

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: P190125

Luminaire Tested: **TRF11-LD4-15W-50-OPL-BK-UNV-EDC1-CSTG**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190125  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27875)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: TRF11-LD4-15W-50-OPL-BK-UNV-EDC1-CSTG  
Description: TERRAPIN 11" LED SHALLOW CAST WALL MOUNT WITH OPEN OPAL LENS AND QUAD LENS COVER  
Light Source: (56) NICHIA 5000  
NF2L757DRT  
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 300mA  
OT25W/1

**Summary**

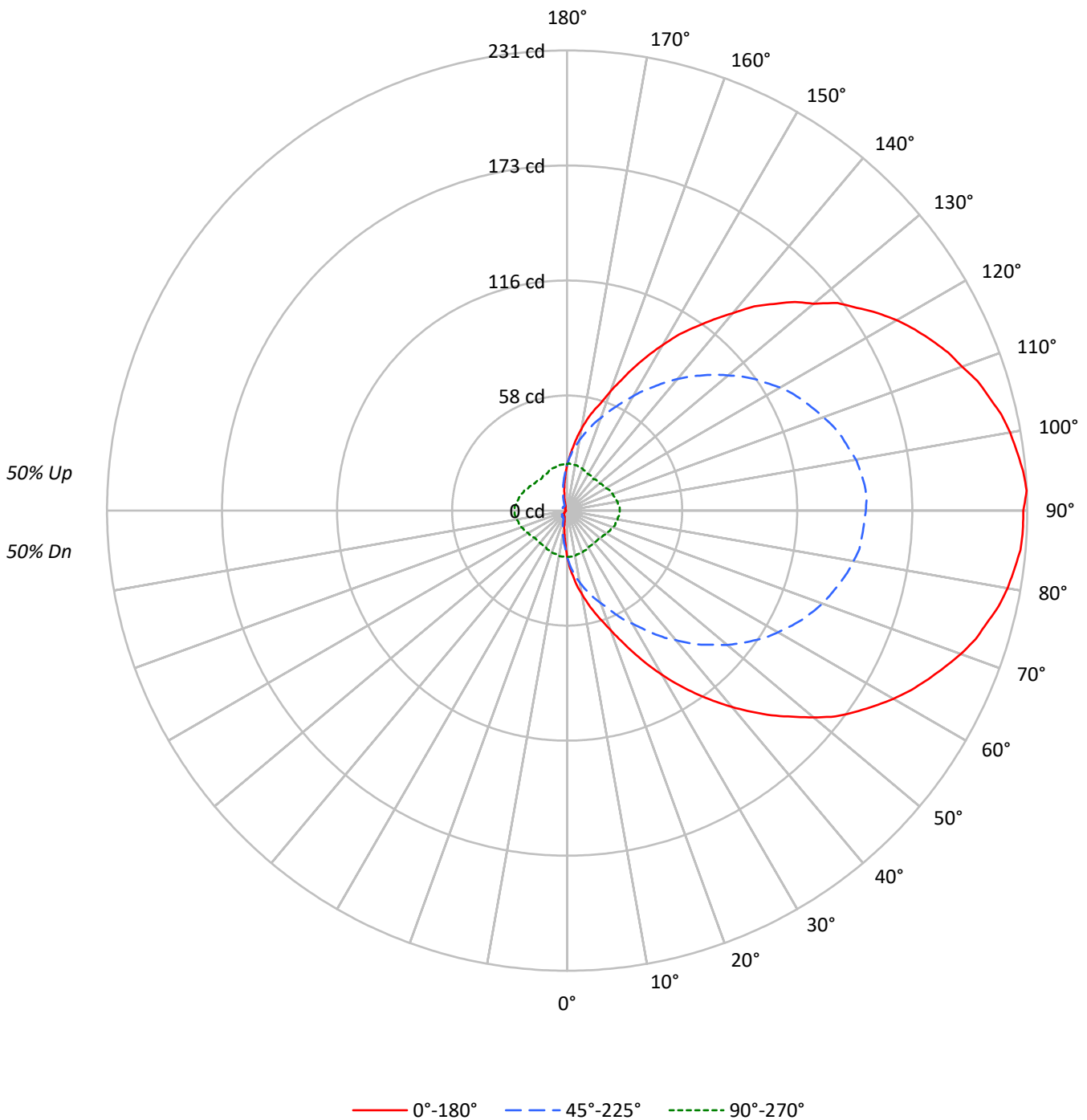
Lumens per Lamp: N/A  
Luminaire Lumens: 706.0 lumens  
Efficiency: N/A  
Efficacy: 49.4 lumens/watt  
Spacing Criteria (0/90/45): 3.51 / 1.41 / 2.84  
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')  
CIE Type: General Diffuse

