

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: P190129

Luminaire Tested: **TRF11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190129
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-LD4-10W-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 200mA OT25W/1

Summary

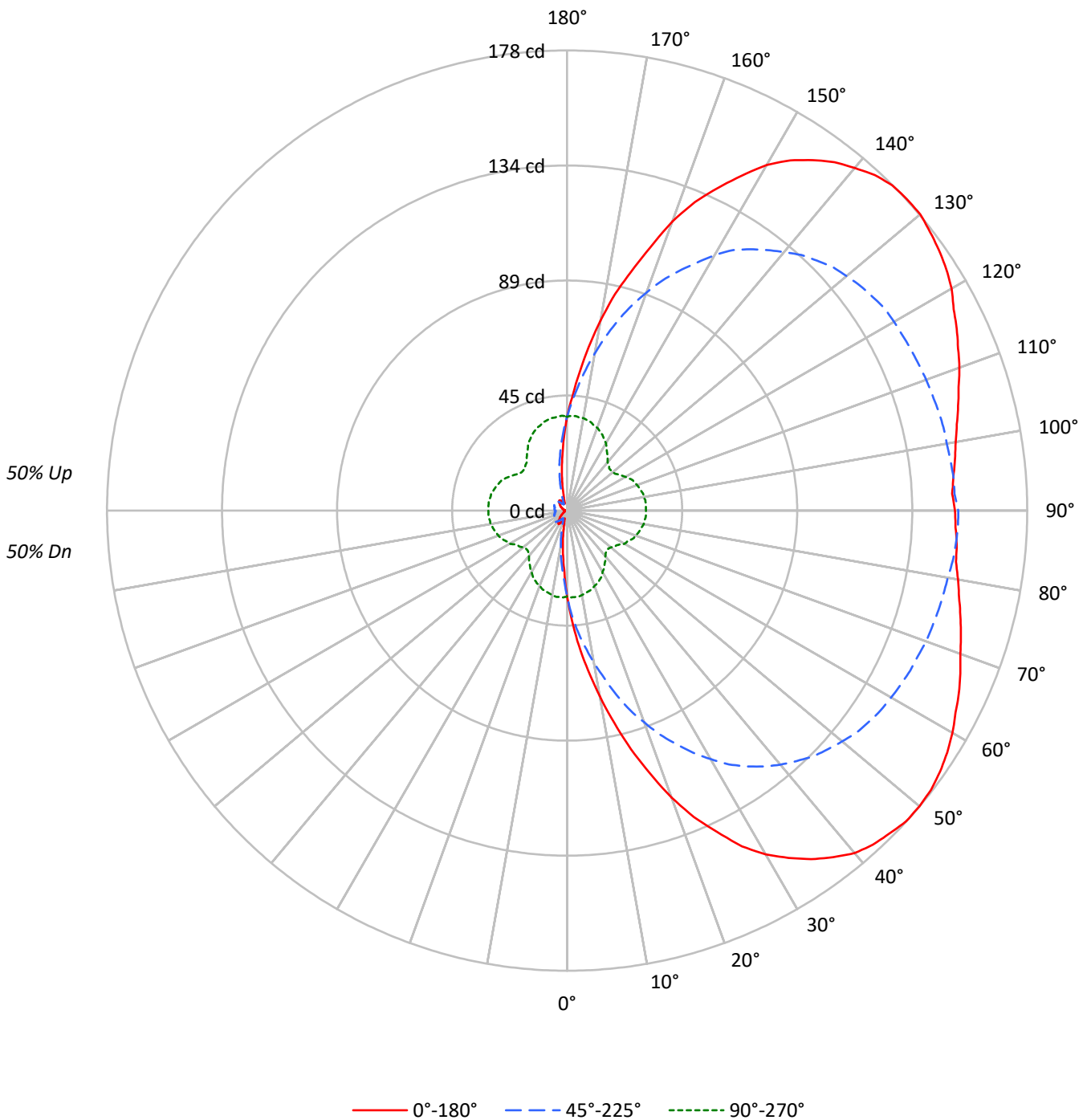
Lumens per Lamp: N/A
Luminaire Lumens: 782.0 lumens
Efficiency: N/A
Efficacy: 78.2 lumens/watt
Spacing Criteria (0/90/45): 2.87 / 1.23 / 2.59
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 10
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°	1337	1337	1337
5°	1667	1249	561
10°	1920	1154	221
15°	2163	1062	91
20°	2360	974	70
25°	2470	897	88
30°	2535	808	96
35°	2528	728	89
40°	2500	657	77
45°	2426	618	55
50°	2348	632	41
55°	2252	676	28
60°	2151	757	22
65°	2058	818	16
70°	1978	889	11
75°	1925	960	16
80°	1891	1046	16
85°	1893	1133	11



