

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: P190086

Luminaire Tested: **TRR11-LD4-15W-50-OPL-BK-UNV-EDC1**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190086
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-LD4-15W-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 300mA
OT25W/1

Summary

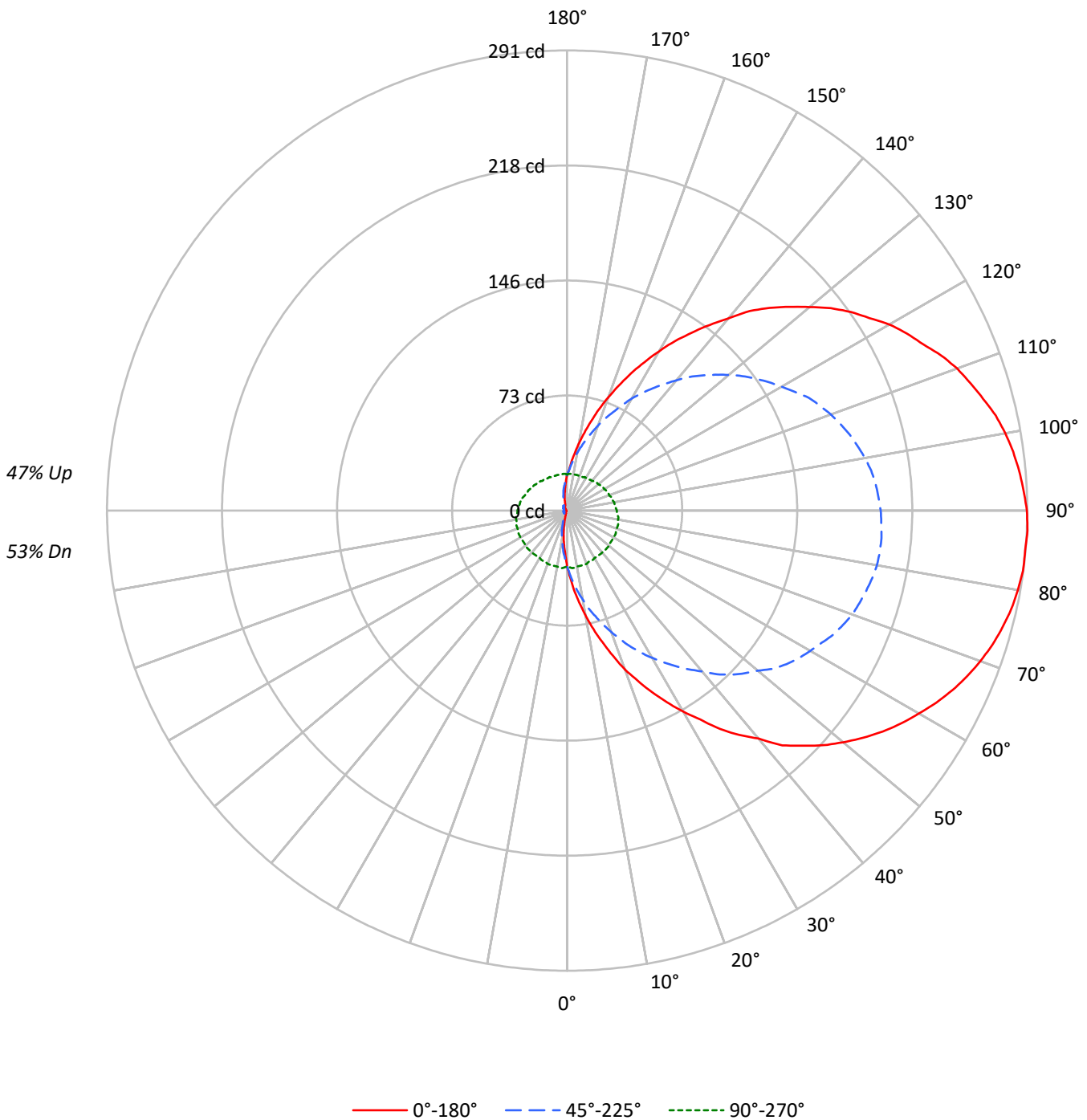
Lumens per Lamp: N/A
Luminaire Lumens: 937.0 lumens
Efficiency: N/A
Efficacy: 65.1 lumens/watt
Spacing Criteria (0/90/45): 3.31 / 1.51 / 2.75
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 14.4
Input Voltage (V): NR
Input Current (A_{in}): 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: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