Input Watts (W): 14.3  
Input Voltage (V): NR  
Input Current (A<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	60	57	52	49	46	41	38	36	30
2	82	71	63	56	74	65	58	51	53	48	43	43	38	34	33	29	26	21
3	73	61	52	44	66	56	47	40	45	39	33	36	31	27	27	23	20	16
4	66	53	43	36	60	48	40	33	39	32	27	31	26	21	23	19	16	12
5	60	46	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	16	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	17	12	8	13	9	6	4

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

	0°	90°	180°
0°	934	934	934
5°	1040	862	428
10°	1118	806	221
15°	1195	740	102
20°	1273	707	78
25°	1414	663	58
30°	1572	625	53
35°	1718	613	40
40°	1860	606	38
45°	1998	604	36
50°	2132	606	25
55°	2255	633	17
60°	2363	663	16
65°	2463	721	16
70°	2570	766	7
75°	2665	825	7
80°	2765	893	7
85°	2857	981	8



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	2.3	0.3
10°-20°	7.4	1.0
20°-30°	14.5	2.1
30°-40°	24.8	3.5
40°-50°	37.5	5.3
50°-60°	50.9	7.2
60°-70°	63.4	9.0
70°-80°	73.3	10.4
80°-90°	78.8	11.2
90°-100°	79.2	11.2
100°-110°	73.5	10.4
110°-120°	63.6	9.0
120°-130°	51.0	7.2
130°-140°	37.4	5.3
140°-150°	24.7	3.5
150°-160°	14.3	2.0
160°-170°	7.2	1.0
170°-180°	2.2	0.3
0°-30°	24.1	3.4
0°-40°	49.0	6.9
0°-60°	137.3	19.5
0°-90°	352.8	50.0
90°-120°	216.2	30.6
90°-150°	329.4	46.7
90°-180°	353.0	50.0
0°-180°	706.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	23	23	23	23	23	
5°	33	30	23	17	14	3
15°	53	43	22	8	4	15
25°	78	57	22	4	3	37
35°	112	75	21	4	3	71
45°	145	95	21	3	3	113
55°	176	114	22	3	1	158
65°	200	130	24	3	1	199
75°	218	142	25	3	1	231
85°	228	149	26	3	1	186
90°	229	150	26	3	1	126
95°	230	150	26	3	1	187
105°	219	143	25	3	1	232
115°	202	131	24	3	1	200
125°	178	115	22	3	1	159
135°	147	96	21	3	1	114
145°	113	76	21	3	2	71
155°	79	57	22	3	2	37
165°	52	42	22	8	4	15
175°	32	30	23	17	14	3
180°	23	23	23	23	23	



