

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: P190113

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

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190113  
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-LD4-15W-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 300mA OT25W/1

**Summary**

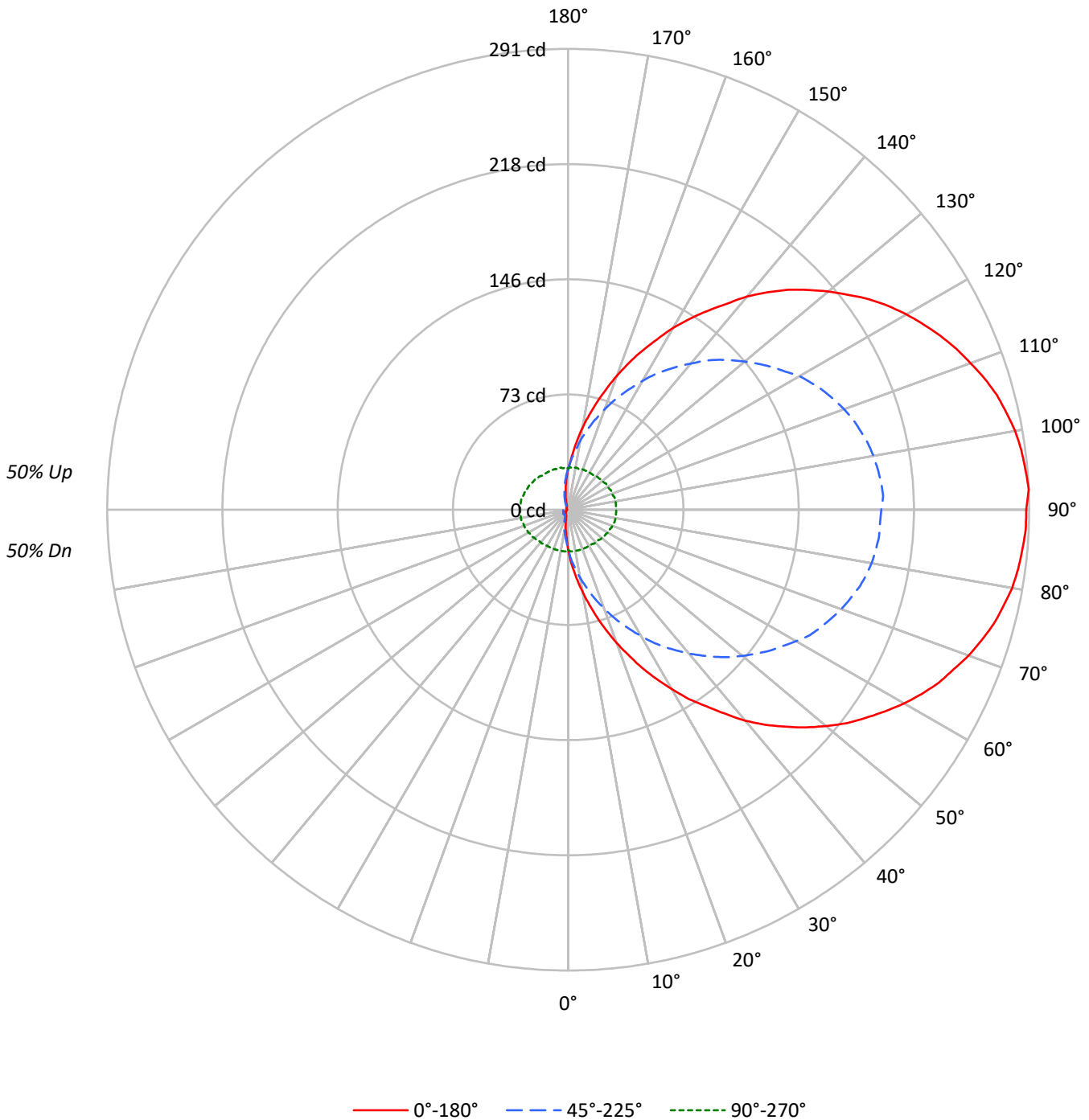
Lumens per Lamp: N/A  
Luminaire Lumens: 931.0 lumens  
Efficiency: N/A  
Efficacy: 65.1 lumens/watt  
Spacing Criteria (0/90/45): 3.83 / 1.63 / 3.13  
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')  
CIE Type: General Diffuse