Luminous Intensity Polar Plot





TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

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°	1417	1417	1417
5°	1598	1356	697
10°	1770	1248	331
15°	1950	1180	129
20°	2138	1128	50
25°	2279	1066	34
30°	2423	1020	31
35°	2591	1000	29
40°	2719	989	19
45°	2889	985	8
50°	3008	989	8
55°	3115	983	8
60°	3209	1002	7
65°	3308	1030	7
70°	3399	1049	7
75°	3484	1098	7
80°	3566	1136	16
85°	3638	1193	8



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	3.5	0.4
10°-20°	11.8	1.3
20°-30°	23.2	2.5
30°-40°	38.1	4.1
40°-50°	55.9	6.0
50°-60°	73.0	7.8
60°-70°	87.9	9.4
70°-80°	98.5	10.5
80°-90°	103.0	11.0
90°-100°	101.1	10.8
100°-110°	92.9	9.9
110°-120°	79.9	8.5
120°-130°	63.8	6.8
130°-140°	46.6	5.0
140°-150°	30.3	3.2
150°-160°	17.2	1.8
160°-170°	8.0	0.9
170°-180°	2.3	0.2
0°-30°	38.5	4.1
0°-40°	76.6	8.2
0°-60°	205.5	21.9
0°-90°	494.9	52.8
90°-120°	273.9	29.2
90°-150°	414.6	44.3
90°-180°	442.0	47.2
0°-180°	937.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	35	35	35	35	35	
5°	50	46	36	26	22	5
15°	86	69	36	13	6	25
25°	126	95	35	4	2	59
35°	169	120	35	2	2	106
45°	210	147	35	2	1	163
55°	244	169	34	2	1	218
65°	269	186	34	2	1	266
75°	285	196	33	2	1	301
85°	291	200	32	2	1	237
90°	291	198	32	2	1	159
95°	287	196	31	2	1	233
105°	272	185	30	2	1	288
115°	249	169	28	2	1	247
125°	219	145	26	3	1	196
135°	181	121	25	3	2	140
145°	137	94	24	4	2	87
155°	96	69	23	4	3	45
165°	58	47	23	9	5	17
175°	31	29	23	17	14	3
180°	23	23	23	23	23	



