

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: P190087

Luminaire Tested: **TRR11-LD4-10W-50-OPL-BK-UNV-EDC1**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190087
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-LD4-10W-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 200mA
OT25W/1

Summary

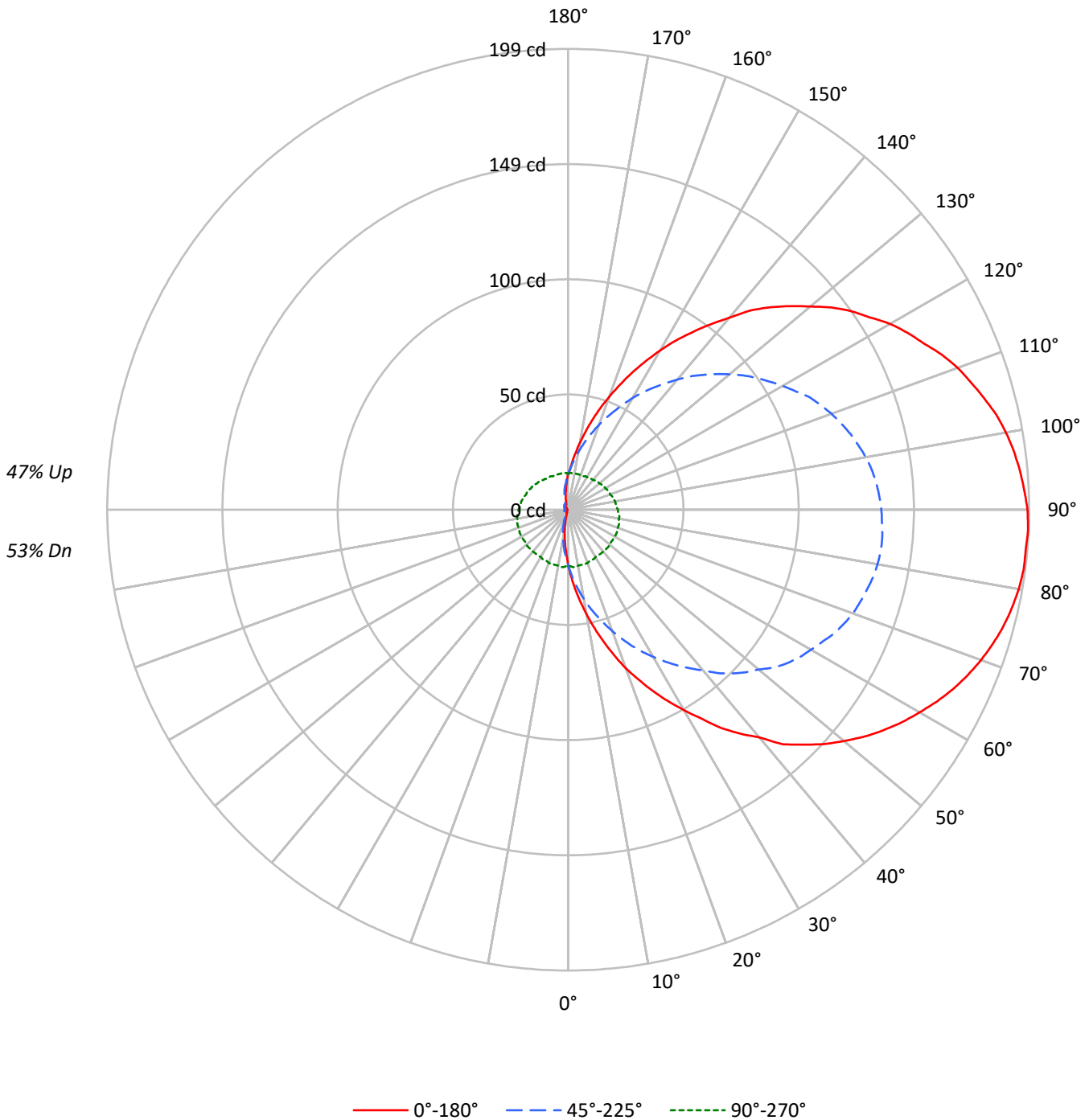
Lumens per Lamp: N/A
Luminaire Lumens: 639.0 lumens
Efficiency: N/A
Efficacy: 63.9 lumens/watt
Spacing Criteria (0/90/45): 3.31 / 1.51 / 2.75
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 10
Input Voltage (V): NR
Input Current (Ain): 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	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°	966	966	966
5°	1087	925	475
10°	1207	851	226
15°	1330	805	88
20°	1459	770	34
25°	1555	727	23
30°	1652	696	21
35°	1766	682	20
40°	1854	674	13
45°	1971	672	5
50°	2051	674	5
55°	2124	671	5
60°	2188	684	5
65°	2256	703	5
70°	2318	716	5
75°	2377	749	5
80°	2433	775	11
85°	2481	814	5



