

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: P190128

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

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190128
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27876)
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-CL-BK-UNV-EDC1-CSTG
Description: TERRAPIN 11" LED SHALLOW CAST WALL MOUNT WITH OPEN CLEAR LENS AND QUAD LENS COVER
Light Source: (56) NICHIA 5000 NF2L757DRT
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 300mA OT25W/1

Summary

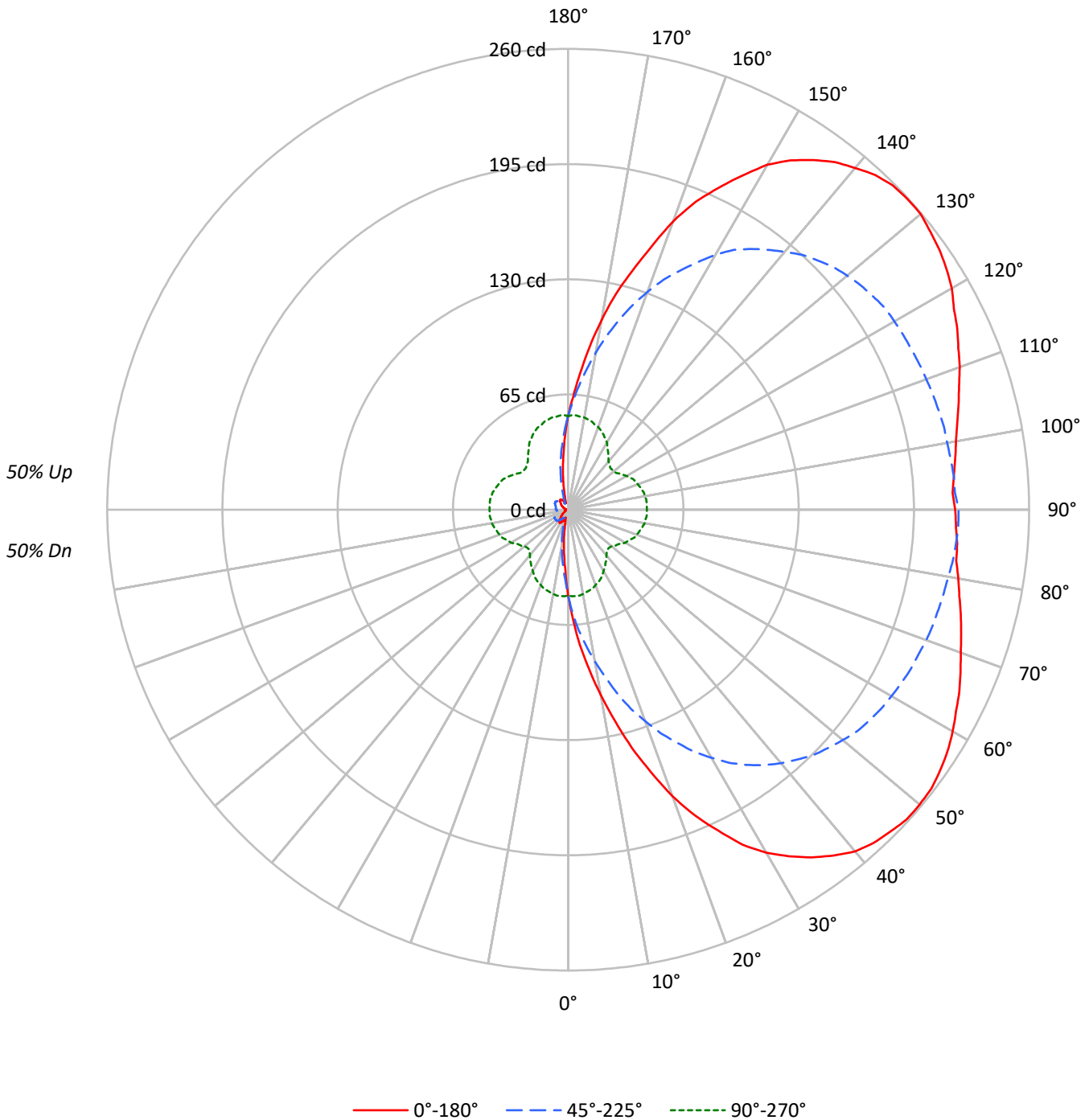
Lumens per Lamp: N/A
Luminaire Lumens: 1138.0 lumens
Efficiency: N/A
Efficacy: 79.6 lumens/watt
Spacing Criteria (0/90/45): 2.87 / 1.23 / 2.59
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