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
2.5°	42.2	42.2	42.2	42.2	41.5	41.5	41.5	41.5	40.9	40.9	40.3
5°	50.4	49.7	50.4	49.7	49.1	49.1	48.5	48.5	47.8	47.2	45.9
7.5°	58.5	58.5	57.9	57.3	56.6	56.6	56.0	55.4	54.1	52.9	51.6
10°	67.3	66.7	66.7	66.1	64.8	64.2	63.6	62.3	60.4	59.2	57.3
12.5°	76.8	76.2	76.2	74.9	73.6	72.4	71.8	69.9	68.0	65.5	63.6
15°	86.2	86.2	85.6	84.3	82.5	81.8	80.6	78.7	75.5	73.0	69.2
17.5°	96.3	95.7	95.7	93.8	91.9	90.6	89.4	86.9	83.1	79.3	75.5
20°	107.0	106.4	105.1	103.2	101.3	100.1	98.2	95.0	91.3	86.9	81.8
22.5°	116.4	115.8	115.2	112.7	110.2	108.9	107.0	103.2	98.8	93.8	88.1
25°	126.5	126.5	124.6	122.7	120.2	118.3	115.8	111.4	107.0	100.7	95.0
27.5°	136.6	136.6	134.7	132.8	129.0	127.8	125.3	120.2	115.2	107.6	101.3
30°	146.7	146.7	145.4	142.9	139.1	136.6	134.1	128.4	122.7	115.2	107.6
32.5°	156.7	156.1	154.8	151.7	147.9	145.4	142.9	137.2	130.3	122.1	113.9
35°	168.7	168.1	165.5	162.4	157.4	154.2	151.7	145.4	137.8	129.0	120.2
37.5°	178.8	177.5	175.6	172.5	168.1	164.3	160.5	153.6	145.4	136.6	126.5
40°	188.2	187.6	185.7	181.9	176.9	173.7	170.6	163.0	153.0	142.9	132.8
42.5°	201.4	200.2	198.3	193.9	188.8	185.7	181.9	173.7	164.3	152.3	140.4
45°	210.2	209.6	207.1	202.7	197.0	193.2	189.5	181.3	171.2	159.2	146.7
47.5°	219.7	218.4	215.9	211.5	205.8	202.0	197.6	188.8	178.8	166.8	152.3
50°	227.9	227.2	224.1	219.7	214.0	209.6	205.2	195.8	185.7	173.1	157.4
52.5°	236.0	234.8	232.3	227.2	220.9	217.2	212.7	202.7	191.3	178.1	164.3
55°	243.6	242.3	239.2	234.1	227.9	223.4	219.0	209.0	197.0	183.8	169.3
57.5°	250.5	249.3	246.1	241.1	234.1	230.4	225.3	214.6	202.7	188.2	173.7
60°	256.8	255.5	252.4	248.0	240.4	236.0	231.0	220.3	207.7	193.2	177.5
62.5°	263.1	261.8	258.7	253.7	246.1	241.7	236.7	226.0	212.7	197.6	181.3
65°	268.8	267.5	264.4	258.7	251.8	246.7	241.7	230.4	217.2	202.0	185.7
67.5°	273.8	272.5	269.4	263.7	256.2	251.1	246.1	234.8	220.9	205.2	188.8
70°	278.2	276.9	273.8	268.1	260.6	255.5	250.5	238.6	224.1	208.3	192.0
72.5°	282.0	280.7	277.6	271.9	263.7	258.7	253.7	241.7	227.2	210.9	193.9
75°	285.1	283.9	280.1	274.4	266.2	261.8	256.2	244.2	229.7	213.4	195.8
77.5°	287.7	287.0	283.2	276.9	269.4	264.4	258.7	246.1	231.6	215.3	197.6
80°	289.5	288.9	285.1	278.8	270.7	265.6	260.6	248.0	233.5	216.5	198.9
82.5°	290.8	289.5	285.8	280.1	271.9	266.9	261.2	248.6	234.1	217.2	199.5
85°	290.8	290.2	286.4	280.1	271.9	267.5	261.2	248.6	234.1	217.2	199.5
87.5°	291.4	289.5	286.4	280.1	271.9	266.9	261.2	248.6	234.1	217.2	198.9
90°	290.8	288.9	285.8	279.5	271.3	266.2	260.6	248.0	232.9	216.5	198.3
92.5°	288.9	287.7	283.9	278.2	270.0	265.0	259.3	246.7	232.3	215.3	197.0
95°	287.0	286.4	282.6	276.3	268.1	263.1	258.1	245.5	230.4	214.0	195.8
97.5°	284.5	283.2	279.5	273.8	265.6	261.2	255.5	243.0	228.5	211.5	193.9
100°	281.4	280.1	276.3	270.7	262.5	258.1	252.4	239.8	225.3	209.0	191.3
102.5°	277.6	276.3	272.5	266.9	258.7	254.3	248.6	236.0	222.2	205.8	188.2
105°	272.5	271.3	267.5	262.5	254.3	249.9	244.2	232.3	218.4	202.0	185.1
107.5°	267.5	266.9	263.1	257.4	249.9	244.8	239.8	227.9	214.0	198.3	181.3
110°	262.5	260.6	257.4	252.4	244.2	239.8	234.8	222.8	209.6	193.9	177.5