Input Watts (W): 14.3  
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	31
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°	1011	1011	1011
5°	1205	981	469
10°	1389	917	237
15°	1588	868	118
20°	1789	829	78
25°	1984	800	58
30°	2159	778	53
35°	2323	763	49
40°	2513	772	38
45°	2663	769	36
50°	2805	792	25
55°	2931	818	24
60°	3058	855	16
65°	3178	879	16
70°	3288	930	16
75°	3400	996	16
80°	3505	1053	16
85°	3601	1126	8



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	2.6	0.3
10°-20°	9.2	1.0
20°-30°	19.5	2.1
30°-40°	33.6	3.6
40°-50°	50.5	5.4
50°-60°	67.8	7.3
60°-70°	83.5	9.0
70°-80°	95.6	10.3
80°-90°	101.8	10.9
90°-100°	102.4	11.0
100°-110°	95.9	10.3
110°-120°	84.0	9.0
120°-130°	68.4	7.3
130°-140°	50.9	5.5
140°-150°	33.8	3.6
150°-160°	19.6	2.1
160°-170°	9.3	1.0
170°-180°	2.6	0.3
0°-30°	31.3	3.4
0°-40°	64.9	7.0
0°-60°	183.2	19.7
0°-90°	464.1	49.8
90°-120°	282.3	30.3
90°-150°	435.4	46.8
90°-180°	467.0	50.2
0°-180°	931.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	25	25	25	25	25	
5°	38	34	26	18	15	4
15°	70	55	26	9	5	21
25°	110	79	26	4	3	51
35°	151	106	26	4	3	96
45°	194	131	27	4	3	150
55°	229	155	28	3	2	206
65°	258	176	29	3	1	256
75°	278	190	30	3	1	294
85°	288	197	30	3	1	235
90°	289	198	30	3	1	159
95°	290	198	30	3	1	236
105°	280	191	30	3	1	296
115°	260	178	30	3	1	257
125°	232	157	29	3	1	208
135°	196	134	28	3	1	152
145°	153	108	27	3	2	97
155°	111	80	27	3	2	52
165°	70	55	26	9	4	21
175°	37	34	26	19	16	4
180°	26	26	26	26	26	



