

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: P190105

Luminaire Tested: **TRO11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190105  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27868)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: TRO11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG  
Description: TERRAPIN 11" LED SHALLOW CAST WALL MOUNT WITH OPEN CLEAR LENS  
Light Source: (56) NICHIA 5000  
NF2L757DRT  
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 200mA  
OT25W/1

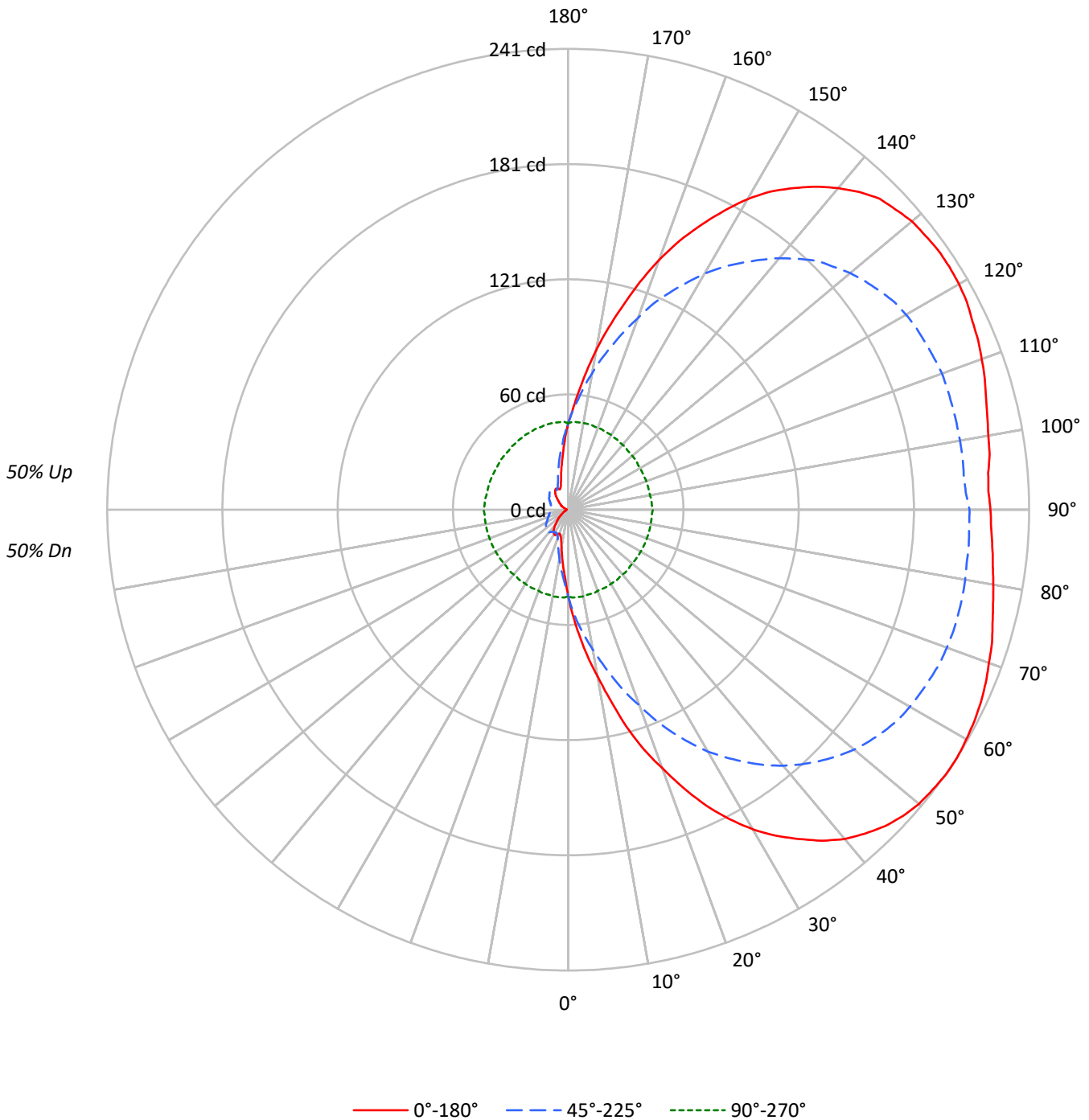
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1115.0 lumens  
Efficiency: N/A  
Efficacy: 111.5 lumens/watt  
Spacing Criteria (0/90/45): 2.89 / 1.51 / 2.68  
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	107	107	107	107	99	99	99	99	84	84	84	69	69	69	57	57	57	50
1	93	87	81	76	85	80	75	70	66	62	59	54	51	48	43	40	38	33
2	83	73	65	58	76	67	60	54	55	50	45	45	40	37	35	32	29	24
3	75	63	54	47	68	57	49	43	47	41	36	38	33	29	29	26	23	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	35	29	36	29	24	29	24	20	22	18	15	12
6	56	43	33	27	51	39	31	25	32	26	21	26	21	17	20	16	13	9
7	52	38	29	23	47	35	27	21	29	22	18	23	18	14	18	14	11	8
8	48	34	26	20	44	31	24	18	26	20	15	21	16	12	16	12	9	7
9	44	31	23	17	40	29	21	16	24	18	13	19	14	11	15	11	8	6
10	41	28	20	15	38	26	19	14	22	16	12	18	13	9	14	10	7	5