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	2.4	0.4
10°-20°	8.0	1.3
20°-30°	15.8	2.5
30°-40°	26.0	4.1
40°-50°	38.1	6.0
50°-60°	49.8	7.8
60°-70°	59.9	9.4
70°-80°	67.2	10.5
80°-90°	70.2	11.0
90°-100°	68.9	10.8
100°-110°	63.4	9.9
110°-120°	54.5	8.5
120°-130°	43.5	6.8
130°-140°	31.8	5.0
140°-150°	20.7	3.2
150°-160°	11.7	1.8
160°-170°	5.5	0.9
170°-180°	1.5	0.2
0°-30°	26.2	4.1
0°-40°	52.2	8.2
0°-60°	140.1	21.9
0°-90°	337.5	52.8
90°-120°	186.8	29.2
90°-150°	282.8	44.3
90°-180°	301.0	47.1
0°-180°	639.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	24	24	24	24	24	
5°	34	31	25	18	15	4
15°	59	47	24	9	4	17
25°	86	65	24	3	1	40
35°	115	82	24	2	1	72
45°	143	100	24	2	0	111
55°	166	116	23	2	0	149
65°	183	127	23	2	0	182
75°	194	134	23	2	0	205
85°	198	136	22	1	0	162
90°	198	135	22	1	0	109
95°	196	134	21	1	0	159
105°	186	126	20	1	0	197
115°	170	115	19	2	0	169
125°	149	99	18	2	1	134
135°	124	82	17	2	1	96
145°	94	64	16	3	2	59
155°	65	47	16	3	2	31
165°	40	32	16	6	3	12
175°	21	20	16	12	10	2
180°	16	16	16	16	16	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
2.5°	28.8	28.8	28.8	28.8	28.3	28.3	28.3	28.3	27.9	27.9	27.5
5°	34.3	33.9	34.3	33.9	33.5	33.5	33.1	33.1	32.6	32.2	31.3
7.5°	39.9	39.9	39.5	39.1	38.6	38.6	38.2	37.8	36.9	36.1	35.2
10°	45.9	45.5	45.5	45.1	44.2	43.8	43.4	42.5	41.2	40.3	39.1
12.5°	52.4	51.9	51.9	51.1	50.2	49.4	48.9	47.6	46.4	44.6	43.4
15°	58.8	58.8	58.4	57.5	56.2	55.8	54.9	53.7	51.5	49.8	47.2
17.5°	65.7	65.2	65.2	64.0	62.7	61.8	61.0	59.2	56.7	54.1	51.5
20°	73.0	72.5	71.7	70.4	69.1	68.3	67.0	64.8	62.2	59.2	55.8
22.5°	79.4	79.0	78.6	76.8	75.1	74.3	73.0	70.4	67.4	64.0	60.1
25°	86.3	86.3	85.0	83.7	82.0	80.7	79.0	76.0	73.0	68.7	64.8
27.5°	93.1	93.1	91.9	90.6	88.0	87.1	85.4	82.0	78.6	73.4	69.1
30°	100.0	100.0	99.2	97.4	94.9	93.1	91.4	87.6	83.7	78.6	73.4
32.5°	106.9	106.5	105.6	103.4	100.9	99.2	97.4	93.6	88.9	83.3	77.7
35°	115.0	114.6	112.9	110.7	107.3	105.2	103.4	99.2	94.0	88.0	82.0
37.5°	121.9	121.0	119.8	117.6	114.6	112.0	109.5	104.7	99.2	93.1	86.3
40°	128.3	127.9	126.6	124.1	120.6	118.5	116.3	111.2	104.3	97.4	90.6
42.5°	137.4	136.5	135.2	132.2	128.8	126.6	124.1	118.5	112.0	103.9	95.7
45°	143.4	142.9	141.2	138.2	134.4	131.8	129.2	123.6	116.8	108.6	100.0
47.5°	149.8	148.9	147.2	144.2	140.4	137.8	134.8	128.8	121.9	113.8	103.9
50°	155.4	155.0	152.8	149.8	145.9	142.9	139.9	133.5	126.6	118.0	107.3
52.5°	161.0	160.1	158.4	155.0	150.7	148.1	145.1	138.2	130.5	121.5	112.0
55°	166.1	165.3	163.1	159.7	155.4	152.4	149.4	142.5	134.4	125.3	115.5
57.5°	170.8	170.0	167.8	164.4	159.7	157.1	153.7	146.4	138.2	128.3	118.5
60°	175.1	174.3	172.1	169.1	164.0	161.0	157.5	150.2	141.7	131.8	121.0
62.5°	179.4	178.6	176.4	173.0	167.8	164.8	161.4	154.1	145.1	134.8	123.6
65°	183.3	182.4	180.3	176.4	171.7	168.3	164.8	157.1	148.1	137.8	126.6
67.5°	186.7	185.9	183.7	179.9	174.7	171.3	167.8	160.1	150.7	139.9	128.8
70°	189.7	188.9	186.7	182.9	177.7	174.3	170.8	162.7	152.8	142.1	130.9
72.5°	192.3	191.4	189.3	185.4	179.9	176.4	173.0	164.8	155.0	143.8	132.2
75°	194.5	193.6	191.0	187.2	181.6	178.6	174.7	166.5	156.7	145.5	133.5
77.5°	196.2	195.7	193.2	188.9	183.7	180.3	176.4	167.8	158.0	146.8	134.8
80°	197.5	197.0	194.5	190.2	184.6	181.1	177.7	169.1	159.3	147.7	135.6
82.5°	198.3	197.5	194.9	191.0	185.4	182.0	178.1	169.6	159.7	148.1	136.1
85°	198.3	197.9	195.3	191.0	185.4	182.4	178.1	169.6	159.7	148.1	136.1
87.5°	198.7	197.5	195.3	191.0	185.4	182.0	178.1	169.6	159.7	148.1	135.6
90°	198.3	197.0	194.9	190.6	185.0	181.6	177.7	169.1	158.8	147.7	135.2
92.5°	197.0	196.2	193.6	189.7	184.1	180.7	176.9	168.3	158.4	146.8	134.4
95°	195.7	195.3	192.7	188.4	182.9	179.4	176.0	167.4	157.1	145.9	133.5
97.5°	194.0	193.2	190.6	186.7	181.1	178.1	174.3	165.7	155.8	144.2	132.2
100°	191.9	191.0	188.4	184.6	179.0	176.0	172.1	163.5	153.7	142.5	130.5
102.5°	189.3	188.4	185.9	182.0	176.4	173.4	169.6	161.0	151.5	140.4	128.3
105°	185.9	185.0	182.4	179.0	173.4	170.4	166.5	158.4	148.9	137.8	126.2
107.5°	182.4	182.0	179.4	175.6	170.4	167.0	163.5	155.4	145.9	135.2	123.6
110°	179.0	177.7	175.6	172.1	166.5	163.5	160.1	152.0	142.9	132.2	121.0



