

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: P190097

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

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190097
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27862)
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
Description: TERRAPIN 11" LED 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

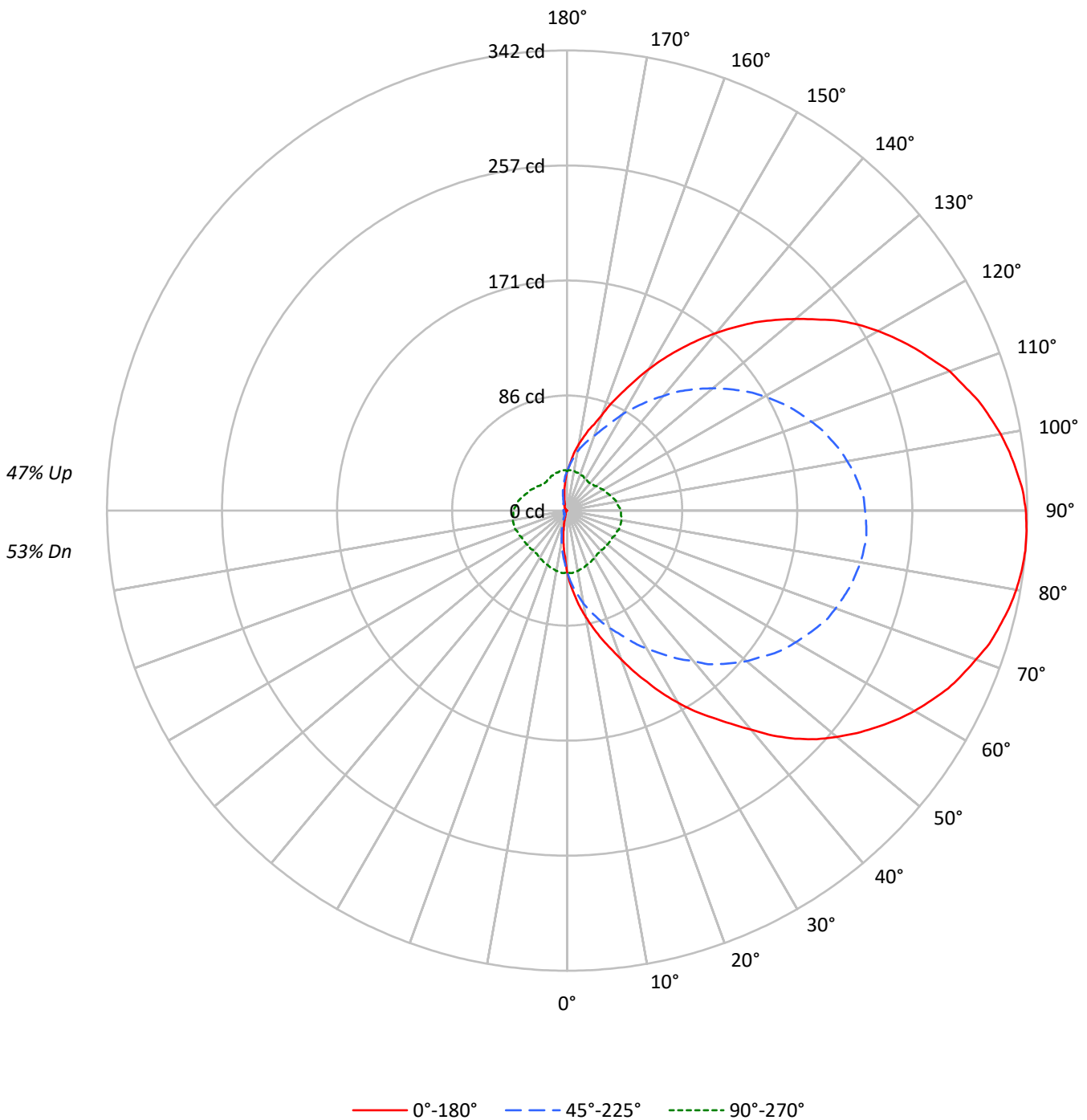
Lumens per Lamp: N/A
Luminaire Lumens: 1053.0 lumens
Efficiency: N/A
Efficacy: 47.9 lumens/watt
Spacing Criteria (0/90/45): 3.12 / 1.34 / 2.56
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 22
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	50	30	10	0	
RCR																						
0	108	108	108	108	100	100	100	100	85	85	85	72	72	72	59	59	59	53				
1	93	86	80	74	85	79	74	69	66	62	58	54	51	48	43	41	39	33				
2	82	72	64	56	75	66	59	52	55	49	44	44	40	36	35	31	28	23				
3	74	62	52	44	67	56	48	41	47	40	34	38	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	29	23	19	22	18	14	11				
6	56	41	32	25	51	38	29	23	32	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	26	19	14	21	15	12	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°	1836	1836	1836
5°	1994	1728	897
10°	2110	1585	408
15°	2226	1469	165
20°	2350	1344	72
25°	2530	1269	49
30°	2725	1208	45
35°	2882	1133	28
40°	3069	1094	26
45°	3294	1116	12
50°	3453	1120	12
55°	3590	1133	12
60°	3724	1155	11
65°	3847	1215	11
70°	3952	1288	11
75°	4066	1348	11
80°	4175	1425	11
85°	4276	1490	11