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	3.4	0.4
10°-20°	11.8	1.5
20°-30°	23.7	3.0
30°-40°	36.9	4.7
40°-50°	48.6	6.2
50°-60°	58.2	7.4
60°-70°	65.2	8.3
70°-80°	69.8	8.9
80°-90°	72.1	9.2
90°-100°	71.8	9.2
100°-110°	69.6	8.9
110°-120°	65.4	8.4
120°-130°	58.7	7.5
130°-140°	49.3	6.3
140°-150°	37.4	4.8
150°-160°	24.3	3.1
160°-170°	12.3	1.6
170°-180°	3.6	0.5
0°-30°	38.9	5.0
0°-40°	75.7	9.7
0°-60°	182.6	23.3
0°-90°	389.7	49.8
90°-120°	206.8	26.4
90°-150°	352.2	45.0
90°-180°	392.0	50.1
0°-180°	782.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	33	33	33	33	33	
5°	53	47	34	22	18	6
15°	96	74	32	8	4	28
25°	137	100	30	4	5	64
35°	165	121	25	4	6	103
45°	176	134	22	6	4	137
55°	176	142	23	6	2	158
65°	167	146	27	6	1	166
75°	158	149	29	5	1	167
85°	151	151	30	4	1	124
90°	150	151	30	4	1	82
95°	150	150	30	5	1	123
105°	157	149	30	5	1	166
115°	166	147	28	6	2	165
125°	176	144	24	6	3	157
135°	178	137	23	5	4	137
145°	166	123	27	3	5	104
155°	138	102	32	3	3	64
165°	96	76	35	10	4	28
175°	53	48	37	26	21	6
180°	36	36	36	36	36	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
2.5°	42.5	42.0	42.0	42.0	42.0	41.6	41.6	41.1	40.7	40.3	40.3
5°	52.6	51.8	51.8	51.3	50.9	50.4	50.4	49.6	48.7	47.8	46.9
7.5°	62.4	61.9	61.5	61.1	60.2	59.7	59.3	58.0	56.6	54.4	53.1
10°	73.0	72.1	72.1	71.2	69.9	69.0	68.6	66.4	64.6	62.4	59.7
12.5°	84.1	83.2	82.7	81.8	80.1	79.2	78.3	75.7	73.0	70.3	66.4
15°	95.6	95.1	94.2	92.9	90.7	89.8	88.5	85.4	81.8	78.3	73.9
17.5°	106.6	106.2	105.3	103.5	100.9	99.5	97.8	94.2	90.3	85.8	81.0
20°	118.1	117.7	116.4	114.1	110.2	108.8	107.5	103.1	98.2	92.9	87.2
22.5°	128.3	127.4	126.1	123.4	120.8	119.0	117.2	111.0	106.2	100.0	93.8
25°	137.1	136.7	135.4	132.7	129.6	127.4	125.2	120.3	114.1	107.1	99.5
27.5°	146.4	145.6	143.8	141.1	137.6	135.4	133.2	127.9	121.7	114.1	105.7
30°	153.5	152.6	151.3	148.2	144.7	142.5	139.8	134.5	127.9	120.3	111.0
32.5°	159.3	158.8	157.1	154.4	150.4	148.2	146.0	140.2	133.2	125.2	116.4
35°	164.6	164.1	162.4	159.3	155.7	153.5	150.9	145.1	138.0	130.1	120.8
37.5°	169.0	168.6	166.8	164.1	160.2	157.9	155.7	149.5	142.5	134.1	124.8
40°	173.0	172.1	170.8	168.1	164.1	161.9	159.3	153.5	146.4	138.0	128.3
42.5°	175.2	174.8	173.0	170.8	166.8	165.0	162.4	156.6	149.5	141.1	131.4
45°	176.5	176.5	174.8	172.5	169.0	167.2	164.6	159.3	152.2	144.2	134.5
47.5°	177.9	177.4	176.1	173.9	170.8	168.6	166.3	161.0	154.4	146.4	136.7
50°	177.9	177.4	176.1	174.3	171.2	169.4	167.2	162.4	156.2	148.2	138.9
52.5°	177.4	177.0	175.6	173.9	170.8	169.4	167.7	162.8	157.1	150.0	141.1
55°	176.1	175.6	174.8	172.5	170.3	168.6	167.2	162.8	157.5	150.9	142.5
57.5°	174.3	173.9	172.5	171.2	169.4	167.7	166.3	162.4	157.5	151.3	143.8
60°	172.1	171.7	170.8	169.4	167.7	166.3	165.0	161.9	157.5	152.2	144.7
62.5°	169.4	169.4	168.1	166.8	165.5	164.1	163.3	160.6	157.1	151.7	145.6
65°	167.2	167.2	165.9	165.0	163.7	162.8	161.5	159.7	156.2	152.2	146.4
67.5°	164.6	164.1	163.7	162.4	161.5	160.6	159.7	157.9	155.3	151.7	146.9
70°	161.9	161.9	161.0	160.2	159.7	158.4	157.9	156.6	154.4	151.7	147.8
72.5°	159.7	159.3	158.8	157.9	157.1	156.6	156.2	154.8	153.5	151.7	148.2
75°	157.5	157.1	156.2	155.7	154.8	154.8	154.4	153.5	153.1	151.3	148.7
77.5°	155.3	154.8	154.4	154.0	153.5	153.1	153.1	152.6	152.2	151.3	149.1
80°	153.5	153.5	152.6	151.7	151.7	151.7	151.7	151.7	151.7	151.7	149.5
82.5°	151.7	151.7	150.9	150.4	150.4	150.0	150.4	150.9	151.3	151.3	150.4
85°	151.3	150.9	150.0	149.5	149.5	149.5	150.0	150.9	151.3	151.7	150.9
87.5°	150.4	150.0	149.5	149.1	149.1	149.1	149.5	150.4	151.3	151.7	151.3
90°	150.0	149.5	149.1	148.7	148.7	148.7	149.5	150.4	151.3	151.7	151.3
92.5°	149.1	149.1	148.2	147.8	148.2	148.2	148.7	149.5	150.4	150.9	150.0
95°	150.0	150.0	149.1	149.1	148.7	148.7	149.1	150.0	150.9	150.9	150.0
97.5°	151.3	150.9	150.4	150.0	149.5	149.5	150.0	150.4	150.9	150.9	149.5
100°	152.6	152.2	151.3	151.3	150.9	150.9	150.9	151.3	151.3	150.9	149.1
102.5°	154.4	154.0	153.5	153.1	152.6	152.6	152.6	152.2	151.7	151.3	149.1
105°	156.6	156.2	155.7	155.3	154.8	154.4	154.0	153.5	152.6	151.3	148.7
107.5°	158.8	158.4	157.9	157.5	157.1	156.2	155.7	154.8	153.5	151.7	148.2
110°	161.5	161.0	160.6	159.7	158.8	158.4	157.5	156.2	154.4	151.7	147.8



