

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: P190116

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

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190116
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-LD4-15W-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 300mA OT25W/1

Summary

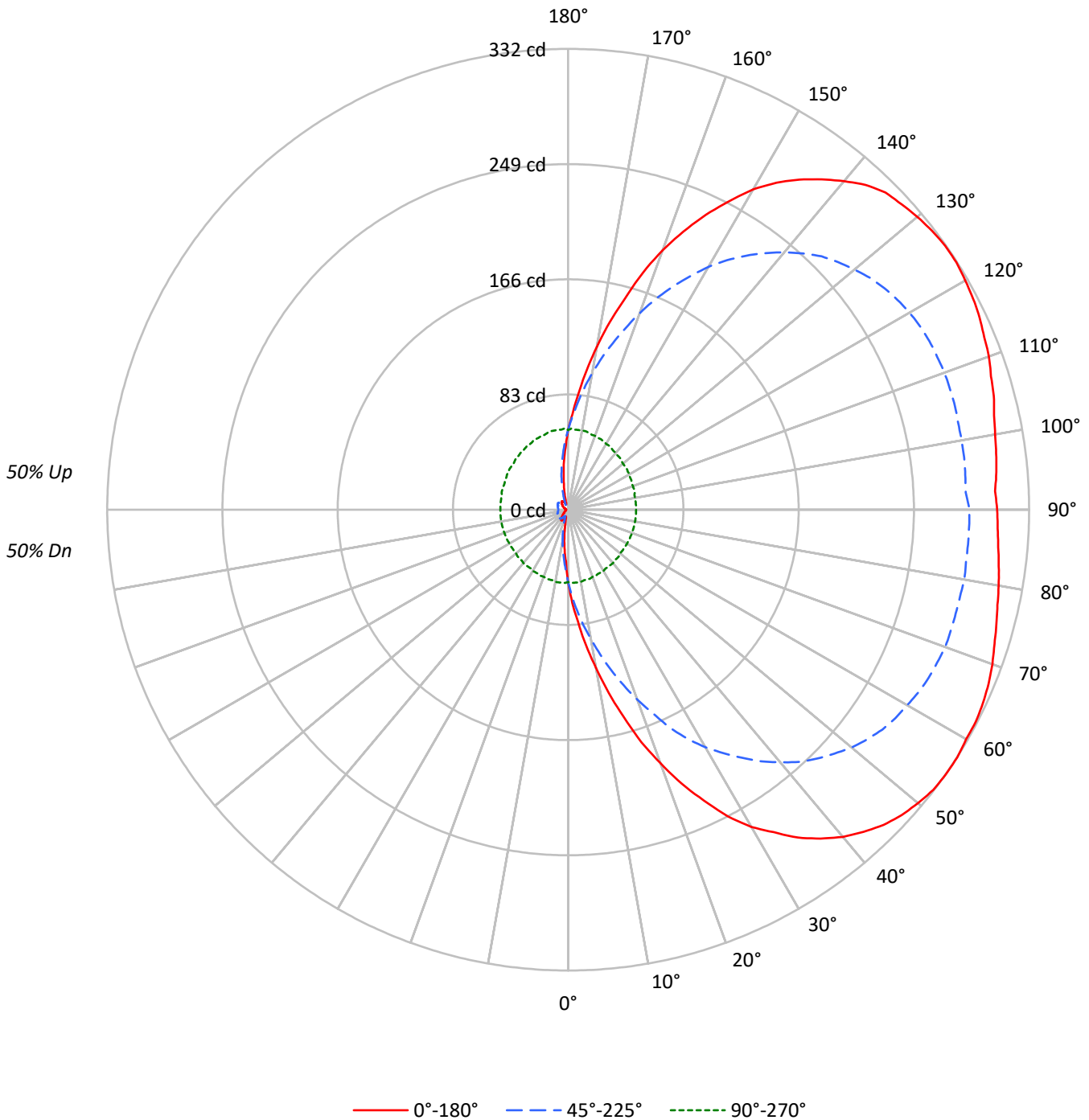
Lumens per Lamp: N/A
Luminaire Lumens: 1476.0 lumens
Efficiency: N/A
Efficacy: 103.2 lumens/watt
Spacing Criteria (0/90/45): 3.14 / 1.48 / 2.84
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 14.3
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

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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	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°	2098	2098	2098
5°	2571	1962	919
10°	3049	1835	374
15°	3496	1713	145
20°	3885	1618	102
25°	4164	1542	128
30°	4359	1500	149
35°	4429	1451	138
40°	4446	1435	111
45°	4414	1412	80
50°	4341	1397	59
55°	4248	1414	41
60°	4135	1441	32
65°	4057	1481	32
70°	3972	1536	23
75°	3902	1607	23
80°	3877	1699	23
85°	3890	1817	24