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	4.4	0.4
10°-20°	13.9	1.3
20°-30°	26.2	2.5
30°-40°	42.5	4.0
40°-50°	62.4	5.9
50°-60°	82.3	7.8
60°-70°	99.6	9.5
70°-80°	112.3	10.7
80°-90°	118.0	11.2
90°-100°	115.4	11.0
100°-110°	105.0	10.0
110°-120°	89.0	8.5
120°-130°	69.8	6.6
130°-140°	50.0	4.8
140°-150°	32.1	3.0
150°-160°	18.1	1.7
160°-170°	9.1	0.9
170°-180°	2.9	0.3
0°-30°	44.4	4.2
0°-40°	87.0	8.3
0°-60°	231.6	22.0
0°-90°	561.5	53.3
90°-120°	309.4	29.4
90°-150°	461.3	43.8
90°-180°	491.0	46.6
0°-180°	1053.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	46	46	46	46	46	
5°	63	58	46	34	28	7
15°	98	81	45	16	7	28
25°	140	105	42	6	3	66
35°	188	132	39	4	2	119
45°	240	161	39	3	1	185
55°	281	186	39	3	1	252
65°	313	205	40	3	1	310
75°	333	218	41	3	1	352
85°	342	223	40	3	1	279
90°	341	222	40	3	1	187
95°	335	218	38	3	1	272
105°	316	203	36	3	1	334
115°	285	182	32	3	1	283
125°	246	156	29	4	2	220
135°	198	127	27	5	2	153
145°	147	97	26	5	4	93
155°	97	69	28	6	5	46
165°	62	52	29	12	7	18
175°	38	36	30	23	19	4
180°	29	29	29	29	29	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2.5°	54.7	53.8	53.8	53.8	53.8	53.8	52.9	52.9	52.9	51.9	51.9
5°	62.9	62.9	62.9	62.0	62.0	62.0	61.1	61.1	60.2	59.2	58.3
7.5°	72.0	72.0	71.1	71.1	70.2	69.3	69.3	68.4	66.5	65.6	63.8
10°	80.2	80.2	79.3	79.3	78.4	77.5	76.6	75.6	73.8	72.0	70.2
12.5°	89.3	89.3	88.4	87.5	86.6	85.7	84.8	82.9	80.2	78.4	75.6
15°	98.4	98.4	97.5	96.6	94.8	93.9	93.0	90.2	87.5	84.8	81.1
17.5°	107.5	107.5	105.7	104.8	103.0	102.1	100.3	97.5	94.8	91.1	87.5
20°	117.6	116.7	115.7	113.9	112.1	110.3	108.5	105.7	101.2	97.5	93.0
22.5°	129.4	127.6	126.7	124.0	121.2	120.3	117.6	113.9	109.4	103.9	98.4
25°	140.4	140.4	137.6	135.8	131.2	130.3	127.6	123.0	117.6	111.2	104.8
27.5°	153.1	152.2	149.5	146.7	143.1	140.4	138.5	133.1	125.8	119.4	112.1
30°	165.0	164.1	161.3	158.6	154.0	151.3	148.6	142.2	134.9	127.6	118.5
32.5°	176.8	175.9	173.2	169.5	164.1	161.3	158.6	151.3	143.1	134.9	124.9
35°	187.7	187.7	185.0	180.5	175.0	172.3	168.6	161.3	152.2	142.2	132.2
37.5°	199.6	199.6	196.9	192.3	185.9	182.3	179.5	170.4	161.3	150.4	139.4