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	256.2	254.9	251.8	246.7	238.6	234.1	229.1	217.8	204.6	188.8	173.1
115°	248.6	248.0	244.8	239.8	232.3	227.9	222.8	212.1	198.9	183.8	168.7
117.5°	242.3	241.1	237.9	232.9	225.3	220.9	216.5	205.8	193.2	178.8	162.4
120°	235.4	233.5	231.0	226.0	219.0	215.3	209.6	199.5	186.9	173.1	156.7
122.5°	226.6	225.3	222.8	217.8	211.5	207.1	202.7	192.6	180.6	166.8	151.1
125°	219.0	217.8	214.6	210.2	203.3	199.5	195.1	185.1	173.7	160.5	145.4
127.5°	210.2	208.3	205.8	201.4	195.1	192.0	186.9	177.5	166.8	153.0	139.7
130°	200.2	199.5	196.4	192.6	186.9	183.2	178.8	169.9	158.0	146.0	133.4
132.5°	190.7	190.1	187.6	183.8	177.5	174.4	169.9	161.1	150.4	139.1	127.1
135°	181.3	180.6	178.1	174.4	168.7	165.5	160.5	152.3	142.9	132.2	120.9
137.5°	171.2	170.6	168.1	164.3	158.0	154.8	151.1	144.1	134.7	124.6	114.6
140°	158.6	158.0	156.1	153.0	147.9	144.8	141.6	134.7	126.5	117.7	107.6
142.5°	147.9	147.3	145.4	142.3	137.8	135.3	132.2	125.9	118.3	110.2	100.7
145°	137.2	137.2	134.7	132.2	128.4	125.9	122.7	117.1	110.2	102.6	94.4
147.5°	127.1	126.5	124.6	122.1	119.0	116.4	113.9	108.9	102.0	95.7	88.1
150°	116.4	116.4	114.6	112.7	109.5	107.0	105.1	100.1	94.4	88.1	81.8
152.5°	105.7	105.7	104.5	102.0	99.5	97.6	95.7	91.3	86.2	81.2	74.9
155°	95.7	95.0	94.4	92.5	90.0	88.1	86.9	83.1	78.7	73.6	68.6
157.5°	85.6	85.6	85.0	83.1	81.2	79.9	78.0	75.5	71.1	67.3	62.9
160°	76.2	76.2	75.5	74.3	73.0	71.1	69.9	68.0	64.2	61.1	57.3
162.5°	67.3	67.3	66.7	65.5	64.2	62.9	61.7	59.8	57.3	54.1	51.6
165°	58.5	58.5	57.9	57.3	56.0	55.4	54.8	52.9	51.0	48.5	46.6
167.5°	50.4	50.4	50.4	49.7	49.1	48.5	47.8	46.6	44.7	43.4	41.5
170°	43.4	43.4	43.4	42.8	42.2	42.2	41.5	40.9	39.7	38.4	37.1
172.5°	36.5	37.1	36.5	36.5	35.9	35.9	35.9	35.2	34.0	33.4	32.7
175°	30.8	30.8	30.8	30.2	30.2	30.2	30.2	30.2	29.6	29.0	29.0
177.5°	25.2	25.8	25.8	25.8	25.8	25.2	25.8	25.8	25.2	25.2	25.2
180°	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
2.5°	40.3	40.3	39.7	39.0	39.0	38.4	37.8	37.1	36.5	35.9	35.2
5°	45.3	44.7	43.4	42.2	41.5	41.5	39.7	39.0	37.8	36.5	35.2
7.5°	50.4	48.5	47.2	45.3	44.7	43.4	41.5	39.7	38.4	36.5	34.6
10°	55.4	52.9	50.4	48.5	47.2	45.9	43.4	40.9	38.4	35.9	34.0
12.5°	60.4	57.9	54.8	51.6	49.7	48.5	45.3	42.2	39.0	35.9	33.4
15°	66.1	62.9	58.5	54.8	52.9	51.0	47.2	43.4	39.7	35.9	32.7
17.5°	71.8	67.3	62.9	57.9	56.0	53.5	49.1	44.7	40.3	35.9	32.1