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	5.3	0.4
10°-20°	19.2	1.3
20°-30°	40.5	2.7
30°-40°	66.5	4.5
40°-50°	91.7	6.2
50°-60°	112.4	7.6
60°-70°	126.8	8.6
70°-80°	135.1	9.2
80°-90°	138.2	9.4
90°-100°	137.6	9.3
100°-110°	134.6	9.1
110°-120°	127.0	8.6
120°-130°	113.2	7.7
130°-140°	92.8	6.3
140°-150°	67.5	4.6
150°-160°	41.5	2.8
160°-170°	20.2	1.4
170°-180°	5.7	0.4
0°-30°	65.1	4.4
0°-40°	131.6	8.9
0°-60°	335.7	22.7
0°-90°	735.7	49.8
90°-120°	399.2	27.0
90°-150°	672.7	45.6
90°-180°	740.0	50.1
0°-180°	1476.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	52	52	52	52	52	
5°	81	73	53	35	29	9
15°	154	120	52	14	6	45
25°	231	173	51	5	7	108
35°	288	218	50	7	9	181
45°	321	254	50	9	6	248
55°	332	276	49	10	3	297
65°	330	286	49	8	3	327
75°	319	289	49	8	2	338
85°	311	289	49	7	2	255
90°	309	289	49	7	1	169
95°	310	287	49	7	2	253
105°	317	288	50	8	2	335
115°	327	287	50	8	3	324
125°	332	278	52	8	5	297
135°	323	258	53	7	6	249
145°	290	223	54	5	7	182
155°	234	177	56	5	5	109
165°	157	124	57	17	7	46
175°	84	77	58	41	35	9
180°	57	57	57	57	57	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1
2.5°	66.9	66.3	65.7	65.0	65.0	65.0	65.0	64.4	63.7	63.1	62.4
5°	81.1	81.1	80.5	79.8	80.5	79.2	78.5	77.2	76.0	74.0	72.7
7.5°	98.5	97.8	96.6	95.9	94.6	94.0	93.3	91.4	89.5	85.6	83.7
10°	115.9	115.2	113.3	112.7	110.7	110.1	108.8	105.6	102.4	98.5	94.6
12.5°	135.2	133.9	132.6	130.7	128.1	127.5	125.5	121.7	117.2	112.0	106.9
15°	154.5	153.8	152.6	150.0	146.8	146.1	144.2	138.4	132.6	126.2	119.7
17.5°	175.7	176.4	173.8	171.2	166.7	165.4	160.3	155.1	148.1	140.3	132.6
20°	194.4	195.0	191.8	189.3	184.1	182.8	179.0	173.2	164.1	154.5	145.5
22.5°	213.7	213.7	210.5	207.3	202.1	200.2	195.7	189.3	180.2	170.6	158.4
25°	231.1	229.8	228.5	224.7	219.5	216.9	212.4	204.7	195.0	184.7	173.2
27.5°	249.1	247.2	245.3	241.4	235.6	233.0	228.5	220.8	209.9	198.9	186.0
30°	263.9	262.0	260.1	256.2	249.8	247.2	242.7	234.3	223.4	210.5	197.6
32.5°	275.5	275.5	272.9	269.1	262.6	259.4	255.6	246.5	235.0	222.7	207.9
35°	288.4	287.1	284.5	280.7	274.9	271.0	267.1	258.1	246.5	233.7	218.2
37.5°	298.7	298.0	295.5	291.6	285.8	282.6	278.1	269.1	257.5	244.0	228.5
40°	307.7	307.1	304.5	300.6	294.8	291.0	287.1	278.1	266.5	253.6	237.5
42.5°	314.8	314.1	312.2	308.3	302.5	299.3	294.8	285.8	274.9	262.0	246.5
45°	321.2	320.6	318.6	314.8	309.0	305.8	302.5	293.5	283.2	269.7	253.6
47.5°	325.7	325.1	323.1	319.3	314.1	310.9	307.7	299.3	289.0	276.2	260.1
50°	328.9	328.3	326.4	323.1	318.0	314.8	312.2	303.8	294.2	281.9	266.5
52.5°	331.5	330.9	328.3	325.7	320.6	318.0	314.8	307.7	298.0	285.8	271.6
55°	332.2	331.5	329.6	327.0	322.5	319.9	316.7	310.3	301.3	290.3	276.2
57.5°	332.2	331.5	329.6	327.0	323.1	320.6	318.0	311.6	303.2	292.9	279.4
60°	330.9	330.9	328.9	326.4	322.5	319.9	318.0	312.2	304.5	294.8	281.9
62.5°	330.9	330.2	328.3	325.7	322.5	319.9	318.0	312.2	305.8	296.1	284.5
65°	329.6	328.9	327.0	324.4	321.2	319.3	317.4	312.2	305.8	297.4	286.5
67.5°	327.7	327.0	325.1	323.1	319.9	318.0	316.1	311.6	305.8	298.0	287.7
70°	325.1	325.1	323.1	321.2	318.0	316.7	314.8	310.3	305.1	298.0	289.0
72.5°	321.9	321.9	320.6	318.6	316.1	314.1	312.8	309.0	304.5	298.0	289.0
75°	319.3	319.3	318.0	316.1	313.5	312.2	310.3	307.1	303.2	297.4	289.0
77.5°	316.7	316.1	315.4	313.5	310.9	309.6	308.3	305.8	301.9	296.8	289.0
80°	314.8	314.1	312.8	310.9	309.6	307.7	307.1	304.5	301.3	296.8	289.7
82.5°	312.8	312.8	310.9	309.6	307.1	305.8	305.1	303.2	300.0	296.1	289.0
85°	310.9	310.3	309.6	307.7	305.8	304.5	303.8	301.9	299.3	295.5	289.0
87.5°	309.6	309.6	308.3	306.4	305.1	303.8	303.2	301.3	298.7	294.8	289.0
90°	309.0	309.0	307.7	306.4	304.5	303.8	303.2	301.3	298.7	294.8	289.0
92.5°	307.7	307.7	305.8	304.5	303.2	302.5	301.3	300.0	297.4	292.9	286.5
95°	309.6	308.3	307.1	305.8	303.8	303.2	302.5	300.6	297.4	293.5	287.1
97.5°	310.9	310.3	309.0	307.1	305.8	304.5	303.8	301.9	298.7	294.2	287.7
100°	312.2	312.2	310.9	309.6	307.7	306.4	305.1	302.5	300.0	295.5	287.7
102.5°	314.1	314.1	312.8	310.9	309.0	308.3	307.1	304.5	300.6	295.5	287.7
105°	317.4	316.1	315.4	313.5	311.6	310.3	309.0	305.1	301.9	296.1	288.4
107.5°	319.3	318.6	317.4	315.4	313.5	312.2	310.9	307.7	302.5	296.8	288.4
110°	322.5	321.9	320.6	318.6	316.1	314.8	312.8	309.0	303.8	297.4	288.4