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

	0°	90°	180°
0°	1816	1816	1816
5°	2076	1709	941
10°	2328	1599	523
15°	2654	1499	330
20°	2874	1417	266
25°	3077	1366	256
30°	3188	1317	241
35°	3228	1292	204
40°	3248	1266	153
45°	3217	1261	110
50°	3160	1252	82
55°	3085	1266	56
60°	3003	1291	39
65°	2931	1327	27
70°	2860	1376	16
75°	2807	1440	16
80°	2780	1522	16
85°	2785	1628	16



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	4.6	0.4
10°-20°	16.0	1.4
20°-30°	32.5	2.9
30°-40°	52.0	4.7
40°-50°	70.6	6.3
50°-60°	85.6	7.7
60°-70°	95.8	8.6
70°-80°	101.6	9.1
80°-90°	103.6	9.3
90°-100°	102.7	9.2
100°-110°	100.0	9.0
110°-120°	94.2	8.5
120°-130°	84.1	7.5
130°-140°	69.2	6.2
140°-150°	50.7	4.5
150°-160°	31.6	2.8
160°-170°	15.7	1.4
170°-180°	4.5	0.4
0°-30°	53.1	4.8
0°-40°	105.1	9.4
0°-60°	261.3	23.4
0°-90°	562.2	50.4
90°-120°	296.9	26.6
90°-150°	501.0	44.9
90°-180°	553.0	49.6
0°-180°	1115.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	45	45	45	45	45	
5°	66	60	46	34	30	7
15°	117	91	46	20	15	34
25°	171	128	45	14	14	79
35°	210	161	45	14	13	132
45°	234	186	44	16	8	181
55°	241	202	44	14	4	216
65°	238	209	44	12	2	236
75°	230	211	44	10	1	243
85°	223	210	44	9	1	182
90°	221	210	44	9	1	121
95°	220	208	44	9	1	181
105°	226	208	43	9	1	239
115°	233	206	43	11	3	232
125°	236	199	44	12	5	212
135°	230	184	44	13	8	177
145°	205	158	45	12	12	129
155°	164	125	45	13	12	77
165°	110	89	46	20	15	32
175°	62	58	46	34	30	7
180°	45	45	45	45	45	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1
2.5°	54.9	54.4	54.9	54.4	54.4	54.4	54.0	54.0	53.5	53.1	52.7
5°	65.5	65.1	65.1	64.6	64.2	63.7	62.8	62.8	62.0	60.6	59.7
7.5°	77.0	76.1	76.1	75.2	74.3	73.9	73.0	72.1	70.4	68.6	66.8
10°	88.5	88.1	88.1	86.7	85.4	85.0	83.6	81.9	79.7	77.0	74.3
12.5°	101.8	101.8	100.9	99.1	97.4	96.0	95.1	92.9	89.8	86.3	82.3
15°	117.3	116.4	115.5	113.7	110.6	108.9	108.0	104.4	100.5	96.5	91.2
17.5°	131.4	130.1	129.2	127.0	124.8	122.6	120.8	116.8	111.5	106.7	100.5
20°	143.8	143.4	142.5	139.8	137.2	135.0	132.8	128.3	122.6	116.8	108.9
22.5°	157.5	156.7	155.3	152.7	149.6	146.9	144.7	139.8	133.2	127.0	119.0
25°	170.8	169.5	168.2	165.1	161.5	159.3	156.7	150.9	143.8	137.2	128.3
27.5°	182.3	181.4	180.1	176.6	172.6	170.4	167.7	162.0	154.5	146.9	137.2
30°	193.0	192.1	190.7	187.2	183.7	180.6	177.9	171.7	163.7	155.8	146.0
32.5°	202.2	201.4	199.1	196.5	192.5	189.4	186.8	180.6	172.2	163.7	153.6
35°	210.2	209.8	208.0	204.9	201.4	198.3	195.2	189.0	180.6	171.7	161.1
37.5°	218.2	217.7	215.5	212.9	208.4	206.2	203.1	196.5	188.5	179.2	168.2
40°	224.8	223.9	221.7	219.1	215.1	212.9	209.8	203.1	195.2	185.9	174.8
42.5°	229.7	229.2	227.0	224.8	220.4	218.2	215.5	208.9	200.9	191.6	180.6
45°	234.1	233.2	231.5	228.8	225.3	223.0	220.4	214.2	206.2	197.4	185.9
47.5°	237.2	236.3	235.0	232.3	228.8	226.6	223.9	218.2	211.1	201.8	190.7
50°	239.4	238.5	237.2	235.0	231.9	229.7	227.0	221.7	214.6	205.8	195.2
52.5°	240.3	239.9	238.5	236.3	233.2	231.5	229.2	223.9	217.3	208.9	198.7
55°	241.2	240.3	239.4	237.2	234.6	232.8	230.6	225.7	219.5	212.0	201.8
57.5°	241.2	240.3	239.0	237.2	234.6	232.8	231.0	227.0	221.3	213.8	204.5
60°	240.3	239.4	238.5	236.8	234.6	232.8	231.0	227.0	222.2	215.1	206.2
62.5°	239.4	238.5	237.2	235.9	233.7	232.3	230.6	227.5	222.6	216.4	207.6
65°	238.1	237.2	236.3	235.0	232.8	231.5	230.1	227.0	222.6	216.8	208.9
67.5°	236.3	235.9	235.0	233.2	231.5	230.1	229.2	226.1	222.2	217.3	210.2
70°	234.1	234.1	233.2	231.9	230.1	228.8	227.9	225.3	221.7	216.8	210.7
72.5°	232.3	231.9	231.0	229.7	228.4	227.5	226.6	223.9	221.3	216.8	211.1
75°	229.7	229.2	228.8	227.5	226.6	225.7	224.8	222.6	219.9	216.4	211.1
77.5°	227.5	227.0	226.6	225.7	224.8	223.9	223.0	221.7	219.1	216.0	211.1
80°	225.7	225.3	224.8	223.9	223.0	222.2	221.7	220.4	218.2	215.5	210.7
82.5°	223.9	223.5	223.0	222.2	221.3	220.4	219.9	219.5	217.7	215.1	210.2
85°	222.6	222.6	221.7	220.8	219.9	219.5	219.1	218.2	216.8	214.2	210.2
87.5°	221.3	221.3	220.8	219.5	219.1	218.6	218.2	217.3	216.0	214.2	209.8
90°	220.8	220.4	219.9	219.1	218.6	218.2	217.7	217.3	216.0	213.8	209.8
92.5°	219.9	219.5	219.1	218.2	217.3	216.8	216.4	215.5	214.2	211.5	208.0
95°	220.4	220.4	219.9	218.6	218.2	217.3	216.8	216.0	214.6	212.0	207.6
97.5°	222.2	221.7	221.3	219.9	219.1	218.6	217.7	216.8	215.1	212.4	208.0
100°	223.0	222.6	222.2	220.8	219.9	219.5	219.1	217.3	215.5	212.9	208.0
102.5°	224.4	224.4	223.5	222.6	221.3	220.8	220.4	218.2	216.0	212.9	208.0
105°	226.1	226.1	225.3	224.4	223.0	222.6	221.7	219.5	216.8	213.3	208.0
107.5°	228.4	228.4	227.5	226.1	224.8	223.9	223.0	220.8	217.7	213.8	208.0
110°	230.1	230.1	229.2	227.9	226.1	225.7	224.4	221.7	218.6	214.2	208.0