20°	76.8	72.4	66.7	61.1	58.5	56.0	50.4	45.3	40.3	35.9	31.5
22.5°	82.5	76.8	70.5	64.2	61.7	58.5	52.2	45.9	40.9	35.2	30.2
25°	88.1	81.8	74.3	68.0	64.2	61.1	53.5	47.2	40.9	35.2	29.6
27.5°	93.8	86.9	78.7	71.1	67.3	62.9	55.4	48.5	41.5	35.2	29.0
30°	99.5	91.3	83.1	74.3	69.9	65.5	57.3	49.1	41.5	34.6	28.3
32.5°	105.1	96.3	86.9	77.4	72.4	68.0	58.5	50.4	42.2	34.6	28.3
35°	110.8	100.7	90.6	79.9	74.9	69.9	60.4	51.0	42.2	34.6	27.7
37.5°	115.8	105.7	94.4	83.1	78.0	72.4	61.7	52.2	42.8	34.6	27.1
40°	121.5	110.2	98.2	86.2	80.6	74.9	63.6	52.9	43.4	34.6	26.4
42.5°	129.0	115.8	103.2	90.6	83.7	77.4	65.5	54.1	44.1	34.6	26.4
45°	134.1	120.2	107.0	93.2	86.2	79.9	67.3	54.8	44.1	34.6	25.8
47.5°	139.1	124.6	110.2	95.7	88.7	81.8	68.6	56.0	44.7	34.6	25.8
50°	143.5	128.4	113.9	98.8	91.3	83.7	69.9	56.6	44.7	34.6	25.2
52.5°	147.9	132.2	116.4	100.7	93.2	85.6	71.1	57.3	44.7	34.0	25.2
55°	152.3	136.0	119.6	103.2	95.0	87.5	72.4	57.9	45.3	34.0	24.5
57.5°	156.1	139.1	122.1	105.1	96.9	88.7	73.0	58.5	45.3	34.0	24.5
60°	160.5	142.3	124.6	107.0	98.2	90.0	73.6	58.5	45.3	34.0	23.9
62.5°	163.7	144.8	127.1	108.9	100.1	91.3	74.9	59.2	45.3	34.0	23.9
65°	168.1	147.9	129.0	110.8	101.3	92.5	75.5	59.8	45.9	34.0	23.3
67.5°	170.6	149.8	130.9	112.0	102.6	93.2	76.2	59.8	45.9	33.4	23.3
70°	173.1	152.3	132.8	113.3	103.9	94.4	76.8	60.4	45.9	33.4	23.3
72.5°	175.0	153.6	134.1	114.6	104.5	95.0	76.8	60.4	45.9	33.4	22.7
75°	176.9	155.5	135.3	115.2	105.1	95.7	77.4	60.4	45.9	33.4	22.7
77.5°	178.1	156.7	136.0	115.8	105.7	95.7	77.4	60.4	45.3	32.7	22.7
80°	179.4	157.4	136.6	115.8	105.7	96.3	77.4	60.4	45.3	32.7	22.0
82.5°	180.0	157.4	136.6	115.8	105.7	95.7	77.4	59.8	45.3	32.7	22.0
85°	179.4	158.0	136.6	115.8	105.1	95.7	76.8	59.8	44.7	32.1	21.4
87.5°	179.4	156.7	136.0	115.2	105.1	95.0	76.2	59.2	44.1	31.5	21.4
90°	178.8	156.1	135.3	114.6	104.5	94.4	76.2	58.5	44.1	31.5	20.8
92.5°	177.5	154.8	134.1	113.9	103.2	93.8	74.9	57.9	43.4	30.8	20.8
95°	176.2	153.6	133.4	112.7	102.6	93.2	74.3	57.9	42.8	30.8	20.8
97.5°	174.4	152.3	132.2	111.4	101.3	91.9	73.6	56.6	42.8	30.2	20.8
100°	171.8	150.4	130.3	110.2	100.1	90.6	72.4	56.0	42.2	30.2	20.1
102.5°	169.3	147.9	127.8	108.3	98.2	89.4	71.8	55.4	41.5	29.6	20.1
105°	166.2	145.4	125.9	106.4	96.9	87.5	70.5	54.1	40.9	29.6	20.1
107.5°	162.4	142.3	123.4	104.5	95.0	85.6	69.2	53.5	40.3	29.0	19.5
110°	158.0	139.1	120.2	102.0	93.2	83.7	67.3	52.9	39.7	28.3	19.5