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CATALOG NUMBER: TRR11-LD4-10W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	174.7	173.8	171.7	168.3	162.7	159.7	156.2	148.5	139.5	128.8	118.0
115°	169.6	169.1	167.0	163.5	158.4	155.4	152.0	144.7	135.6	125.3	115.0
117.5°	165.3	164.4	162.3	158.8	153.7	150.7	147.7	140.4	131.8	121.9	110.7
120°	160.5	159.3	157.5	154.1	149.4	146.8	142.9	136.1	127.5	118.0	106.9
122.5°	154.5	153.7	152.0	148.5	144.2	141.2	138.2	131.4	123.2	113.8	103.0
125°	149.4	148.5	146.4	143.4	138.6	136.1	133.1	126.2	118.5	109.5	99.2
127.5°	143.4	142.1	140.4	137.4	133.1	130.9	127.5	121.0	113.8	104.3	95.3
130°	136.5	136.1	133.9	131.4	127.5	124.9	121.9	115.9	107.7	99.6	91.0
132.5°	130.1	129.6	127.9	125.3	121.0	118.9	115.9	109.9	102.6	94.9	86.7
135°	123.6	123.2	121.5	118.9	115.0	112.9	109.5	103.9	97.4	90.1	82.4
137.5°	116.8	116.3	114.6	112.0	107.7	105.6	103.0	98.3	91.9	85.0	78.1
140°	108.2	107.7	106.5	104.3	100.9	98.7	96.6	91.9	86.3	80.3	73.4
142.5°	100.9	100.4	99.2	97.0	94.0	92.3	90.1	85.8	80.7	75.1	68.7
145°	93.6	93.6	91.9	90.1	87.6	85.8	83.7	79.8	75.1	70.0	64.4
147.5°	86.7	86.3	85.0	83.3	81.1	79.4	77.7	74.3	69.5	65.2	60.1
150°	79.4	79.4	78.1	76.8	74.7	73.0	71.7	68.3	64.4	60.1	55.8
152.5°	72.1	72.1	71.3	69.5	67.8	66.5	65.2	62.2	58.8	55.4	51.1
155°	65.2	64.8	64.4	63.1	61.4	60.1	59.2	56.7	53.7	50.2	46.8
157.5°	58.4	58.4	57.9	56.7	55.4	54.5	53.2	51.5	48.5	45.9	42.9
160°	51.9	51.9	51.5	50.7	49.8	48.5	47.6	46.4	43.8	41.6	39.1
162.5°	45.9	45.9	45.5	44.6	43.8	42.9	42.1	40.8	39.1	36.9	35.2
165°	39.9	39.9	39.5	39.1	38.2	37.8	37.3	36.1	34.8	33.1	31.8
167.5°	34.3	34.3	34.3	33.9	33.5	33.1	32.6	31.8	30.5	29.6	28.3
170°	29.6	29.6	29.6	29.2	28.8	28.8	28.3	27.9	27.0	26.2	25.3
172.5°	24.9	25.3	24.9	24.9	24.5	24.5	24.5	24.0	23.2	22.8	22.3
175°	21.0	21.0	21.0	20.6	20.6	20.6	20.6	20.6	20.2	19.7	19.7
177.5°	17.2	17.6	17.6	17.6	17.6	17.2	17.6	17.6	17.2	17.2	17.2
180°	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
2.5°	27.5	27.5	27.0	26.6	26.6	26.2	25.8	25.3	24.9	24.5	24.0
5°	30.9	30.5	29.6	28.8	28.3	28.3	27.0	26.6	25.8	24.9	24.0
7.5°	34.3	33.1	32.2	30.9	30.5	29.6	28.3	27.0	26.2	24.9	23.6
10°	37.8	36.1	34.3	33.1	32.2	31.3	29.6	27.9	26.2	24.5	23.2
12.5°	41.2	39.5	37.3	35.2	33.9	33.1	30.9	28.8	26.6	24.5	22.8
15°	45.1	42.9	39.9	37.3	36.1	34.8	32.2	29.6	27.0	24.5	22.3