40°	212.4	211.4	207.8	203.2	196.9	192.3	188.7	179.5	169.5	157.7	145.8
42.5°	226.9	226.0	222.4	217.8	210.5	206.9	202.3	191.4	180.5	168.6	154.9
45°	239.7	239.7	236.1	228.8	220.6	216.9	212.4	201.4	188.7	175.9	161.3
47.5°	251.5	250.6	246.1	240.6	230.6	226.0	221.5	209.6	196.9	183.2	167.7
50°	261.6	260.7	257.0	250.6	242.4	237.9	229.7	218.7	205.1	190.5	174.1
52.5°	271.6	270.7	267.0	260.7	251.5	247.0	240.6	226.0	212.4	196.9	179.5
55°	280.7	279.8	275.2	268.9	260.7	254.3	248.8	235.1	219.6	203.2	185.9
57.5°	289.8	288.0	284.4	277.1	268.0	262.5	257.0	243.3	226.0	208.7	191.4
60°	298.0	296.2	291.6	285.3	275.2	269.8	263.4	249.7	233.3	215.1	196.0
62.5°	305.3	303.5	298.9	292.6	282.5	276.2	270.7	256.1	239.7	219.6	200.5
65°	312.6	309.9	305.3	298.9	288.9	282.5	276.2	262.5	246.1	225.1	205.1
67.5°	318.1	316.3	311.7	304.4	294.4	288.0	281.6	267.0	250.6	229.7	209.6
70°	323.5	322.6	317.2	310.8	299.9	293.5	287.1	272.5	255.2	234.2	212.4
72.5°	329.0	327.2	322.6	315.3	304.4	298.0	291.6	276.2	257.9	238.8	215.1
75°	332.7	331.7	326.3	319.0	308.1	301.7	294.4	278.9	261.6	241.5	217.8
77.5°	336.3	334.5	329.9	321.7	311.7	304.4	298.0	282.5	264.3	244.3	219.6
80°	339.0	337.2	332.7	324.5	313.5	307.1	299.9	284.4	266.1	246.1	221.5
82.5°	340.9	339.0	333.6	325.4	315.3	309.0	301.7	286.2	268.0	247.0	222.4
85°	341.8	340.0	334.5	326.3	316.3	309.9	302.6	286.2	268.0	247.9	223.3
87.5°	341.8	340.0	334.5	326.3	315.3	309.0	301.7	286.2	268.0	247.0	222.4
90°	340.9	339.0	333.6	325.4	314.4	308.1	300.8	285.3	266.1	246.1	221.5
92.5°	339.0	336.3	331.7	323.5	312.6	306.2	298.9	283.4	265.2	245.2	220.6
95°	335.4	334.5	329.0	320.8	309.9	304.4	297.1	280.7	262.5	242.4	217.8
97.5°	331.7	329.9	325.4	317.2	306.2	299.9	293.5	278.0	259.7	239.7	215.1
100°	327.2	325.4	320.8	312.6	301.7	296.2	288.9	273.4	256.1	234.2	211.4
102.5°	321.7	320.8	315.3	308.1	297.1	291.6	284.4	268.9	251.5	228.8	207.8
105°	316.3	314.4	309.9	301.7	291.6	285.3	278.9	263.4	246.1	224.2	203.2
107.5°	309.0	308.1	303.5	295.3	286.2	279.8	272.5	257.9	240.6	219.6	198.7
110°	302.6	299.9	296.2	288.9	278.9	273.4	266.1	251.5	233.3	213.3	193.2