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	324.4	323.8	322.5	320.6	317.4	316.1	314.1	310.3	304.5	297.4	287.7
115°	327.0	326.4	325.1	322.5	319.3	318.0	316.1	311.6	305.1	297.4	287.1
117.5°	328.9	328.3	327.0	324.4	321.2	319.3	316.7	312.2	305.8	296.8	285.8
120°	330.2	329.6	328.3	325.7	321.9	319.3	317.4	312.2	304.5	295.5	283.9
122.5°	331.5	330.2	328.9	325.7	322.5	319.9	317.4	311.6	303.8	294.2	281.3
125°	331.5	330.9	328.9	325.7	321.9	319.3	316.7	310.3	301.9	291.0	278.1
127.5°	330.2	329.6	327.7	324.4	320.6	318.0	314.8	307.7	298.7	287.7	274.2
130°	328.3	327.7	325.7	322.5	318.0	314.8	312.2	304.5	295.5	283.2	269.1
132.5°	325.7	325.1	323.1	319.3	314.8	312.2	309.0	300.6	291.0	278.1	263.9
135°	323.1	321.9	319.3	316.1	311.6	307.7	304.5	296.1	285.8	272.9	258.1
137.5°	317.4	315.4	313.5	310.3	305.1	301.3	298.0	289.7	278.7	265.2	250.4
140°	309.0	308.3	305.8	301.9	296.8	293.5	289.7	280.7	269.7	256.2	242.0
142.5°	300.0	299.3	296.8	292.9	287.1	283.9	280.7	271.6	260.1	247.2	233.0
145°	290.3	289.7	286.5	283.2	277.4	274.2	270.4	261.3	250.4	236.9	223.4
147.5°	279.4	278.7	276.2	272.3	266.5	262.6	259.4	250.4	239.5	226.6	213.1
150°	266.5	264.6	262.0	258.8	253.0	249.8	247.2	237.5	226.6	215.0	202.1
152.5°	250.4	249.1	246.5	243.3	238.2	234.3	231.7	223.4	212.4	201.5	189.3
155°	234.3	233.0	230.5	227.9	222.1	218.9	216.9	207.9	198.9	188.6	177.0
157.5°	216.9	215.6	214.4	210.5	206.0	202.8	200.2	193.1	184.1	174.4	164.1
160°	198.9	197.0	195.0	193.1	188.6	185.4	183.5	177.0	168.7	159.0	150.6
162.5°	179.0	177.7	175.7	173.8	170.6	167.4	164.8	158.4	151.9	144.2	137.1
165°	157.1	155.8	154.5	153.2	150.0	147.4	145.5	141.6	136.5	130.0	124.2
167.5°	138.4	137.1	136.5	134.5	132.6	130.0	129.4	125.5	121.7	116.5	112.0
170°	119.1	118.4	117.8	116.5	114.6	113.3	112.0	109.4	107.5	103.0	99.8
172.5°	101.1	100.4	99.8	99.1	97.8	96.6	95.9	94.0	92.7	90.1	88.2
175°	83.7	83.0	83.0	82.4	82.4	81.1	81.1	79.8	79.2	77.2	76.6
177.5°	68.9	68.2	68.9	68.2	68.2	67.6	68.2	67.6	67.6	67.6	66.9
180°	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1
2.5°	61.8	61.2	59.9	59.2	58.6	57.9	56.6	55.4	54.1	52.8	51.5
5°	70.8	68.9	66.9	65.0	63.7	62.4	60.5	57.9	55.4	52.8	50.9
7.5°	80.5	77.9	74.0	70.8	68.9	66.9	63.7	59.9	56.6	52.8	49.6
10°	90.1	86.3	81.1	76.6	74.0	71.5	66.9	61.8	57.3	52.8	48.3
12.5°	101.7	94.6	88.8	82.4	79.2	76.0	70.2	63.7	57.9	52.1	47.0
15°	112.7	104.9	97.2	89.5	85.0	81.8	74.0	66.3	58.6	52.1	45.7
17.5°	124.2	114.6	104.9	95.9	90.8	86.3	77.2	68.2	59.9	52.1	45.1