17.5°	48.9	45.9	42.9	39.5	38.2	36.5	33.5	30.5	27.5	24.5	21.9
20°	52.4	49.4	45.5	41.6	39.9	38.2	34.3	30.9	27.5	24.5	21.5
22.5°	56.2	52.4	48.1	43.8	42.1	39.9	35.6	31.3	27.9	24.0	20.6
25°	60.1	55.8	50.7	46.4	43.8	41.6	36.5	32.2	27.9	24.0	20.2
27.5°	64.0	59.2	53.7	48.5	45.9	42.9	37.8	33.1	28.3	24.0	19.7
30°	67.8	62.2	56.7	50.7	47.6	44.6	39.1	33.5	28.3	23.6	19.3
32.5°	71.7	65.7	59.2	52.8	49.4	46.4	39.9	34.3	28.8	23.6	19.3
35°	75.5	68.7	61.8	54.5	51.1	47.6	41.2	34.8	28.8	23.6	18.9
37.5°	79.0	72.1	64.4	56.7	53.2	49.4	42.1	35.6	29.2	23.6	18.5
40°	82.8	75.1	67.0	58.8	54.9	51.1	43.4	36.1	29.6	23.6	18.0
42.5°	88.0	79.0	70.4	61.8	57.1	52.8	44.6	36.9	30.0	23.6	18.0
45°	91.4	82.0	73.0	63.5	58.8	54.5	45.9	37.3	30.0	23.6	17.6
47.5°	94.9	85.0	75.1	65.2	60.5	55.8	46.8	38.2	30.5	23.6	17.6
50°	97.9	87.6	77.7	67.4	62.2	57.1	47.6	38.6	30.5	23.6	17.2
52.5°	100.9	90.1	79.4	68.7	63.5	58.4	48.5	39.1	30.5	23.2	17.2
55°	103.9	92.7	81.6	70.4	64.8	59.7	49.4	39.5	30.9	23.2	16.7
57.5°	106.5	94.9	83.3	71.7	66.1	60.5	49.8	39.9	30.9	23.2	16.7
60°	109.5	97.0	85.0	73.0	67.0	61.4	50.2	39.9	30.9	23.2	16.3
62.5°	111.6	98.7	86.7	74.3	68.3	62.2	51.1	40.3	30.9	23.2	16.3
65°	114.6	100.9	88.0	75.5	69.1	63.1	51.5	40.8	31.3	23.2	15.9
67.5°	116.3	102.2	89.3	76.4	70.0	63.5	51.9	40.8	31.3	22.8	15.9
70°	118.0	103.9	90.6	77.3	70.8	64.4	52.4	41.2	31.3	22.8	15.9
72.5°	119.3	104.7	91.4	78.1	71.3	64.8	52.4	41.2	31.3	22.8	15.5
75°	120.6	106.0	92.3	78.6	71.7	65.2	52.8	41.2	31.3	22.8	15.5
77.5°	121.5	106.9	92.7	79.0	72.1	65.2	52.8	41.2	30.9	22.3	15.5
80°	122.3	107.3	93.1	79.0	72.1	65.7	52.8	41.2	30.9	22.3	15.0
82.5°	122.8	107.3	93.1	79.0	72.1	65.2	52.8	40.8	30.9	22.3	15.0
85°	122.3	107.7	93.1	79.0	71.7	65.2	52.4	40.8	30.5	21.9	14.6
87.5°	122.3	106.9	92.7	78.6	71.7	64.8	51.9	40.3	30.0	21.5	14.6
90°	121.9	106.5	92.3	78.1	71.3	64.4	51.9	39.9	30.0	21.5	14.2
92.5°	121.0	105.6	91.4	77.7	70.4	64.0	51.1	39.5	29.6	21.0	14.2
95°	120.2	104.7	91.0	76.8	70.0	63.5	50.7	39.5	29.2	21.0	14.2
97.5°	118.9	103.9	90.1	76.0	69.1	62.7	50.2	38.6	29.2	20.6	14.2
100°	117.2	102.6	88.9	75.1	68.3	61.8	49.4	38.2	28.8	20.6	13.7
102.5°	115.5	100.9	87.1	73.8	67.0	61.0	48.9	37.8	28.3	20.2	13.7
105°	113.3	99.2	85.8	72.5	66.1	59.7	48.1	36.9	27.9	20.2	13.7
107.5°	110.7	97.0	84.1	71.3	64.8	58.4	47.2	36.5	27.5	19.7	13.3
110°	107.7	94.9	82.0	69.5	63.5	57.1	45.9	36.1	27.0	19.3	13.3