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	231.9	231.9	230.6	229.2	227.5	226.6	225.3	222.6	219.1	213.8	207.1
115°	233.2	233.2	232.3	230.6	228.8	227.5	226.1	223.0	219.1	213.8	206.2
117.5°	235.0	235.0	233.7	231.9	229.7	228.4	227.0	223.5	219.1	213.3	205.3
120°	235.9	235.4	234.6	232.8	230.1	228.8	227.5	223.5	218.6	212.4	204.0
122.5°	236.3	236.3	235.0	233.2	230.6	229.2	227.5	223.0	218.2	211.1	202.2
125°	236.3	235.9	234.6	232.8	230.1	228.4	226.6	222.2	216.4	208.4	199.1
127.5°	235.4	235.0	233.7	231.9	228.8	227.5	225.3	220.4	214.2	205.8	196.0
130°	234.6	233.7	232.8	230.1	227.5	225.7	223.5	218.2	211.1	202.7	192.5
132.5°	232.3	231.9	230.6	228.4	224.8	223.0	220.4	215.1	207.6	198.7	188.1
135°	230.1	229.2	227.5	225.7	222.2	219.9	217.3	211.5	203.6	194.7	184.1
137.5°	225.3	224.4	223.5	220.4	217.3	214.6	212.0	205.8	198.3	189.0	177.9
140°	219.5	218.6	216.8	214.2	211.1	208.4	205.8	199.6	191.6	181.9	171.7
142.5°	212.9	212.0	210.7	208.0	204.0	202.2	198.7	192.5	185.0	175.2	164.6
145°	205.3	205.3	203.6	200.5	196.9	194.3	191.6	185.4	177.5	168.2	157.5
147.5°	197.4	196.9	195.6	192.5	188.5	186.3	183.2	177.0	169.5	160.2	150.5
150°	187.6	187.2	185.4	182.8	178.8	176.6	173.9	167.7	160.6	151.8	142.5
152.5°	176.1	176.1	174.4	171.7	167.7	165.5	163.3	157.5	150.5	142.5	133.7
155°	164.2	164.2	162.4	160.2	156.7	154.5	151.8	146.9	140.7	133.2	125.2
157.5°	152.2	152.2	150.9	148.7	145.2	142.9	140.7	136.7	130.6	123.9	116.8
160°	139.0	139.0	137.6	135.9	132.8	131.0	128.8	125.2	119.9	114.2	106.7
162.5°	124.8	125.2	123.9	122.6	119.9	118.2	116.4	113.3	108.0	103.1	97.8
165°	110.2	110.2	109.8	108.4	106.2	104.9	103.6	100.5	97.4	93.4	89.0
167.5°	97.4	97.4	96.9	96.0	94.3	93.4	92.1	89.8	87.6	84.1	81.0
170°	85.0	84.5	84.5	84.1	82.8	81.9	81.0	80.1	77.9	75.2	72.6
172.5°	72.6	72.6	73.0	72.1	71.7	70.8	70.4	69.9	68.2	66.8	65.1
175°	61.5	61.5	62.0	61.5	61.1	60.6	60.6	60.2	59.3	58.4	57.5
177.5°	51.8	52.2	52.2	52.2	52.2	51.8	51.8	52.2	51.8	51.3	51.3
180°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1
2.5°	52.2	51.3	50.9	50.0	50.0	49.1	48.7	47.8	46.9	46.0	45.1
5°	58.4	57.1	55.3	54.0	53.5	52.2	50.9	49.6	47.8	46.0	44.7
7.5°	65.1	62.4	60.2	58.0	57.1	55.8	53.1	50.9	48.2	46.0	43.8
10°	71.7	68.2	65.1	62.0	60.2	58.9	55.3	52.2	49.1	46.0	42.9
12.5°	78.8	74.8	70.4	66.4	64.2	62.0	57.5	53.5	49.6	45.6	42.0
15°	86.7	81.4	76.1	70.8	68.2	65.5	60.2	54.9	50.5	45.6	41.6
17.5°	94.7	88.1	81.9	75.2	72.1	68.6	62.4	56.6	50.9	45.6	40.7
