

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: P190124

Luminaire Tested: **TRF11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190124
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-LD4-20W-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 450mA OT40W/1

Summary

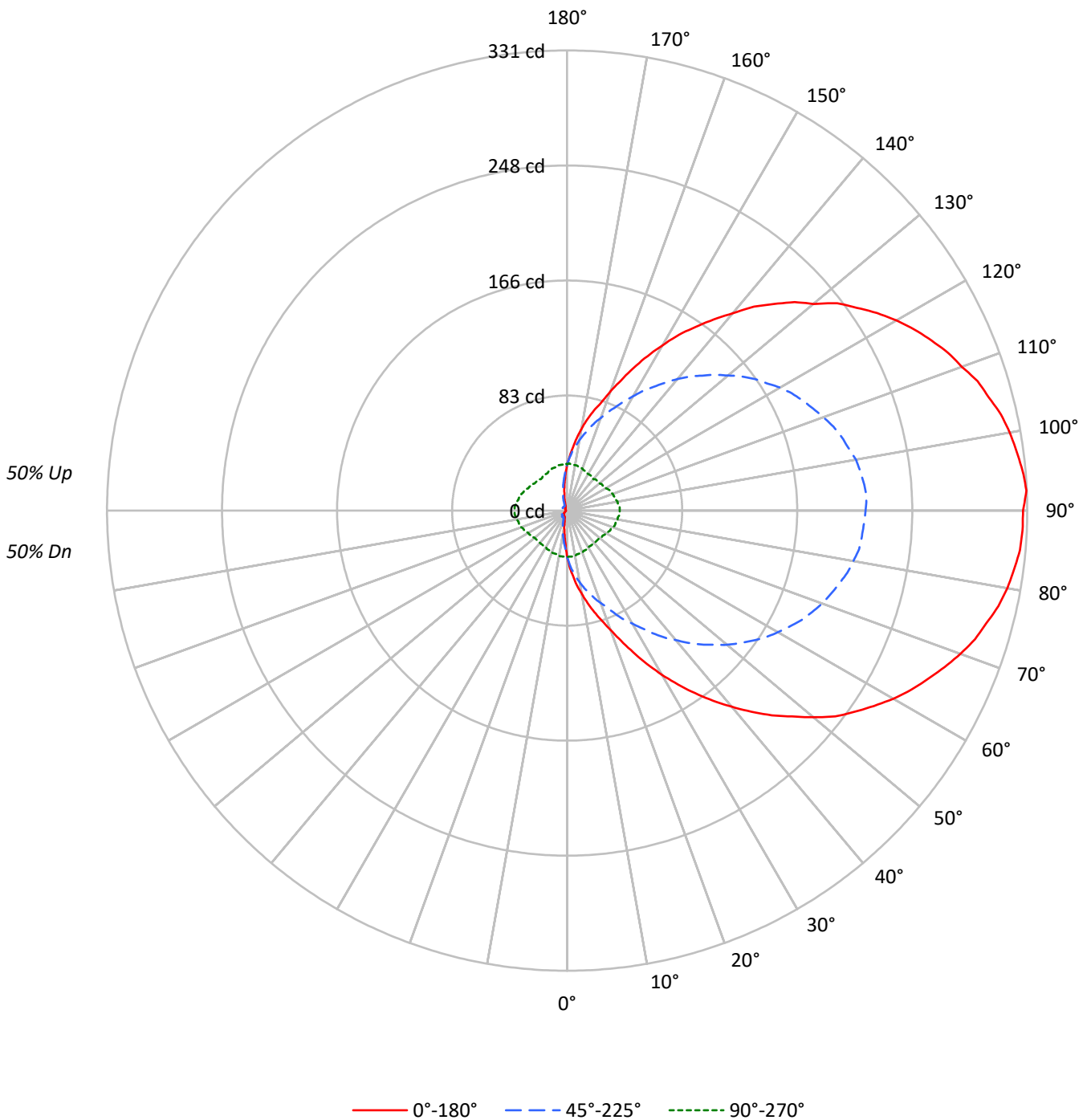
Lumens per Lamp: N/A
Luminaire Lumens: 1011.0 lumens
Efficiency: N/A
Efficacy: 46.2 lumens/watt
Spacing Criteria (0/90/45): 3.51 / 1.41 / 2.84
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 21.9
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	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°	1337	1337	1337
5°	1490	1234	612
10°	1599	1154	316
15°	1708	1058	145
20°	1823	1011	110
25°	2025	948	83
30°	2251	896	76
35°	2462	879	57
40°	2662	869	53
45°	2861	865	51
50°	3051	869	37
55°	3228	905	23
60°	3384	949	22
65°	3526	1033	22
70°	3680	1099	11
75°	3816	1180	11
80°	3960	1279	11
85°	4091	1405	11