TEST NUMBER: P190113

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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1
2.5°	31.6	30.9	30.9	30.9	30.9	30.9	30.9	30.3	30.3	30.3	29.6
5°	38.0	37.3	37.3	37.3	36.7	36.7	36.7	36.1	35.4	34.8	34.1
7.5°	45.1	44.4	44.4	44.4	43.8	43.1	43.1	41.9	41.2	39.9	38.6
10°	52.8	52.2	51.5	50.9	50.9	50.2	49.6	48.3	47.0	45.7	43.8
12.5°	61.2	61.2	59.9	59.2	58.6	58.0	57.3	55.4	53.4	51.5	48.9
15°	70.2	70.2	69.5	68.3	67.0	66.3	65.0	63.1	60.5	58.0	54.7
17.5°	79.8	79.8	78.6	77.3	76.0	74.7	73.4	70.8	67.6	64.4	60.5
20°	89.5	88.9	88.2	86.3	84.4	83.1	81.8	78.6	75.3	70.8	66.3
22.5°	99.2	99.2	97.9	95.9	93.4	91.4	90.1	86.3	82.4	77.9	72.8
25°	110.1	109.5	108.2	105.6	103.7	101.1	99.8	95.3	90.8	85.0	79.2
27.5°	120.4	119.8	118.5	115.9	112.7	110.8	108.8	103.7	98.5	92.1	85.6
30°	130.7	130.7	128.8	126.2	122.3	120.4	117.8	112.7	106.9	99.8	92.1
32.5°	141.7	141.0	138.4	135.9	132.0	129.4	126.8	121.7	114.6	106.9	99.2
35°	151.3	151.3	148.7	145.5	141.7	139.1	136.5	130.1	122.3	114.0	105.6
37.5°	162.3	161.6	159.0	155.8	151.3	148.7	145.5	138.4	130.7	121.7	112.0
40°	173.9	173.2	171.3	167.4	161.0	157.8	155.2	147.5	138.4	128.8	118.5
42.5°	184.2	183.5	180.9	177.1	171.9	168.7	163.6	155.8	146.2	136.5	124.9
45°	193.8	193.2	190.6	186.7	180.9	177.7	173.9	164.8	153.9	142.9	131.4
47.5°	203.5	202.8	199.6	195.7	190.0	186.1	182.9	173.2	161.6	150.0	137.8
50°	212.5	211.8	208.6	204.8	198.3	194.5	190.6	180.9	170.6	157.1	143.6
52.5°	221.5	220.9	217.6	212.5	206.7	202.8	198.3	188.7	177.1	164.2	149.4
55°	229.2	227.9	225.4	220.9	213.8	209.9	206.0	195.7	183.5	170.6	155.2
57.5°	237.0	235.7	233.1	227.9	221.5	217.0	212.5	202.2	190.0	176.4	160.3
60°	244.7	243.4	240.2	235.0	227.9	224.1	219.6	208.6	195.7	181.6	166.1
62.5°	251.8	250.5	247.3	241.5	235.0	230.5	225.4	214.4	201.5	187.4	171.9
65°	258.2	256.9	253.7	248.5	240.8	236.3	231.2	220.2	206.7	191.9	175.8
67.5°	263.4	262.7	258.8	253.7	246.6	241.5	236.3	224.7	211.2	196.4	179.6
70°	269.1	267.9	264.6	258.8	251.8	246.6	241.5	229.9	215.7	200.9	183.5
72.5°	273.7	272.4	268.5	263.4	255.6	251.1	245.3	233.7	219.6	204.1	186.7
75°	278.2	276.9	273.0	267.9	259.5	255.0	249.2	237.6	223.4	207.3	190.0
77.5°	281.4	280.1	276.9	271.1	262.7	258.2	253.1	240.8	226.0	209.9	192.5
80°	284.6	283.3	279.5	273.7	265.9	260.8	255.6	242.7	228.6	212.5	194.5
82.5°	286.5	285.2	281.4	275.6	267.9	262.7	257.6	244.7	229.9	213.8	195.7
85°	287.8	286.5	282.7	277.5	269.1	264.0	258.8	246.0	231.8	215.1	197.0
87.5°	289.1	287.8	284.0	278.2	269.8	264.6	259.5	246.6	232.4	215.7	197.0
90°	289.1	287.8	284.6	278.2	270.4	265.3	260.1	247.3	232.4	216.4	197.7
92.5°	291.0	289.8	285.9	280.1	271.7	267.2	261.4	248.5	233.7	217.6	199.0
95°	289.8	289.1	285.2	279.5	271.1	265.9	260.1	247.9	233.1	217.0	198.3
97.5°	288.5	287.2	283.3	277.5	269.1	264.6	258.8	246.6	231.8	215.1	197.0
100°	286.5	284.6	281.4	274.9	267.2	262.1	256.9	244.0	229.9	213.8	195.7
102.5°	283.3	281.4	278.2	272.4	264.6	259.5	254.3	242.1	227.9	211.2	193.8
105°	280.1	278.2	274.3	268.5	261.4	256.3	251.1	238.9	224.7	208.6	191.2
107.5°	275.6	274.3	271.1	265.3	257.6	252.4	247.9	235.7	221.5	206.0	188.7
110°	270.4	269.1	265.9	260.1	253.1	248.5	243.4	231.8	217.6	202.2	185.4