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	80	75	70	66	62	59	54	51	48	42	40	38	32
2	83	73	65	59	76	67	60	54	55	50	45	45	40	37	35	31	29	24
3	75	63	54	47	68	58	50	43	47	41	36	38	33	29	29	26	22	18
4	68	55	45	38	61	50	42	35	41	35	29	33	28	24	25	21	18	14
5	62	48	39	32	56	44	36	29	36	30	24	29	24	20	22	18	15	12
6	56	43	34	27	51	39	31	25	32	26	21	26	21	17	20	16	13	10
7	52	38	29	23	47	35	27	21	29	23	18	23	18	14	18	14	11	8
8	48	34	26	20	44	32	24	18	26	20	15	21	16	12	16	12	9	7
9	45	31	23	18	41	29	21	16	24	18	14	19	14	11	15	11	8	6
10	42	28	21	15	38	26	19	14	22	16	12	18	13	10	14	10	7	5

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	1945	1945	1945
5°	2428	1817	818
10°	2793	1679	321
15°	3147	1545	131
20°	3435	1417	104
25°	3596	1306	128
30°	3690	1176	139
35°	3678	1061	129
40°	3637	957	111
45°	3531	897	80
50°	3416	920	59
55°	3276	986	41
60°	3129	1099	32
65°	2996	1191	23
70°	2878	1294	16
75°	2801	1397	23
80°	2752	1522	23
85°	2755	1650	16



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	4.9	0.4
10°-20°	17.2	1.5
20°-30°	34.5	3.0
30°-40°	53.6	4.7
40°-50°	70.7	6.2
50°-60°	84.7	7.4
60°-70°	94.9	8.3
70°-80°	101.5	8.9
80°-90°	105.0	9.2
90°-100°	104.5	9.2
100°-110°	101.3	8.9
110°-120°	95.1	8.4
120°-130°	85.4	7.5
130°-140°	71.7	6.3
140°-150°	54.4	4.8
150°-160°	35.3	3.1
160°-170°	18.0	1.6
170°-180°	5.2	0.5
0°-30°	56.6	5.0
0°-40°	110.2	9.7
0°-60°	265.7	23.3
0°-90°	567.1	49.8
90°-120°	300.9	26.4
90°-150°	512.5	45.0
90°-180°	571.0	50.2
0°-180°	1138.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	48	48	48	48	48	
5°	77	68	49	32	26	8
15°	139	108	47	12	6	40
25°	200	145	43	5	7	93
35°	240	176	37	6	8	150
45°	257	196	32	9	6	199
55°	256	207	34	9	3	229
65°	243	213	39	8	2	241
75°	229	216	42	7	2	243
85°	220	220	44	6	1	180
90°	218	220	44	6	1	120
95°	218	218	44	7	1	179
105°	228	216	43	7	2	241
115°	242	214	41	8	3	240
125°	256	210	35	8	4	229
135°	259	199	34	7	6	200
145°	241	180	39	4	7	151
155°	200	149	47	4	4	93
165°	139	111	52	15	6	41
175°	77	70	53	37	31	8
180°	53	53	53	53	53	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
2.5°	61.8	61.2	61.2	61.2	61.2	60.5	60.5	59.9	59.2	58.6	58.6
5°	76.6	75.3	75.3	74.7	74.0	73.4	73.4	72.1	70.8	69.5	68.2
7.5°	90.8	90.1	89.5	88.8	87.6	86.9	86.3	84.3	82.4	79.2	77.3
10°	106.2	104.9	104.9	103.7	101.7	100.4	99.8	96.6	94.0	90.8	86.9
12.5°	122.3	121.0	120.4	119.1	116.5	115.2	114.0	110.1	106.2	102.4	96.6
15°	139.1	138.4	137.1	135.2	132.0	130.7	128.8	124.3	119.1	114.0	107.5
17.5°	155.2	154.5	153.2	150.7	146.8	144.9	142.3	137.1	131.3	124.9	117.8
20°	171.9	171.3	169.3	166.1	160.3	158.4	156.4	150.0	142.9	135.2	126.8
22.5°	186.7	185.4	183.5	179.6	175.8	173.2	170.6	161.6	154.5	145.5	136.5
25°	199.6	198.9	197.0	193.1	188.6	185.4	182.2	175.1	166.1	155.8	144.9
27.5°	213.1	211.8	209.2	205.4	200.2	197.0	193.8	186.1	177.1	166.1	153.9
30°	223.4	222.1	220.2	215.7	210.5	207.3	203.4	195.7	186.1	175.1	161.6
32.5°	231.8	231.1	228.6	224.7	218.9	215.7	212.5	204.1	193.8	182.2	169.3
35°	239.5	238.9	236.3	231.8	226.6	223.4	219.5	211.2	200.9	189.3	175.8
37.5°	245.9	245.3	242.7	238.9	233.1	229.8	226.6	217.6	207.3	195.1	181.6
40°	251.7	250.4	248.5	244.7	238.9	235.6	231.8	223.4	213.1	200.9	186.7
42.5°	255.0	254.3	251.7	248.5	242.7	240.1	236.3	227.9	217.6	205.4	191.2
45°	256.9	256.9	254.3	251.1	245.9	243.4	239.5	231.8	221.5	209.9	195.7
47.5°	258.8	258.2	256.2	253.0	248.5	245.3	242.1	234.4	224.7	213.1	198.9
50°	258.8	258.2	256.2	253.7	249.2	246.6	243.4	236.3	227.3	215.7	202.2
52.5°	258.2	257.5	255.6	253.0	248.5	246.6	244.0	236.9	228.6	218.3	205.4
55°	256.2	255.6	254.3	251.1	247.9	245.3	243.4	236.9	229.2	219.5	207.3
57.5°	253.7	253.0	251.1	249.2	246.6	244.0	242.1	236.3	229.2	220.2	209.2
60°	250.4	249.8	248.5	246.6	244.0	242.1	240.1	235.6	229.2	221.5	210.5
62.5°	246.6	246.6	244.7	242.7	240.8	238.9	237.6	233.7	228.6	220.8	211.8
65°	243.4	243.4	241.4	240.1	238.2	236.9	235.0	232.4	227.3	221.5	213.1
67.5°	239.5	238.9	238.2	236.3	235.0	233.7	232.4	229.8	226.0	220.8	213.7
70°	235.6	235.6	234.4	233.1	232.4	230.5	229.8	227.9	224.7	220.8	215.0
72.5°	232.4	231.8	231.1	229.8	228.6	227.9	227.3	225.3	223.4	220.8	215.7
75°	229.2	228.6	227.3	226.6	225.3	225.3	224.7	223.4	222.8	220.2	216.3
77.5°	226.0	225.3	224.7	224.0	223.4	222.8	222.8	222.1	221.5	220.2	217.0
80°	223.4	223.4	222.1	220.8	220.8	220.8	220.8	220.8	220.8	220.8	217.6
82.5°	220.8	220.8	219.5	218.9	218.9	218.3	218.9	219.5	220.2	220.2	218.9
85°	220.2	219.5	218.3	217.6	217.6	217.6	218.3	219.5	220.2	220.8	219.5
87.5°	218.9	218.3	217.6	217.0	217.0	217.0	217.6	218.9	220.2	220.8	220.2
90°	218.3	217.6	217.0	216.3	216.3	216.3	217.6	218.9	220.2	220.8	220.2
92.5°	217.0	217.0	215.7	215.0	215.7	215.7	216.3	217.6	218.9	219.5	218.3
95°	218.3	218.3	217.0	217.0	216.3	216.3	217.0	218.3	219.5	219.5	218.3
97.5°	220.2	219.5	218.9	218.3	217.6	217.6	218.3	218.9	219.5	219.5	217.6
100°	222.1	221.5	220.2	220.2	219.5	219.5	219.5	220.2	220.2	219.5	217.0
102.5°	224.7	224.0	223.4	222.8	222.1	222.1	222.1	221.5	220.8	220.2	217.0
105°	227.9	227.3	226.6	226.0	225.3	224.7	224.0	223.4	222.1	220.2	216.3
107.5°	231.1	230.5	229.8	229.2	228.6	227.3	226.6	225.3	223.4	220.8	215.7
110°	235.0	234.4	233.7	232.4	231.1	230.5	229.2	227.3	224.7	220.8	215.0