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	3.2	0.3
10°-20°	10.6	1.0
20°-30°	20.8	2.1
30°-40°	35.6	3.5
40°-50°	53.6	5.3
50°-60°	72.9	7.2
60°-70°	90.8	9.0
70°-80°	104.9	10.4
80°-90°	112.8	11.2
90°-100°	113.4	11.2
100°-110°	105.2	10.4
110°-120°	91.1	9.0
120°-130°	73.0	7.2
130°-140°	53.6	5.3
140°-150°	35.4	3.5
150°-160°	20.5	2.0
160°-170°	10.4	1.0
170°-180°	3.2	0.3
0°-30°	34.6	3.4
0°-40°	70.1	6.9
0°-60°	196.6	19.4
0°-90°	505.2	50.0
90°-120°	309.7	30.6
90°-150°	471.7	46.7
90°-180°	506.0	50.0
0°-180°	1011.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	33	33	33	33	33	
5°	47	43	33	24	19	5
15°	76	62	32	12	6	22
25°	112	82	31	6	5	53
35°	160	108	30	6	4	101
45°	208	136	30	5	4	161
55°	252	163	31	5	2	226
65°	286	186	34	5	2	284
75°	312	203	36	5	1	330
85°	327	213	38	4	1	266
90°	328	215	38	4	1	180
95°	329	215	38	4	1	267
105°	314	204	36	4	1	332
115°	289	187	34	4	1	287
125°	254	165	31	4	2	228
135°	210	137	30	4	2	163
145°	161	109	30	4	3	102
155°	113	82	31	5	3	53
165°	75	61	32	11	6	22
175°	45	42	33	24	20	5
180°	33	33	33	33	33	