TEST NUMBER: P190125

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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
2.5°	28.3	27.7	27.7	27.7	27.7	27.7	27.7	27.7	27.0	27.0	27.0
5°	32.8	32.8	32.8	32.8	32.2	32.2	32.2	31.5	31.5	30.9	30.2
7.5°	38.0	38.0	37.3	37.3	36.7	36.7	36.0	36.0	35.4	34.1	33.5
10°	42.5	42.5	42.5	41.8	41.2	41.2	40.5	39.9	39.2	38.0	36.7
12.5°	47.6	47.6	47.0	46.3	45.7	45.7	45.0	43.7	43.1	41.2	39.9
15°	52.8	52.8	52.1	51.5	50.8	50.2	49.5	48.2	47.0	45.0	43.1
17.5°	57.9	57.9	57.3	56.6	55.3	54.7	54.0	52.1	50.8	48.9	46.3
20°	63.7	63.7	62.4	61.1	59.8	59.2	58.5	56.6	54.0	52.1	49.5
22.5°	70.8	70.8	69.5	67.5	66.3	65.0	64.3	61.8	59.2	56.0	52.8
25°	78.5	78.5	77.2	75.3	73.3	72.0	70.1	67.5	64.3	60.5	57.3
27.5°	86.8	86.2	85.6	83.0	80.4	79.1	77.2	74.0	70.1	65.6	61.8
30°	95.2	95.2	93.9	90.7	88.1	86.8	84.3	80.4	75.9	70.8	65.6
32.5°	103.6	102.9	101.6	99.1	95.9	93.9	92.0	87.5	81.7	75.9	70.1
35°	111.9	111.3	110.0	106.8	103.6	101.0	99.1	93.9	88.1	81.7	75.3
37.5°	120.3	120.3	118.4	115.1	111.3	108.7	106.1	101.0	94.6	87.5	80.4
40°	128.7	128.7	126.7	122.9	119.0	116.4	113.9	107.4	100.4	93.3	84.9
42.5°	137.0	136.4	134.4	131.2	126.7	124.2	120.9	114.5	106.8	98.4	90.1
45°	145.4	144.7	142.8	139.0	133.8	131.2	128.0	120.9	113.2	104.2	95.2
47.5°	153.1	152.5	150.5	146.7	141.5	138.3	135.1	127.4	119.0	110.0	99.7
50°	161.5	160.2	157.6	153.7	148.0	144.7	141.5	133.8	124.8	115.1	104.9
52.5°	169.8	169.2	165.3	160.2	155.0	151.8	148.0	140.2	130.6	120.3	109.4
55°	176.3	175.6	172.4	168.5	161.5	157.6	153.7	146.0	135.7	125.4	113.9
57.5°	182.7	182.1	178.8	175.0	169.2	164.7	160.2	151.2	140.9	129.9	118.4
60°	189.1	188.5	185.3	180.8	175.0	171.1	166.0	156.3	146.0	134.4	122.2
62.5°	194.9	194.3	191.1	185.9	180.1	176.3	171.8	161.5	150.5	139.0	126.1
65°	200.1	199.4	196.2	191.7	185.3	181.4	176.9	166.6	155.0	142.8	129.9
67.5°	205.2	204.6	201.4	196.2	189.8	185.9	181.4	171.8	158.9	146.7	133.2
70°	210.4	209.1	205.9	201.4	194.3	190.4	185.9	175.6	163.4	150.5	136.4
72.5°	214.9	213.6	210.4	205.2	198.1	194.3	189.8	179.5	167.3	153.7	139.0
75°	218.1	217.4	213.6	208.4	202.0	197.5	193.0	182.7	170.5	155.7	141.5
77.5°	221.9	220.0	216.8	211.6	204.6	200.7	196.2	185.3	173.7	158.9	144.1
80°	224.5	223.2	220.0	214.2	207.1	203.3	198.1	187.8	175.6	160.8	146.0
82.5°	226.4	225.2	221.9	216.8	209.1	205.2	200.1	189.8	177.5	162.1	148.0
85°	228.4	227.1	223.2	218.1	211.0	206.5	202.0	191.1	178.8	164.0	148.6
87.5°	229.0	227.7	224.5	218.7	211.6	207.1	202.6	191.7	179.5	165.3	149.2
90°	229.0	227.7	224.5	219.4	211.6	207.8	202.6	192.3	179.5	165.3	149.9
92.5°	230.9	229.0	225.8	220.7	212.9	208.4	203.9	193.0	180.8	166.0	150.5
95°	229.7	228.4	225.2	219.4	212.3	207.8	203.3	192.3	180.1	164.7	149.9
97.5°	227.7	227.1	223.2	218.1	211.0	206.5	202.0	191.1	178.8	163.4	148.6
100°	225.8	224.5	221.3	215.5	208.4	204.6	199.4	189.1	176.9	161.5	147.3
102.5°	223.2	221.3	218.1	212.9	205.9	202.0	196.8	186.6	174.3	159.5	144.7
105°	219.4	218.7	215.5	209.7	202.6	198.8	194.3	184.0	171.8	157.0	142.8
107.5°	216.1	214.9	211.6	205.9	199.4	194.9	190.4	180.8	168.5	154.4	140.2
110°	211.0	210.4	207.1	202.0	195.6	191.1	186.6	176.9	164.0	151.2	137.0