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	265.3	264.0	260.8	255.0	247.9	243.4	238.2	226.7	213.1	198.3	181.6
115°	259.5	258.2	255.0	249.2	242.7	237.6	233.1	221.5	208.6	193.2	177.7
117.5°	253.1	251.8	248.5	243.4	236.3	232.4	227.3	216.4	203.5	188.7	173.2
120°	246.6	245.3	242.1	237.0	229.9	226.0	221.5	210.6	198.3	184.2	168.7
122.5°	239.5	238.2	235.0	230.5	223.4	218.9	215.1	204.1	192.5	178.4	162.3
125°	231.8	229.9	227.3	222.1	215.7	211.8	207.3	197.7	185.4	172.6	157.1
127.5°	222.8	222.1	218.9	213.8	208.0	204.1	200.3	190.6	179.0	165.5	151.3
130°	214.4	213.8	210.6	206.0	200.3	196.4	192.5	183.5	172.6	159.0	145.5
132.5°	205.4	204.8	201.5	197.7	191.9	188.0	184.2	175.8	163.6	152.6	139.7
135°	196.4	195.1	192.5	188.7	182.9	179.6	176.4	167.4	155.8	145.5	133.9
137.5°	186.1	185.4	182.9	178.4	173.9	170.6	166.8	157.8	148.1	138.4	127.5
140°	175.8	175.1	172.6	169.3	162.3	159.7	156.5	149.4	140.4	130.7	120.4
142.5°	163.6	162.9	161.0	157.1	153.2	150.0	146.8	140.4	132.0	123.6	114.0
145°	153.2	152.6	150.7	147.5	142.9	141.0	137.8	131.4	124.3	116.5	107.5
147.5°	142.9	142.3	140.4	137.8	133.9	132.0	128.8	123.0	116.5	108.8	101.1
150°	132.6	132.0	130.1	127.5	124.3	121.7	119.8	114.6	108.2	101.7	94.0
152.5°	121.1	121.1	119.8	117.2	114.0	112.7	110.1	105.6	99.8	94.0	86.9
155°	110.8	110.8	109.5	106.9	104.3	103.0	101.1	96.6	92.1	86.3	80.5
157.5°	100.4	100.4	99.2	97.2	94.7	93.4	92.1	88.2	83.7	79.2	74.0
160°	90.1	90.1	89.5	87.6	85.6	84.4	83.1	79.8	76.6	72.1	67.6
162.5°	79.8	79.8	79.2	77.9	76.0	75.3	74.0	71.5	68.3	65.0	61.2
165°	70.2	70.2	69.5	68.3	67.0	66.3	65.7	63.1	61.2	58.6	55.4
167.5°	61.2	61.2	60.5	59.9	58.6	58.6	58.0	56.0	54.1	52.2	49.6
170°	52.8	52.8	52.2	51.5	50.9	50.2	50.2	48.9	47.6	46.4	44.4
172.5°	44.4	44.4	44.4	43.8	43.1	43.1	43.1	41.9	41.2	40.6	38.6
175°	36.7	36.7	36.7	36.7	36.1	36.1	36.1	35.4	35.4	34.8	34.1
177.5°	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	29.6
180°	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1
2.5°	29.6	29.6	29.0	28.3	28.3	28.3	27.7	27.0	27.0	26.4	25.8
5°	33.5	32.8	31.6	30.9	30.3	30.3	29.0	28.3	27.0	26.4	25.1
7.5°	37.3	36.7	34.8	33.5	32.8	32.2	30.9	29.0	27.7	26.4	25.1
10°	41.9	39.9	38.0	36.1	35.4	34.1	32.2	30.3	28.3	26.4	24.5
12.5°	46.4	44.4	41.2	38.6	37.3	36.1	33.5	30.9	28.3	26.4	23.8
15°	51.5	48.9	45.1	41.9	39.9	38.6	35.4	32.2	29.0	26.4	23.8
17.5°	56.7	52.8	48.9	45.1	42.5	40.6	36.7	32.8	29.6	26.4	23.2
20°	61.8	57.3	52.8	47.6	45.7	43.1	38.6	34.1	30.3	26.4	22.5
22.5°	67.6	61.8	56.7	50.9	48.3	45.1	39.9	34.8	30.3	26.4	22.5
25°	72.8	67.0	60.5	54.1	50.9	47.6	41.9	36.1	30.9	26.4	21.9
27.5°	78.6	71.5	64.4	57.3	53.4	50.2	43.8	37.3	31.6	26.4	21.9
30°	84.4	76.6	68.3	60.5	56.7	52.8	45.1	38.6	32.2	26.4	21.2
32.5°	90.1	81.8	72.8	63.7	59.2	55.4	47.0	39.3	32.8	26.4	21.2
35°	95.9	86.3	76.6	67.0	62.5	58.0	48.9	40.6	32.8	26.4	21.2
37.5°	101.7	91.4	80.5	70.2	65.0	59.9	50.2	41.9	33.5	27.0	20.6
40°	107.5	96.6	85.0	73.4	68.3	62.5	52.2	42.5	34.1	27.0	20.6
42.5°	113.3	101.1	88.9	77.3	70.8	65.0	54.1	43.8	34.8	27.0	20.6
45°	119.1	106.2	93.4	79.8	74.0	67.6	56.0	45.1	35.4	27.0	20.6
47.5°	124.9	110.8	97.2	83.1	76.6	70.2	57.3	46.4	36.1	27.7	20.6
50°	130.1	115.3	101.1	86.3	79.2	72.1	59.2	47.6	36.7	27.7	20.0
52.5°	135.2	119.8	104.3	89.5	81.8	74.7	61.2	48.3	37.3	28.3	20.6
55°	139.7	124.3	108.2	92.1	84.4	76.6	62.5	49.6	38.0	28.3	20.0
57.5°	144.2	128.1	111.4	94.7	86.9	78.6	63.7	50.2	38.6	28.3	20.0
60°	148.7	132.0	114.6	97.2	88.9	81.1	65.7	51.5	39.3	29.0	20.6
62.5°	153.2	135.9	117.8	99.8	91.4	82.4	67.0	52.2	39.9	29.0	20.0
65°	157.1	139.1	120.4	102.4	93.4	84.4	68.3	53.4	39.9	29.0	20.0
67.5°	160.3	142.3	123.0	104.3	95.3	86.3	69.5	54.1	40.6	29.6	20.6
70°	164.8	144.9	125.6	106.2	97.2	87.6	70.2	54.7	41.2	29.6	20.6
72.5°	167.4	147.5	128.1	108.2	98.5	89.5	71.5	55.4	41.2	29.6	20.6
75°	171.3	150.0	130.1	109.5	99.8	90.8	72.1	56.0	41.9	30.3	20.6
77.5°	173.2	152.0	131.4	110.8	101.1	91.4	72.8	56.7	41.9	30.3	20.6
80°	175.1	153.2	132.6	112.0	102.4	92.7	74.0	57.3	42.5	30.3	20.6
82.5°	176.4	154.5	133.9	112.7	103.0	92.7	74.0	57.3	42.5	30.3	20.6
85°	177.1	155.8	134.6	113.3	103.7	93.4	74.7	57.3	42.5	30.3	20.6
87.5°	177.7	155.8	135.2	114.0	103.7	94.0	74.7	57.3	42.5	30.3	20.6
90°	178.4	156.5	135.2	114.0	103.7	94.0	74.7	58.0	42.5	30.3	20.6
92.5°	179.0	157.1	135.9	114.6	104.3	94.7	75.3	58.0	43.1	30.3	20.6
95°	179.0	156.5	135.2	114.6	104.3	94.0	75.3	58.0	43.1	30.3	20.6
97.5°	177.7	155.8	134.6	114.0	103.7	94.0	74.7	58.0	42.5	30.3	20.6
100°	176.4	154.5	133.9	112.7	103.0	93.4	74.0	57.3	42.5	30.3	20.6
102.5°	174.5	153.2	132.6	112.0	101.7	92.1	73.4	56.7	42.5	30.3	20.6
105°	171.9	151.3	130.7	110.8	101.1	91.4	72.8	56.7	41.9	30.3	20.6
107.5°	170.0	148.7	128.8	108.8	99.8	90.1	72.1	56.0	41.9	29.6	20.6
110°	166.1	146.2	126.8	107.5	97.9	88.9	70.8	55.4	41.2	29.6	20.6