TEST NUMBER: P190124

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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°	40.5	39.6	39.6	39.6	39.6	39.6	39.6	39.6	38.7	38.7	38.7
5°	47.0	47.0	47.0	47.0	46.1	46.1	46.1	45.1	45.1	44.2	43.3
7.5°	54.4	54.4	53.4	53.4	52.5	52.5	51.6	51.6	50.7	48.8	47.9
10°	60.8	60.8	60.8	59.9	59.0	59.0	58.0	57.1	56.2	54.4	52.5
12.5°	68.2	68.2	67.2	66.3	65.4	65.4	64.5	62.6	61.7	59.0	57.1
15°	75.5	75.5	74.6	73.7	72.8	71.9	70.9	69.1	67.2	64.5	61.7
17.5°	82.9	82.9	82.0	81.1	79.2	78.3	77.4	74.6	72.8	70.0	66.3
20°	91.2	91.2	89.4	87.5	85.7	84.8	83.8	81.1	77.4	74.6	70.9
22.5°	101.3	101.3	99.5	96.7	94.9	93.0	92.1	88.4	84.8	80.1	75.5
25°	112.4	112.4	110.5	107.8	105.0	103.2	100.4	96.7	92.1	86.6	82.0
27.5°	124.4	123.4	122.5	118.8	115.2	113.3	110.5	105.9	100.4	94.0	88.4
30°	136.3	136.3	134.5	129.9	126.2	124.4	120.7	115.2	108.7	101.3	94.0
32.5°	148.3	147.4	145.6	141.9	137.3	134.5	131.7	125.3	117.0	108.7	100.4
35°	160.3	159.4	157.5	152.9	148.3	144.6	141.9	134.5	126.2	117.0	107.8
37.5°	172.3	172.3	169.5	164.9	159.4	155.7	152.0	144.6	135.4	125.3	115.2
40°	184.2	184.2	181.5	176.0	170.4	166.7	163.1	153.8	143.7	133.6	121.6
42.5°	196.2	195.3	192.5	187.9	181.5	177.8	173.2	164.0	152.9	140.9	129.0
45°	208.2	207.3	204.5	199.0	191.6	187.9	183.3	173.2	162.1	149.2	136.3
47.5°	219.2	218.3	215.6	210.0	202.7	198.1	193.5	182.4	170.4	157.5	142.8
50°	231.2	229.4	225.7	220.2	211.9	207.3	202.7	191.6	178.7	164.9	150.2
52.5°	243.2	242.3	236.8	229.4	222.0	217.4	211.9	200.8	187.0	172.3	156.6
55°	252.4	251.5	246.9	241.4	231.2	225.7	220.2	209.1	194.4	179.6	163.1
57.5°	261.6	260.7	256.1	250.6	242.3	235.8	229.4	216.5	201.7	186.1	169.5
60°	270.8	269.9	265.3	258.9	250.6	245.0	237.7	223.9	209.1	192.5	175.0
62.5°	279.1	278.2	273.6	266.2	257.9	252.4	246.0	231.2	215.6	199.0	180.6
65°	286.5	285.6	281.0	274.5	265.3	259.8	253.3	238.6	222.0	204.5	186.1
67.5°	293.9	292.9	288.3	281.0	271.8	266.2	259.8	246.0	227.5	210.0	190.7
70°	301.2	299.4	294.8	288.3	278.2	272.7	266.2	251.5	234.0	215.6	195.3
72.5°	307.7	305.8	301.2	293.9	283.7	278.2	271.8	257.0	239.5	220.2	199.0
75°	312.3	311.4	305.8	298.5	289.3	282.8	276.4	261.6	244.1	222.9	202.7
77.5°	317.8	315.1	310.4	303.1	292.9	287.4	281.0	265.3	248.7	227.5	206.4
80°	321.5	319.7	315.1	306.8	296.6	291.1	283.7	269.0	251.5	230.3	209.1
82.5°	324.3	322.4	317.8	310.4	299.4	293.9	286.5	271.8	254.3	232.1	211.9
85°	327.0	325.2	319.7	312.3	302.2	295.7	289.3	273.6	256.1	234.9	212.8
87.5°	327.9	326.1	321.5	313.2	303.1	296.6	290.2	274.5	257.0	236.8	213.7
90°	327.9	326.1	321.5	314.1	303.1	297.5	290.2	275.4	257.0	236.8	214.6
92.5°	330.7	327.9	323.3	316.0	304.9	298.5	292.0	276.4	258.9	237.7	215.6
95°	328.9	327.0	322.4	314.1	304.0	297.5	291.1	275.4	257.9	235.8	214.6
97.5°	326.1	325.2	319.7	312.3	302.2	295.7	289.3	273.6	256.1	234.0	212.8
100°	323.3	321.5	316.9	308.6	298.5	292.9	285.6	270.8	253.3	231.2	211.0
102.5°	319.7	316.9	312.3	304.9	294.8	289.3	281.9	267.1	249.6	228.5	207.3
105°	314.1	313.2	308.6	300.3	290.2	284.7	278.2	263.5	246.0	224.8	204.5
107.5°	309.5	307.7	303.1	294.8	285.6	279.1	272.7	258.9	241.4	221.1	200.8
110°	302.2	301.2	296.6	289.3	280.0	273.6	267.1	253.3	234.9	216.5	196.2



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	296.6	294.8	290.2	282.8	273.6	268.1	261.6	247.8	229.4	211.9	191.6
115°	289.3	287.4	282.8	276.4	266.2	260.7	255.2	241.4	223.9	206.4	187.0
117.5°	281.9	279.1	275.4	268.1	259.8	254.3	248.7	232.1	217.4	200.8	182.4
120°	273.6	270.8	267.1	260.7	251.5	246.0	240.4	225.7	211.0	194.4	176.9
122.5°	264.4	262.5	257.9	252.4	243.2	236.8	231.2	218.3	203.6	187.9	170.4
125°	254.3	252.4	248.7	242.3	232.1	227.5	222.0	210.0	196.2	180.6	164.9
127.5°	245.0	242.3	238.6	231.2	222.9	218.3	213.7	201.7	188.8	174.1	158.4
130°	231.2	230.3	226.6	221.1	213.7	209.1	204.5	192.5	180.6	166.7	151.1
132.5°	222.0	219.2	216.5	211.0	203.6	199.0	195.3	184.2	172.3	158.4	144.6
135°	210.0	208.2	205.4	199.9	193.5	189.8	185.2	175.0	164.0	151.1	137.3
137.5°	199.0	197.1	194.4	189.8	183.3	178.7	175.0	165.8	154.8	142.8	130.8
140°	185.2	184.2	181.5	176.9	171.3	167.7	164.9	155.7	145.6	134.5	123.4
142.5°	173.2	172.3	169.5	165.8	160.3	156.6	153.8	145.6	136.3	126.2	116.1
145°	161.2	160.3	158.4	153.8	149.2	146.5	142.8	135.4	127.1	118.8	108.7
147.5°	150.2	149.2	146.5	142.8	138.2	136.3	132.7	126.2	118.8	110.5	102.3
150°	137.3	136.3	134.5	131.7	127.1	125.3	122.5	116.1	109.6	103.2	94.9
152.5°	125.3	124.4	122.5	119.8	116.1	114.2	112.4	105.9	100.4	94.9	88.4
155°	113.3	112.4	110.5	108.7	105.0	104.1	101.3	96.7	92.1	87.5	82.0
157.5°	101.3	101.3	99.5	97.6	94.9	94.0	92.1	88.4	84.8	81.1	76.5
160°	91.2	90.3	89.4	88.4	85.7	84.8	83.8	81.1	77.4	74.6	70.9
162.5°	81.1	81.1	80.1	79.2	78.3	77.4	76.5	73.7	71.9	69.1	66.3
165°	74.6	73.7	72.8	71.9	70.9	70.9	70.0	68.2	66.3	63.6	60.8
167.5°	67.2	67.2	66.3	65.4	64.5	64.5	63.6	61.7	60.8	59.0	56.2
170°	59.9	59.9	59.0	59.0	58.0	58.0	57.1	56.2	55.3	53.4	51.6
172.5°	52.5	52.5	52.5	51.6	51.6	51.6	50.7	49.7	48.8	47.9	47.0
175°	45.1	45.1	45.1	44.2	44.2	44.2	44.2	43.3	43.3	42.4	42.4
177.5°	38.7	38.7	37.8	38.7	37.8	38.7	37.8	37.8	37.8	37.8	37.8
180°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2