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	207.1	205.9	202.6	197.5	191.1	187.2	182.7	173.0	160.2	148.0	133.8
115°	202.0	200.7	197.5	193.0	185.9	182.1	178.2	168.5	156.3	144.1	130.6
117.5°	196.8	194.9	192.3	187.2	181.4	177.5	173.7	162.1	151.8	140.2	127.4
120°	191.1	189.1	186.6	182.1	175.6	171.8	167.9	157.6	147.3	135.7	123.5
122.5°	184.6	183.3	180.1	176.3	169.8	165.3	161.5	152.5	142.2	131.2	119.0
125°	177.5	176.3	173.7	169.2	162.1	158.9	155.0	146.7	137.0	126.1	115.1
127.5°	171.1	169.2	166.6	161.5	155.7	152.5	149.2	140.9	131.9	121.6	110.6
130°	161.5	160.8	158.3	154.4	149.2	146.0	142.8	134.4	126.1	116.4	105.5
132.5°	155.0	153.1	151.2	147.3	142.2	139.0	136.4	128.7	120.3	110.6	101.0
135°	146.7	145.4	143.5	139.6	135.1	132.5	129.3	122.2	114.5	105.5	95.9
137.5°	139.0	137.7	135.7	132.5	128.0	124.8	122.2	115.8	108.1	99.7	91.3
140°	129.3	128.7	126.7	123.5	119.7	117.1	115.1	108.7	101.6	93.9	86.2
142.5°	120.9	120.3	118.4	115.8	111.9	109.4	107.4	101.6	95.2	88.1	81.1
145°	112.6	111.9	110.6	107.4	104.2	102.3	99.7	94.6	88.8	83.0	75.9
147.5°	104.9	104.2	102.3	99.7	96.5	95.2	92.6	88.1	83.0	77.2	71.4
150°	95.9	95.2	93.9	92.0	88.8	87.5	85.6	81.1	76.6	72.0	66.3
152.5°	87.5	86.8	85.6	83.6	81.1	79.8	78.5	74.0	70.1	66.3	61.8
155°	79.1	78.5	77.2	75.9	73.3	72.7	70.8	67.5	64.3	61.1	57.3
157.5°	70.8	70.8	69.5	68.2	66.3	65.6	64.3	61.8	59.2	56.6	53.4
160°	63.7	63.0	62.4	61.8	59.8	59.2	58.5	56.6	54.0	52.1	49.5
162.5°	56.6	56.6	56.0	55.3	54.7	54.0	53.4	51.5	50.2	48.2	46.3
165°	52.1	51.5	50.8	50.2	49.5	49.5	48.9	47.6	46.3	44.4	42.5
167.5°	47.0	47.0	46.3	45.7	45.0	45.0	44.4	43.1	42.5	41.2	39.2
170°	41.8	41.8	41.2	41.2	40.5	40.5	39.9	39.2	38.6	37.3	36.0
172.5°	36.7	36.7	36.7	36.0	36.0	36.0	35.4	34.7	34.1	33.5	32.8
175°	31.5	31.5	31.5	30.9	30.9	30.9	30.9	30.2	30.2	29.6	29.6
177.5°	27.0	27.0	26.4	27.0	26.4	27.0	26.4	26.4	26.4	26.4	26.4
180°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
2.5°	26.4	26.4	25.7	25.7	25.7	25.1	25.1	24.4	23.8	23.2	23.2
5°	29.6	28.9	28.3	27.7	27.0	27.0	25.7	25.1	24.4	23.2	22.5
7.5°	32.8	31.5	30.9	29.6	28.9	28.3	27.0	25.7	24.4	23.2	21.9
10°	35.4	34.1	32.8	30.9	30.2	29.6	27.7	26.4	24.4	23.2	21.9
12.5°	38.0	36.7	34.7	32.8	31.5	30.9	28.9	27.0	25.1	22.5	21.2
15°	41.2	39.2	36.7	34.7	33.5	32.2	29.6	27.0	25.1	22.5	20.6
17.5°	44.4	41.8	39.2	36.0	34.7	33.5	30.2	27.7	25.1	22.5	19.9
20°	47.0	43.7	40.5	38.0	36.0	34.1	31.5	28.3	25.1	22.5	19.3
22.5°	49.5	46.3	42.5	39.2	37.3	35.4	31.5	28.3	25.1	21.9	19.3
25°	53.4	48.9	44.4	40.5	38.6	36.7	32.2	28.9	25.1	21.9	18.7
27.5°	56.6	52.1	47.0	42.5	39.9	38.0	32.8	28.9	25.1	21.9	18.7
30°	60.5	55.3	49.5	44.4	41.8	38.6	34.1	29.6	25.1	21.2	18.0
32.5°	64.3	58.5	52.8	46.3	43.1	40.5	34.7	29.6	25.1	21.2	18.0
35°	68.8	61.8	55.3	48.2	45.0	41.8	35.4	30.2	25.1	21.2	17.4
37.5°	72.7	65.6	57.9	50.8	47.0	43.1	36.7	30.9	25.7	21.2	17.4
40°	77.2	68.8	61.1	52.8	48.9	45.0	37.3	30.9	25.7	21.2	17.4
42.5°	81.1	72.7	63.7	55.3	50.8	47.0	38.6	32.2	25.7	21.2	16.7
45°	85.6	75.9	66.3	57.3	52.8	48.9	39.9	32.8	26.4	21.2	16.7
47.5°	90.1	79.8	69.5	59.8	54.7	50.2	41.2	33.5	27.0	21.2	16.7
50°	93.9	83.0	72.0	61.8	57.3	52.1	42.5	34.1	27.0	21.2	16.7
52.5°	97.8	86.2	74.6	63.7	58.5	53.4	43.7	35.4	27.7	21.9	16.7
55°	101.6	89.4	77.2	65.6	60.5	55.3	45.0	36.0	28.3	21.9	16.7
57.5°	105.5	92.6	80.4	68.2	62.4	56.6	46.3	36.7	28.9	22.5	16.7
60°	108.7	95.9	82.3	69.5	63.7	58.5	47.0	38.0	29.6	22.5	16.7
62.5°	112.6	98.4	84.9	71.4	65.6	59.8	48.2	38.6	30.2	23.2	16.7
65°	115.8	101.6	87.5	73.3	66.9	61.1	49.5	39.9	31.5	23.8	16.7
67.5°	119.0	104.2	89.4	75.3	68.2	62.4	50.2	40.5	32.2	23.8	17.4
70°	121.6	106.8	91.3	76.6	69.5	63.0	51.5	41.8	32.8	24.4	17.4
72.5°	124.2	108.7	93.3	77.8	70.8	64.3	52.1	42.5	33.5	25.1	17.4
75°	126.7	110.6	94.6	79.1	72.0	65.0	53.4	43.1	34.1	25.1	17.4
77.5°	128.7	112.6	95.9	80.4	72.7	65.6	54.0	43.7	34.7	25.1	17.4
80°	130.6	113.9	97.1	81.1	73.3	66.3	54.7	45.0	35.4	25.7	17.4
82.5°	131.9	115.1	98.4	81.7	74.0	66.9	55.3	45.0	35.4	25.7	17.4
85°	132.5	116.4	99.1	82.3	74.6	66.9	55.3	45.7	36.0	26.4	17.4
87.5°	133.8	117.1	99.7	83.0	75.3	67.5	56.0	46.3	36.0	26.4	17.4
90°	133.8	117.1	100.4	83.0	75.3	67.5	56.0	46.3	36.0	26.4	17.4
92.5°	134.4	117.7	100.4	83.6	75.3	67.5	56.0	46.3	36.0	26.4	18.0
95°	133.8	117.1	99.7	83.0	75.3	67.5	56.0	45.7	36.0	26.4	17.4
97.5°	132.5	115.8	99.1	82.3	74.6	66.9	55.3	45.0	35.4	25.7	17.4
100°	131.2	114.5	97.8	81.7	74.0	66.3	54.7	45.0	35.4	25.7	17.4
102.5°	129.3	113.2	96.5	80.4	73.3	65.6	54.0	43.7	34.7	25.1	17.4
105°	127.4	111.3	95.2	79.8	72.0	65.0	53.4	43.1	34.1	25.1	17.4
107.5°	125.4	109.4	93.3	78.5	70.8	64.3	52.1	42.5	33.5	24.4	17.4
110°	122.9	106.8	92.0	76.6	70.1	63.0	51.5	41.8	32.8	24.4	16.7