TEST NUMBER: P190128

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

CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	238.2	237.6	236.3	235.6	233.7	233.1	231.8	229.2	226.0	220.8	214.4
115°	242.1	241.4	240.1	238.9	236.9	236.3	235.0	231.8	227.3	222.1	213.7
117.5°	245.3	245.3	244.0	242.1	240.1	238.9	237.6	233.7	228.6	222.8	213.1
120°	249.8	249.2	247.9	246.6	243.4	242.1	240.1	235.6	230.5	222.8	212.5
122.5°	253.0	252.4	251.1	249.2	246.6	244.7	242.1	237.6	230.5	222.8	211.8
125°	255.6	255.6	253.7	251.1	248.5	245.9	244.0	237.6	230.5	221.5	209.9
127.5°	257.5	256.9	255.6	253.0	249.2	247.2	244.7	238.2	229.8	220.2	208.0
130°	259.5	258.2	256.2	253.7	249.8	247.2	244.7	237.6	229.2	218.3	205.4
132.5°	259.5	258.8	256.9	254.3	249.8	247.2	244.0	236.9	227.3	215.7	202.8
135°	258.8	258.2	256.2	253.0	248.5	245.3	242.1	234.4	224.7	213.1	198.9
137.5°	256.2	255.6	253.0	250.4	245.3	242.7	238.9	230.5	220.8	209.2	195.1
140°	251.7	251.1	249.2	245.9	240.8	237.6	234.4	226.0	215.7	203.4	189.9
142.5°	247.2	246.6	244.0	240.8	235.0	232.4	228.6	220.2	210.5	198.3	184.8
145°	240.8	240.1	237.6	234.4	229.2	226.0	222.8	213.7	204.1	192.5	179.6
147.5°	233.7	232.4	230.5	227.3	222.1	218.9	215.7	207.3	197.7	186.1	173.8
150°	224.7	224.0	221.5	218.3	213.1	209.9	206.7	198.3	189.3	178.3	166.1
152.5°	212.5	212.5	209.9	207.3	202.8	199.6	195.7	188.0	179.6	169.3	157.1
155°	200.2	200.2	198.3	195.1	191.2	188.0	184.8	177.7	170.0	159.0	148.7
157.5°	188.0	187.4	185.4	182.2	179.0	175.8	173.2	166.1	157.7	149.4	140.4
160°	173.2	173.2	171.3	168.7	164.8	161.0	158.4	152.6	146.8	138.4	130.7
162.5°	155.2	155.2	153.9	151.3	149.4	146.8	144.2	139.1	133.9	127.5	121.0
165°	139.1	139.1	137.8	135.8	133.9	132.0	130.1	126.2	121.7	115.9	110.7
167.5°	124.9	123.6	122.3	121.0	119.8	117.8	116.5	112.7	109.4	104.9	100.4
170°	108.8	107.5	106.9	105.6	104.9	103.0	102.4	99.8	97.2	93.4	90.1
172.5°	92.7	91.4	91.4	90.1	90.1	88.8	88.2	86.3	85.0	82.4	79.8
175°	77.3	76.6	76.6	76.0	76.0	74.7	74.7	73.4	72.8	71.5	70.2
177.5°	63.7	63.1	63.1	63.1	63.1	62.5	63.1	62.5	62.5	61.8	61.2
180°	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8