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	153.6	136.0	117.7	99.5	90.6	81.8	66.1	51.6	39.0	28.3	19.5
115°	149.8	132.2	114.6	96.9	88.1	79.9	64.8	50.4	38.4	27.7	19.5
117.5°	145.4	128.4	111.4	94.4	86.2	78.0	62.9	49.7	37.8	27.7	19.5
120°	140.4	124.0	107.6	91.3	83.1	75.5	61.7	48.5	36.5	27.1	19.5
122.5°	136.0	119.6	104.5	88.7	81.2	73.6	59.8	47.2	35.9	27.1	18.9
125°	130.9	115.2	100.7	85.6	78.0	71.1	57.9	45.9	35.2	26.4	18.9
127.5°	125.9	110.8	96.9	82.5	75.5	68.6	56.0	44.7	34.6	26.4	18.9
130°	120.2	106.4	92.5	79.3	73.0	66.1	54.1	43.4	34.0	25.8	18.9
132.5°	114.6	101.3	88.7	76.2	69.9	64.2	52.9	42.2	33.4	25.8	18.9
135°	108.9	96.9	85.0	73.0	66.7	61.7	51.0	41.5	32.7	25.2	18.9
137.5°	103.2	91.9	80.6	69.9	64.2	59.2	49.1	39.7	32.1	25.2	18.9
140°	97.6	86.9	76.2	66.1	61.1	56.0	47.2	38.4	31.5	24.5	18.9
142.5°	91.3	81.8	72.4	62.9	57.9	53.5	45.3	37.1	30.2	24.5	18.9
145°	85.6	76.8	68.0	59.8	55.4	51.0	43.4	36.5	29.6	23.9	19.5
147.5°	79.9	72.4	64.2	56.6	52.2	48.5	41.5	35.2	29.6	23.9	19.5
150°	74.3	67.3	60.4	53.5	49.7	46.6	40.3	34.0	29.0	23.9	19.5
152.5°	68.6	62.3	56.0	49.7	46.6	44.1	38.4	32.7	27.7	23.9	19.5
155°	63.6	57.9	52.2	47.2	44.1	41.5	36.5	32.1	27.7	23.3	20.1
157.5°	58.5	53.5	49.1	44.1	41.5	39.7	35.2	30.8	27.1	23.3	20.1
160°	53.5	49.1	45.3	41.5	39.0	37.1	33.4	30.2	26.4	23.3	20.8
162.5°	48.5	45.3	41.5	38.4	36.5	35.2	32.1	29.0	25.8	23.3	20.8
165°	43.4	40.9	38.4	35.9	34.6	33.4	30.8	28.3	25.8	23.3	21.4
167.5°	39.7	37.8	35.2	33.4	32.1	31.5	29.0	27.1	25.2	23.3	21.4
170°	35.9	34.0	32.7	30.8	30.2	29.6	27.7	26.4	24.5	23.3	22.0
172.5°	31.5	30.8	29.6	29.0	28.3	27.7	26.4	25.8	24.5	23.3	22.0
175°	28.3	27.7	27.1	26.4	26.4	25.8	25.2	24.5	23.9	23.3	22.7
177.5°	25.2	25.2	24.5	24.5	24.5	24.5	23.9	23.9	23.9	23.3	23.3
180°	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
2.5°	34.6	34.0	33.4	33.4	32.7	32.1	31.5	30.8	30.2	29.6	29.6
5°	34.0	32.7	31.5	30.8	30.2	29.6	28.3	27.1	26.4	25.2	24.5
7.5°	32.7	30.8	29.6	29.0	28.3	26.4	25.2	23.9	22.0	21.4	20.8
10°	31.5	29.6	27.7	26.4	25.2	23.3	22.0	20.1	18.9	17.6	16.4
12.5°	30.2	27.7	25.2	24.5	23.3	20.8	18.9	17.0	15.7	13.8	12.6
15°	29.0	26.4	23.3	22.0	20.8	18.3	16.4	14.5	12.6	10.7	9.4
17.5°	28.3	24.5	21.4	20.1	18.9	16.4	13.8	11.3	9.4	8.2	6.9
20°	27.1	23.3	20.1	18.3	17.0	13.8	11.3	9.4	7.6	5.7	4.4
22.5°	25.8	22.0	18.3	16.4	15.1	12.0	9.4	6.9	5.0	3.8	3.1
25°	25.2	20.8	16.4	15.1	13.2	10.1	7.6	5.7	3.8	3.1	2.5
27.5°	23.9	19.5	15.1	13.2	11.3	8.2	5.7	3.8	3.1	2.5	2.5
30°	23.3	18.3	13.8	12.0	10.1	6.9	4.4	3.1	2.5	2.5	2.5
32.5°	22.0	17.0	12.6	10.7	8.8	5.7	3.8	2.5	2.5	2.5	2.5
35°	21.4	16.4	11.3	9.4	7.6	4.4	3.1	2.5	2.5	2.5	2.5
37.5°	20.8	15.1	10.7	8.2	6.3	3.8	3.1	2.5	2.5	2.5	2.5
40°	20.1	14.5	9.4	7.6	5.7	3.1	2.5	2.5	2.5	2.5	1.9
42.5°	19.5	13.8	8.2	6.3	5.0	3.1	3.1	2.5	2.5	2.5	1.9
45°	18.9	12.6	7.6	5.7	4.4	3.1	3.1	2.5	2.5	1.9	1.9
47.5°	18.3	12.0	6.9	5.0	3.8	3.1	2.5	2.5	2.5	1.9	1.9
50°	17.6	11.3	6.3	4.4	3.1	3.1	2.5	2.5	2.5	1.9	1.9
52.5°	17.6	10.7	5.7	3.8	3.1	3.1	2.5	2.5	2.5	1.9	1.9
55°	17.0	10.7	5.0	3.8	3.1	3.1	2.5	2.5	2.5	1.9	1.9
57.5°	16.4	10.1	5.0	3.8	3.1	3.1	2.5	2.5	2.5	1.9	1.9
60°	16.4	9.4	4.4	3.1	3.1	3.1	2.5	2.5	2.5	1.9	1.9
62.5°	15.7	8.8	4.4	3.1	3.1	3.1	2.5	2.5	1.9	1.9	1.9
65°	15.7	8.8	3.8	3.8	3.1	3.1	2.5	2.5	2.5	1.9	1.9
67.5°	15.1	8.2	3.8	3.8	3.1	3.1	2.5	2.5	2.5	1.9	1.9
70°	15.1	8.2	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
72.5°	14.5	8.2	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
75°	14.5	7.6	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
77.5°	14.5	7.6	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
80°	13.8	7.6	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
82.5°	13.8	7.6	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.3
85°	13.2	6.9	3.8	3.8	3.8	3.1	2.5	2.5	1.9	1.9	1.3
87.5°	13.2	6.9	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9	1.3
90°	13.2	6.9	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.3	1.3
92.5°	13.2	6.9	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9	1.3
95°	13.2	6.9	3.8	3.8	3.8	3.1	2.5	2.5	1.9	1.9	1.3
97.5°	12.6	6.9	3.8	3.8	3.8	3.1	3.1	2.5	1.9	1.9	1.3
100°	12.6	6.9	3.8	3.8	3.8	3.1	3.1	2.5	1.9	1.9	1.3
102.5°	12.6	6.9	3.8	3.8	3.8	3.1	2.5	2.5	1.9	1.9	1.3
105°	12.6	6.9	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9	1.3
107.5°	12.6	6.9	3.8	3.8	3.1	3.1	3.1	2.5	1.9	1.9	1.3
110°	12.6	7.6	3.8	3.8	3.8	3.1	3.1	2.5	1.9	1.9	1.3