TEST NUMBER: P190087

CATALOG NUMBER: TRR11-LD4-10W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	104.7	92.7	80.3	67.8	61.8	55.8	45.1	35.2	26.6	19.3	13.3
115°	102.2	90.1	78.1	66.1	60.1	54.5	44.2	34.3	26.2	18.9	13.3
117.5°	99.2	87.6	76.0	64.4	58.8	53.2	42.9	33.9	25.8	18.9	13.3
120°	95.7	84.6	73.4	62.2	56.7	51.5	42.1	33.1	24.9	18.5	13.3
122.5°	92.7	81.6	71.3	60.5	55.4	50.2	40.8	32.2	24.5	18.5	12.9
125°	89.3	78.6	68.7	58.4	53.2	48.5	39.5	31.3	24.0	18.0	12.9
127.5°	85.8	75.5	66.1	56.2	51.5	46.8	38.2	30.5	23.6	18.0	12.9
130°	82.0	72.5	63.1	54.1	49.8	45.1	36.9	29.6	23.2	17.6	12.9
132.5°	78.1	69.1	60.5	51.9	47.6	43.8	36.1	28.8	22.8	17.6	12.9
135°	74.3	66.1	57.9	49.8	45.5	42.1	34.8	28.3	22.3	17.2	12.9
137.5°	70.4	62.7	54.9	47.6	43.8	40.3	33.5	27.0	21.9	17.2	12.9
140°	66.5	59.2	51.9	45.1	41.6	38.2	32.2	26.2	21.5	16.7	12.9
142.5°	62.2	55.8	49.4	42.9	39.5	36.5	30.9	25.3	20.6	16.7	12.9
145°	58.4	52.4	46.4	40.8	37.8	34.8	29.6	24.9	20.2	16.3	13.3
147.5°	54.5	49.4	43.8	38.6	35.6	33.1	28.3	24.0	20.2	16.3	13.3
150°	50.7	45.9	41.2	36.5	33.9	31.8	27.5	23.2	19.7	16.3	13.3
152.5°	46.8	42.5	38.2	33.9	31.8	30.0	26.2	22.3	18.9	16.3	13.3
155°	43.4	39.5	35.6	32.2	30.0	28.3	24.9	21.9	18.9	15.9	13.7
157.5°	39.9	36.5	33.5	30.0	28.3	27.0	24.0	21.0	18.5	15.9	13.7
160°	36.5	33.5	30.9	28.3	26.6	25.3	22.8	20.6	18.0	15.9	14.2
162.5°	33.1	30.9	28.3	26.2	24.9	24.0	21.9	19.7	17.6	15.9	14.2
165°	29.6	27.9	26.2	24.5	23.6	22.8	21.0	19.3	17.6	15.9	14.6
167.5°	27.0	25.8	24.0	22.8	21.9	21.5	19.7	18.5	17.2	15.9	14.6
170°	24.5	23.2	22.3	21.0	20.6	20.2	18.9	18.0	16.7	15.9	15.0
172.5°	21.5	21.0	20.2	19.7	19.3	18.9	18.0	17.6	16.7	15.9	15.0
175°	19.3	18.9	18.5	18.0	18.0	17.6	17.2	16.7	16.3	15.9	15.5
177.5°	17.2	17.2	16.7	16.7	16.7	16.7	16.3	16.3	16.3	15.9	15.9
180°	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5