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	163.7	163.3	162.4	161.9	160.6	160.2	159.3	157.5	155.3	151.7	147.3
115°	166.3	165.9	165.0	164.1	162.8	162.4	161.5	159.3	156.2	152.6	146.9
117.5°	168.6	168.6	167.7	166.3	165.0	164.1	163.3	160.6	157.1	153.1	146.4
120°	171.7	171.2	170.3	169.4	167.2	166.3	165.0	161.9	158.4	153.1	146.0
122.5°	173.9	173.4	172.5	171.2	169.4	168.1	166.3	163.3	158.4	153.1	145.6
125°	175.6	175.6	174.3	172.5	170.8	169.0	167.7	163.3	158.4	152.2	144.2
127.5°	177.0	176.5	175.6	173.9	171.2	169.9	168.1	163.7	157.9	151.3	142.9
130°	178.3	177.4	176.1	174.3	171.7	169.9	168.1	163.3	157.5	150.0	141.1
132.5°	178.3	177.9	176.5	174.8	171.7	169.9	167.7	162.8	156.2	148.2	139.4
135°	177.9	177.4	176.1	173.9	170.8	168.6	166.3	161.0	154.4	146.4	136.7
137.5°	176.1	175.6	173.9	172.1	168.6	166.8	164.1	158.4	151.7	143.8	134.1
140°	173.0	172.5	171.2	169.0	165.5	163.3	161.0	155.3	148.2	139.8	130.5
142.5°	169.9	169.4	167.7	165.5	161.5	159.7	157.1	151.3	144.7	136.3	127.0
145°	165.5	165.0	163.3	161.0	157.5	155.3	153.1	146.9	140.2	132.3	123.4
147.5°	160.6	159.7	158.4	156.2	152.6	150.4	148.2	142.5	135.8	127.9	119.5
150°	154.4	154.0	152.2	150.0	146.4	144.2	142.0	136.3	130.1	122.5	114.1
152.5°	146.0	146.0	144.2	142.5	139.4	137.1	134.5	129.2	123.4	116.4	107.9
155°	137.6	137.6	136.3	134.1	131.4	129.2	127.0	122.1	116.8	109.3	102.2
157.5°	129.2	128.7	127.4	125.2	123.0	120.8	119.0	114.1	108.4	102.6	96.4
160°	119.0	119.0	117.7	115.9	113.3	110.6	108.8	104.9	100.9	95.1	89.8
162.5°	106.6	106.6	105.7	104.0	102.6	100.9	99.1	95.6	92.0	87.6	83.2
165°	95.6	95.6	94.7	93.3	92.0	90.7	89.4	86.7	83.6	79.6	76.1
167.5°	85.8	84.9	84.1	83.2	82.3	81.0	80.1	77.4	75.2	72.1	69.0
170°	74.8	73.9	73.4	72.6	72.1	70.8	70.3	68.6	66.8	64.2	61.9
172.5°	63.7	62.8	62.8	61.9	61.9	61.1	60.6	59.3	58.4	56.6	54.9
175°	53.1	52.6	52.6	52.2	52.2	51.3	51.3	50.4	50.0	49.1	48.2
177.5°	43.8	43.4	43.4	43.4	43.4	42.9	43.4	42.9	42.9	42.5	42.0
180°	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
2.5°	39.4	38.9	38.5	37.6	37.2	36.7	36.3	35.4	34.5	33.6	32.7
5°	45.6	43.8	42.9	41.6	40.7	39.8	38.5	36.7	35.4	33.6	32.3
7.5°	51.3	49.1	47.3	45.1	43.8	42.5	40.3	38.0	35.8	33.6	31.4
10°	57.1	54.0	51.3	48.2	46.9	45.1	42.0	38.9	35.8	33.2	30.5
12.5°	62.8	59.3	55.7	51.8	50.0	47.8	43.8	39.8	36.3	32.7	29.2
15°	69.5	65.0	60.2	55.3	53.1	50.4	45.6	41.1	36.7	32.3	28.3
17.5°	75.7	69.9	64.2	58.4	55.7	52.6	46.9	41.6	36.7	31.9	27.4