TEST NUMBER: P190113

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

**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	162.3	143.6	124.3	105.6	96.6	87.6	70.2	54.7	41.2	29.6	20.6
115°	158.4	140.4	121.7	103.7	94.7	85.6	68.9	54.1	40.6	29.6	20.6
117.5°	154.5	137.2	119.1	101.1	92.7	84.4	67.6	53.4	39.9	29.0	20.6
120°	150.7	133.9	116.5	99.2	90.8	82.4	66.3	52.2	39.9	29.0	20.6
122.5°	146.2	130.1	113.3	96.6	88.2	80.5	65.0	51.5	39.3	29.0	20.6
125°	141.7	126.2	110.1	94.0	86.3	78.6	63.7	50.2	38.6	29.0	20.6
127.5°	136.5	121.7	106.2	90.8	83.7	76.0	62.5	49.6	38.0	28.3	20.6
130°	131.4	117.2	103.0	88.2	81.1	74.0	60.5	48.3	37.3	28.3	20.6
132.5°	126.2	112.7	99.2	85.0	78.6	71.5	59.2	47.6	37.3	28.3	20.6
135°	121.1	108.2	95.3	81.8	75.3	69.5	57.3	46.4	36.7	27.7	20.6
137.5°	115.3	103.7	90.8	78.6	72.8	67.0	55.4	45.1	36.1	27.7	20.6
140°	109.5	97.9	86.9	75.3	69.5	64.4	53.4	43.8	35.4	27.7	21.2
142.5°	103.7	93.4	82.4	72.1	67.0	61.8	52.2	42.5	34.8	27.0	21.2
145°	97.9	88.2	78.6	68.9	63.7	59.2	50.2	41.9	34.1	27.0	21.2
147.5°	92.7	83.7	74.0	65.7	61.2	56.7	48.3	40.6	33.5	27.0	21.9
150°	86.3	78.6	70.2	61.8	58.0	54.1	46.4	39.3	32.8	27.0	21.9
152.5°	80.5	73.4	65.7	58.6	55.4	51.5	44.4	38.0	32.2	27.0	21.9
155°	74.7	68.3	61.8	55.4	52.2	48.9	43.1	37.3	31.6	27.0	22.5
157.5°	68.9	63.1	58.0	52.2	49.6	46.4	41.2	36.1	30.9	27.0	22.5
160°	63.1	58.6	53.4	48.9	46.4	43.8	39.3	34.8	30.9	27.0	23.2
162.5°	58.0	54.1	49.6	45.7	43.8	41.2	37.3	34.1	30.3	27.0	23.8
165°	52.8	48.9	45.7	42.5	41.2	39.3	35.4	32.8	29.6	26.4	23.8
167.5°	47.6	45.1	42.5	39.9	38.6	36.7	34.1	31.6	29.0	27.0	24.5
170°	42.5	40.6	38.6	36.7	35.4	34.8	32.8	30.9	28.3	27.0	25.1
172.5°	38.0	36.7	35.4	34.1	33.5	32.2	30.9	29.6	28.3	26.4	25.1
175°	33.5	32.8	32.2	30.9	30.9	30.3	29.6	28.3	27.7	26.4	25.8
177.5°	29.6	29.0	29.0	29.0	28.3	28.3	27.7	27.7	27.0	27.0	26.4
180°	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8