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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°	37.8	37.8	36.8	36.8	36.8	35.9	35.9	35.0	34.1	33.2	33.2
5°	42.4	41.5	40.5	39.6	38.7	38.7	36.8	35.9	35.0	33.2	32.2
7.5°	47.0	45.1	44.2	42.4	41.5	40.5	38.7	36.8	35.0	33.2	31.3
10°	50.7	48.8	47.0	44.2	43.3	42.4	39.6	37.8	35.0	33.2	31.3
12.5°	54.4	52.5	49.7	47.0	45.1	44.2	41.5	38.7	35.9	32.2	30.4
15°	59.0	56.2	52.5	49.7	47.9	46.1	42.4	38.7	35.9	32.2	29.5
17.5°	63.6	59.9	56.2	51.6	49.7	47.9	43.3	39.6	35.9	32.2	28.6
20°	67.2	62.6	58.0	54.4	51.6	48.8	45.1	40.5	35.9	32.2	27.6
22.5°	70.9	66.3	60.8	56.2	53.4	50.7	45.1	40.5	35.9	31.3	27.6
25°	76.5	70.0	63.6	58.0	55.3	52.5	46.1	41.5	35.9	31.3	26.7
27.5°	81.1	74.6	67.2	60.8	57.1	54.4	47.0	41.5	35.9	31.3	26.7
30°	86.6	79.2	70.9	63.6	59.9	55.3	48.8	42.4	35.9	30.4	25.8
32.5°	92.1	83.8	75.5	66.3	61.7	58.0	49.7	42.4	35.9	30.4	25.8
35°	98.6	88.4	79.2	69.1	64.5	59.9	50.7	43.3	35.9	30.4	24.9
37.5°	104.1	94.0	82.9	72.8	67.2	61.7	52.5	44.2	36.8	30.4	24.9
40°	110.5	98.6	87.5	75.5	70.0	64.5	53.4	44.2	36.8	30.4	24.9
42.5°	116.1	104.1	91.2	79.2	72.8	67.2	55.3	46.1	36.8	30.4	24.0
45°	122.5	108.7	94.9	82.0	75.5	70.0	57.1	47.0	37.8	30.4	24.0
47.5°	129.0	114.2	99.5	85.7	78.3	71.9	59.0	47.9	38.7	30.4	24.0
50°	134.5	118.8	103.2	88.4	82.0	74.6	60.8	48.8	38.7	30.4	24.0
52.5°	140.0	123.4	106.9	91.2	83.8	76.5	62.6	50.7	39.6	31.3	24.0
55°	145.6	128.0	110.5	94.0	86.6	79.2	64.5	51.6	40.5	31.3	24.0
57.5°	151.1	132.7	115.2	97.6	89.4	81.1	66.3	52.5	41.5	32.2	24.0
60°	155.7	137.3	117.9	99.5	91.2	83.8	67.2	54.4	42.4	32.2	24.0
62.5°	161.2	140.9	121.6	102.3	94.0	85.7	69.1	55.3	43.3	33.2	24.0
65°	165.8	145.6	125.3	105.0	95.8	87.5	70.9	57.1	45.1	34.1	24.0
67.5°	170.4	149.2	128.0	107.8	97.6	89.4	71.9	58.0	46.1	34.1	24.9
70°	174.1	152.9	130.8	109.6	99.5	90.3	73.7	59.9	47.0	35.0	24.9
72.5°	177.8	155.7	133.6	111.5	101.3	92.1	74.6	60.8	47.9	35.9	24.9
75°	181.5	158.4	135.4	113.3	103.2	93.0	76.5	61.7	48.8	35.9	24.9
77.5°	184.2	161.2	137.3	115.2	104.1	94.0	77.4	62.6	49.7	35.9	24.9
80°	187.0	163.1	139.1	116.1	105.0	94.9	78.3	64.5	50.7	36.8	24.9
82.5°	188.8	164.9	140.9	117.0	105.9	95.8	79.2	64.5	50.7	36.8	24.9
85°	189.8	166.7	141.9	117.9	106.9	95.8	79.2	65.4	51.6	37.8	24.9
87.5°	191.6	167.7	142.8	118.8	107.8	96.7	80.1	66.3	51.6	37.8	24.9
90°	191.6	167.7	143.7	118.8	107.8	96.7	80.1	66.3	51.6	37.8	24.9
92.5°	192.5	168.6	143.7	119.8	107.8	96.7	80.1	66.3	51.6	37.8	25.8
95°	191.6	167.7	142.8	118.8	107.8	96.7	80.1	65.4	51.6	37.8	24.9
97.5°	189.8	165.8	141.9	117.9	106.9	95.8	79.2	64.5	50.7	36.8	24.9
100°	187.9	164.0	140.0	117.0	105.9	94.9	78.3	64.5	50.7	36.8	24.9
102.5°	185.2	162.1	138.2	115.2	105.0	94.0	77.4	62.6	49.7	35.9	24.9
105°	182.4	159.4	136.3	114.2	103.2	93.0	76.5	61.7	48.8	35.9	24.9
107.5°	179.6	156.6	133.6	112.4	101.3	92.1	74.6	60.8	47.9	35.0	24.9
110°	176.0	152.9	131.7	109.6	100.4	90.3	73.7	59.9	47.0	35.0	24.0