20°	102.2	95.1	87.2	79.7	76.1	72.1	64.6	58.0	51.3	45.1	39.8
22.5°	109.8	101.8	92.9	84.5	79.7	75.2	67.3	59.3	51.8	45.1	38.9
25°	119.0	108.9	98.7	89.0	84.1	78.8	69.5	60.6	52.7	45.1	38.5
27.5°	127.0	116.8	104.9	93.8	88.1	82.8	72.1	62.0	53.1	45.1	37.6
30°	135.0	123.9	111.1	98.2	92.5	85.9	74.3	63.7	53.5	44.7	37.2
32.5°	141.6	130.1	116.8	102.7	96.0	89.4	76.6	64.6	54.0	44.7	36.3
35°	149.1	136.7	122.6	107.1	100.0	92.9	79.2	65.9	54.4	44.7	35.8
37.5°	155.8	142.5	127.9	112.0	104.0	96.0	81.4	67.3	55.3	44.3	35.4
40°	162.0	148.3	133.2	116.8	107.5	99.6	83.6	68.6	55.8	44.3	35.0
42.5°	167.7	153.6	137.6	120.8	111.5	102.7	85.9	69.9	56.2	44.3	34.1
45°	173.0	158.9	142.5	124.8	115.9	105.8	88.1	71.3	56.6	44.3	33.6
47.5°	177.9	163.3	146.5	128.3	119.5	108.4	89.8	72.6	57.1	43.8	33.2
50°	182.3	167.7	150.9	132.3	122.6	112.0	92.1	73.5	57.5	43.8	33.2
52.5°	185.9	171.3	154.5	135.0	125.2	115.1	93.8	74.8	58.0	43.8	32.7
55°	189.4	175.2	158.0	138.5	128.3	117.7	95.6	75.7	58.4	43.8	32.3
57.5°	192.5	177.9	160.6	141.2	131.0	119.9	97.4	77.0	58.9	43.8	31.9
60°	194.7	180.6	163.3	143.8	133.2	122.1	99.1	77.9	59.3	43.8	31.4
62.5°	196.5	182.8	166.0	146.0	135.4	124.4	100.5	78.8	59.7	43.8	31.4
65°	198.7	185.4	168.2	148.3	137.6	126.6	102.2	79.7	60.2	43.8	31.4
67.5°	200.0	186.8	170.4	150.5	139.8	128.3	103.6	80.5	60.2	43.8	31.0
70°	201.4	188.5	172.2	152.2	141.6	129.7	104.9	81.4	60.6	43.8	31.0
72.5°	202.2	189.9	173.5	153.6	142.9	131.4	105.8	82.3	61.1	43.8	30.5
75°	202.7	190.7	174.8	154.9	144.3	132.3	107.1	82.8	61.5	43.8	30.5
77.5°	202.7	191.2	175.7	155.8	145.2	133.7	107.5	83.6	61.5	43.8	30.5
80°	203.1	191.6	176.1	156.7	146.0	134.1	108.4	84.1	62.0	43.8	30.5
82.5°	203.1	192.1	176.6	157.1	146.5	134.5	108.9	84.1	62.0	43.8	30.5
85°	203.1	192.5	177.0	157.5	146.5	135.0	109.3	84.5	62.0	43.8	30.5
87.5°	203.1	192.5	177.0	158.0	146.9	135.4	109.3	85.0	62.4	43.8	30.5
90°	203.1	192.5	177.5	158.0	147.4	135.4	109.8	85.0	62.4	44.3	30.5
92.5°	200.9	190.7	175.7	157.1	146.0	134.5	109.8	84.1	62.0	43.8	30.1
95°	200.9	190.3	175.2	156.7	145.6	134.1	109.3	84.1	62.0	43.8	30.1
97.5°	200.9	190.3	175.2	156.2	145.2	133.7	108.9	83.6	61.5	43.8	30.1
100°	200.9	189.4	174.4	155.3	144.3	133.2	108.0	83.2	61.5	43.4	30.1
102.5°	200.5	189.0	173.9	154.5	143.8	131.9	107.1	82.8	61.1	43.4	30.1
105°	200.5	188.1	172.6	153.6	142.5	131.0	106.2	81.9	61.1	43.4	30.1
107.5°	199.6	187.2	171.7	152.7	141.2	130.1	105.3	81.4	60.6	43.4	30.1
110°	198.7	186.3	170.4	150.9	139.8	128.8	104.0	80.5	60.2	43.4	30.5