TEST NUMBER: P190128

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

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
2.5°	57.3	56.7	56.0	54.7	54.1	53.4	52.8	51.5	50.2	48.9	47.6
5°	66.3	63.7	62.5	60.5	59.2	57.9	56.0	53.4	51.5	48.9	47.0
7.5°	74.7	71.5	68.9	65.7	63.7	61.8	58.6	55.4	52.1	48.9	45.7
10°	83.1	78.5	74.7	70.2	68.2	65.7	61.2	56.7	52.1	48.3	44.4
12.5°	91.4	86.3	81.1	75.3	72.8	69.5	63.7	57.9	52.8	47.6	42.5
15°	101.1	94.6	87.6	80.5	77.3	73.4	66.3	59.9	53.4	47.0	41.2
17.5°	110.1	101.7	93.4	85.0	81.1	76.6	68.2	60.5	53.4	46.4	39.9
20°	117.8	108.8	99.1	89.5	84.3	79.8	70.2	61.2	52.8	45.1	38.6
22.5°	126.2	115.2	104.3	93.4	88.2	82.4	72.1	61.8	52.8	44.4	36.7
25°	133.9	122.3	109.4	97.2	90.8	85.0	72.8	61.8	52.1	43.1	35.4
27.5°	141.6	128.1	114.6	100.4	94.0	86.9	74.0	61.8	51.5	41.8	33.5
30°	148.1	133.9	119.1	103.7	95.9	88.8	74.0	61.2	50.2	39.9	31.5
32.5°	153.9	139.1	122.3	106.2	97.9	89.5	74.7	60.5	48.9	38.6	30.3
35°	159.0	142.9	126.2	108.2	99.8	90.8	74.0	59.9	47.0	36.7	28.3
37.5°	165.5	147.4	129.4	110.7	101.1	92.1	74.0	58.6	45.7	35.4	26.4
40°	170.6	151.3	132.6	112.7	103.0	92.7	74.0	57.9	44.4	33.5	25.1
42.5°	175.1	155.2	135.8	115.2	104.3	94.0	74.7	57.3	43.1	32.2	23.8
45°	179.0	159.0	139.1	117.8	106.9	95.9	75.3	57.3	43.1	31.5	23.2
47.5°	182.2	163.5	142.3	120.4	109.4	97.9	76.6	58.6	43.1	31.5	23.2
50°	186.1	168.0	145.5	123.6	112.7	101.1	79.2	59.9	44.4	32.2	23.2
52.5°	189.3	171.3	149.4	127.5	115.9	104.3	81.1	61.8	45.7	33.5	23.8
55°	192.5	174.5	153.2	131.3	119.8	107.5	84.3	64.4	47.6	34.1	23.8
57.5°	195.1	178.3	156.4	134.6	123.0	111.4	87.6	67.0	49.6	35.4	24.5
60°	197.7	181.6	160.3	139.1	127.5	115.2	91.4	70.2	52.1	37.3	25.1
62.5°	199.6	184.1	164.8	142.9	131.3	119.1	95.9	73.4	54.1	38.0	25.8
65°	202.2	187.4	169.3	147.4	135.8	124.3	99.8	76.6	56.7	39.3	25.8
67.5°	204.1	190.6	173.2	151.3	140.4	128.1	103.7	79.8	58.6	40.6	26.4
70°	206.0	193.8	177.1	155.2	144.2	132.0	107.5	82.4	60.5	41.2	26.4
72.5°	208.0	196.4	180.9	159.7	148.1	135.8	110.7	85.0	61.8	41.8	26.4
75°	209.2	198.9	184.1	163.5	151.9	139.7	113.3	87.6	63.1	42.5	26.4
77.5°	211.2	201.5	186.7	167.4	155.2	142.9	116.5	89.5	64.4	43.1	26.4
80°	212.5	203.4	189.3	170.0	157.7	145.5	118.5	90.8	65.7	43.8	26.4
82.5°	214.4	205.4	191.9	172.5	159.7	147.4	120.4	92.1	66.3	43.8	27.0
85°	215.7	207.3	193.8	174.5	161.6	149.4	121.7	93.4	67.0	44.4	27.0
87.5°	216.3	208.6	195.1	175.8	162.9	150.7	123.0	94.0	67.6	44.4	27.0
90°	217.0	209.2	195.7	176.4	163.5	150.7	123.6	94.6	67.6	44.4	27.0
92.5°	214.4	206.7	193.1	174.5	162.2	148.7	121.7	93.4	67.0	44.4	27.0
95°	213.7	205.4	191.9	173.2	161.0	148.1	121.0	92.7	67.0	44.4	27.0
97.5°	213.1	204.1	189.9	171.3	158.4	146.1	119.8	92.1	66.3	44.4	27.0
100°	211.8	202.2	188.0	168.7	156.4	144.2	117.8	90.8	65.7	43.8	27.0
102.5°	210.5	200.2	185.4	166.1	153.9	142.3	115.9	89.5	64.4	43.8	27.0
105°	209.2	198.3	182.8	162.9	151.3	139.1	113.3	87.6	63.7	43.1	27.0
107.5°	208.0	195.7	180.3	159.0	147.4	135.8	110.7	85.6	62.5	42.5	27.0
110°	206.0	193.8	177.1	155.2	144.2	132.6	107.5	83.1	60.5	41.8	27.0