TEST NUMBER: P190124

CATALOG NUMBER: TRF11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	171.3	150.2	129.0	107.8	98.6	89.4	72.8	58.0	46.1	34.1	24.0
115°	167.7	146.5	125.3	105.9	96.7	87.5	70.9	57.1	45.1	34.1	24.0
117.5°	163.1	142.8	122.5	103.2	94.9	85.7	70.0	55.3	43.3	33.2	24.0
120°	157.5	138.2	119.8	100.4	92.1	83.8	68.2	54.4	42.4	32.2	24.0
122.5°	152.9	133.6	116.1	97.6	90.3	82.0	66.3	53.4	41.5	32.2	24.0
125°	147.4	129.0	112.4	94.9	87.5	80.1	64.5	51.6	40.5	31.3	24.0
127.5°	141.9	125.3	108.7	92.1	84.8	77.4	63.6	50.7	39.6	31.3	24.0
130°	135.4	119.8	104.1	89.4	82.0	75.5	61.7	48.8	38.7	30.4	24.0
132.5°	129.9	115.2	100.4	86.6	79.2	72.8	59.9	47.9	38.7	30.4	24.0
135°	124.4	110.5	96.7	83.8	76.5	70.0	58.0	47.0	37.8	30.4	24.0
137.5°	117.9	105.0	92.1	80.1	73.7	68.2	56.2	46.1	36.8	30.4	24.0
140°	111.5	99.5	88.4	76.5	70.9	65.4	54.4	45.1	36.8	29.5	24.0
142.5°	105.0	94.0	83.8	72.8	68.2	62.6	52.5	44.2	35.9	29.5	24.0
145°	99.5	89.4	80.1	70.0	65.4	60.8	51.6	43.3	35.9	30.4	24.9
147.5°	94.0	84.8	75.5	67.2	62.6	58.0	49.7	42.4	35.9	30.4	24.9
150°	87.5	80.1	71.9	63.6	59.9	56.2	48.8	42.4	35.9	30.4	25.8
152.5°	82.0	74.6	68.2	60.8	57.1	54.4	47.9	41.5	35.9	30.4	25.8
155°	76.5	70.0	64.5	58.0	55.3	52.5	47.0	41.5	35.9	31.3	26.7
157.5°	70.9	66.3	60.8	56.2	53.4	50.7	46.1	40.5	35.9	31.3	27.6
160°	66.3	62.6	58.0	53.4	51.6	49.7	44.2	40.5	35.9	32.2	27.6
162.5°	62.6	59.0	55.3	51.6	49.7	47.9	43.3	39.6	35.9	32.2	28.6
165°	58.0	55.3	52.5	48.8	47.9	46.1	42.4	38.7	35.9	32.2	29.5
167.5°	54.4	51.6	49.7	47.0	45.1	44.2	41.5	38.7	35.9	33.2	30.4
170°	50.7	48.8	46.1	44.2	43.3	42.4	39.6	37.8	35.0	33.2	30.4
172.5°	46.1	45.1	43.3	41.5	40.5	40.5	38.7	36.8	35.0	33.2	31.3
175°	41.5	40.5	39.6	38.7	38.7	37.8	36.8	35.9	35.0	33.2	32.2
177.5°	36.8	36.8	36.8	35.9	35.9	35.9	35.0	35.0	34.1	34.1	33.2
180°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2