TEST NUMBER: P190125

CATALOG NUMBER: TRF11-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°	119.7	104.9	90.1	75.3	68.8	62.4	50.8	40.5	32.2	23.8	16.7
115°	117.1	102.3	87.5	74.0	67.5	61.1	49.5	39.9	31.5	23.8	16.7
117.5°	113.9	99.7	85.6	72.0	66.3	59.8	48.9	38.6	30.2	23.2	16.7
120°	110.0	96.5	83.6	70.1	64.3	58.5	47.6	38.0	29.6	22.5	16.7
122.5°	106.8	93.3	81.1	68.2	63.0	57.3	46.3	37.3	28.9	22.5	16.7
125°	102.9	90.1	78.5	66.3	61.1	56.0	45.0	36.0	28.3	21.9	16.7
127.5°	99.1	87.5	75.9	64.3	59.2	54.0	44.4	35.4	27.7	21.9	16.7
130°	94.6	83.6	72.7	62.4	57.3	52.8	43.1	34.1	27.0	21.2	16.7
132.5°	90.7	80.4	70.1	60.5	55.3	50.8	41.8	33.5	27.0	21.2	16.7
135°	86.8	77.2	67.5	58.5	53.4	48.9	40.5	32.8	26.4	21.2	16.7
137.5°	82.3	73.3	64.3	56.0	51.5	47.6	39.2	32.2	25.7	21.2	16.7
140°	77.8	69.5	61.8	53.4	49.5	45.7	38.0	31.5	25.7	20.6	16.7
142.5°	73.3	65.6	58.5	50.8	47.6	43.7	36.7	30.9	25.1	20.6	16.7
145°	69.5	62.4	56.0	48.9	45.7	42.5	36.0	30.2	25.1	21.2	17.4
147.5°	65.6	59.2	52.8	47.0	43.7	40.5	34.7	29.6	25.1	21.2	17.4
150°	61.1	56.0	50.2	44.4	41.8	39.2	34.1	29.6	25.1	21.2	18.0
152.5°	57.3	52.1	47.6	42.5	39.9	38.0	33.5	28.9	25.1	21.2	18.0
155°	53.4	48.9	45.0	40.5	38.6	36.7	32.8	28.9	25.1	21.9	18.7
157.5°	49.5	46.3	42.5	39.2	37.3	35.4	32.2	28.3	25.1	21.9	19.3
160°	46.3	43.7	40.5	37.3	36.0	34.7	30.9	28.3	25.1	22.5	19.3
162.5°	43.7	41.2	38.6	36.0	34.7	33.5	30.2	27.7	25.1	22.5	19.9
165°	40.5	38.6	36.7	34.1	33.5	32.2	29.6	27.0	25.1	22.5	20.6
167.5°	38.0	36.0	34.7	32.8	31.5	30.9	28.9	27.0	25.1	23.2	21.2
170°	35.4	34.1	32.2	30.9	30.2	29.6	27.7	26.4	24.4	23.2	21.2
172.5°	32.2	31.5	30.2	28.9	28.3	28.3	27.0	25.7	24.4	23.2	21.9
175°	28.9	28.3	27.7	27.0	27.0	26.4	25.7	25.1	24.4	23.2	22.5
177.5°	25.7	25.7	25.7	25.1	25.1	25.1	24.4	24.4	23.8	23.8	23.2
180°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2