TEST NUMBER: P190113

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

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1
2.5°	25.1	24.5	23.8	23.8	23.2	23.2	22.5	21.9	21.2	21.2	20.6
5°	24.5	23.2	22.5	21.9	21.2	20.6	20.0	19.3	18.0	18.0	17.4
7.5°	23.8	22.5	21.2	20.6	20.0	18.7	17.4	16.7	15.5	14.8	14.2
10°	22.5	21.2	19.3	18.7	18.0	16.7	15.5	14.2	13.5	12.2	11.6
12.5°	21.9	20.0	18.0	17.4	16.1	14.8	13.5	12.2	10.9	10.3	9.0
15°	21.2	18.7	16.7	16.1	14.8	13.5	11.6	10.3	9.0	8.4	7.7
17.5°	20.6	18.0	15.5	14.8	13.5	11.6	10.3	9.0	7.7	6.4	5.8
20°	19.3	16.7	14.8	13.5	12.2	10.3	9.0	7.1	6.4	5.2	4.5
22.5°	18.7	16.1	13.5	12.2	10.9	9.0	7.1	5.8	5.2	4.5	3.9
25°	18.0	15.5	12.2	10.9	9.7	7.7	6.4	5.2	4.5	3.9	3.9
27.5°	17.4	14.2	11.6	10.3	9.0	7.1	5.2	4.5	3.9	3.9	3.9
30°	17.4	13.5	10.9	9.0	8.4	6.4	4.5	4.5	3.9	3.9	3.9
32.5°	16.7	12.9	9.7	8.4	7.1	5.2	4.5	4.5	3.9	3.9	3.9
35°	16.1	12.2	9.0	7.7	6.4	4.5	4.5	3.9	3.9	3.9	3.9
37.5°	16.1	11.6	8.4	7.1	5.8	4.5	3.9	3.9	3.9	3.9	3.2
40°	15.5	11.6	7.7	6.4	5.8	4.5	3.9	3.9	3.9	3.9	3.2
42.5°	15.5	10.9	7.7	5.8	5.2	4.5	3.9	3.9	3.9	3.9	3.2
45°	14.8	10.3	7.1	5.8	4.5	4.5	3.9	3.9	3.9	3.2	3.2
47.5°	14.8	10.3	6.4	5.2	4.5	4.5	3.9	3.9	3.9	3.2	3.2
50°	14.2	9.7	6.4	5.2	4.5	4.5	3.9	3.9	3.9	3.2	3.2
52.5°	14.2	9.7	5.8	4.5	4.5	4.5	3.9	3.9	3.9	3.2	3.2
55°	14.2	9.0	5.8	4.5	4.5	4.5	3.9	3.9	3.2	3.2	3.2
57.5°	13.5	9.0	5.2	4.5	4.5	4.5	3.9	3.9	3.2	3.2	3.2
60°	13.5	8.4	5.2	4.5	4.5	4.5	3.9	3.9	3.2	3.2	3.2
62.5°	13.5	8.4	5.2	4.5	4.5	4.5	3.9	3.9	3.2	3.2	2.6
65°	13.5	8.4	4.5	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6
67.5°	13.5	7.7	4.5	4.5	4.5	4.5	3.9	3.9	3.2	3.2	2.6
70°	13.5	7.7	4.5	4.5	4.5	4.5	3.9	3.9	3.2	3.2	2.6
72.5°	12.9	7.7	4.5	4.5	4.5	4.5	3.9	3.9	3.2	3.2	2.6
75°	12.9	7.7	4.5	4.5	4.5	4.5	3.9	3.9	3.2	3.2	2.6
77.5°	12.9	7.7	4.5	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6
80°	12.9	7.7	4.5	4.5	4.5	4.5	3.9	3.9	3.2	3.2	2.6
82.5°	12.9	7.1	4.5	4.5	4.5	3.9	3.9	3.9	3.2	2.6	2.6
85°	12.9	7.1	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6	2.6
87.5°	12.9	7.1	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6	1.9
90°	12.9	7.1	4.5	3.9	3.9	3.9	3.2	3.2	2.6	2.6	1.9
92.5°	12.9	7.1	4.5	3.9	3.9	3.9	3.2	3.2	2.6	2.6	1.9
95°	12.9	7.1	3.9	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6
97.5°	12.9	7.1	3.9	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6
100°	12.9	7.1	3.9	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6
102.5°	12.9	7.1	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6	1.9
105°	12.9	7.1	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6	1.9
107.5°	12.9	7.1	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6	1.9
110°	12.9	7.7	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6	1.9