TEST NUMBER: P190124

CATALOG NUMBER: TRF11-LD4-20W-50-OPL-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°	32.2	31.3	31.3	30.4	30.4	29.5	28.6	28.6	27.6	26.7	26.7
5°	31.3	30.4	28.6	28.6	27.6	26.7	25.8	24.9	24.0	23.0	22.1
7.5°	30.4	28.6	26.7	25.8	24.9	24.0	22.1	21.2	20.3	19.3	18.4
10°	28.6	26.7	24.9	24.0	23.0	21.2	19.3	18.4	17.5	15.7	14.7
12.5°	27.6	24.9	23.0	22.1	21.2	18.4	17.5	15.7	13.8	12.9	12.0
15°	26.7	24.0	21.2	20.3	19.3	16.6	14.7	13.8	12.0	11.1	9.2
17.5°	25.8	23.0	20.3	18.4	17.5	14.7	12.9	11.1	10.1	8.3	7.4
20°	24.9	21.2	18.4	17.5	15.7	12.9	11.1	9.2	8.3	7.4	6.4
22.5°	24.0	20.3	17.5	15.7	13.8	12.0	10.1	8.3	6.4	6.4	5.5
25°	23.0	19.3	15.7	14.7	12.9	10.1	8.3	7.4	6.4	5.5	5.5
27.5°	22.1	18.4	14.7	12.9	12.0	9.2	7.4	6.4	5.5	5.5	5.5
30°	21.2	17.5	13.8	12.0	11.1	8.3	6.4	5.5	5.5	5.5	5.5
32.5°	21.2	16.6	12.9	11.1	10.1	7.4	6.4	5.5	5.5	5.5	5.5
35°	20.3	16.6	12.9	11.1	9.2	6.4	5.5	5.5	5.5	5.5	4.6
37.5°	19.3	15.7	12.0	10.1	8.3	6.4	5.5	5.5	5.5	5.5	4.6
40°	19.3	14.7	11.1	9.2	7.4	5.5	5.5	5.5	5.5	5.5	4.6
42.5°	19.3	14.7	10.1	8.3	7.4	5.5	5.5	5.5	5.5	5.5	4.6
45°	18.4	13.8	10.1	8.3	6.4	5.5	5.5	5.5	5.5	4.6	4.6
47.5°	18.4	13.8	9.2	7.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6
50°	18.4	12.9	8.3	7.4	5.5	5.5	5.5	5.5	5.5	4.6	4.6
52.5°	17.5	12.9	8.3	6.4	5.5	5.5	5.5	5.5	5.5	4.6	4.6
55°	17.5	12.0	7.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6	3.7
57.5°	17.5	12.0	7.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6	3.7
60°	16.6	11.1	7.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6	3.7
62.5°	16.6	11.1	6.4	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7
65°	16.6	10.1	6.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6	3.7
67.5°	16.6	10.1	6.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6	3.7
70°	16.6	10.1	6.4	6.4	5.5	5.5	5.5	5.5	4.6	4.6	3.7
72.5°	16.6	10.1	6.4	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7
75°	15.7	9.2	6.4	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7
77.5°	15.7	9.2	5.5	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7
80°	15.7	9.2	5.5	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7
82.5°	15.7	9.2	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7	3.7
85°	15.7	9.2	5.5	5.5	5.5	5.5	5.5	4.6	4.6	3.7	3.7
87.5°	15.7	9.2	5.5	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7
90°	15.7	8.3	5.5	5.5	5.5	5.5	4.6	4.6	4.6	3.7	2.8
92.5°	15.7	9.2	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	2.8
95°	15.7	9.2	5.5	5.5	5.5	4.6	4.6	4.6	3.7	3.7	2.8
97.5°	15.7	9.2	5.5	5.5	5.5	4.6	4.6	3.7	3.7	3.7	2.8
100°	15.7	9.2	5.5	5.5	4.6	4.6	4.6	3.7	3.7	3.7	2.8
102.5°	15.7	9.2	5.5	4.6	4.6	4.6	4.6	3.7	3.7	2.8	2.8
105°	15.7	9.2	5.5	4.6	4.6	4.6	4.6	3.7	3.7	2.8	2.8
107.5°	15.7	9.2	5.5	4.6	4.6	4.6	4.6	3.7	3.7	2.8	2.8
110°	15.7	9.2	5.5	4.6	4.6	4.6	4.6	3.7	3.7	2.8	2.8