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	293.5	292.6	288.0	280.7	270.7	265.2	258.8	244.3	226.0	207.8	187.7
115°	285.3	283.4	279.8	272.5	263.4	257.9	251.5	236.1	218.7	201.4	182.3
117.5°	276.2	275.2	270.7	263.4	255.2	249.7	243.3	226.9	211.4	194.1	175.9
120°	267.0	265.2	261.6	254.3	246.1	240.6	232.4	218.7	204.2	187.7	169.5
122.5°	257.0	255.2	250.6	245.2	236.1	228.8	223.3	210.5	196.0	179.5	163.1
125°	246.1	245.2	240.6	232.4	225.1	219.6	214.2	201.4	187.7	172.3	155.8
127.5°	233.3	231.5	227.8	222.4	214.2	209.6	204.2	192.3	179.5	164.1	148.6
130°	221.5	220.6	216.9	211.4	204.2	198.7	194.1	182.3	170.4	155.8	141.3
132.5°	209.6	209.6	205.1	200.5	193.2	188.7	184.1	173.2	161.3	147.6	134.0
135°	197.8	196.9	194.1	188.7	182.3	177.7	173.2	163.1	152.2	139.4	126.7
137.5°	185.0	185.0	181.4	176.8	170.4	166.8	162.2	153.1	142.2	130.3	119.4
140°	172.3	171.3	168.6	165.0	158.6	154.9	151.3	142.2	132.2	122.1	111.2
142.5°	159.5	158.6	155.8	152.2	146.7	143.1	139.4	131.2	123.0	113.9	103.9
145°	146.7	145.8	144.0	140.4	134.9	132.2	128.5	121.2	113.9	104.8	96.6
147.5°	134.0	133.1	131.2	128.5	124.0	120.3	117.6	111.2	104.8	97.5	89.3
150°	121.2	121.2	119.4	116.7	113.0	110.3	107.5	102.1	95.7	89.3	82.9
152.5°	108.5	108.5	107.5	104.8	101.2	99.3	96.6	92.1	86.6	81.1	75.6
155°	96.6	96.6	95.7	93.0	90.2	88.4	86.6	82.9	78.4	74.7	69.3
157.5°	86.6	85.7	84.8	82.9	81.1	79.3	77.5	74.7	72.0	68.4	63.8
160°	75.6	75.6	74.7	73.8	72.0	71.1	70.2	67.4	64.7	62.0	59.2
162.5°	67.4	67.4	66.5	65.6	64.7	63.8	63.8	62.0	60.2	57.4	55.6
165°	62.0	61.1	61.1	60.2	59.2	59.2	58.3	57.4	55.6	53.8	51.9
167.5°	55.6	55.6	55.6	55.6	53.8	53.8	53.8	52.9	51.0	50.1	48.3
170°	50.1	50.1	50.1	50.1	49.2	48.3	48.3	47.4	46.5	45.6	44.7
172.5°	44.7	44.7	44.7	43.7	43.7	43.7	42.8	42.8	41.9	41.0	40.1
175°	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	37.4	37.4	36.5
177.5°	32.8	32.8	32.8	33.7	32.8	32.8	32.8	33.7	32.8	32.8	32.8
180°	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2.5°	51.9	51.0	50.1	50.1	49.2	49.2	48.3	48.3	47.4	46.5	45.6
5°	57.4	55.6	54.7	53.8	52.9	51.9	51.0	49.2	47.4	46.5	44.7
7.5°	62.0	60.2	58.3	56.5	55.6	54.7	52.9	50.1	48.3	45.6	43.7
10°	67.4	64.7	62.9	60.2	58.3	57.4	53.8	51.0	48.3	45.6	42.8
12.5°	72.9	69.3	66.5	62.9	61.1	59.2	55.6	51.9	48.3	44.7	41.0
15°	78.4	73.8	70.2	65.6	63.8	62.0	57.4	52.9	48.3	44.7	40.1
17.5°	82.9	78.4	73.8	68.4	66.5	63.8	58.3	53.8	48.3	43.7	39.2