20°	81.0	74.8	68.1	61.5	58.0	54.9	48.2	42.0	36.3	31.0	26.5
22.5°	86.7	79.2	71.7	64.2	60.6	56.6	49.6	42.5	36.3	30.5	25.2
25°	92.0	84.1	75.2	66.8	62.4	58.4	50.0	42.5	35.8	29.6	24.3
27.5°	97.3	88.0	78.7	69.0	64.6	59.7	50.9	42.5	35.4	28.8	23.0
30°	101.8	92.0	81.8	71.2	65.9	61.1	50.9	42.0	34.5	27.4	21.7
32.5°	105.7	95.6	84.1	73.0	67.2	61.5	51.3	41.6	33.6	26.5	20.8
35°	109.3	98.2	86.7	74.3	68.6	62.4	50.9	41.1	32.3	25.2	19.5
37.5°	113.7	101.3	88.9	76.1	69.5	63.3	50.9	40.3	31.4	24.3	18.1
40°	117.2	104.0	91.1	77.4	70.8	63.7	50.9	39.8	30.5	23.0	17.3
42.5°	120.3	106.6	93.3	79.2	71.7	64.6	51.3	39.4	29.6	22.1	16.4
45°	123.0	109.3	95.6	81.0	73.4	65.9	51.8	39.4	29.6	21.7	15.9
47.5°	125.2	112.4	97.8	82.7	75.2	67.2	52.6	40.3	29.6	21.7	15.9
50°	127.9	115.5	100.0	84.9	77.4	69.5	54.4	41.1	30.5	22.1	15.9
52.5°	130.1	117.7	102.6	87.6	79.6	71.7	55.7	42.5	31.4	23.0	16.4
55°	132.3	119.9	105.3	90.3	82.3	73.9	58.0	44.2	32.7	23.4	16.4
57.5°	134.1	122.5	107.5	92.5	84.5	76.5	60.2	46.0	34.1	24.3	16.8
60°	135.8	124.8	110.2	95.6	87.6	79.2	62.8	48.2	35.8	25.7	17.3
62.5°	137.1	126.5	113.3	98.2	90.3	81.8	65.9	50.4	37.2	26.1	17.7
65°	138.9	128.7	116.4	101.3	93.3	85.4	68.6	52.6	38.9	27.0	17.7
67.5°	140.2	131.0	119.0	104.0	96.4	88.0	71.2	54.9	40.3	27.9	18.1
70°	141.6	133.2	121.7	106.6	99.1	90.7	73.9	56.6	41.6	28.3	18.1
72.5°	142.9	134.9	124.3	109.7	101.8	93.3	76.1	58.4	42.5	28.8	18.1
75°	143.8	136.7	126.5	112.4	104.4	96.0	77.9	60.2	43.4	29.2	18.1
77.5°	145.1	138.5	128.3	115.0	106.6	98.2	80.1	61.5	44.2	29.6	18.1
80°	146.0	139.8	130.1	116.8	108.4	100.0	81.4	62.4	45.1	30.1	18.1
82.5°	147.3	141.1	131.8	118.6	109.7	101.3	82.7	63.3	45.6	30.1	18.6
85°	148.2	142.5	133.2	119.9	111.0	102.6	83.6	64.2	46.0	30.5	18.6
87.5°	148.7	143.3	134.1	120.8	111.9	103.5	84.5	64.6	46.5	30.5	18.6
90°	149.1	143.8	134.5	121.2	112.4	103.5	84.9	65.0	46.5	30.5	18.6
92.5°	147.3	142.0	132.7	119.9	111.5	102.2	83.6	64.2	46.0	30.5	18.6
95°	146.9	141.1	131.8	119.0	110.6	101.8	83.2	63.7	46.0	30.5	18.6
97.5°	146.4	140.2	130.5	117.7	108.8	100.4	82.3	63.3	45.6	30.5	18.6
100°	145.6	138.9	129.2	115.9	107.5	99.1	81.0	62.4	45.1	30.1	18.6
102.5°	144.7	137.6	127.4	114.1	105.7	97.8	79.6	61.5	44.2	30.1	18.6
105°	143.8	136.3	125.6	111.9	104.0	95.6	77.9	60.2	43.8	29.6	18.6
107.5°	142.9	134.5	123.9	109.3	101.3	93.3	76.1	58.8	42.9	29.2	18.6
110°	141.6	133.2	121.7	106.6	99.1	91.1	73.9	57.1	41.6	28.8	18.6