TEST NUMBER: P190124

CATALOG NUMBER: TRF11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	15.7	9.2	5.5	4.6	4.6	4.6	3.7	3.7	3.7	2.8	2.8
115°	16.6	10.1	5.5	4.6	4.6	4.6	4.6	3.7	3.7	3.7	2.8
117.5°	16.6	10.1	6.4	4.6	4.6	4.6	4.6	3.7	3.7	3.7	2.8
120°	16.6	11.1	6.4	4.6	4.6	4.6	4.6	3.7	3.7	3.7	2.8
122.5°	16.6	11.1	6.4	4.6	4.6	4.6	4.6	3.7	3.7	3.7	2.8
125°	17.5	11.1	7.4	5.5	4.6	4.6	3.7	3.7	3.7	3.7	2.8
127.5°	17.5	12.0	7.4	5.5	4.6	4.6	3.7	3.7	3.7	3.7	2.8
130°	17.5	12.0	8.3	6.4	4.6	4.6	3.7	3.7	3.7	3.7	2.8
132.5°	17.5	12.9	8.3	6.4	4.6	4.6	3.7	3.7	3.7	3.7	2.8
135°	18.4	12.9	9.2	7.4	5.5	4.6	3.7	3.7	3.7	3.7	2.8
137.5°	18.4	13.8	9.2	8.3	6.4	4.6	3.7	3.7	3.7	3.7	2.8
140°	18.4	13.8	10.1	8.3	6.4	4.6	3.7	3.7	3.7	2.8	2.8
142.5°	19.3	14.7	11.1	9.2	7.4	4.6	3.7	3.7	3.7	2.8	2.8
145°	19.3	15.7	12.0	10.1	8.3	5.5	3.7	3.7	3.7	3.7	2.8
147.5°	20.3	15.7	12.0	11.1	9.2	6.4	4.6	3.7	3.7	3.7	2.8
150°	21.2	16.6	12.9	12.0	10.1	7.4	5.5	3.7	3.7	3.7	2.8
152.5°	21.2	17.5	13.8	12.9	11.1	8.3	6.4	4.6	3.7	3.7	2.8
155°	22.1	18.4	15.7	13.8	12.0	9.2	7.4	5.5	4.6	3.7	3.7
157.5°	23.0	19.3	16.6	14.7	13.8	11.1	9.2	7.4	5.5	4.6	3.7
160°	24.0	21.2	17.5	16.6	14.7	12.9	10.1	8.3	7.4	5.5	4.6
162.5°	24.9	22.1	19.3	18.4	16.6	14.7	12.0	10.1	9.2	7.4	6.4
165°	26.7	24.0	21.2	19.3	18.4	16.6	14.7	12.9	11.1	10.1	9.2
167.5°	27.6	24.9	23.0	22.1	20.3	18.4	16.6	15.7	13.8	12.9	11.1
170°	28.6	26.7	24.9	24.0	23.0	21.2	19.3	18.4	16.6	15.7	14.7
172.5°	30.4	28.6	26.7	25.8	24.9	24.0	23.0	21.2	20.3	19.3	18.4
175°	31.3	30.4	29.5	28.6	27.6	26.7	25.8	24.9	24.0	23.0	22.1
177.5°	32.2	32.2	31.3	31.3	30.4	30.4	29.5	29.5	28.6	28.6	27.6
180°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2