20°	135.8	124.2	113.3	102.4	96.6	90.8	80.5	70.2	60.5	51.5	43.8
22.5°	146.8	133.9	121.7	108.8	102.4	95.9	83.7	72.1	61.2	51.5	42.5
25°	158.4	144.2	130.0	115.9	108.1	101.1	86.9	74.0	61.8	50.9	41.2
27.5°	171.9	154.5	139.0	123.0	114.6	106.2	90.8	76.0	63.1	50.9	40.6
30°	182.2	164.8	146.8	129.4	120.4	111.4	94.0	77.9	63.7	50.9	39.3
32.5°	192.5	174.4	155.1	135.8	125.5	115.9	97.8	79.8	64.4	50.2	38.6
35°	202.1	183.5	163.5	141.6	131.3	121.0	101.1	81.8	65.0	50.2	38.0
37.5°	211.8	192.5	171.2	148.1	137.1	125.5	104.3	83.7	65.7	50.2	36.7
40°	220.2	200.2	179.0	154.5	142.3	130.0	107.5	85.6	66.3	50.2	36.0
42.5°	227.9	207.9	185.4	159.6	147.4	134.5	110.1	86.9	66.9	49.6	35.4
45°	236.2	215.0	191.8	167.4	151.9	139.0	113.3	88.8	67.6	49.6	34.8
47.5°	242.7	221.4	197.6	172.5	157.1	143.5	115.9	90.8	68.2	49.6	34.1
50°	248.5	227.2	203.4	177.0	161.6	147.4	119.1	92.1	68.9	48.9	33.5
52.5°	254.3	233.0	209.2	182.2	167.4	151.3	121.7	93.3	69.5	48.9	32.8
55°	258.8	238.2	213.7	186.7	171.2	154.5	124.2	95.3	70.2	48.9	32.2
57.5°	262.6	242.0	218.2	189.9	174.4	157.7	126.8	96.6	70.2	48.9	31.5
60°	265.9	245.9	221.4	193.8	178.3	160.9	128.7	97.8	70.8	48.9	31.5
62.5°	269.1	249.1	225.3	197.6	181.5	164.8	131.3	99.1	71.5	48.9	30.9
65°	271.6	252.3	228.5	200.8	184.7	168.7	133.2	100.4	72.1	48.9	30.9
67.5°	274.2	255.6	231.7	203.4	188.0	171.2	135.2	101.7	72.1	48.9	30.9
70°	275.5	257.5	234.3	206.0	189.9	173.8	137.1	102.4	72.7	48.9	30.3
72.5°	276.8	259.4	236.2	208.6	192.5	175.7	138.4	103.6	73.4	48.9	30.3
75°	277.4	260.1	238.2	209.9	193.8	177.0	139.7	104.3	73.4	48.9	30.3
77.5°	278.1	261.3	238.8	211.1	195.0	178.3	141.0	104.9	74.0	48.9	29.6
80°	278.7	262.6	240.1	212.4	196.3	179.6	141.6	105.6	74.0	48.9	29.6
82.5°	278.7	262.6	240.8	213.1	197.0	180.2	142.3	105.6	74.0	48.9	29.6
85°	278.1	263.3	240.8	213.7	197.6	180.2	142.9	106.2	74.0	48.9	29.6
87.5°	278.7	263.3	242.0	214.4	198.3	180.9	142.9	106.2	74.0	48.9	29.6
90°	278.7	263.9	242.0	215.0	198.3	181.5	143.5	106.9	74.7	48.9	29.6
92.5°	276.8	261.3	240.1	213.1	197.0	180.2	142.3	106.2	74.7	48.9	30.3
95°	276.8	261.3	240.1	213.1	197.0	180.2	142.3	106.2	74.7	48.9	30.3
97.5°	276.8	261.3	240.1	212.4	196.3	179.6	142.3	106.2	74.7	48.9	30.3
100°	277.4	260.7	239.5	211.8	195.7	179.0	141.6	106.2	74.7	48.9	30.3
102.5°	277.4	260.7	238.8	211.1	195.0	178.3	141.0	105.6	74.7	48.9	30.3
105°	276.8	260.1	237.5	209.9	194.4	177.7	140.3	104.9	74.7	49.6	30.9
107.5°	276.2	258.8	236.2	208.6	192.5	176.4	139.7	104.3	74.0	49.6	30.9
110°	275.5	257.5	235.0	206.6	191.2	174.4	138.4	104.3	74.0	49.6	31.5