TEST NUMBER: P190125

CATALOG NUMBER: TRF11-LD4-15W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
2.5°	22.5	21.9	21.9	21.2	21.2	20.6	19.9	19.9	19.3	18.7	18.7
5°	21.9	21.2	19.9	19.9	19.3	18.7	18.0	17.4	16.7	16.1	15.4
7.5°	21.2	19.9	18.7	18.0	17.4	16.7	15.4	14.8	14.2	13.5	12.9
10°	19.9	18.7	17.4	16.7	16.1	14.8	13.5	12.9	12.2	10.9	10.3
12.5°	19.3	17.4	16.1	15.4	14.8	12.9	12.2	10.9	9.6	9.0	8.4
15°	18.7	16.7	14.8	14.2	13.5	11.6	10.3	9.6	8.4	7.7	6.4
17.5°	18.0	16.1	14.2	12.9	12.2	10.3	9.0	7.7	7.1	5.8	5.1
20°	17.4	14.8	12.9	12.2	10.9	9.0	7.7	6.4	5.8	5.1	4.5
22.5°	16.7	14.2	12.2	10.9	9.6	8.4	7.1	5.8	4.5	4.5	3.9
25°	16.1	13.5	10.9	10.3	9.0	7.1	5.8	5.1	4.5	3.9	3.9
27.5°	15.4	12.9	10.3	9.0	8.4	6.4	5.1	4.5	3.9	3.9	3.9
30°	14.8	12.2	9.6	8.4	7.7	5.8	4.5	3.9	3.9	3.9	3.9
32.5°	14.8	11.6	9.0	7.7	7.1	5.1	4.5	3.9	3.9	3.9	3.9
35°	14.2	11.6	9.0	7.7	6.4	4.5	3.9	3.9	3.9	3.9	3.2
37.5°	13.5	10.9	8.4	7.1	5.8	4.5	3.9	3.9	3.9	3.2	3.2
40°	13.5	10.3	7.7	6.4	5.1	3.9	3.9	3.9	3.9	3.2	3.2
42.5°	13.5	10.3	7.1	5.8	5.1	3.9	3.9	3.9	3.9	3.2	3.2
45°	12.9	9.6	7.1	5.8	4.5	3.9	3.9	3.9	3.2	3.2	3.2
47.5°	12.9	9.6	6.4	5.1	4.5	3.9	3.9	3.9	3.2	3.2	3.2
50°	12.9	9.0	5.8	5.1	3.9	3.9	3.9	3.9	3.2	3.2	3.2
52.5°	12.2	9.0	5.8	4.5	3.9	3.9	3.9	3.9	3.2	3.2	2.6
55°	12.2	8.4	5.1	4.5	3.9	3.9	3.9	3.2	3.2	3.2	2.6
57.5°	12.2	8.4	5.1	4.5	3.9	3.9	3.9	3.9	3.2	3.2	2.6
60°	11.6	7.7	5.1	4.5	3.9	3.9	3.9	3.2	3.2	3.2	2.6
62.5°	11.6	7.7	4.5	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6
65°	11.6	7.1	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6	2.6
67.5°	11.6	7.1	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6	2.6
70°	11.6	7.1	4.5	4.5	3.9	3.9	3.9	3.2	3.2	2.6	2.6
72.5°	11.6	7.1	4.5	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6
75°	10.9	6.4	4.5	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6
77.5°	10.9	6.4	3.9	3.9	3.9	3.9	3.9	3.2	3.2	2.6	1.9
80°	10.9	6.4	3.9	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6
82.5°	10.9	6.4	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6	1.9
85°	10.9	6.4	3.9	3.9	3.9	3.9	3.2	3.2	2.6	2.6	1.9
87.5°	10.9	6.4	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6	1.9
90°	10.9	5.8	3.9	3.9	3.9	3.2	3.2	3.2	2.6	1.9	1.9
92.5°	10.9	6.4	3.9	3.9	3.9	3.2	3.2	3.2	2.6	1.9	1.9
95°	10.9	6.4	3.9	3.9	3.9	3.2	3.2	3.2	2.6	2.6	1.9
97.5°	10.9	6.4	3.9	3.9	3.9	3.2	3.2	2.6	2.6	2.6	1.9
100°	10.9	6.4	3.9	3.9	3.2	3.2	3.2	2.6	2.6	2.6	1.9
102.5°	10.9	6.4	3.9	3.2	3.2	3.2	3.2	2.6	2.6	1.9	1.9
105°	10.9	6.4	3.9	3.2	3.2	3.2	3.2	2.6	2.6	1.9	1.9
107.5°	10.9	6.4	3.9	3.2	3.2	3.2	3.2	2.6	2.6	1.9	1.9
110°	10.9	6.4	3.9	3.2	3.2	3.2	3.2	2.6	2.6	1.9	1.9