TEST NUMBER: P190105

CATALOG NUMBER: TRO11-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°	197.8	184.5	168.6	149.1	138.1	126.6	102.7	79.7	59.7	43.4	30.5
115°	196.5	183.2	166.8	146.9	135.9	125.2	101.3	79.2	59.7	43.4	31.0
117.5°	195.2	181.0	164.6	144.7	134.1	123.5	100.0	78.3	59.3	43.4	31.0
120°	193.0	178.8	162.0	142.5	131.9	121.3	98.2	77.4	58.9	43.4	31.4
122.5°	190.7	176.1	159.3	139.8	129.2	119.0	96.9	76.1	58.4	43.4	31.9
125°	187.6	173.0	155.8	136.7	126.6	115.9	95.1	75.2	58.0	43.8	31.9
127.5°	184.1	169.1	152.7	133.7	123.5	113.3	92.9	74.3	57.5	43.8	32.3
130°	180.1	165.1	148.7	130.6	120.8	110.6	91.2	73.0	57.1	43.8	32.7
132.5°	175.7	161.1	144.3	127.0	117.3	107.5	89.4	72.1	56.6	43.8	33.2
135°	171.3	156.2	140.3	123.5	113.7	104.4	87.2	70.8	56.2	43.8	33.6
137.5°	165.5	150.9	135.4	119.5	110.2	101.3	85.0	69.5	55.8	44.3	34.1
140°	158.9	145.2	130.1	114.2	105.8	98.2	82.8	68.2	55.3	44.3	34.5
142.5°	152.7	139.4	125.2	110.2	102.2	94.7	80.5	66.8	54.9	44.3	35.4
145°	146.5	133.7	120.4	105.8	98.2	91.6	78.3	65.9	54.4	44.7	35.8
147.5°	139.8	127.5	114.6	101.3	94.7	88.5	76.1	64.6	54.0	44.7	36.7
150°	132.3	121.3	108.4	96.9	91.2	85.4	73.9	63.3	53.5	45.1	37.2
152.5°	124.4	113.7	102.7	92.5	86.7	81.9	71.7	61.5	53.1	45.1	37.6
155°	116.8	106.7	97.4	87.6	82.8	78.3	69.0	60.6	52.7	45.1	38.5
157.5°	108.4	100.0	92.1	83.6	79.2	75.2	66.8	59.3	52.2	45.6	39.4
160°	100.5	92.9	86.3	78.8	75.2	71.7	64.6	57.5	51.3	45.6	40.3
162.5°	92.5	86.3	80.5	74.3	71.3	68.2	62.0	56.2	50.9	45.6	40.7
165°	84.5	79.7	74.8	69.9	67.3	64.6	59.7	54.9	50.0	46.0	41.6
167.5°	77.4	73.5	69.9	65.5	63.7	61.5	57.5	53.5	49.6	46.0	42.5
170°	70.4	67.3	64.6	61.5	59.7	58.4	54.9	51.8	48.7	46.0	42.9
172.5°	63.3	61.1	59.3	57.1	55.8	54.9	52.7	50.5	48.2	46.0	43.8
175°	56.6	55.3	54.4	53.1	52.7	51.8	50.0	48.7	47.4	46.0	44.3
177.5°	50.9	50.5	50.0	49.1	49.1	48.7	48.2	47.4	46.5	46.0	45.1
180°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1