TEST NUMBER: P190116

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

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	273.6	255.6	232.4	204.1	188.6	171.9	136.5	103.0	74.0	49.6	31.5
115°	272.3	254.3	230.5	202.1	186.7	169.9	135.2	102.4	74.0	50.2	32.2
117.5°	271.0	251.7	227.9	199.6	184.1	167.4	133.2	101.7	73.4	50.2	32.8
120°	267.8	248.5	224.7	196.3	180.9	164.8	131.3	100.4	73.4	50.9	33.5
122.5°	265.2	244.6	220.8	193.1	178.3	162.2	129.4	99.1	72.7	50.9	34.1
125°	261.3	240.8	216.9	189.3	174.4	158.4	127.5	98.5	72.7	51.5	34.1
127.5°	256.8	236.2	212.4	184.7	170.6	154.5	124.9	96.6	72.1	51.5	34.8
130°	251.7	230.5	207.3	180.2	166.1	151.3	122.3	95.3	72.1	51.5	35.4
132.5°	245.9	225.3	201.5	175.7	161.6	147.4	119.7	94.0	71.5	52.1	36.7
135°	240.1	219.5	196.3	170.6	156.4	143.5	117.2	92.7	71.5	52.8	37.3
137.5°	232.4	211.8	189.9	164.1	151.3	139.0	114.6	91.4	70.8	52.8	38.0
140°	224.0	204.1	182.2	157.7	146.1	134.5	111.4	89.5	70.2	53.4	39.3
142.5°	215.6	195.7	175.7	151.3	141.0	130.0	108.1	87.5	69.5	53.4	39.9
145°	206.6	188.0	167.4	146.1	135.8	125.5	105.6	86.3	69.5	54.1	41.2
147.5°	197.0	179.0	159.6	139.7	130.7	121.0	102.4	85.0	68.9	54.7	42.5
150°	186.7	169.9	151.3	133.2	124.9	115.9	99.1	83.0	68.2	54.7	43.8
152.5°	175.1	158.4	143.5	126.8	119.1	110.7	95.9	81.1	67.6	55.4	44.4
155°	163.5	148.7	135.2	120.4	113.3	106.2	92.1	79.2	66.9	56.0	45.7
157.5°	151.9	139.0	126.8	113.3	107.5	101.1	88.8	77.2	66.3	56.0	47.0
160°	140.3	129.4	118.4	106.9	101.7	96.6	85.6	75.3	65.7	56.6	48.3
162.5°	128.7	119.1	110.1	100.4	95.9	91.4	81.8	73.4	65.0	56.6	49.6
165°	117.2	109.4	101.7	93.3	90.1	86.3	78.5	71.5	64.4	57.3	50.9
167.5°	106.2	99.8	94.0	87.5	85.0	81.8	75.3	69.5	63.7	57.9	52.1
170°	95.3	90.8	86.3	81.1	79.2	76.6	71.5	66.9	62.4	57.9	53.4
172.5°	85.0	81.1	78.5	74.7	73.4	71.5	68.2	65.0	61.2	57.9	54.7
175°	74.7	72.7	70.8	68.2	67.6	66.3	64.4	62.4	60.5	57.9	56.0
177.5°	65.7	65.0	64.4	63.1	63.1	62.4	61.2	60.5	59.9	58.6	57.3
180°	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3