TEST NUMBER: P190087

CATALOG NUMBER: TRR11-LD4-10W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
2.5°	23.6	23.2	22.8	22.8	22.3	21.9	21.5	21.0	20.6	20.2	20.2
5°	23.2	22.3	21.5	21.0	20.6	20.2	19.3	18.5	18.0	17.2	16.7
7.5°	22.3	21.0	20.2	19.7	19.3	18.0	17.2	16.3	15.0	14.6	14.2
10°	21.5	20.2	18.9	18.0	17.2	15.9	15.0	13.7	12.9	12.0	11.2
12.5°	20.6	18.9	17.2	16.7	15.9	14.2	12.9	11.6	10.7	9.4	8.6
15°	19.7	18.0	15.9	15.0	14.2	12.4	11.2	9.9	8.6	7.3	6.4
17.5°	19.3	16.7	14.6	13.7	12.9	11.2	9.4	7.7	6.4	5.6	4.7
20°	18.5	15.9	13.7	12.4	11.6	9.4	7.7	6.4	5.2	3.9	3.0
22.5°	17.6	15.0	12.4	11.2	10.3	8.2	6.4	4.7	3.4	2.6	2.1
25°	17.2	14.2	11.2	10.3	9.0	6.9	5.2	3.9	2.6	2.1	1.7
27.5°	16.3	13.3	10.3	9.0	7.7	5.6	3.9	2.6	2.1	1.7	1.7
30°	15.9	12.4	9.4	8.2	6.9	4.7	3.0	2.1	1.7	1.7	1.7
32.5°	15.0	11.6	8.6	7.3	6.0	3.9	2.6	1.7	1.7	1.7	1.7
35°	14.6	11.2	7.7	6.4	5.2	3.0	2.1	1.7	1.7	1.7	1.7
37.5°	14.2	10.3	7.3	5.6	4.3	2.6	2.1	1.7	1.7	1.7	1.7
40°	13.7	9.9	6.4	5.2	3.9	2.1	1.7	1.7	1.7	1.7	1.3
42.5°	13.3	9.4	5.6	4.3	3.4	2.1	2.1	1.7	1.7	1.7	1.3
45°	12.9	8.6	5.2	3.9	3.0	2.1	2.1	1.7	1.7	1.3	1.3
47.5°	12.4	8.2	4.7	3.4	2.6	2.1	1.7	1.7	1.7	1.3	1.3
50°	12.0	7.7	4.3	3.0	2.1	2.1	1.7	1.7	1.7	1.3	1.3
52.5°	12.0	7.3	3.9	2.6	2.1	2.1	1.7	1.7	1.7	1.3	1.3
55°	11.6	7.3	3.4	2.6	2.1	2.1	1.7	1.7	1.7	1.3	1.3
57.5°	11.2	6.9	3.4	2.6	2.1	2.1	1.7	1.7	1.7	1.3	1.3
60°	11.2	6.4	3.0	2.1	2.1	2.1	1.7	1.7	1.7	1.3	1.3
62.5°	10.7	6.0	3.0	2.1	2.1	2.1	1.7	1.7	1.3	1.3	1.3
65°	10.7	6.0	2.6	2.6	2.1	2.1	1.7	1.7	1.7	1.3	1.3
67.5°	10.3	5.6	2.6	2.6	2.1	2.1	1.7	1.7	1.7	1.3	1.3
70°	10.3	5.6	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
72.5°	9.9	5.6	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
75°	9.9	5.2	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
77.5°	9.9	5.2	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
80°	9.4	5.2	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
82.5°	9.4	5.2	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	0.9
85°	9.0	4.7	2.6	2.6	2.6	2.1	1.7	1.7	1.3	1.3	0.9
87.5°	9.0	4.7	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3	0.9
90°	9.0	4.7	2.6	2.6	2.1	2.1	1.7	1.7	1.3	0.9	0.9
92.5°	9.0	4.7	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3	0.9
95°	9.0	4.7	2.6	2.6	2.6	2.1	1.7	1.7	1.3	1.3	0.9
97.5°	8.6	4.7	2.6	2.6	2.6	2.1	2.1	1.7	1.3	1.3	0.9
100°	8.6	4.7	2.6	2.6	2.6	2.1	2.1	1.7	1.3	1.3	0.9
102.5°	8.6	4.7	2.6	2.6	2.6	2.1	1.7	1.7	1.3	1.3	0.9
105°	8.6	4.7	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3	0.9
107.5°	8.6	4.7	2.6	2.6	2.1	2.1	2.1	1.7	1.3	1.3	0.9
110°	8.6	5.2	2.6	2.6	2.6	2.1	2.1	1.7	1.3	1.3	0.9