TEST NUMBER: P190105

CATALOG NUMBER: TRO11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1
2.5°	44.3	43.8	42.9	42.5	42.0	41.2	40.3	39.8	38.9	38.5	37.6
5°	42.9	41.6	40.3	39.4	38.9	37.6	36.3	35.4	34.1	33.2	32.3
7.5°	41.6	39.8	37.6	36.7	35.8	34.1	32.7	31.4	30.1	28.8	27.9
10°	40.3	37.6	35.4	34.1	33.2	31.0	29.2	27.4	26.1	24.8	23.9
12.5°	38.9	35.8	33.2	31.9	30.5	28.3	26.1	24.3	23.0	21.2	20.4
15°	37.6	34.1	31.0	29.7	27.9	25.7	23.5	21.7	19.9	18.6	17.7
17.5°	36.3	32.3	29.2	27.4	26.1	23.5	21.2	19.0	17.7	16.4	15.5
20°	35.0	31.0	27.0	25.2	23.9	21.2	19.0	17.3	15.9	15.0	14.2
22.5°	33.6	29.2	25.2	23.5	22.1	19.5	17.3	15.5	14.6	14.2	13.7
25°	32.7	27.9	23.9	22.1	20.4	17.7	15.9	14.6	13.7	13.7	13.7
27.5°	31.9	26.6	22.6	20.8	19.0	16.4	14.6	13.7	13.7	13.7	13.7
30°	30.5	25.2	21.2	19.5	17.7	15.5	14.2	13.7	13.7	13.7	14.2
32.5°	29.7	24.3	19.9	18.1	16.8	14.6	13.7	13.7	13.7	14.2	14.6
35°	28.8	23.5	19.0	17.3	15.9	14.2	13.7	13.7	14.2	15.0	15.0
37.5°	27.9	22.1	18.1	16.4	15.5	14.2	13.7	14.2	14.6	15.0	15.0
40°	27.4	21.7	17.3	15.9	14.6	13.7	14.2	14.6	15.5	15.5	15.0
42.5°	26.6	20.8	16.8	15.5	14.6	13.7	14.2	15.0	15.5	15.0	14.2
45°	26.1	19.9	15.9	15.0	14.2	14.2	14.6	15.5	15.5	14.6	13.7
47.5°	25.2	19.5	15.5	14.6	14.2	14.2	15.0	15.9	15.5	14.2	12.8
50°	24.8	19.0	15.5	14.6	14.2	14.2	15.5	15.9	15.0	13.7	11.9
52.5°	24.3	18.6	15.0	14.2	14.2	14.6	15.9	15.9	14.6	12.8	11.1
55°	23.9	18.1	15.0	14.2	14.2	15.0	15.9	15.5	14.2	11.9	10.2
57.5°	23.5	17.7	14.6	14.2	14.2	15.0	15.9	15.5	13.7	11.5	9.3
60°	23.0	17.3	14.6	14.2	14.2	15.5	16.4	15.0	12.8	11.1	8.9
62.5°	22.6	16.8	14.6	14.2	14.6	15.9	15.9	14.6	12.4	10.2	8.4
65°	22.6	16.8	14.6	14.2	14.6	15.9	15.9	14.6	11.9	9.7	7.5
67.5°	22.1	16.4	14.6	14.2	14.6	15.9	15.9	14.2	11.5	9.3	7.1
70°	22.1	16.4	14.6	14.6	15.0	16.4	15.9	13.7	11.1	8.9	7.1
72.5°	21.7	16.4	14.2	14.6	15.0	16.4	15.5	13.3	10.6	8.4	6.6
75°	21.7	16.4	14.6	14.6	15.0	16.4	15.5	12.8	10.2	8.0	6.2
77.5°	21.7	15.9	14.6	14.6	15.0	16.4	15.0	12.8	10.2	8.0	6.2
80°	21.2	15.9	14.6	14.6	15.0	16.4	15.0	12.4	9.7	7.5	5.8
82.5°	21.2	15.9	14.6	14.6	15.5	16.4	15.0	12.4	9.7	7.5	5.3
85°	21.2	15.9	14.2	14.6	15.0	16.4	15.0	11.9	9.3	7.1	5.3
87.5°	21.2	15.9	14.2	14.6	15.0	16.4	14.6	11.9	9.3	7.1	5.3
90°	21.2	15.9	14.2	14.6	15.0	15.9	14.6	11.9	9.3	7.1	5.3
92.5°	21.2	15.9	14.2	14.2	15.0	15.9	14.6	11.9	9.3	7.1	5.3
95°	21.2	15.9	14.2	14.2	15.0	15.9	14.6	11.9	9.3	7.1	5.3
97.5°	21.2	15.9	14.2	14.2	14.6	15.5	14.2	11.9	9.3	7.1	5.3
100°	21.2	15.9	13.7	14.2	14.6	15.5	14.2	11.9	9.3	7.1	5.3
102.5°	21.2	15.9	13.7	13.7	14.2	15.0	14.2	11.9	9.3	7.1	5.3
105°	21.2	15.9	13.7	13.7	14.2	15.0	14.2	11.9	9.3	7.1	5.3
107.5°	21.2	15.9	13.7	13.7	14.2	15.0	14.2	11.9	9.7	7.5	5.8
110°	21.7	15.9	13.7	13.3	13.7	14.6	14.2	12.4	9.7	7.5	5.8