TEST NUMBER: P190116

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1
2.5°	50.2	49.6	48.3	47.0	47.0	45.7	44.4	43.1	42.5	41.8	40.6
5°	48.3	46.3	44.4	43.1	42.5	39.9	38.6	36.7	35.4	33.5	32.8
7.5°	46.3	43.8	40.6	39.3	38.0	35.4	32.8	30.9	29.0	27.0	25.7
10°	44.4	40.6	37.3	35.4	33.5	30.9	28.3	25.7	23.2	21.2	19.3
12.5°	41.8	38.0	33.5	31.5	29.6	26.4	23.2	20.6	18.0	15.4	14.2
15°	40.6	35.4	30.3	28.3	26.4	22.5	18.7	16.1	13.5	11.6	10.3
17.5°	38.6	32.8	27.7	25.1	23.2	18.7	15.4	12.2	10.3	8.4	7.1
20°	36.7	30.3	24.5	22.5	20.0	15.4	12.2	9.7	7.7	6.4	5.8
22.5°	34.8	28.3	21.9	19.3	16.7	12.2	9.7	7.1	5.8	5.1	5.1
25°	32.8	26.4	19.3	16.7	14.2	10.3	7.7	5.8	5.1	5.1	5.8
27.5°	31.5	24.5	17.4	14.8	12.2	9.0	6.4	5.1	5.1	5.8	6.4
30°	30.3	22.5	15.4	12.9	10.3	7.1	5.1	5.1	5.8	6.4	7.1
32.5°	29.0	20.6	13.5	10.9	9.0	6.4	5.1	5.8	6.4	7.1	7.7
35°	27.7	19.3	12.2	9.7	7.7	5.8	5.1	5.8	7.1	7.7	8.4
37.5°	26.4	17.4	10.9	8.4	7.1	5.1	5.8	6.4	7.7	8.4	9.0
40°	25.1	16.1	9.7	7.7	6.4	5.1	6.4	7.1	8.4	9.0	9.0
42.5°	24.5	14.8	9.0	7.1	5.8	5.1	6.4	7.7	8.4	9.0	9.0
45°	23.2	14.2	8.4	6.4	5.1	5.8	7.1	8.4	9.0	9.0	9.0
47.5°	22.5	12.9	7.1	5.8	5.1	6.4	7.7	9.0	9.0	9.0	8.4
50°	21.9	12.2	7.1	5.8	5.1	6.4	8.4	9.0	9.7	9.0	8.4
52.5°	20.6	11.6	6.4	5.1	5.8	7.1	8.4	9.7	9.7	9.0	7.7
55°	20.0	10.9	5.8	5.1	5.8	7.7	9.0	9.7	9.7	8.4	7.7
57.5°	19.3	10.3	5.8	5.1	5.8	7.7	9.0	9.7	9.0	8.4	7.1
60°	18.7	9.7	5.8	5.8	6.4	8.4	9.7	9.7	9.0	7.7	6.4
62.5°	18.7	9.7	5.8	5.8	6.4	8.4	9.7	9.7	9.0	7.7	6.4
65°	18.0	9.0	5.8	5.8	7.1	8.4	9.7	9.7	8.4	7.1	5.8
67.5°	17.4	9.0	5.8	6.4	7.1	9.0	9.7	9.7	8.4	7.1	5.8
70°	17.4	8.4	5.8	6.4	7.1	9.0	9.7	9.7	8.4	6.4	5.8
72.5°	16.7	8.4	5.8	6.4	7.1	9.0	9.7	9.0	7.7	6.4	5.1
75°	16.7	8.4	5.8	6.4	7.7	9.0	9.7	9.0	7.7	6.4	5.1
77.5°	16.7	8.4	5.8	6.4	7.7	9.7	9.7	9.0	7.7	5.8	5.1
80°	16.7	7.7	5.8	6.4	7.7	9.7	9.7	9.0	7.7	5.8	5.1
82.5°	16.7	8.4	5.8	7.1	7.7	9.7	9.7	9.0	7.1	5.8	4.5
85°	16.1	7.7	5.8	6.4	7.7	9.7	9.7	8.4	7.1	5.8	4.5
87.5°	16.1	7.7	5.8	6.4	7.7	9.0	9.7	8.4	7.1	5.8	4.5
90°	16.1	7.7	5.8	6.4	7.7	9.0	9.7	8.4	7.1	5.1	4.5
92.5°	16.7	8.4	5.8	6.4	7.7	9.0	9.7	8.4	7.1	5.8	4.5
95°	16.7	8.4	5.8	6.4	7.7	9.0	9.7	9.0	7.1	5.8	5.1
97.5°	16.7	8.4	5.8	6.4	7.1	9.0	9.7	8.4	7.1	5.8	5.1
100°	16.7	8.4	5.8	5.8	7.1	8.4	9.0	8.4	7.7	5.8	5.1
102.5°	17.4	8.4	5.1	5.8	7.1	8.4	9.0	9.0	7.7	6.4	5.1
105°	17.4	8.4	5.1	5.8	6.4	8.4	9.0	9.0	7.7	6.4	5.1
107.5°	17.4	8.4	5.1	5.1	6.4	7.7	9.0	8.4	7.7	6.4	5.8
110°	18.0	9.0	5.1	5.1	5.8	7.7	9.0	9.0	7.7	7.1	5.8