20°	87.5	82.0	76.6	71.1	68.4	65.6	60.2	53.8	48.3	42.8	38.3
22.5°	92.1	86.6	80.2	73.8	70.2	67.4	61.1	54.7	48.3	42.8	37.4
25°	97.5	91.1	83.8	76.6	72.9	69.3	62.0	54.7	48.3	41.9	35.5
27.5°	103.9	95.7	87.5	79.3	74.7	71.1	62.9	55.6	48.3	41.0	34.6
30°	109.4	101.2	92.1	82.0	77.5	72.9	63.8	55.6	48.3	41.0	34.6
32.5°	115.7	105.7	95.7	84.8	80.2	74.7	64.7	55.6	47.4	40.1	32.8
35°	121.2	110.3	99.3	88.4	82.9	77.5	66.5	56.5	47.4	39.2	32.8
37.5°	127.6	115.7	103.0	91.1	84.8	79.3	67.4	57.4	47.4	39.2	31.9
40°	133.1	120.3	106.6	93.9	87.5	81.1	69.3	57.4	47.4	38.3	31.0
42.5°	140.4	126.7	112.1	98.4	91.1	84.8	71.1	59.2	48.3	39.2	31.0
45°	146.7	131.2	116.7	101.2	93.9	86.6	72.0	59.2	48.3	39.2	31.0
47.5°	152.2	135.8	119.4	103.9	96.6	88.4	73.8	60.2	48.3	38.3	30.1
50°	157.7	140.4	123.0	106.6	98.4	91.1	74.7	61.1	49.2	39.2	30.1
52.5°	162.2	144.9	126.7	109.4	101.2	93.0	76.6	62.0	49.2	39.2	30.1
55°	167.7	148.6	130.3	112.1	103.0	93.9	77.5	62.9	50.1	39.2	30.1
57.5°	172.3	152.2	133.1	113.9	104.8	95.7	78.4	63.8	50.1	39.2	29.2
60°	175.9	155.8	135.8	115.7	106.6	97.5	79.3	63.8	51.0	39.2	29.2
62.5°	180.5	159.5	137.6	117.6	107.5	98.4	80.2	64.7	51.9	40.1	29.2
65°	184.1	162.2	140.4	119.4	109.4	99.3	81.1	65.6	51.9	40.1	29.2
67.5°	187.7	165.0	143.1	121.2	110.3	100.3	82.0	66.5	52.9	40.1	29.2
70°	190.5	167.7	144.9	122.1	111.2	101.2	82.9	67.4	53.8	41.0	29.2
72.5°	193.2	169.5	145.8	123.0	112.1	102.1	82.9	68.4	53.8	41.0	28.3
75°	195.0	171.3	147.6	124.0	113.0	102.1	83.8	68.4	54.7	41.0	28.3
77.5°	196.9	173.2	148.6	124.9	113.0	102.1	83.8	69.3	54.7	41.0	28.3
80°	197.8	174.1	149.5	124.9	113.9	103.0	83.8	69.3	54.7	41.0	28.3
82.5°	198.7	175.0	149.5	124.9	113.9	102.1	84.8	70.2	55.6	41.0	27.3
85°	198.7	175.0	149.5	124.9	113.0	102.1	84.8	70.2	54.7	40.1	27.3
87.5°	198.7	174.1	149.5	124.9	113.0	102.1	84.8	69.3	54.7	40.1	27.3
90°	197.8	173.2	148.6	124.0	112.1	101.2	83.8	69.3	54.7	40.1	26.4
92.5°	196.9	172.3	146.7	122.1	111.2	100.3	82.9	68.4	53.8	39.2	26.4
95°	194.1	169.5	144.9	121.2	109.4	98.4	82.0	67.4	52.9	38.3	25.5
97.5°	191.4	167.7	143.1	119.4	108.5	97.5	81.1	66.5	51.9	37.4	25.5
100°	188.7	165.0	140.4	117.6	106.6	96.6	79.3	65.6	51.0	37.4	24.6
102.5°	185.0	162.2	137.6	114.8	104.8	94.8	78.4	63.8	50.1	36.5	24.6
105°	180.5	157.7	134.9	113.0	103.0	93.0	76.6	62.0	48.3	35.5	24.6
107.5°	176.8	154.0	132.2	110.3	100.3	91.1	74.7	60.2	47.4	34.6	23.7
110°	172.3	150.4	128.5	107.5	98.4	89.3	72.9	58.3	45.6	33.7	23.7