TEST NUMBER: P190105

CATALOG NUMBER: TRO11-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°	21.7	15.9	13.7	13.3	13.3	14.6	14.2	12.4	10.2	8.0	6.2
115°	22.1	16.4	13.7	13.3	13.3	14.2	14.2	12.4	10.6	8.4	6.6
117.5°	22.6	16.8	13.7	13.3	13.3	14.2	14.2	12.8	11.1	8.9	7.5
120°	22.6	16.8	13.7	13.3	13.3	13.7	14.2	13.3	11.5	9.7	8.0
122.5°	23.0	17.3	14.2	13.3	12.8	13.3	14.2	13.3	11.9	10.2	8.4
125°	23.5	17.7	14.2	13.3	12.8	13.3	13.7	13.3	11.9	10.6	9.3
127.5°	23.9	18.1	14.6	13.3	12.8	12.8	13.7	13.7	12.4	11.1	9.7
130°	24.3	18.6	14.6	13.7	12.8	12.8	13.3	13.3	12.8	11.9	10.6
132.5°	25.2	19.0	15.0	13.7	13.3	12.4	12.8	13.3	13.3	12.4	11.1
135°	25.7	19.9	15.5	14.2	13.3	12.4	12.4	13.3	13.3	12.8	11.9
137.5°	26.6	20.4	16.4	14.6	13.7	12.4	12.4	12.8	13.3	12.8	12.4
140°	27.0	21.2	16.8	15.5	14.2	12.8	12.4	12.4	12.8	12.8	12.8
142.5°	27.9	22.1	17.7	15.9	14.6	12.8	12.4	11.9	12.4	12.8	12.8
145°	28.8	23.0	18.6	16.8	15.5	13.7	12.4	11.9	11.9	12.4	12.8
147.5°	29.7	24.3	19.9	18.1	16.4	14.2	12.8	12.4	11.9	11.9	12.4
150°	31.0	25.2	20.8	19.0	17.7	15.0	13.3	12.4	11.9	11.9	11.9
152.5°	31.9	26.6	22.1	20.4	19.0	16.4	14.2	13.3	12.4	11.9	11.9
155°	32.7	27.9	23.9	22.1	20.4	17.7	15.5	14.2	12.8	12.4	11.9
157.5°	34.1	29.7	25.2	23.9	22.1	19.5	17.3	15.0	14.2	13.3	12.8
160°	35.4	31.0	27.0	25.7	23.9	21.2	19.0	16.8	15.5	14.2	13.7
162.5°	36.7	32.7	29.2	27.4	26.1	23.5	21.2	19.0	17.7	16.4	15.5
165°	37.6	34.5	31.0	29.7	28.3	26.1	23.9	21.7	19.9	18.6	17.7
167.5°	38.9	36.3	33.2	31.9	31.0	28.8	26.6	24.8	23.0	21.7	20.8
170°	40.3	38.1	35.8	34.5	33.6	31.4	29.7	27.9	26.6	25.2	24.3
172.5°	41.6	39.8	38.1	37.2	36.3	35.0	33.2	31.9	30.5	29.2	28.3
175°	42.9	41.6	40.3	39.8	39.4	38.1	37.2	35.8	34.5	34.1	33.6
177.5°	44.7	43.8	43.4	42.9	42.9	42.0	41.6	40.7	39.8	39.4	39.4
180°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1



