53.8	48.3	43.8	38.3	33.8	30.1
162.5°	70.2	65.7	60.2	55.6	52.9	51.1	46.5	42.0	37.4	33.8	30.1
165°	62.9	59.3	55.6	52.0	50.2	48.3	44.7	41.1	37.4	33.8	31.0
167.5°	57.5	54.7	51.1	48.3	46.5	45.6	42.0	39.2	36.5	33.8	31.0
170°	52.0	49.3	47.4	44.7	43.8	42.9	40.1	38.3	35.6	33.8	31.9
172.5°	45.6	44.7	42.9	42.0	41.1	40.1	38.3	37.4	35.6	33.8	31.9
175°	41.1	40.1	39.2	38.3	38.3	37.4	36.5	35.6	34.7	33.8	32.8
177.5°	36.5	36.5	35.6	35.6	35.6	35.6	34.7	34.7	34.7	33.8	33.8
180°	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1
2.5°	50.2	49.3	48.3	48.3	47.4	46.5	45.6	44.7	43.8	42.9	42.9
5°	49.3	47.4	45.6	44.7	43.8	42.9	41.1	39.2	38.3	36.5	35.6
7.5°	47.4	44.7	42.9	42.0	41.1	38.3	36.5	34.7	31.9	31.0	30.1
10°	45.6	42.9	40.1	38.3	36.5	33.8	31.9	29.2	27.4	25.5	23.7
12.5°	43.8	40.1	36.5	35.6	33.8	30.1	27.4	24.6	22.8	20.1	18.2
15°	42.0	38.3	33.8	31.9	30.1	26.5	23.7	21.0	18.2	15.5	13.7
17.5°	41.1	35.6	31.0	29.2	27.4	23.7	20.1	16.4	13.7	11.9	10.0
20°	39.2	33.8	29.2	26.5	24.6	20.1	16.4	13.7	10.9	8.2	6.4
22.5°	37.4	31.9	26.5	23.7	21.9	17.3	13.7	10.0	7.3	5.5	4.6
25°	36.5	30.1	23.7	21.9	19.2	14.6	10.9	8.2	5.5	4.6	3.6
27.5°	34.7	28.3	21.9	19.2	16.4	11.9	8.2	5.5	4.6	3.6	3.6
30°	33.8	26.5	20.1	17.3	14.6	10.0	6.4	4.6	3.6	3.6	3.6
32.5°	31.9	24.6	18.2	15.5	12.8	8.2	5.5	3.6	3.6	3.6	3.6
35°	31.0	23.7	16.4	13.7	10.9	6.4	4.6	3.6	3.6	3.6	3.6
37.5°	30.1	21.9	15.5	11.9	9.1	5.5	4.6	3.6	3.6	3.6	3.6
40°	29.2	21.0	13.7	10.9	8.2	4.6	3.6	3.6	3.6	3.6	2.7
42.5°	28.3	20.1	11.9	9.1	7.3	4.6	4.6	3.6	3.6	3.6	2.7
45°	27.4	18.2	10.9	8.2	6.4	4.6	4.6	3.6	3.6	2.7	2.7
47.5°	26.5	17.3	10.0	7.3	5.5	4.6	3.6	3.6	3.6	2.7	2.7
50°	25.5	16.4	9.1	6.4	4.6	4.6	3.6	3.6	3.6	2.7	2.7
52.5°	25.5	15.5	8.2	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7
55°	24.6	15.5	7.3	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7
57.5°	23.7	14.6	7.3	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7
60°	23.7	13.7	6.4	4.6	4.6	4.6	3.6	3.6	3.6	2.7	2.7
62.5°	22.8	12.8	6.4	4.6	4.6	4.6	3.6	3.6	2.7	2.7	2.7
65°	22.8	12.8	5.5	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7
67.5°	21.9	11.9	5.5	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7
70°	21.9	11.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
72.5°	21.0	11.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
75°	21.0	10.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
77.5°	21.0	10.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
80°	20.1	10.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
82.5°	20.1	10.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	1.8
85°	19.2	10.0	5.5	5.5	5.5	4.6	3.6	3.6	2.7	2.7	1.8
87.5°	19.2	10.0	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7	1.8
90°	19.2	10.0	5.5	5.5	4.6	4.6	3.6	3.6	2.7	1.8	1.8
92.5°	19.2	10.0	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7	1.8
95°	19.2	10.0	5.5	5.5	5.5	4.6	3.6	3.6	2.7	2.7	1.8
97.5°	18.2	10.0	5.5	5.5	5.5	4.6	4.6	3.6	2.7	2.7	1.8
100°	18.2	10.0	5.5	5.5	5.5	4.6	4.6	3.6	2.7	2.7	1.8
102.5°	18.2	10.0	5.5	5.5	5.5	4.6	3.6	3.6	2.7	2.7	1.8
105°	18.2	10.0	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7	1.8
107.5°	18.2	10.0	5.5	5.5	4.6	4.6	4.6	3.6	2.7	2.7	1.8
110°	18.2	10.9	5.5	5.5	5.5	4.6	4.6	3.6	2.7	2.7	1.8