TEST NUMBER: P190097

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

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	166.8	145.8	124.9	104.8	95.7	87.5	71.1	57.4	44.7	32.8	22.8
115°	162.2	141.3	121.2	102.1	93.0	84.8	69.3	55.6	42.8	31.9	22.8
117.5°	156.8	136.7	117.6	99.3	90.2	82.9	67.4	53.8	41.9	31.9	22.8
120°	150.4	132.2	113.0	95.7	87.5	80.2	65.6	51.9	40.1	31.0	22.8
122.5°	144.9	126.7	109.4	93.0	84.8	77.5	62.9	50.1	39.2	30.1	21.9
125°	138.5	122.1	104.8	89.3	82.0	74.7	61.1	48.3	38.3	29.2	21.9
127.5°	132.2	116.7	100.3	85.7	79.3	72.0	59.2	47.4	37.4	29.2	21.9
130°	125.8	111.2	95.7	82.0	75.6	69.3	56.5	45.6	35.5	28.3	21.9
132.5°	119.4	105.7	92.1	79.3	72.9	66.5	54.7	43.7	34.6	27.3	21.9
135°	113.0	100.3	87.5	75.6	69.3	63.8	52.9	42.8	33.7	27.3	21.9
137.5°	106.6	94.8	82.9	72.0	66.5	61.1	50.1	41.0	33.7	27.3	21.9
140°	100.3	89.3	78.4	68.4	62.9	57.4	48.3	40.1	32.8	26.4	21.9
142.5°	93.9	83.8	73.8	64.7	60.2	55.6	46.5	39.2	31.9	26.4	21.9
145°	87.5	78.4	70.2	61.1	56.5	52.9	44.7	37.4	31.9	26.4	22.8
147.5°	81.1	73.8	65.6	57.4	53.8	50.1	43.7	37.4	31.9	27.3	22.8
150°	75.6	68.4	62.0	54.7	51.0	48.3	41.9	36.5	31.9	27.3	23.7
152.5°	70.2	63.8	57.4	51.9	49.2	46.5	41.0	36.5	31.9	27.3	23.7
155°	64.7	59.2	54.7	49.2	47.4	44.7	40.1	35.5	31.9	28.3	24.6
157.5°	60.2	55.6	51.9	47.4	45.6	43.7	39.2	35.5	31.9	28.3	24.6
160°	55.6	52.9	49.2	45.6	43.7	42.8	39.2	35.5	31.9	28.3	25.5
162.5°	52.9	50.1	47.4	43.7	42.8	41.0	38.3	34.6	31.9	29.2	26.4
165°	49.2	47.4	44.7	41.9	41.0	39.2	37.4	34.6	31.9	29.2	26.4
167.5°	46.5	44.7	42.8	40.1	39.2	38.3	36.5	33.7	31.9	29.2	27.3
170°	42.8	41.9	40.1	38.3	37.4	36.5	35.5	33.7	31.9	30.1	28.3
172.5°	39.2	38.3	37.4	36.5	35.5	35.5	33.7	32.8	31.0	30.1	28.3
175°	35.5	35.5	34.6	33.7	33.7	33.7	32.8	31.9	31.0	30.1	29.2
177.5°	32.8	32.8	32.8	31.9	31.9	31.9	31.9	31.0	31.0	30.1	30.1
180°	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2