TEST NUMBER: P190113

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

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	12.9	7.7	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6	1.9
115°	13.5	7.7	4.5	3.9	3.9	3.2	3.2	3.2	2.6	2.6	2.6
117.5°	13.5	8.4	4.5	3.9	3.9	3.2	3.2	3.2	2.6	2.6	2.6
120°	13.5	8.4	4.5	3.9	3.9	3.2	3.2	3.2	2.6	2.6	2.6
122.5°	13.5	8.4	5.2	3.9	3.9	3.2	3.2	3.2	2.6	2.6	2.6
125°	14.2	9.0	5.2	3.9	3.9	3.2	3.2	3.2	2.6	2.6	2.6
127.5°	14.2	9.0	5.8	3.9	3.2	3.2	3.2	3.2	2.6	2.6	2.6
130°	14.2	9.7	5.8	4.5	3.2	3.2	3.2	3.2	2.6	2.6	2.6
132.5°	14.8	9.7	6.4	4.5	3.9	3.2	3.2	2.6	2.6	2.6	2.6
135°	14.8	10.3	6.4	5.2	3.9	3.2	3.2	2.6	2.6	2.6	2.6
137.5°	15.5	10.3	7.1	5.8	4.5	3.2	3.2	2.6	2.6	2.6	2.6
140°	15.5	10.9	7.7	5.8	4.5	3.2	3.2	2.6	2.6	2.6	2.6
142.5°	16.1	11.6	8.4	6.4	5.8	3.9	3.2	2.6	2.6	2.6	2.6
145°	16.1	12.2	9.0	7.1	5.8	3.9	3.2	2.6	2.6	2.6	2.6
147.5°	16.7	12.9	9.7	8.4	7.1	4.5	3.2	2.6	2.6	2.6	2.6
150°	17.4	13.5	10.3	9.0	7.7	5.8	3.9	2.6	2.6	2.6	2.6
152.5°	18.0	14.2	10.9	9.7	8.4	6.4	4.5	3.2	2.6	2.6	2.6
155°	18.7	15.5	12.2	10.9	9.7	7.7	5.8	4.5	3.2	2.6	2.6
157.5°	19.3	16.1	13.5	12.2	10.9	9.0	7.1	5.2	4.5	3.2	2.6
160°	20.0	16.7	14.2	13.5	12.2	10.3	8.4	7.1	5.8	4.5	3.9
162.5°	20.6	18.0	15.5	14.8	13.5	11.6	9.7	8.4	7.1	5.8	5.2
165°	21.2	19.3	16.7	16.1	14.8	13.5	11.6	10.3	9.0	7.7	7.1
167.5°	22.5	20.0	18.7	17.4	16.7	14.8	13.5	12.2	10.9	10.3	9.0
170°	23.2	21.2	20.0	19.3	18.7	16.7	15.5	14.8	13.5	12.2	11.6
172.5°	23.8	22.5	21.2	20.6	20.0	19.3	18.0	17.4	16.1	15.5	14.8
175°	25.1	23.8	23.2	22.5	22.5	21.2	20.6	20.0	19.3	18.0	18.0
177.5°	25.8	25.1	25.1	24.5	24.5	23.8	23.2	23.2	22.5	21.9	21.9
180°	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8