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	18.2	10.9	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
115°	18.2	10.9	6.4	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
117.5°	19.2	10.9	6.4	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7
120°	19.2	11.9	7.3	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7
122.5°	19.2	11.9	7.3	5.5	5.5	5.5	4.6	4.6	3.6	3.6	2.7
125°	19.2	12.8	7.3	6.4	5.5	5.5	4.6	4.6	4.6	3.6	3.6
127.5°	19.2	12.8	8.2	6.4	5.5	5.5	4.6	4.6	4.6	3.6	3.6
130°	20.1	13.7	8.2	7.3	5.5	5.5	5.5	4.6	4.6	3.6	3.6
132.5°	20.1	13.7	9.1	7.3	6.4	5.5	5.5	4.6	4.6	3.6	3.6
135°	20.1	14.6	10.0	8.2	6.4	5.5	5.5	4.6	4.6	4.6	3.6
137.5°	21.0	14.6	10.0	9.1	7.3	5.5	5.5	5.5	4.6	4.6	4.6
140°	21.0	15.5	10.9	9.1	8.2	6.4	5.5	5.5	5.5	4.6	4.6
142.5°	21.9	16.4	11.9	10.0	9.1	6.4	5.5	5.5	5.5	4.6	4.6
145°	21.9	17.3	12.8	10.9	9.1	7.3	5.5	5.5	5.5	4.6	4.6
147.5°	22.8	18.2	13.7	11.9	10.9	8.2	6.4	5.5	5.5	5.5	4.6
150°	22.8	19.2	14.6	12.8	11.9	9.1	7.3	6.4	5.5	5.5	5.5
152.5°	23.7	19.2	15.5	14.6	12.8	10.0	8.2	6.4	5.5	5.5	5.5
155°	24.6	20.1	17.3	15.5	13.7	11.9	9.1	8.2	6.4	5.5	5.5
157.5°	25.5	21.9	18.2	17.3	15.5	12.8	10.9	9.1	8.2	6.4	6.4
160°	26.5	22.8	20.1	18.2	17.3	14.6	12.8	10.9	9.1	8.2	7.3
162.5°	26.5	23.7	21.0	20.1	19.2	16.4	14.6	12.8	10.9	10.0	9.1
165°	27.4	24.6	22.8	21.9	20.1	18.2	16.4	14.6	13.7	11.9	10.9
167.5°	28.3	26.5	24.6	22.8	21.9	20.1	19.2	17.3	15.5	14.6	13.7
170°	30.1	28.3	26.5	25.5	24.6	22.8	21.0	20.1	19.2	17.3	16.4
172.5°	31.0	29.2	28.3	27.4	26.5	25.5	23.7	22.8	21.9	21.0	20.1
175°	31.9	31.0	30.1	29.2	29.2	27.4	26.5	25.5	24.6	24.6	23.7
177.5°	32.8	31.9	31.9	31.9	31.0	31.0	30.1	29.2	29.2	28.3	28.3
180°	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1
2.5°	42.0	41.1	41.1	41.1	40.1	40.1	39.2	39.2
5°	34.7	33.8	33.8	32.8	32.8	31.9	31.9	31.9
7.5°	28.3	27.4	26.5	26.5	25.5	25.5	24.6	24.6
10°	21.9	21.0	20.1	20.1	19.2	18.2	18.2	18.2
12.5°	16.4	15.5	14.6	14.6	13.7	12.8	12.8	12.8
15°	11.9	10.9	10.0	10.0	9.1	8.2	8.2	8.2
17.5°	8.2	7.3	6.4	6.4	5.5	4.6	4.6	4.6
20°	5.5	4.6	4.6	3.6	3.6	3.6	3.6	3.6
22.5°	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
25°	3.6	3.6	3.6	3.6	3.6	3.6	2.7	2.7
27.5°	3.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
30°	3.6	3.6	2.7	2.7	2.7	2.7	2.7	2.7
32.5°	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
35°	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
37.5°	2.7	2.7	2.7	2.7	2.7	2.7	1.8	1.8
40°	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8
42.5°	2.7	2.7	2.7	1.8	1.8	1.8	0.9	0.9
45°	2.7	2.7	1.8	1.8	1.8	1.8	0.9	0.9
47.5°	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9
50°	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9
52.5°	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
55°	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
57.5°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
60°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
62.5°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
65°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
67.5°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
70°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
72.5°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
75°	1.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
77.5°	1.8	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	0.9	0.9	0.9	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	0.9	0.9	0.9	0.9	0.9	0.9	0.9
92.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
95°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
97.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
100°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
102.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
105°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
107.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
110°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9



TEST NUMBER: P190085

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

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
115°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
117.5°	2.7	1.8	1.8	1.8	0.9	0.9	0.9	0.9
120°	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9
122.5°	2.7	2.7	1.8	1.8	1.8	1.8	1.8	0.9
125°	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8
127.5°	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8
130°	3.6	2.7	2.7	2.7	2.7	1.8	1.8	1.8
132.5°	3.6	2.7	2.7	2.7	2.7	2.7	1.8	1.8
135°	3.6	3.6	3.6	2.7	2.7	2.7	2.7	2.7
137.5°	3.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
140°	3.6	3.6	3.6	3.6	3.6	3.6	2.7	2.7
142.5°	4.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
145°	4.6	4.6	3.6	3.6	3.6	3.6	3.6	3.6
147.5°	4.6	4.6	4.6	4.6	3.6	3.6	3.6	3.6
150°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
152.5°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
155°	5.5	5.5	5.5	4.6	4.6	4.6	4.6	4.6
157.5°	5.5	5.5	5.5	5.5	5.5	4.6	4.6	4.6
160°	6.4	5.5	5.5	5.5	5.5	5.5	5.5	5.5
162.5°	8.2	7.3	7.3	6.4	6.4	6.4	5.5	5.5
165°	10.0	9.1	9.1	9.1	8.2	8.2	8.2	7.3
167.5°	12.8	11.9	11.9	10.9	10.9	10.0	10.0	10.0
170°	15.5	15.5	14.6	14.6	13.7	13.7	13.7	12.8
172.5°	19.2	18.2	18.2	18.2	17.3	17.3	17.3	16.4
175°	22.8	22.8	21.9	21.9	21.0	21.9	21.0	21.0
177.5°	27.4	27.4	26.5	26.5	26.5	26.5	26.5	26.5
180°	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8

(END OF REPORT)