TEST NUMBER: P190125

CATALOG NUMBER: TRF11-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°	10.9	6.4	3.9	3.2	3.2	3.2	2.6	2.6	2.6	1.9	1.9
115°	11.6	7.1	3.9	3.2	3.2	3.2	3.2	2.6	2.6	2.6	1.9
117.5°	11.6	7.1	4.5	3.2	3.2	3.2	3.2	2.6	2.6	2.6	1.9
120°	11.6	7.7	4.5	3.2	3.2	3.2	3.2	2.6	2.6	2.6	1.9
122.5°	11.6	7.7	4.5	3.2	3.2	3.2	3.2	2.6	2.6	2.6	1.9
125°	12.2	7.7	5.1	3.9	3.2	3.2	2.6	2.6	2.6	2.6	1.9
127.5°	12.2	8.4	5.1	3.9	3.2	3.2	2.6	2.6	2.6	2.6	1.9
130°	12.2	8.4	5.8	4.5	3.2	3.2	2.6	2.6	2.6	2.6	1.9
132.5°	12.2	9.0	5.8	4.5	3.2	3.2	2.6	2.6	2.6	2.6	1.9
135°	12.9	9.0	6.4	5.1	3.9	3.2	2.6	2.6	2.6	2.6	1.9
137.5°	12.9	9.6	6.4	5.8	4.5	3.2	2.6	2.6	2.6	2.6	1.9
140°	12.9	9.6	7.1	5.8	4.5	3.2	2.6	2.6	2.6	1.9	1.9
142.5°	13.5	10.3	7.7	6.4	5.1	3.2	2.6	2.6	2.6	1.9	1.9
145°	13.5	10.9	8.4	7.1	5.8	3.9	2.6	2.6	2.6	2.6	1.9
147.5°	14.2	10.9	8.4	7.7	6.4	4.5	3.2	2.6	2.6	2.6	1.9
150°	14.8	11.6	9.0	8.4	7.1	5.1	3.9	2.6	2.6	2.6	1.9
152.5°	14.8	12.2	9.6	9.0	7.7	5.8	4.5	3.2	2.6	2.6	1.9
155°	15.4	12.9	10.9	9.6	8.4	6.4	5.1	3.9	3.2	2.6	2.6
157.5°	16.1	13.5	11.6	10.3	9.6	7.7	6.4	5.1	3.9	3.2	2.6
160°	16.7	14.8	12.2	11.6	10.3	9.0	7.1	5.8	5.1	3.9	3.2
162.5°	17.4	15.4	13.5	12.9	11.6	10.3	8.4	7.1	6.4	5.1	4.5
165°	18.7	16.7	14.8	13.5	12.9	11.6	10.3	9.0	7.7	7.1	6.4
167.5°	19.3	17.4	16.1	15.4	14.2	12.9	11.6	10.9	9.6	9.0	7.7
170°	19.9	18.7	17.4	16.7	16.1	14.8	13.5	12.9	11.6	10.9	10.3
172.5°	21.2	19.9	18.7	18.0	17.4	16.7	16.1	14.8	14.2	13.5	12.9
175°	21.9	21.2	20.6	19.9	19.3	18.7	18.0	17.4	16.7	16.1	15.4
177.5°	22.5	22.5	21.9	21.9	21.2	21.2	20.6	20.6	19.9	19.9	19.3
180°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2