TEST NUMBER: P190129

CATALOG NUMBER: TRF11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	140.7	131.0	119.5	104.4	96.4	88.5	71.2	55.3	40.7	28.3	18.6
115°	139.4	129.6	117.2	101.8	93.8	85.8	69.0	53.1	39.4	27.9	18.6
117.5°	138.5	127.9	114.6	99.1	91.1	83.2	66.4	51.3	38.0	27.0	18.1
120°	137.1	126.1	112.4	96.9	88.9	80.5	64.2	49.1	36.3	26.1	18.1
122.5°	135.8	124.3	109.7	94.2	86.3	77.9	61.5	46.9	35.0	25.2	17.7
125°	134.1	122.1	107.5	92.0	83.6	75.7	59.3	45.1	33.6	24.3	17.3
127.5°	132.3	119.9	104.9	89.4	81.4	73.4	57.5	43.8	32.3	23.4	16.8
130°	130.1	118.1	102.6	87.2	79.2	71.2	56.2	42.5	31.4	23.0	16.8
132.5°	127.9	115.9	100.4	85.4	77.4	69.9	54.9	41.6	31.0	23.0	16.8
135°	125.6	112.8	98.2	83.6	76.1	68.6	54.0	41.6	31.0	23.0	17.3
137.5°	123.0	109.7	96.0	81.8	74.8	67.2	53.5	41.6	31.4	23.9	17.7
140°	119.9	107.1	93.8	80.1	73.0	66.4	53.5	42.0	32.3	24.3	18.6
142.5°	116.4	104.0	91.6	78.7	72.1	65.9	53.5	42.5	33.2	25.7	19.5
145°	112.4	101.3	89.4	77.4	71.2	65.0	53.5	43.4	34.5	27.0	20.8
147.5°	108.4	98.2	87.2	75.7	70.3	64.6	54.0	44.2	35.8	28.3	22.6
150°	104.4	95.1	84.5	73.9	69.0	63.7	54.0	45.1	36.7	30.1	23.9
152.5°	99.5	90.7	81.4	71.7	67.2	62.4	53.5	45.1	37.6	31.0	25.2
155°	94.7	86.7	78.3	69.5	65.5	61.1	53.1	45.6	38.5	32.3	26.5
157.5°	89.8	82.3	74.8	67.2	63.3	59.7	52.2	45.6	38.9	33.2	27.9
160°	84.1	77.9	71.2	64.2	61.1	58.0	51.3	45.1	39.4	34.1	29.2
162.5°	77.9	72.6	66.8	61.1	58.4	55.3	50.0	44.7	39.4	34.5	30.1
165°	71.7	67.2	62.4	57.5	55.3	53.1	48.2	43.8	39.4	35.4	31.4
167.5°	65.9	62.4	58.4	54.4	52.6	50.4	46.9	42.9	39.4	35.8	32.7
170°	59.7	56.6	54.0	50.9	49.6	47.8	45.1	42.0	38.9	36.3	33.6
172.5°	53.5	51.3	49.1	46.9	46.0	45.1	42.9	40.7	38.5	36.3	34.5
175°	47.3	46.0	44.7	43.4	42.9	42.0	40.7	39.4	38.0	36.7	35.0
177.5°	41.6	41.1	40.7	40.3	39.8	39.4	38.9	38.0	37.6	36.7	36.3
180°	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3