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	12.6	7.6	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
115°	12.6	7.6	4.4	3.8	3.8	3.1	3.1	2.5	2.5	1.9	1.9
117.5°	13.2	7.6	4.4	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9
120°	13.2	8.2	5.0	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9
122.5°	13.2	8.2	5.0	3.8	3.8	3.8	3.1	3.1	2.5	2.5	1.9
125°	13.2	8.8	5.0	4.4	3.8	3.8	3.1	3.1	3.1	2.5	2.5
127.5°	13.2	8.8	5.7	4.4	3.8	3.8	3.1	3.1	3.1	2.5	2.5
130°	13.8	9.4	5.7	5.0	3.8	3.8	3.8	3.1	3.1	2.5	2.5
132.5°	13.8	9.4	6.3	5.0	4.4	3.8	3.8	3.1	3.1	2.5	2.5
135°	13.8	10.1	6.9	5.7	4.4	3.8	3.8	3.1	3.1	3.1	2.5
137.5°	14.5	10.1	6.9	6.3	5.0	3.8	3.8	3.8	3.1	3.1	3.1
140°	14.5	10.7	7.6	6.3	5.7	4.4	3.8	3.8	3.8	3.1	3.1
142.5°	15.1	11.3	8.2	6.9	6.3	4.4	3.8	3.8	3.8	3.1	3.1
145°	15.1	12.0	8.8	7.6	6.3	5.0	3.8	3.8	3.8	3.1	3.1
147.5°	15.7	12.6	9.4	8.2	7.6	5.7	4.4	3.8	3.8	3.8	3.1
150°	15.7	13.2	10.1	8.8	8.2	6.3	5.0	4.4	3.8	3.8	3.8
152.5°	16.4	13.2	10.7	10.1	8.8	6.9	5.7	4.4	3.8	3.8	3.8
155°	17.0	13.8	12.0	10.7	9.4	8.2	6.3	5.7	4.4	3.8	3.8
157.5°	17.6	15.1	12.6	12.0	10.7	8.8	7.6	6.3	5.7	4.4	4.4
160°	18.3	15.7	13.8	12.6	12.0	10.1	8.8	7.6	6.3	5.7	5.0
162.5°	18.3	16.4	14.5	13.8	13.2	11.3	10.1	8.8	7.6	6.9	6.3
165°	18.9	17.0	15.7	15.1	13.8	12.6	11.3	10.1	9.4	8.2	7.6
167.5°	19.5	18.3	17.0	15.7	15.1	13.8	13.2	12.0	10.7	10.1	9.4
170°	20.8	19.5	18.3	17.6	17.0	15.7	14.5	13.8	13.2	12.0	11.3
172.5°	21.4	20.1	19.5	18.9	18.3	17.6	16.4	15.7	15.1	14.5	13.8
175°	22.0	21.4	20.8	20.1	20.1	18.9	18.3	17.6	17.0	17.0	16.4
177.5°	22.7	22.0	22.0	22.0	21.4	21.4	20.8	20.1	20.1	19.5	19.5
180°	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
2.5°	29.0	28.3	28.3	28.3	27.7	27.7	27.1	27.1
5°	23.9	23.3	23.3	22.7	22.7	22.0	22.0	22.0
7.5°	19.5	18.9	18.3	18.3	17.6	17.6	17.0	17.0
10°	15.1	14.5	13.8	13.8	13.2	12.6	12.6	12.6
12.5°	11.3	10.7	10.1	10.1	9.4	8.8	8.8	8.8
15°	8.2	7.6	6.9	6.9	6.3	5.7	5.7	5.7
17.5°	5.7	5.0	4.4	4.4	3.8	3.1	3.1	3.1
20°	3.8	3.1	3.1	2.5	2.5	2.5	2.5	2.5
22.5°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
25°	2.5	2.5	2.5	2.5	2.5	2.5	1.9	1.9
27.5°	2.5	2.5	2.5	2.5	1.9	1.9	1.9	1.9
30°	2.5	2.5	1.9	1.9	1.9	1.9	1.9	1.9
32.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
35°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
37.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.3	1.3
40°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
42.5°	1.9	1.9	1.9	1.3	1.3	1.3	0.6	0.6
45°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
47.5°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
50°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
52.5°	1.3	1.3	1.3	1.3	1.3	0.6	0.6	0.6
55°	1.3	1.3	1.3	1.3	1.3	0.6	0.6	0.6
57.5°	1.3	1.3	1.3	1.3	0.6	0.6	0.6	0.6
60°	1.3	1.3	1.3	1.3	0.6	0.6	0.6	0.6
62.5°	1.3	1.3	1.3	0.6	0.6	0.6	0.6	0.6
65°	1.3	1.3	1.3	0.6	0.6	0.6	0.6	0.6
67.5°	1.3	1.3	1.3	0.6	0.6	0.6	0.6	0.6
70°	1.3	1.3	1.3	1.3	0.6	0.6	0.6	0.6
72.5°	1.3	1.3	1.3	0.6	0.6	0.6	0.6	0.6
75°	1.3	1.3	1.3	1.3	1.3	0.6	0.6	0.6
77.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
80°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
82.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
85°	1.3	1.3	0.6	0.6	0.6	0.6	0.6	0.6
87.5°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
90°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
92.5°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
95°	1.3	1.3	0.6	0.6	0.6	0.6	0.6	0.6
97.5°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
100°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
102.5°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
105°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
107.5°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
110°	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6