TEST NUMBER: P190128

CATALOG NUMBER: TRF11-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°	204.7	190.6	173.8	151.9	140.4	128.8	103.7	80.5	59.2	41.2	27.0
115°	202.8	188.6	170.6	148.1	136.5	124.9	100.4	77.3	57.3	40.6	27.0
117.5°	201.5	186.1	166.7	144.2	132.6	121.0	96.6	74.7	55.4	39.3	26.4
120°	199.6	183.5	163.5	141.0	129.4	117.2	93.4	71.5	52.8	38.0	26.4
122.5°	197.7	180.9	159.7	137.1	125.5	113.3	89.5	68.2	50.9	36.7	25.8
125°	195.1	177.7	156.4	133.9	121.7	110.1	86.3	65.7	48.9	35.4	25.1
127.5°	192.5	174.5	152.6	130.1	118.5	106.9	83.7	63.7	47.0	34.1	24.5
130°	189.3	171.9	149.4	126.8	115.2	103.7	81.8	61.8	45.7	33.5	24.5
132.5°	186.1	168.7	146.1	124.3	112.7	101.7	79.8	60.5	45.1	33.5	24.5
135°	182.8	164.2	142.9	121.7	110.7	99.8	78.5	60.5	45.1	33.5	25.1
137.5°	179.0	159.7	139.7	119.1	108.8	97.9	77.9	60.5	45.7	34.8	25.8
140°	174.5	155.8	136.5	116.5	106.2	96.6	77.9	61.2	47.0	35.4	27.0
142.5°	169.3	151.3	133.3	114.6	104.9	95.9	77.9	61.8	48.3	37.3	28.3
145°	163.5	147.4	130.1	112.7	103.7	94.6	77.9	63.1	50.2	39.3	30.3
147.5°	157.7	142.9	126.8	110.1	102.4	94.0	78.5	64.4	52.1	41.2	32.8
150°	151.9	138.4	123.0	107.5	100.4	92.7	78.5	65.7	53.4	43.8	34.8
152.5°	144.9	132.0	118.5	104.3	97.9	90.8	77.9	65.7	54.7	45.1	36.7
155°	137.8	126.2	114.0	101.1	95.3	88.8	77.3	66.3	56.0	47.0	38.6
157.5°	130.7	119.8	108.8	97.9	92.1	86.9	76.0	66.3	56.7	48.3	40.6
160°	122.3	113.3	103.7	93.4	88.8	84.3	74.7	65.7	57.3	49.6	42.5
162.5°	113.3	105.6	97.2	88.8	85.0	80.5	72.8	65.0	57.3	50.2	43.8
165°	104.3	97.9	90.8	83.7	80.5	77.3	70.2	63.7	57.3	51.5	45.7
167.5°	95.9	90.8	85.0	79.2	76.6	73.4	68.2	62.5	57.3	52.1	47.6
170°	86.9	82.4	78.5	74.0	72.1	69.5	65.7	61.2	56.7	52.8	48.9
172.5°	77.9	74.7	71.5	68.2	67.0	65.7	62.5	59.2	56.0	52.8	50.2
175°	68.9	67.0	65.0	63.1	62.5	61.2	59.2	57.3	55.4	53.4	50.9
177.5°	60.5	59.9	59.2	58.6	57.9	57.3	56.7	55.4	54.7	53.4	52.8
180°	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8