TEST NUMBER: P190129

CATALOG NUMBER: TRF11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
2.5°	31.9	31.4	30.5	30.1	29.6	29.2	28.3	27.4	27.0	26.5	26.1
5°	30.5	29.2	27.9	27.4	26.5	25.7	24.3	23.4	22.1	21.2	20.8
7.5°	29.2	27.4	25.7	24.8	23.4	22.1	20.8	19.5	18.1	16.8	15.9
10°	27.9	25.2	23.0	22.1	20.8	19.0	17.3	15.9	14.2	13.3	11.9
12.5°	26.5	23.4	20.8	19.5	18.6	16.4	14.2	12.4	11.1	9.7	8.4
15°	25.2	21.7	19.0	17.7	16.4	13.7	11.5	9.7	8.0	7.1	6.2
17.5°	23.4	19.9	16.8	15.5	14.2	11.5	9.3	7.5	6.2	5.3	4.4
20°	22.1	18.6	15.0	13.3	11.9	9.3	7.1	5.8	4.9	4.0	3.5
22.5°	20.8	16.8	13.3	11.9	10.2	7.5	5.8	4.4	4.0	3.5	3.5
25°	19.5	15.5	11.9	10.2	8.8	6.2	4.9	4.0	3.5	3.5	3.5
27.5°	18.1	14.2	10.6	8.8	7.5	5.3	4.0	3.5	3.5	4.0	4.0
30°	16.8	12.8	9.3	7.5	6.6	4.4	3.5	3.5	3.5	4.4	4.9
32.5°	15.9	11.9	8.4	6.6	5.8	4.0	3.1	3.5	4.0	4.9	5.3
35°	14.6	10.6	7.5	6.2	4.9	3.5	3.5	4.0	4.4	5.3	5.8
37.5°	13.7	9.7	6.6	5.8	4.4	3.5	3.5	4.4	4.9	5.8	5.8
40°	12.8	9.3	6.2	5.3	4.0	3.5	4.0	4.9	5.3	5.8	6.2
42.5°	12.4	8.8	5.8	4.9	4.0	3.5	4.4	5.3	5.8	6.2	6.2
45°	11.9	8.4	5.3	4.4	3.5	4.0	4.9	5.8	6.2	6.2	6.2
47.5°	11.5	8.0	4.9	4.0	3.5	4.0	4.9	5.8	6.2	6.2	5.8
50°	11.5	7.5	4.4	3.5	3.5	4.4	5.3	6.2	6.2	6.2	5.8
52.5°	11.1	7.1	4.4	3.5	3.5	4.4	5.8	6.2	6.2	5.8	5.3
55°	11.1	6.6	4.0	3.5	3.5	4.9	5.8	6.6	6.2	5.8	4.9
57.5°	11.1	6.6	4.0	3.5	4.0	5.3	6.2	6.6	6.2	5.3	4.9
60°	11.1	6.2	3.5	3.5	4.0	5.3	6.2	6.6	6.2	5.3	4.4
62.5°	10.6	5.8	3.5	3.5	4.4	5.3	6.2	6.6	5.8	4.9	4.0
65°	10.6	5.3	3.5	4.0	4.4	5.8	6.6	6.2	5.8	4.9	4.0
67.5°	10.6	5.3	3.5	4.0	4.4	5.8	6.6	6.2	5.3	4.4	3.5
70°	10.2	5.3	3.5	4.0	4.9	5.8	6.6	6.2	5.3	4.4	3.5
72.5°	10.2	4.9	3.5	4.0	4.9	6.2	6.6	6.2	5.3	4.0	3.5
75°	10.2	4.9	3.5	4.0	4.9	6.2	6.6	6.2	4.9	4.0	3.1
77.5°	9.7	4.9	3.5	4.4	4.9	6.2	6.6	5.8	4.9	4.0	3.1
80°	9.7	4.9	3.5	4.4	4.9	6.2	6.6	5.8	4.9	4.0	3.1
82.5°	9.7	4.4	3.5	4.4	4.9	6.2	6.6	5.8	4.9	3.5	3.1
85°	9.7	4.4	3.5	4.4	4.9	6.2	6.6	5.8	4.4	3.5	3.1
87.5°	9.7	4.4	3.5	4.4	4.9	6.2	6.2	5.8	4.4	3.5	2.7
90°	9.7	4.4	3.5	4.4	4.9	6.2	6.2	5.8	4.4	3.5	2.7
92.5°	10.2	4.9	3.5	4.4	4.9	6.2	6.2	5.8	4.9	4.0	3.1
95°	10.2	4.9	3.5	4.0	4.9	6.2	6.2	5.8	4.9	4.0	3.1
97.5°	10.2	4.9	3.5	4.0	4.9	5.8	6.2	5.8	4.9	4.0	3.1
100°	10.2	4.9	3.5	4.0	4.4	5.8	6.2	5.8	4.9	4.0	3.1
102.5°	10.2	4.9	3.5	4.0	4.4	5.8	6.2	5.8	4.9	4.0	3.5
105°	10.2	4.9	3.1	3.5	4.4	5.3	6.2	5.8	4.9	4.0	3.5
107.5°	10.6	4.9	3.1	3.5	4.0	5.3	5.8	5.8	5.3	4.4	3.5
110°	10.6	5.3	3.1	3.5	4.0	5.3	5.8	5.8	5.3	4.4	4.0