TEST NUMBER: P190113

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

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	25.1	25.1	25.1	25.1	25.1	25.1	25.1	25.1
2.5°	20.0	20.0	19.3	19.3	19.3	18.7	18.7	18.7
5°	16.7	16.1	16.1	15.5	15.5	14.8	14.8	14.8
7.5°	13.5	12.9	12.9	12.9	12.2	11.6	11.6	11.6
10°	10.9	10.3	10.3	9.7	9.7	9.0	9.0	9.0
12.5°	8.4	7.7	7.7	7.7	7.1	7.1	6.4	6.4
15°	6.4	6.4	5.8	5.8	5.2	5.2	5.2	5.2
17.5°	5.2	4.5	4.5	4.5	3.9	3.9	3.9	3.9
20°	4.5	3.9	3.9	3.9	3.9	3.9	3.9	3.9
22.5°	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
25°	3.9	3.9	3.9	3.9	3.9	3.9	3.2	3.2
27.5°	3.9	3.9	3.9	3.2	3.2	3.2	3.2	3.2
30°	3.9	3.9	3.2	3.2	3.2	3.2	3.2	3.2
32.5°	3.9	3.2	3.2	3.2	3.2	3.2	3.2	3.2
35°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
37.5°	3.2	3.2	3.2	3.2	3.2	2.6	2.6	2.6
40°	3.2	3.2	3.2	3.2	2.6	2.6	2.6	2.6
42.5°	3.2	3.2	3.2	2.6	2.6	2.6	2.6	2.6
45°	3.2	2.6	2.6	2.6	2.6	2.6	2.6	2.6
47.5°	3.2	2.6	2.6	2.6	2.6	2.6	1.9	1.9
50°	2.6	2.6	2.6	2.6	2.6	1.9	1.9	1.9
52.5°	2.6	2.6	2.6	2.6	1.9	1.9	1.9	1.9
55°	2.6	2.6	2.6	1.9	1.9	1.9	1.9	1.9
57.5°	2.6	2.6	1.9	1.9	1.9	1.9	1.3	1.3
60°	2.6	2.6	1.9	1.9	1.9	1.9	1.3	1.3
62.5°	2.6	2.6	1.9	1.9	1.9	1.3	1.3	1.3
65°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
67.5°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
70°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
72.5°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
75°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
77.5°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
80°	2.6	1.9	1.9	1.9	1.3	1.3	1.3	1.3
82.5°	1.9	1.9	1.9	1.3	1.3	1.3	1.3	1.3
85°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
87.5°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
90°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
92.5°	1.9	1.9	1.3	1.3	1.3	0.6	0.6	0.6
95°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
97.5°	1.9	1.9	1.3	1.3	1.3	0.6	0.6	0.6
100°	1.9	1.9	1.3	1.3	1.3	0.6	0.6	0.6
102.5°	1.9	1.9	1.3	1.3	1.3	0.6	0.6	0.6
105°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
107.5°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
110°	1.9	1.9	1.3	1.3	1.3	0.6	0.6	0.6



TEST NUMBER: P190113

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

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	0.6
115°	1.9	1.9	1.9	1.3	1.3	1.3	1.3	1.3
117.5°	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3
120°	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3
122.5°	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3
125°	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3
127.5°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
130°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
132.5°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
135°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
137.5°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
140°	1.9	1.9	1.9	1.9	1.9	1.9	1.3	1.3
142.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
145°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
147.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
150°	2.6	1.9	1.9	1.9	1.9	1.9	1.9	1.9
152.5°	2.6	1.9	1.9	1.9	1.9	1.9	1.9	1.9
155°	2.6	2.6	1.9	1.9	1.9	1.9	1.9	1.9
157.5°	2.6	1.9	1.9	1.9	1.9	1.9	1.9	1.9
160°	3.2	2.6	2.6	2.6	1.9	1.9	1.9	1.9
162.5°	4.5	3.9	3.9	3.2	3.2	2.6	2.6	2.6
165°	6.4	5.8	5.2	5.2	4.5	4.5	4.5	4.5
167.5°	8.4	7.7	7.7	7.1	7.1	6.4	6.4	6.4
170°	10.9	10.3	10.3	9.7	9.7	9.0	9.0	9.0
172.5°	14.2	13.5	12.9	12.9	12.9	12.2	12.2	12.2
175°	17.4	16.7	16.7	16.7	16.1	16.1	16.1	16.1
177.5°	21.2	21.2	20.6	20.6	20.6	20.6	20.0	20.6
180°	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8

(END OF REPORT)