TEST NUMBER: P190116

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	18.0	9.0	5.1	5.1	5.8	7.1	8.4	8.4	7.7	7.1	5.8
115°	18.7	9.7	5.1	5.1	5.8	7.1	8.4	9.0	8.4	7.7	6.4
117.5°	20.0	10.3	5.8	5.1	5.1	7.1	8.4	9.0	8.4	7.7	7.1
120°	20.0	10.9	5.8	5.1	5.1	6.4	7.7	9.0	8.4	7.7	7.1
122.5°	21.2	11.6	5.8	5.1	5.1	6.4	7.7	8.4	9.0	8.4	7.7
125°	21.9	12.2	6.4	5.1	5.1	5.8	7.1	8.4	8.4	8.4	7.7
127.5°	22.5	12.9	7.1	5.1	4.5	5.8	7.1	7.7	8.4	8.4	7.7
130°	23.2	13.5	7.7	5.8	5.1	5.1	6.4	7.1	7.7	8.4	7.7
132.5°	24.5	14.8	8.4	5.8	5.1	5.1	5.8	7.1	7.7	7.7	7.7
135°	25.1	16.1	9.0	6.4	5.1	4.5	5.1	6.4	7.1	7.7	7.7
137.5°	26.4	16.7	9.7	7.7	5.8	4.5	5.1	5.8	6.4	7.1	7.7
140°	27.7	18.7	10.9	8.4	6.4	4.5	4.5	5.1	5.8	7.1	7.1
142.5°	29.0	20.0	12.9	9.7	7.7	4.5	4.5	5.1	5.8	6.4	6.4
145°	30.9	21.9	14.2	10.9	9.0	5.8	4.5	4.5	5.1	5.8	6.4
147.5°	32.2	23.2	16.1	12.9	10.3	7.1	4.5	3.9	4.5	5.1	5.8
150°	33.5	25.1	18.0	14.8	12.2	8.4	5.8	4.5	3.9	4.5	5.1
152.5°	35.4	27.0	20.6	17.4	14.2	10.3	7.1	5.1	3.9	3.9	4.5
155°	36.7	29.6	22.5	20.0	17.4	12.2	9.0	6.4	5.1	3.9	3.9
157.5°	38.6	31.5	25.7	22.5	20.0	14.8	11.6	8.4	6.4	5.1	4.5
160°	41.2	34.1	28.3	25.7	23.2	18.7	14.2	11.6	9.0	7.1	5.8
162.5°	43.1	36.7	31.5	29.0	26.4	22.5	18.0	14.8	12.2	10.3	8.4
165°	45.1	39.9	34.8	32.8	30.3	26.4	22.5	19.3	16.7	14.2	12.2
167.5°	47.0	42.5	38.6	36.0	34.1	30.9	27.7	24.5	21.9	19.3	17.4
170°	49.6	45.7	41.8	40.6	38.6	35.4	32.8	30.3	27.7	25.7	23.8
172.5°	51.5	48.3	45.7	44.4	43.1	40.6	38.0	36.0	34.1	32.2	30.9
175°	53.4	51.5	49.6	48.3	47.6	45.7	44.4	43.1	41.2	39.3	38.6
177.5°	56.0	55.4	54.1	53.4	52.8	52.1	51.5	50.2	49.6	48.3	47.6
180°	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3