TEST NUMBER: P190097

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2.5°	44.7	43.7	42.8	42.8	41.9	41.9	41.0	40.1	39.2	38.3	37.4
5°	42.8	41.9	40.1	39.2	39.2	37.4	35.5	34.6	33.7	32.8	31.0
7.5°	41.0	39.2	37.4	36.5	35.5	33.7	31.0	30.1	28.3	27.3	25.5
10°	40.1	37.4	34.6	32.8	31.9	29.2	27.3	25.5	23.7	22.8	21.0
12.5°	38.3	34.6	31.9	30.1	29.2	26.4	23.7	21.9	19.1	17.3	15.5
15°	36.5	32.8	29.2	28.3	26.4	22.8	20.1	18.2	15.5	13.7	11.8
17.5°	34.6	31.0	27.3	25.5	23.7	20.1	17.3	14.6	11.8	10.0	8.2
20°	33.7	29.2	24.6	22.8	21.0	17.3	14.6	11.8	9.1	7.3	6.4
22.5°	31.9	27.3	22.8	21.0	19.1	15.5	11.8	9.1	7.3	5.5	4.6
25°	30.1	25.5	21.0	18.2	16.4	12.8	9.1	7.3	5.5	3.6	3.6
27.5°	29.2	23.7	19.1	16.4	14.6	10.9	7.3	5.5	3.6	3.6	3.6
30°	28.3	22.8	17.3	15.5	12.8	9.1	6.4	4.6	3.6	3.6	3.6
32.5°	27.3	21.0	16.4	13.7	11.8	7.3	4.6	3.6	3.6	3.6	3.6
35°	25.5	20.1	14.6	12.8	10.0	6.4	3.6	3.6	3.6	3.6	2.7
37.5°	25.5	19.1	13.7	10.9	9.1	5.5	3.6	3.6	3.6	3.6	2.7
40°	24.6	18.2	12.8	10.0	8.2	4.6	3.6	3.6	2.7	2.7	2.7
42.5°	23.7	17.3	11.8	9.1	6.4	4.6	3.6	3.6	3.6	2.7	2.7
45°	23.7	17.3	10.9	8.2	5.5	3.6	3.6	3.6	2.7	2.7	2.7
47.5°	22.8	15.5	10.0	7.3	4.6	3.6	3.6	3.6	2.7	2.7	2.7
50°	22.8	15.5	9.1	6.4	4.6	3.6	3.6	3.6	2.7	2.7	2.7
52.5°	21.9	14.6	8.2	5.5	4.6	3.6	3.6	3.6	2.7	2.7	2.7
55°	21.0	13.7	7.3	5.5	4.6	3.6	3.6	3.6	2.7	2.7	1.8
57.5°	21.0	12.8	6.4	4.6	4.6	3.6	3.6	3.6	2.7	2.7	1.8
60°	20.1	12.8	6.4	4.6	4.6	3.6	3.6	2.7	2.7	2.7	1.8
62.5°	20.1	11.8	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7	1.8
65°	20.1	10.9	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
67.5°	19.1	10.9	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
70°	19.1	10.0	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
72.5°	18.2	10.0	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
75°	18.2	10.0	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
77.5°	17.3	9.1	4.6	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
80°	17.3	9.1	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
82.5°	17.3	9.1	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
85°	17.3	9.1	4.6	4.6	4.6	4.6	3.6	2.7	2.7	1.8	1.8
87.5°	16.4	8.2	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8	1.8
90°	16.4	8.2	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8	1.8
92.5°	16.4	8.2	5.5	4.6	4.6	4.6	3.6	2.7	2.7	1.8	1.8
95°	15.5	8.2	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8	1.8
97.5°	15.5	8.2	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8	1.8
100°	15.5	8.2	4.6	4.6	4.6	4.6	3.6	2.7	2.7	1.8	1.8
102.5°	15.5	8.2	5.5	4.6	4.6	4.6	3.6	3.6	2.7	1.8	1.8
105°	15.5	8.2	5.5	4.6	4.6	4.6	3.6	3.6	2.7	1.8	1.8
107.5°	15.5	9.1	5.5	4.6	4.6	4.6	3.6	3.6	2.7	1.8	1.8
110°	15.5	9.1	5.5	4.6	4.6	4.6	3.6	3.6	2.7	1.8	1.8