TEST NUMBER: P190087

CATALOG NUMBER: TRR11-LD4-10W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	8.6	5.2	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
115°	8.6	5.2	3.0	2.6	2.6	2.1	2.1	1.7	1.7	1.3	1.3
117.5°	9.0	5.2	3.0	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3
120°	9.0	5.6	3.4	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3
122.5°	9.0	5.6	3.4	2.6	2.6	2.6	2.1	2.1	1.7	1.7	1.3
125°	9.0	6.0	3.4	3.0	2.6	2.6	2.1	2.1	2.1	1.7	1.7
127.5°	9.0	6.0	3.9	3.0	2.6	2.6	2.1	2.1	2.1	1.7	1.7
130°	9.4	6.4	3.9	3.4	2.6	2.6	2.6	2.1	2.1	1.7	1.7
132.5°	9.4	6.4	4.3	3.4	3.0	2.6	2.6	2.1	2.1	1.7	1.7
135°	9.4	6.9	4.7	3.9	3.0	2.6	2.6	2.1	2.1	2.1	1.7
137.5°	9.9	6.9	4.7	4.3	3.4	2.6	2.6	2.6	2.1	2.1	2.1
140°	9.9	7.3	5.2	4.3	3.9	3.0	2.6	2.6	2.6	2.1	2.1
142.5°	10.3	7.7	5.6	4.7	4.3	3.0	2.6	2.6	2.6	2.1	2.1
145°	10.3	8.2	6.0	5.2	4.3	3.4	2.6	2.6	2.6	2.1	2.1
147.5°	10.7	8.6	6.4	5.6	5.2	3.9	3.0	2.6	2.6	2.6	2.1
150°	10.7	9.0	6.9	6.0	5.6	4.3	3.4	3.0	2.6	2.6	2.6
152.5°	11.2	9.0	7.3	6.9	6.0	4.7	3.9	3.0	2.6	2.6	2.6
155°	11.6	9.4	8.2	7.3	6.4	5.6	4.3	3.9	3.0	2.6	2.6
157.5°	12.0	10.3	8.6	8.2	7.3	6.0	5.2	4.3	3.9	3.0	3.0
160°	12.4	10.7	9.4	8.6	8.2	6.9	6.0	5.2	4.3	3.9	3.4
162.5°	12.4	11.2	9.9	9.4	9.0	7.7	6.9	6.0	5.2	4.7	4.3
165°	12.9	11.6	10.7	10.3	9.4	8.6	7.7	6.9	6.4	5.6	5.2
167.5°	13.3	12.4	11.6	10.7	10.3	9.4	9.0	8.2	7.3	6.9	6.4
170°	14.2	13.3	12.4	12.0	11.6	10.7	9.9	9.4	9.0	8.2	7.7
172.5°	14.6	13.7	13.3	12.9	12.4	12.0	11.2	10.7	10.3	9.9	9.4
175°	15.0	14.6	14.2	13.7	13.7	12.9	12.4	12.0	11.6	11.6	11.2
177.5°	15.5	15.0	15.0	15.0	14.6	14.6	14.2	13.7	13.7	13.3	13.3
180°	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5