TEST NUMBER: P190105

CATALOG NUMBER: TRO11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1
2.5°	37.2	36.7	36.3	36.3	35.8	35.8	35.8	35.8
5°	31.4	31.0	30.5	30.5	30.1	29.7	29.7	29.7
7.5°	27.0	26.1	25.7	25.7	24.8	24.8	24.8	24.3
10°	22.6	22.1	21.2	21.2	20.8	20.4	20.4	19.9
12.5°	19.5	18.6	18.1	18.1	17.3	17.3	16.8	16.8
15°	16.8	15.9	15.9	15.5	15.0	15.0	15.0	14.6
17.5°	15.0	14.6	14.2	14.2	14.2	13.7	13.7	13.7
20°	14.2	13.7	13.7	13.7	13.3	13.3	13.3	13.3
22.5°	13.7	13.7	13.7	13.3	13.7	13.7	13.7	13.7
25°	13.7	13.7	13.7	13.7	14.2	14.2	14.2	14.2
27.5°	13.7	14.2	14.6	14.6	14.6	14.6	15.0	15.0
30°	14.6	15.0	15.0	15.0	15.0	15.0	15.0	14.6
32.5°	15.0	15.0	15.0	15.0	14.6	14.6	14.2	14.2
35°	15.0	14.6	14.6	14.2	13.7	13.7	13.3	13.3
37.5°	14.6	14.2	13.7	13.3	12.8	12.4	11.9	11.9
40°	14.2	13.3	12.8	12.4	11.5	11.1	10.6	10.6
42.5°	13.3	12.4	11.5	11.1	10.2	9.7	9.3	9.3
45°	12.4	11.1	10.6	10.2	9.3	8.4	8.0	8.0
47.5°	11.1	10.2	9.3	8.9	8.0	7.5	7.1	7.1
50°	10.2	8.9	8.4	8.0	7.1	6.6	6.2	6.2
52.5°	9.3	8.0	7.5	7.1	6.2	5.3	5.3	4.9
55°	8.4	7.1	6.6	6.2	5.3	4.9	4.4	4.4
57.5°	8.0	6.6	5.8	5.3	4.4	4.0	3.5	3.5
60°	7.1	5.8	5.3	4.9	4.0	3.5	3.1	3.1
62.5°	6.6	5.3	4.9	4.4	3.5	3.1	2.7	2.7
65°	6.2	4.9	4.4	4.0	3.1	2.7	2.2	2.2
67.5°	5.8	4.4	4.0	3.5	2.7	2.2	1.8	1.8
70°	5.3	4.0	3.5	3.1	2.7	1.8	1.8	1.3
72.5°	4.9	4.0	3.5	3.1	2.2	1.8	1.3	1.3
75°	4.9	3.5	3.1	2.7	2.2	1.8	1.3	1.3
77.5°	4.4	3.5	3.1	2.7	1.8	1.3	1.3	1.3
80°	4.4	3.1	2.7	2.2	1.8	1.3	1.3	1.3
82.5°	4.0	3.1	2.7	2.2	1.8	1.3	1.3	1.3
85°	4.0	2.7	2.2	2.2	1.8	1.3	1.3	1.3
87.5°	4.0	2.7	2.2	1.8	1.3	1.3	1.3	1.3
90°	4.0	2.7	2.2	1.8	1.3	1.3	1.3	1.3
92.5°	4.0	2.7	2.2	1.8	1.3	1.3	1.3	0.9
95°	4.0	2.7	2.2	2.2	1.3	1.3	1.3	1.3
97.5°	4.0	2.7	2.2	2.2	1.8	1.3	1.3	1.3
100°	4.0	2.7	2.7	2.2	1.8	1.3	1.3	0.9
102.5°	4.0	3.1	2.7	2.2	1.8	1.3	1.3	1.3
105°	4.4	3.1	2.7	2.7	1.8	1.8	1.3	1.3
107.5°	4.4	3.5	3.1	2.7	2.2	1.8	1.8	1.3
110°	4.4	3.5	3.1	3.1	2.2	2.2	1.8	1.8



TEST NUMBER: P190105

CATALOG NUMBER: TRO11-LD4-10W-50-CL-BK-UNV-EDC1-CSTG

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	4.9	4.0	3.5	3.1	2.7	2.2	2.2	2.2
115°	5.3	4.4	4.0	4.0	3.1	3.1	2.7	2.7
117.5°	5.8	4.9	4.4	4.4	4.0	3.5	3.5	3.5
120°	6.6	5.3	5.3	4.9	4.4	4.0	4.0	4.0
122.5°	7.1	6.2	5.8	5.3	4.9	4.4	4.4	4.4
125°	7.5	6.6	6.2	6.2	5.3	5.3	4.9	4.9
127.5°	8.4	7.5	7.1	6.6	6.2	5.8	5.8	5.8
130°	9.3	8.4	8.0	7.5	7.1	6.6	6.6	6.2
132.5°	10.2	8.9	8.9	8.4	8.0	7.5	7.5	7.1
135°	10.6	9.7	9.3	9.3	8.9	8.4	8.4	8.0
137.5°	11.5	10.6	10.2	10.2	9.7	9.3	9.3	9.3
140°	11.9	11.5	11.1	11.1	10.6	10.2	10.2	10.2
142.5°	12.4	11.9	11.9	11.9	11.5	11.1	11.1	11.1
145°	12.8	12.4	12.4	12.4	12.4	11.9	11.9	11.9
147.5°	12.8	12.8	12.8	12.8	12.8	12.4	12.4	12.4
150°	12.4	12.4	12.4	12.4	12.8	12.8	12.8	12.8
152.5°	11.9	11.9	11.9	11.9	12.4	12.4	12.4	12.4
155°	11.9	11.9	11.9	11.5	11.9	11.9	11.9	11.9
157.5°	12.4	11.9	11.9	11.9	11.9	11.9	11.5	11.5
160°	12.8	12.4	12.4	12.4	11.9	11.9	11.9	11.9
162.5°	14.6	13.7	13.7	13.3	13.3	12.8	12.8	12.8
165°	16.8	15.9	15.5	15.5	15.0	14.6	14.6	14.6
167.5°	19.9	18.6	18.6	18.1	17.7	17.3	17.3	16.8
170°	23.5	22.1	22.1	21.7	21.2	20.8	20.8	20.8
172.5°	27.9	26.6	26.6	26.1	25.7	25.2	25.2	24.8
175°	32.3	31.9	31.9	31.4	31.0	30.5	30.5	30.1
177.5°	38.5	38.1	38.1	38.1	37.6	37.6	37.6	37.2
180°	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1

(END OF REPORT)