TEST NUMBER: P190086

CATALOG NUMBER: TRR11-LD4-15W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	1.3	1.3	0.6	0.6	0.6	0.6	0.6	0.6
115°	1.3	1.3	1.3	1.3	0.6	0.6	0.6	0.6
117.5°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
120°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
122.5°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	0.6
125°	1.9	1.9	1.9	1.3	1.3	1.3	1.3	1.3
127.5°	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3
130°	2.5	1.9	1.9	1.9	1.9	1.3	1.3	1.3
132.5°	2.5	1.9	1.9	1.9	1.9	1.9	1.3	1.3
135°	2.5	2.5	2.5	1.9	1.9	1.9	1.9	1.9
137.5°	2.5	2.5	2.5	2.5	1.9	1.9	1.9	1.9
140°	2.5	2.5	2.5	2.5	2.5	2.5	1.9	1.9
142.5°	3.1	2.5	2.5	2.5	2.5	2.5	2.5	2.5
145°	3.1	3.1	2.5	2.5	2.5	2.5	2.5	2.5
147.5°	3.1	3.1	3.1	3.1	2.5	2.5	2.5	2.5
150°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
152.5°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
155°	3.8	3.8	3.8	3.1	3.1	3.1	3.1	3.1
157.5°	3.8	3.8	3.8	3.8	3.8	3.1	3.1	3.1
160°	4.4	3.8	3.8	3.8	3.8	3.8	3.8	3.8
162.5°	5.7	5.0	5.0	4.4	4.4	4.4	3.8	3.8
165°	6.9	6.3	6.3	6.3	5.7	5.7	5.7	5.0
167.5°	8.8	8.2	8.2	7.6	7.6	6.9	6.9	6.9
170°	10.7	10.7	10.1	10.1	9.4	9.4	9.4	8.8
172.5°	13.2	12.6	12.6	12.6	12.0	12.0	12.0	11.3
175°	15.7	15.7	15.1	15.1	14.5	15.1	14.5	14.5
177.5°	18.9	18.9	18.3	18.3	18.3	18.3	18.3	18.3
180°	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7

(END OF REPORT)