TEST NUMBER: P190129

CATALOG NUMBER: TRF11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	11.1	5.3	3.1	3.1	3.5	4.9	5.8	5.8	5.3	4.9	4.0
115°	11.1	5.8	3.5	3.1	3.5	4.9	5.8	5.8	5.8	4.9	4.4
117.5°	11.5	6.2	3.5	3.1	3.5	4.4	5.3	5.8	5.8	5.3	4.4
120°	11.5	6.6	3.5	3.1	3.5	4.4	5.3	5.8	5.8	5.3	4.9
122.5°	11.5	7.1	4.0	3.1	3.1	4.0	4.9	5.8	5.8	5.3	4.9
125°	11.5	7.1	4.0	3.1	3.1	4.0	4.9	5.3	5.8	5.3	4.9
127.5°	11.9	7.5	4.4	3.5	3.1	3.5	4.4	5.3	5.3	5.3	5.3
130°	11.9	8.0	4.9	3.5	3.1	3.5	4.0	4.9	5.3	5.3	5.3
132.5°	12.4	8.4	5.3	4.0	3.1	3.1	4.0	4.4	4.9	5.3	5.3
135°	12.4	8.8	5.8	4.4	3.5	3.1	3.5	4.0	4.9	4.9	5.3
137.5°	13.3	9.3	6.2	4.9	4.0	2.7	3.1	4.0	4.4	4.9	4.9
140°	13.7	9.7	6.6	5.3	4.4	3.1	3.1	3.5	4.0	4.4	4.9
142.5°	14.6	10.6	7.5	6.2	4.9	3.1	2.7	3.1	3.5	4.0	4.4
145°	15.9	11.9	8.4	6.6	5.3	3.5	2.7	2.7	3.1	3.5	4.0
147.5°	17.3	12.8	9.3	7.5	6.2	4.4	3.1	2.7	3.1	3.1	3.5
150°	18.6	14.2	10.6	8.8	7.5	4.9	3.5	2.7	2.7	3.1	3.1
152.5°	19.9	15.9	11.9	10.2	8.4	6.2	4.4	3.1	2.7	2.7	3.1
155°	21.7	17.3	13.7	11.9	10.2	7.5	5.3	4.0	3.1	2.7	2.7
157.5°	23.0	19.0	15.5	13.7	11.9	9.3	6.6	5.3	4.0	3.1	2.7
160°	24.8	20.8	17.3	15.5	14.2	11.1	8.8	6.6	5.3	4.4	3.5
162.5°	26.1	22.6	19.0	17.7	15.9	13.3	11.1	8.8	7.1	6.2	4.9
165°	27.9	24.3	21.2	19.9	18.6	15.9	13.7	11.5	10.2	8.4	7.5
167.5°	29.2	26.1	23.4	22.1	21.2	19.0	16.8	15.0	13.3	11.9	10.6
170°	31.0	28.3	26.1	24.8	23.9	22.1	19.9	18.6	17.3	15.9	14.6
172.5°	32.3	30.1	28.8	27.4	27.0	25.2	23.4	22.1	21.2	19.9	19.0
175°	33.6	32.3	31.4	30.5	30.1	28.8	27.4	26.5	25.7	24.8	23.9
177.5°	35.4	34.5	34.1	33.6	33.6	32.7	32.3	31.4	31.0	30.5	30.1
180°	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3