TEST NUMBER: P190125

CATALOG NUMBER: TRF11-LD4-15W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
2.5°	18.0	18.0	18.0	17.4	17.4	17.4	16.7	17.4
5°	14.8	14.8	14.2	14.2	13.5	13.5	13.5	13.5
7.5°	12.2	11.6	11.6	10.9	10.9	10.9	10.9	10.3
10°	9.6	9.0	9.0	9.0	8.4	8.4	8.4	8.4
12.5°	7.7	7.1	7.1	6.4	6.4	6.4	5.8	5.8
15°	5.8	5.8	5.1	5.1	5.1	4.5	4.5	4.5
17.5°	5.1	4.5	4.5	3.9	3.9	3.9	3.9	3.9
20°	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
22.5°	3.9	3.9	3.9	3.9	3.2	3.2	3.2	3.2
25°	3.9	3.9	3.9	3.9	3.2	3.2	3.2	3.2
27.5°	3.9	3.2	3.2	3.2	3.2	3.2	3.2	3.2
30°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
32.5°	3.2	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	2.6	2.6
37.5°	3.2	3.2	3.2	2.6	2.6	2.6	2.6	2.6
40°	3.2	3.2	2.6	2.6	2.6	2.6	2.6	2.6
42.5°	3.2	2.6	2.6	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°	2.6	2.6	2.6	2.6	2.6	1.9	1.9	1.9
50°	2.6	2.6	2.6	1.9	1.9	1.9	1.9	1.9
52.5°	2.6	2.6	2.6	1.9	1.9	1.9	1.9	1.9
55°	2.6	1.9	1.9	1.9	1.9	1.9	1.3	1.3
57.5°	2.6	1.9	1.9	1.9	1.9	1.3	1.3	1.3
60°	2.6	1.9	1.9	1.9	1.9	1.3	1.3	1.3
62.5°	2.6	1.9	1.9	1.9	1.3	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°	1.9	1.9	1.9	1.3	1.3	1.3	0.6	0.6
70°	1.9	1.9	1.9	1.3	1.3	1.3	0.6	0.6
72.5°	1.9	1.9	1.9	1.3	1.3	1.3	0.6	0.6
75°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
77.5°	1.9	1.9	1.3	1.3	1.3	0.6	0.6	0.6
80°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
82.5°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
85°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
87.5°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
90°	1.3	1.3	1.3	1.3	0.6	0.6	0.6	0.6
92.5°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
95°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
97.5°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
100°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
102.5°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
105°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
107.5°	1.9	1.3	1.3	1.3	0.6	0.6	0.6	0.6
110°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6



TEST NUMBER: P190125

CATALOG NUMBER: TRF11-LD4-15W-50-OPL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	1.9	1.3	1.3	1.3	1.3	0.6	0.6	0.6
115°	1.9	1.9	1.3	1.3	1.3	1.3	0.6	0.6
117.5°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	1.3
120°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	1.3
122.5°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	1.3
125°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	1.3
127.5°	1.9	1.9	1.3	1.3	1.3	1.3	1.3	1.3
130°	1.9	1.9	1.9	1.3	1.3	1.3	1.3	1.3
132.5°	1.9	1.9	1.9	1.9	1.3	1.3	1.3	1.3
135°	1.9	1.9	1.9	1.9	1.3	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	1.3	1.3	1.3
142.5°	1.9	1.9	1.9	1.9	1.9	1.3	1.3	1.3
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°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
152.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
155°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
157.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
160°	2.6	2.6	1.9	1.9	1.9	1.9	1.9	1.9
162.5°	3.9	3.2	3.2	3.2	2.6	2.6	2.6	2.6
165°	5.1	4.5	4.5	4.5	3.9	3.9	3.9	3.9
167.5°	7.1	6.4	6.4	6.4	5.8	5.8	5.8	5.8
170°	9.6	9.0	9.0	8.4	8.4	7.7	7.7	7.7
172.5°	12.2	11.6	11.6	11.6	10.9	10.9	10.9	10.9
175°	15.4	14.8	14.8	14.8	14.2	14.2	14.2	14.2
177.5°	18.7	18.7	18.7	18.7	18.0	18.0	18.0	18.0
180°	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2

(END OF REPORT)