TEST NUMBER: P190128

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
2.5°	46.4	45.7	44.4	43.8	43.1	42.5	41.2	39.9	39.3	38.6	38.0
5°	44.4	42.5	40.6	39.9	38.6	37.3	35.4	34.1	32.2	30.9	30.3
7.5°	42.5	39.9	37.3	36.1	34.1	32.2	30.3	28.3	26.4	24.5	23.2
10°	40.6	36.7	33.5	32.2	30.3	27.7	25.1	23.2	20.6	19.3	17.4
12.5°	38.6	34.1	30.3	28.3	27.0	23.8	20.6	18.0	16.1	14.2	12.2
15°	36.7	31.5	27.7	25.8	23.8	20.0	16.7	14.2	11.6	10.3	9.0
17.5°	34.1	29.0	24.5	22.5	20.6	16.7	13.5	10.9	9.0	7.7	6.4
20°	32.2	27.0	21.9	19.3	17.4	13.5	10.3	8.4	7.1	5.8	5.2
22.5°	30.3	24.5	19.3	17.4	14.8	10.9	8.4	6.4	5.8	5.2	5.2
25°	28.3	22.5	17.4	14.8	12.9	9.0	7.1	5.8	5.2	5.2	5.2
27.5°	26.4	20.6	15.5	12.9	10.9	7.7	5.8	5.2	5.2	5.8	5.8
30°	24.5	18.7	13.5	10.9	9.7	6.4	5.2	5.2	5.2	6.4	7.1
32.5°	23.2	17.4	12.2	9.7	8.4	5.8	4.5	5.2	5.8	7.1	7.7
35°	21.2	15.5	10.9	9.0	7.1	5.2	5.2	5.8	6.4	7.7	8.4
37.5°	20.0	14.2	9.7	8.4	6.4	5.2	5.2	6.4	7.1	8.4	8.4
40°	18.7	13.5	9.0	7.7	5.8	5.2	5.8	7.1	7.7	8.4	9.0
42.5°	18.0	12.9	8.4	7.1	5.8	5.2	6.4	7.7	8.4	9.0	9.0
45°	17.4	12.2	7.7	6.4	5.2	5.8	7.1	8.4	9.0	9.0	9.0
47.5°	16.7	11.6	7.1	5.8	5.2	5.8	7.1	8.4	9.0	9.0	8.4
50°	16.7	10.9	6.4	5.2	5.2	6.4	7.7	9.0	9.0	9.0	8.4
52.5°	16.1	10.3	6.4	5.2	5.2	6.4	8.4	9.0	9.0	8.4	7.7
55°	16.1	9.7	5.8	5.2	5.2	7.1	8.4	9.7	9.0	8.4	7.1
57.5°	16.1	9.7	5.8	5.2	5.8	7.7	9.0	9.7	9.0	7.7	7.1
60°	16.1	9.0	5.2	5.2	5.8	7.7	9.0	9.7	9.0	7.7	6.4
62.5°	15.5	8.4	5.2	5.2	6.4	7.7	9.0	9.7	8.4	7.1	5.8
65°	15.5	7.7	5.2	5.8	6.4	8.4	9.7	9.0	8.4	7.1	5.8
67.5°	15.5	7.7	5.2	5.8	6.4	8.4	9.7	9.0	7.7	6.4	5.2
70°	14.8	7.7	5.2	5.8	7.1	8.4	9.7	9.0	7.7	6.4	5.2
72.5°	14.8	7.1	5.2	5.8	7.1	9.0	9.7	9.0	7.7	5.8	5.2
75°	14.8	7.1	5.2	5.8	7.1	9.0	9.7	9.0	7.1	5.8	4.5
77.5°	14.2	7.1	5.2	6.4	7.1	9.0	9.7	8.4	7.1	5.8	4.5
80°	14.2	7.1	5.2	6.4	7.1	9.0	9.7	8.4	7.1	5.8	4.5
82.5°	14.2	6.4	5.2	6.4	7.1	9.0	9.7	8.4	7.1	5.2	4.5
85°	14.2	6.4	5.2	6.4	7.1	9.0	9.7	8.4	6.4	5.2	4.5
87.5°	14.2	6.4	5.2	6.4	7.1	9.0	9.0	8.4	6.4	5.2	3.9
90°	14.2	6.4	5.2	6.4	7.1	9.0	9.0	8.4	6.4	5.2	3.9
92.5°	14.8	7.1	5.2	6.4	7.1	9.0	9.0	8.4	7.1	5.8	4.5
95°	14.8	7.1	5.2	5.8	7.1	9.0	9.0	8.4	7.1	5.8	4.5
97.5°	14.8	7.1	5.2	5.8	7.1	8.4	9.0	8.4	7.1	5.8	4.5
100°	14.8	7.1	5.2	5.8	6.4	8.4	9.0	8.4	7.1	5.8	4.5
102.5°	14.8	7.1	5.2	5.8	6.4	8.4	9.0	8.4	7.1	5.8	5.2
105°	14.8	7.1	4.5	5.2	6.4	7.7	9.0	8.4	7.1	5.8	5.2
107.5°	15.5	7.1	4.5	5.2	5.8	7.7	8.4	8.4	7.7	6.4	5.2
110°	15.5	7.7	4.5	5.2	5.8	7.7	8.4	8.4	7.7	6.4	5.8