TEST NUMBER: P190124

CATALOG NUMBER: TRF11-LD4-20W-50-OPL-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°	25.8	25.8	25.8	24.9	24.9	24.9	24.0	24.9
5°	21.2	21.2	20.3	20.3	19.3	19.3	19.3	19.3
7.5°	17.5	16.6	16.6	15.7	15.7	15.7	15.7	14.7
10°	13.8	12.9	12.9	12.9	12.0	12.0	12.0	12.0
12.5°	11.1	10.1	10.1	9.2	9.2	9.2	8.3	8.3
15°	8.3	8.3	7.4	7.4	7.4	6.4	6.4	6.4
17.5°	7.4	6.4	6.4	5.5	5.5	5.5	5.5	5.5
20°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
22.5°	5.5	5.5	5.5	5.5	4.6	4.6	4.6	4.6
25°	5.5	5.5	5.5	5.5	4.6	4.6	4.6	4.6
27.5°	5.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
30°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
32.5°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
35°	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7
37.5°	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7
40°	4.6	4.6	3.7	3.7	3.7	3.7	3.7	3.7
42.5°	4.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7
45°	4.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7
47.5°	3.7	3.7	3.7	3.7	3.7	2.8	2.8	2.8
50°	3.7	3.7	3.7	2.8	2.8	2.8	2.8	2.8
52.5°	3.7	3.7	3.7	2.8	2.8	2.8	2.8	2.8
55°	3.7	2.8	2.8	2.8	2.8	2.8	1.8	1.8
57.5°	3.7	2.8	2.8	2.8	2.8	1.8	1.8	1.8
60°	3.7	2.8	2.8	2.8	2.8	1.8	1.8	1.8
62.5°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
65°	3.7	2.8	2.8	2.8	1.8	1.8	1.8	1.8
67.5°	2.8	2.8	2.8	1.8	1.8	1.8	0.9	0.9
70°	2.8	2.8	2.8	1.8	1.8	1.8	0.9	0.9
72.5°	2.8	2.8	2.8	1.8	1.8	1.8	0.9	0.9
75°	2.8	2.8	1.8	1.8	1.8	1.8	0.9	0.9
77.5°	2.8	2.8	1.8	1.8	1.8	0.9	0.9	0.9
80°	2.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
82.5°	2.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
85°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
87.5°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
90°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
92.5°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
95°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
97.5°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
100°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
102.5°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
105°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
107.5°	2.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
110°	2.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9



TEST NUMBER: P190124

CATALOG NUMBER: TRF11-LD4-20W-50-OPL-BK-UNV-EDC1-CSTG

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	2.8	1.8	1.8	1.8	1.8	0.9	0.9	0.9
115°	2.8	2.8	1.8	1.8	1.8	1.8	0.9	0.9
117.5°	2.8	2.8	1.8	1.8	1.8	1.8	1.8	1.8
120°	2.8	2.8	1.8	1.8	1.8	1.8	1.8	1.8
122.5°	2.8	2.8	1.8	1.8	1.8	1.8	1.8	1.8
125°	2.8	2.8	1.8	1.8	1.8	1.8	1.8	1.8
127.5°	2.8	2.8	1.8	1.8	1.8	1.8	1.8	1.8
130°	2.8	2.8	2.8	1.8	1.8	1.8	1.8	1.8
132.5°	2.8	2.8	2.8	2.8	1.8	1.8	1.8	1.8
135°	2.8	2.8	2.8	2.8	1.8	1.8	1.8	1.8
137.5°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
140°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
142.5°	2.8	2.8	2.8	2.8	2.8	1.8	1.8	1.8
145°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
147.5°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
150°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
152.5°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
155°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
157.5°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
160°	3.7	3.7	2.8	2.8	2.8	2.8	2.8	2.8
162.5°	5.5	4.6	4.6	4.6	3.7	3.7	3.7	3.7
165°	7.4	6.4	6.4	6.4	5.5	5.5	5.5	5.5
167.5°	10.1	9.2	9.2	9.2	8.3	8.3	8.3	8.3
170°	13.8	12.9	12.9	12.0	12.0	11.1	11.1	11.1
172.5°	17.5	16.6	16.6	16.6	15.7	15.7	15.7	15.7
175°	22.1	21.2	21.2	21.2	20.3	20.3	20.3	20.3
177.5°	26.7	26.7	26.7	26.7	25.8	25.8	25.8	25.8
180°	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2

(END OF REPORT)