TEST NUMBER: P190087

CATALOG NUMBER: TRR11-LD4-10W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
2.5°	19.7	19.3	19.3	19.3	18.9	18.9	18.5	18.5
5°	16.3	15.9	15.9	15.5	15.5	15.0	15.0	15.0
7.5°	13.3	12.9	12.4	12.4	12.0	12.0	11.6	11.6
10°	10.3	9.9	9.4	9.4	9.0	8.6	8.6	8.6
12.5°	7.7	7.3	6.9	6.9	6.4	6.0	6.0	6.0
15°	5.6	5.2	4.7	4.7	4.3	3.9	3.9	3.9
17.5°	3.9	3.4	3.0	3.0	2.6	2.1	2.1	2.1
20°	2.6	2.1	2.1	1.7	1.7	1.7	1.7	1.7
22.5°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
25°	1.7	1.7	1.7	1.7	1.7	1.7	1.3	1.3
27.5°	1.7	1.7	1.7	1.7	1.3	1.3	1.3	1.3
30°	1.7	1.7	1.3	1.3	1.3	1.3	1.3	1.3
32.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
35°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
37.5°	1.3	1.3	1.3	1.3	1.3	1.3	0.9	0.9
40°	1.3	1.3	1.3	1.3	1.3	0.9	0.9	0.9
42.5°	1.3	1.3	1.3	0.9	0.9	0.9	0.4	0.4
45°	1.3	1.3	0.9	0.9	0.9	0.9	0.4	0.4
47.5°	1.3	0.9	0.9	0.9	0.9	0.4	0.4	0.4
50°	1.3	0.9	0.9	0.9	0.9	0.4	0.4	0.4
52.5°	0.9	0.9	0.9	0.9	0.9	0.4	0.4	0.4
55°	0.9	0.9	0.9	0.9	0.9	0.4	0.4	0.4
57.5°	0.9	0.9	0.9	0.9	0.4	0.4	0.4	0.4
60°	0.9	0.9	0.9	0.9	0.4	0.4	0.4	0.4
62.5°	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4
65°	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4
67.5°	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4
70°	0.9	0.9	0.9	0.9	0.4	0.4	0.4	0.4
72.5°	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4
75°	0.9	0.9	0.9	0.9	0.9	0.4	0.4	0.4
77.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
80°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
82.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
85°	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4
87.5°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
90°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
92.5°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
95°	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4
97.5°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
100°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
102.5°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
105°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
107.5°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4
110°	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4



TEST NUMBER: P190087

CATALOG NUMBER: TRR11-LD4-10W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4
115°	0.9	0.9	0.9	0.9	0.4	0.4	0.4	0.4
117.5°	1.3	0.9	0.9	0.9	0.4	0.4	0.4	0.4
120°	1.3	0.9	0.9	0.9	0.9	0.4	0.4	0.4
122.5°	1.3	1.3	0.9	0.9	0.9	0.9	0.9	0.4
125°	1.3	1.3	1.3	0.9	0.9	0.9	0.9	0.9
127.5°	1.3	1.3	1.3	1.3	0.9	0.9	0.9	0.9
130°	1.7	1.3	1.3	1.3	1.3	0.9	0.9	0.9
132.5°	1.7	1.3	1.3	1.3	1.3	1.3	0.9	0.9
135°	1.7	1.7	1.7	1.3	1.3	1.3	1.3	1.3
137.5°	1.7	1.7	1.7	1.7	1.3	1.3	1.3	1.3
140°	1.7	1.7	1.7	1.7	1.7	1.7	1.3	1.3
142.5°	2.1	1.7	1.7	1.7	1.7	1.7	1.7	1.7
145°	2.1	2.1	1.7	1.7	1.7	1.7	1.7	1.7
147.5°	2.1	2.1	2.1	2.1	1.7	1.7	1.7	1.7
150°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
152.5°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
155°	2.6	2.6	2.6	2.1	2.1	2.1	2.1	2.1
157.5°	2.6	2.6	2.6	2.6	2.6	2.1	2.1	2.1
160°	3.0	2.6	2.6	2.6	2.6	2.6	2.6	2.6
162.5°	3.9	3.4	3.4	3.0	3.0	3.0	2.6	2.6
165°	4.7	4.3	4.3	4.3	3.9	3.9	3.9	3.4
167.5°	6.0	5.6	5.6	5.2	5.2	4.7	4.7	4.7
170°	7.3	7.3	6.9	6.9	6.4	6.4	6.4	6.0
172.5°	9.0	8.6	8.6	8.6	8.2	8.2	8.2	7.7
175°	10.7	10.7	10.3	10.3	9.9	10.3	9.9	9.9
177.5°	12.9	12.9	12.4	12.4	12.4	12.4	12.4	12.4
180°	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5

(END OF REPORT)