TEST NUMBER: P190128

CATALOG NUMBER: TRF11-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°	16.1	7.7	4.5	4.5	5.2	7.1	8.4	8.4	7.7	7.1	5.8
115°	16.1	8.4	5.2	4.5	5.2	7.1	8.4	8.4	8.4	7.1	6.4
117.5°	16.7	9.0	5.2	4.5	5.2	6.4	7.7	8.4	8.4	7.7	6.4
120°	16.7	9.7	5.2	4.5	5.2	6.4	7.7	8.4	8.4	7.7	7.1
122.5°	16.7	10.3	5.8	4.5	4.5	5.8	7.1	8.4	8.4	7.7	7.1
125°	16.7	10.3	5.8	4.5	4.5	5.8	7.1	7.7	8.4	7.7	7.1
127.5°	17.4	10.9	6.4	5.2	4.5	5.2	6.4	7.7	7.7	7.7	7.7
130°	17.4	11.6	7.1	5.2	4.5	5.2	5.8	7.1	7.7	7.7	7.7
132.5°	18.0	12.2	7.7	5.8	4.5	4.5	5.8	6.4	7.1	7.7	7.7
135°	18.0	12.9	8.4	6.4	5.2	4.5	5.2	5.8	7.1	7.1	7.7
137.5°	19.3	13.5	9.0	7.1	5.8	3.9	4.5	5.8	6.4	7.1	7.1
140°	20.0	14.2	9.7	7.7	6.4	4.5	4.5	5.2	5.8	6.4	7.1
142.5°	21.2	15.5	10.9	9.0	7.1	4.5	3.9	4.5	5.2	5.8	6.4
145°	23.2	17.4	12.2	9.7	7.7	5.2	3.9	3.9	4.5	5.2	5.8
147.5°	25.1	18.7	13.5	10.9	9.0	6.4	4.5	3.9	4.5	4.5	5.2
150°	27.0	20.6	15.5	12.9	10.9	7.1	5.2	3.9	3.9	4.5	4.5
152.5°	29.0	23.2	17.4	14.8	12.2	9.0	6.4	4.5	3.9	3.9	4.5
155°	31.5	25.1	20.0	17.4	14.8	10.9	7.7	5.8	4.5	3.9	3.9
157.5°	33.5	27.7	22.5	20.0	17.4	13.5	9.7	7.7	5.8	4.5	3.9
160°	36.1	30.3	25.1	22.5	20.6	16.1	12.9	9.7	7.7	6.4	5.2
162.5°	38.0	32.8	27.7	25.8	23.2	19.3	16.1	12.9	10.3	9.0	7.1
165°	40.6	35.4	30.9	29.0	27.0	23.2	20.0	16.7	14.8	12.2	10.9
167.5°	42.5	38.0	34.1	32.2	30.9	27.7	24.5	21.9	19.3	17.4	15.5
170°	45.1	41.2	38.0	36.1	34.8	32.2	29.0	27.0	25.1	23.2	21.2
172.5°	47.0	43.8	41.8	39.9	39.3	36.7	34.1	32.2	30.9	29.0	27.7
175°	48.9	47.0	45.7	44.4	43.8	41.8	39.9	38.6	37.3	36.1	34.8
177.5°	51.5	50.2	49.6	48.9	48.9	47.6	47.0	45.7	45.1	44.4	43.8
180°	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8