TEST NUMBER: P190129

CATALOG NUMBER: TRF11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
2.5°	25.2	24.8	24.8	24.8	23.9	23.9	23.9	23.9
5°	19.9	19.5	19.0	18.6	18.1	17.7	17.7	17.7
7.5°	15.0	14.6	14.2	13.7	13.3	12.8	12.8	12.4
10°	11.1	10.2	9.7	9.7	8.8	8.4	8.4	8.4
12.5°	7.5	7.1	6.6	6.6	6.2	5.8	5.8	5.3
15°	5.3	4.9	4.9	4.4	4.4	4.0	4.0	4.0
17.5°	4.0	3.5	3.5	3.5	3.5	3.1	3.1	3.1
20°	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
22.5°	3.5	4.0	4.0	4.0	4.0	4.4	4.4	4.4
25°	4.0	4.4	4.4	4.4	4.9	4.9	4.9	4.9
27.5°	4.4	4.9	4.9	5.3	5.3	5.3	5.8	5.3
30°	5.3	5.3	5.8	5.8	5.8	5.8	5.8	5.8
32.5°	5.8	5.8	5.8	6.2	6.2	6.2	6.2	6.2
35°	5.8	6.2	6.2	6.2	6.2	5.8	5.8	5.8
37.5°	6.2	6.2	6.2	5.8	5.8	5.8	5.8	5.8
40°	6.2	5.8	5.8	5.8	5.3	5.3	5.3	5.3
42.5°	5.8	5.8	5.3	5.3	4.9	4.9	4.4	4.4
45°	5.8	5.3	4.9	4.9	4.4	4.0	4.0	4.0
47.5°	5.3	4.9	4.4	4.4	4.0	3.5	3.5	3.5
50°	4.9	4.4	4.0	4.0	3.5	3.1	3.1	3.1
52.5°	4.4	4.0	3.5	3.5	3.1	2.7	2.7	2.7
55°	4.4	3.5	3.1	3.1	2.7	2.2	2.2	2.2
57.5°	4.0	3.1	3.1	2.7	2.2	2.2	1.8	1.8
60°	3.5	3.1	2.7	2.7	2.2	1.8	1.8	1.8
62.5°	3.5	2.7	2.7	2.2	1.8	1.8	1.3	1.3
65°	3.1	2.7	2.2	2.2	1.8	1.3	1.3	1.3
67.5°	3.1	2.2	2.2	1.8	1.8	1.3	1.3	1.3
70°	2.7	2.2	2.2	1.8	1.8	1.3	1.3	0.9
72.5°	2.7	2.2	2.2	1.8	1.3	1.3	1.3	1.3
75°	2.7	2.2	1.8	1.8	1.3	1.3	1.3	1.3
77.5°	2.7	2.2	1.8	1.8	1.3	1.3	1.3	0.9
80°	2.7	2.2	1.8	1.8	1.3	1.3	1.3	1.3
82.5°	2.2	1.8	1.8	1.8	1.3	1.3	0.9	1.3
85°	2.2	1.8	1.8	1.8	1.3	0.9	0.9	0.9
87.5°	2.2	1.8	1.8	1.3	1.3	0.9	0.9	0.9
90°	2.2	1.8	1.8	1.3	1.3	0.9	0.9	0.9
92.5°	2.7	2.2	1.8	1.8	1.3	1.3	0.9	0.9
95°	2.7	2.2	1.8	1.8	1.3	1.3	0.9	0.9
97.5°	2.7	2.2	1.8	1.8	1.8	1.3	1.3	1.3
100°	2.7	2.2	2.2	1.8	1.8	1.3	0.9	0.9
102.5°	2.7	2.2	2.2	1.8	1.8	1.3	1.3	0.9
105°	3.1	2.2	2.2	2.2	1.8	1.3	1.3	1.3
107.5°	3.1	2.7	2.2	2.2	1.8	1.8	1.3	1.3
110°	3.1	2.7	2.7	2.2	2.2	1.8	1.8	1.8



TEST NUMBER: P190129

CATALOG NUMBER: TRF11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	3.5	2.7	2.7	2.7	2.2	1.8	1.8	1.8
115°	3.5	3.1	3.1	2.7	2.7	2.2	2.2	2.2
117.5°	4.0	3.5	3.1	3.1	2.7	2.7	2.7	2.2
120°	4.0	3.5	3.5	3.1	3.1	2.7	2.7	2.7
122.5°	4.4	4.0	3.5	3.5	3.1	3.1	3.1	3.1
125°	4.4	4.0	4.0	3.5	3.5	3.1	3.1	3.1
127.5°	4.9	4.4	4.0	4.0	3.5	3.5	3.5	3.5
130°	4.9	4.9	4.4	4.4	4.0	4.0	4.0	3.5
132.5°	5.3	4.9	4.9	4.4	4.4	4.0	4.0	4.0
135°	5.3	4.9	4.9	4.9	4.4	4.4	4.4	4.4
137.5°	5.3	5.3	4.9	4.9	4.9	4.9	4.9	4.4
140°	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
142.5°	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
145°	4.4	4.4	4.9	4.9	4.9	4.9	4.9	4.9
147.5°	4.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4
150°	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.4
152.5°	3.1	3.5	3.5	3.5	3.5	3.5	3.5	3.5
155°	2.7	3.1	3.1	3.1	3.1	3.1	3.1	3.1
157.5°	2.7	2.7	2.7	2.7	2.7	3.1	2.7	3.1
160°	3.1	2.7	2.7	2.7	2.7	2.7	2.7	2.7
162.5°	4.4	4.0	3.5	3.5	3.1	3.1	3.1	3.1
165°	6.6	5.8	5.3	5.3	4.9	4.4	4.4	4.4
167.5°	9.7	8.8	8.4	8.0	7.5	7.1	7.1	6.6
170°	13.7	12.8	12.4	11.9	11.5	11.1	11.1	10.6
172.5°	18.1	17.3	17.3	16.8	16.4	15.9	15.9	15.5
175°	23.4	23.0	22.6	22.1	21.7	21.7	21.7	21.2
177.5°	29.6	29.2	29.2	29.2	28.8	28.8	28.3	28.3
180°	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3

(END OF REPORT)