TEST NUMBER: P190116

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1
2.5°	39.9	39.3	38.6	38.6	38.6	38.0	37.3	37.3
5°	31.5	30.3	30.3	30.3	29.6	29.0	28.3	29.0
7.5°	24.5	23.2	22.5	22.5	21.9	21.2	20.6	21.2
10°	18.0	16.7	16.1	15.4	14.8	14.2	14.2	14.2
12.5°	12.2	11.6	10.9	10.3	9.7	9.7	9.0	9.0
15°	9.0	8.4	7.7	7.1	7.1	6.4	6.4	6.4
17.5°	6.4	5.8	5.8	5.1	5.1	5.1	5.1	5.1
20°	5.1	5.1	5.1	5.1	5.1	5.1	5.8	5.1
22.5°	5.1	5.8	5.8	5.8	6.4	6.4	6.4	6.4
25°	5.8	6.4	6.4	7.1	7.1	7.1	7.1	7.1
27.5°	7.1	7.1	7.7	7.7	7.7	8.4	8.4	8.4
30°	7.7	8.4	8.4	8.4	8.4	9.0	9.0	9.0
32.5°	8.4	8.4	9.0	9.0	9.0	9.0	9.0	9.0
35°	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
37.5°	9.0	9.0	9.0	9.0	8.4	8.4	8.4	8.4
40°	9.0	9.0	8.4	8.4	8.4	7.7	7.7	7.7
42.5°	9.0	8.4	7.7	7.7	7.1	7.1	7.1	6.4
45°	8.4	7.7	7.7	7.1	6.4	6.4	5.8	5.8
47.5°	7.7	7.1	7.1	6.4	5.8	5.1	5.1	5.1
50°	7.7	6.4	6.4	5.8	5.1	5.1	4.5	4.5
52.5°	7.1	5.8	5.8	5.1	4.5	4.5	3.9	3.9
55°	6.4	5.8	5.1	4.5	3.9	3.9	3.2	3.2
57.5°	5.8	5.1	4.5	3.9	3.9	3.2	3.2	3.2
60°	5.8	4.5	4.5	3.9	3.2	3.2	2.6	2.6
62.5°	5.1	4.5	3.9	3.9	3.2	2.6	2.6	2.6
65°	5.1	3.9	3.9	3.2	3.2	2.6	2.6	2.6
67.5°	4.5	3.9	3.9	3.2	2.6	2.6	1.9	1.9
70°	4.5	3.9	3.2	3.2	2.6	2.6	1.9	1.9
72.5°	4.5	3.9	3.2	3.2	2.6	1.9	1.9	1.9
75°	4.5	3.2	3.2	3.2	2.6	1.9	1.9	1.9
77.5°	3.9	3.2	3.2	3.2	2.6	1.9	1.9	1.9
80°	3.9	3.2	3.2	3.2	2.6	1.9	1.9	1.9
82.5°	3.9	3.2	3.2	2.6	2.6	1.9	1.9	1.9
85°	3.9	3.2	2.6	2.6	1.9	1.9	1.9	1.9
87.5°	3.9	2.6	2.6	2.6	1.9	1.9	1.9	1.9
90°	3.9	2.6	2.6	2.6	1.9	1.9	1.3	1.3
92.5°	3.9	3.2	3.2	2.6	2.6	1.9	1.9	1.9
95°	3.9	3.2	3.2	3.2	2.6	1.9	1.9	1.9
97.5°	3.9	3.2	3.2	3.2	2.6	1.9	1.9	1.9
100°	4.5	3.9	3.2	3.2	2.6	1.9	1.9	1.9
102.5°	4.5	3.9	3.2	3.2	2.6	2.6	1.9	1.9
105°	4.5	3.9	3.9	3.2	2.6	2.6	1.9	1.9
107.5°	4.5	3.9	3.9	3.2	3.2	2.6	2.6	1.9
110°	5.1	4.5	3.9	3.9	3.2	2.6	2.6	2.6



TEST NUMBER: P190116

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	5.1	4.5	3.9	3.9	3.2	3.2	2.6	2.6
115°	5.8	4.5	4.5	4.5	3.9	3.9	3.2	3.2
117.5°	5.8	5.1	5.1	4.5	4.5	3.9	3.9	3.9
120°	6.4	5.8	5.1	5.1	4.5	4.5	3.9	3.9
122.5°	6.4	5.8	5.8	5.1	5.1	4.5	4.5	4.5
125°	7.1	6.4	5.8	5.8	5.1	5.1	5.1	5.1
127.5°	7.1	6.4	6.4	6.4	5.8	5.1	5.1	5.1
130°	7.7	7.1	7.1	6.4	6.4	5.8	5.8	5.8
132.5°	7.7	7.1	7.1	7.1	6.4	6.4	6.4	6.4
135°	7.7	7.7	7.7	7.1	7.1	7.1	6.4	6.4
137.5°	7.7	7.7	7.7	7.7	7.1	7.1	7.1	7.1
140°	7.7	7.7	7.7	7.7	7.7	7.7	7.1	7.1
142.5°	7.1	7.1	7.7	7.7	7.7	7.7	7.1	7.7
145°	6.4	7.1	7.1	7.1	7.1	7.1	7.1	7.1
147.5°	5.8	6.4	6.4	6.4	7.1	7.1	7.1	7.1
150°	5.1	5.8	5.8	5.8	5.8	6.4	6.4	6.4
152.5°	4.5	5.1	5.1	5.1	5.1	5.8	5.8	5.8
155°	4.5	4.5	4.5	4.5	4.5	5.1	5.1	5.1
157.5°	3.9	3.9	3.9	3.9	3.9	4.5	4.5	4.5
160°	5.1	4.5	3.9	3.9	3.9	3.9	3.9	3.9
162.5°	7.1	6.4	5.8	5.8	5.1	4.5	4.5	4.5
165°	10.9	9.7	9.0	9.0	7.7	7.7	7.1	7.1
167.5°	16.1	14.2	14.2	13.5	12.2	12.2	11.6	11.6
170°	22.5	20.6	20.0	20.0	18.7	18.0	18.0	17.4
172.5°	29.6	28.3	27.7	27.7	26.4	26.4	25.7	25.1
175°	38.0	36.7	36.0	36.0	34.8	34.8	34.1	34.8
177.5°	47.6	46.3	46.3	46.3	45.7	45.7	45.1	44.4
180°	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3

(END OF REPORT)