TEST NUMBER: P190128

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
2.5°	36.7	36.1	36.1	36.1	34.8	34.8	34.8	34.8
5°	29.0	28.3	27.7	27.0	26.4	25.8	25.8	25.8
7.5°	21.9	21.2	20.6	20.0	19.3	18.7	18.7	18.0
10°	16.1	14.8	14.2	14.2	12.9	12.2	12.2	12.2
12.5°	10.9	10.3	9.7	9.7	9.0	8.4	8.4	7.7
15°	7.7	7.1	7.1	6.4	6.4	5.8	5.8	5.8
17.5°	5.8	5.2	5.2	5.2	5.2	4.5	4.5	4.5
20°	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
22.5°	5.2	5.8	5.8	5.8	5.8	6.4	6.4	6.4
25°	5.8	6.4	6.4	6.4	7.1	7.1	7.1	7.1
27.5°	6.4	7.1	7.1	7.7	7.7	7.7	8.4	7.7
30°	7.7	7.7	8.4	8.4	8.4	8.4	8.4	8.4
32.5°	8.4	8.4	8.4	9.0	9.0	9.0	9.0	9.0
35°	8.4	9.0	9.0	9.0	9.0	8.4	8.4	8.4
37.5°	9.0	9.0	9.0	8.4	8.4	8.4	8.4	8.4
40°	9.0	8.4	8.4	8.4	7.7	7.7	7.7	7.7
42.5°	8.4	8.4	7.7	7.7	7.1	7.1	6.4	6.4
45°	8.4	7.7	7.1	7.1	6.4	5.8	5.8	5.8
47.5°	7.7	7.1	6.4	6.4	5.8	5.2	5.2	5.2
50°	7.1	6.4	5.8	5.8	5.2	4.5	4.5	4.5
52.5°	6.4	5.8	5.2	5.2	4.5	3.9	3.9	3.9
55°	6.4	5.2	4.5	4.5	3.9	3.2	3.2	3.2
57.5°	5.8	4.5	4.5	3.9	3.2	3.2	2.6	2.6
60°	5.2	4.5	3.9	3.9	3.2	2.6	2.6	2.6
62.5°	5.2	3.9	3.9	3.2	2.6	2.6	1.9	1.9
65°	4.5	3.9	3.2	3.2	2.6	1.9	1.9	1.9
67.5°	4.5	3.2	3.2	2.6	2.6	1.9	1.9	1.9
70°	3.9	3.2	3.2	2.6	2.6	1.9	1.9	1.3
72.5°	3.9	3.2	3.2	2.6	1.9	1.9	1.9	1.9
75°	3.9	3.2	2.6	2.6	1.9	1.9	1.9	1.9
77.5°	3.9	3.2	2.6	2.6	1.9	1.9	1.9	1.3
80°	3.9	3.2	2.6	2.6	1.9	1.9	1.9	1.9
82.5°	3.2	2.6	2.6	2.6	1.9	1.9	1.3	1.9
85°	3.2	2.6	2.6	2.6	1.9	1.3	1.3	1.3
87.5°	3.2	2.6	2.6	1.9	1.9	1.3	1.3	1.3
90°	3.2	2.6	2.6	1.9	1.9	1.3	1.3	1.3
92.5°	3.9	3.2	2.6	2.6	1.9	1.9	1.3	1.3
95°	3.9	3.2	2.6	2.6	1.9	1.9	1.3	1.3
97.5°	3.9	3.2	2.6	2.6	2.6	1.9	1.9	1.9
100°	3.9	3.2	3.2	2.6	2.6	1.9	1.3	1.3
102.5°	3.9	3.2	3.2	2.6	2.6	1.9	1.9	1.3
105°	4.5	3.2	3.2	3.2	2.6	1.9	1.9	1.9
107.5°	4.5	3.9	3.2	3.2	2.6	2.6	1.9	1.9
110°	4.5	3.9	3.9	3.2	3.2	2.6	2.6	2.6



TEST NUMBER: P190128

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	5.2	3.9	3.9	3.9	3.2	2.6	2.6	2.6
115°	5.2	4.5	4.5	3.9	3.9	3.2	3.2	3.2
117.5°	5.8	5.2	4.5	4.5	3.9	3.9	3.9	3.2
120°	5.8	5.2	5.2	4.5	4.5	3.9	3.9	3.9
122.5°	6.4	5.8	5.2	5.2	4.5	4.5	4.5	4.5
125°	6.4	5.8	5.8	5.2	5.2	4.5	4.5	4.5
127.5°	7.1	6.4	5.8	5.8	5.2	5.2	5.2	5.2
130°	7.1	7.1	6.4	6.4	5.8	5.8	5.8	5.2
132.5°	7.7	7.1	7.1	6.4	6.4	5.8	5.8	5.8
135°	7.7	7.1	7.1	7.1	6.4	6.4	6.4	6.4
137.5°	7.7	7.7	7.1	7.1	7.1	7.1	7.1	6.4
140°	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
142.5°	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
145°	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
147.5°	5.8	6.4	6.4	6.4	6.4	6.4	6.4	6.4
150°	5.2	5.2	5.8	5.8	5.8	5.8	5.8	6.4
152.5°	4.5	5.2	5.2	5.2	5.2	5.2	5.2	5.2
155°	3.9	4.5	4.5	4.5	4.5	4.5	4.5	4.5
157.5°	3.9	3.9	3.9	3.9	3.9	4.5	3.9	4.5
160°	4.5	3.9	3.9	3.9	3.9	3.9	3.9	3.9
162.5°	6.4	5.8	5.2	5.2	4.5	4.5	4.5	4.5
165°	9.7	8.4	7.7	7.7	7.1	6.4	6.4	6.4
167.5°	14.2	12.9	12.2	11.6	10.9	10.3	10.3	9.7
170°	20.0	18.7	18.0	17.4	16.7	16.1	16.1	15.5
172.5°	26.4	25.1	25.1	24.5	23.8	23.2	23.2	22.5
175°	34.1	33.5	32.8	32.2	31.5	31.5	31.5	30.9
177.5°	43.1	42.5	42.5	42.5	41.8	41.8	41.2	41.2
180°	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8

(END OF REPORT)