TEST NUMBER: P190097

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

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	15.5	9.1	5.5	4.6	4.6	4.6	3.6	3.6	2.7	2.7	1.8
115°	15.5	10.0	5.5	5.5	4.6	4.6	4.6	3.6	2.7	2.7	1.8
117.5°	15.5	10.0	6.4	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
120°	15.5	10.0	6.4	5.5	5.5	4.6	4.6	3.6	3.6	2.7	2.7
122.5°	15.5	10.9	7.3	5.5	5.5	4.6	4.6	3.6	3.6	3.6	2.7
125°	16.4	10.9	7.3	5.5	5.5	4.6	4.6	4.6	3.6	3.6	2.7
127.5°	16.4	11.8	8.2	6.4	5.5	5.5	4.6	4.6	3.6	3.6	2.7
130°	16.4	11.8	8.2	6.4	5.5	4.6	4.6	4.6	3.6	3.6	3.6
132.5°	16.4	12.8	9.1	7.3	5.5	5.5	4.6	4.6	4.6	3.6	3.6
135°	16.4	12.8	9.1	7.3	6.4	5.5	4.6	4.6	4.6	3.6	3.6
137.5°	17.3	13.7	10.0	8.2	6.4	5.5	4.6	4.6	4.6	3.6	3.6
140°	17.3	13.7	10.9	9.1	7.3	5.5	5.5	4.6	4.6	4.6	3.6
142.5°	18.2	14.6	10.9	10.0	8.2	6.4	5.5	5.5	4.6	4.6	4.6
145°	18.2	14.6	11.8	10.0	9.1	6.4	5.5	5.5	4.6	4.6	4.6
147.5°	19.1	15.5	12.8	10.9	10.0	7.3	6.4	5.5	5.5	4.6	4.6
150°	20.1	16.4	13.7	11.8	10.9	8.2	6.4	5.5	5.5	4.6	4.6
152.5°	20.1	17.3	14.6	12.8	11.8	9.1	7.3	6.4	5.5	5.5	5.5
155°	21.0	18.2	15.5	13.7	12.8	10.0	8.2	7.3	6.4	5.5	5.5
157.5°	21.9	19.1	16.4	15.5	13.7	11.8	10.0	8.2	7.3	6.4	5.5
160°	22.8	20.1	17.3	16.4	15.5	13.7	11.8	10.0	8.2	7.3	6.4
162.5°	23.7	21.0	19.1	17.3	16.4	14.6	12.8	11.8	10.0	9.1	8.2
165°	24.6	21.9	20.1	19.1	18.2	16.4	14.6	13.7	11.8	10.9	10.0
167.5°	25.5	23.7	21.9	21.0	20.1	18.2	17.3	15.5	14.6	12.8	12.8
170°	26.4	24.6	23.7	22.8	21.9	20.1	19.1	18.2	16.4	15.5	14.6
172.5°	27.3	26.4	24.6	24.6	23.7	22.8	21.0	20.1	19.1	18.2	18.2
175°	28.3	27.3	26.4	26.4	25.5	24.6	23.7	22.8	22.8	21.9	21.0
177.5°	29.2	29.2	28.3	28.3	28.3	27.3	27.3	26.4	26.4	25.5	25.5
180°	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2



TEST NUMBER: P190097

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2.5°	37.4	36.5	36.5	36.5	36.5	35.5	35.5	34.6
5°	30.1	30.1	30.1	29.2	28.3	28.3	28.3	28.3
7.5°	24.6	23.7	23.7	22.8	22.8	21.9	21.9	21.0
10°	19.1	18.2	18.2	17.3	16.4	16.4	16.4	15.5
12.5°	14.6	13.7	12.8	12.8	11.8	10.9	10.9	10.9
15°	10.0	9.1	9.1	8.2	8.2	7.3	7.3	7.3
17.5°	7.3	6.4	5.5	5.5	4.6	4.6	4.6	4.6
20°	4.6	4.6	3.6	3.6	3.6	3.6	3.6	3.6
22.5°	3.6	3.6	3.6	3.6	3.6	3.6	2.7	2.7
25°	3.6	3.6	3.6	2.7	2.7	2.7	2.7	2.7
27.5°	3.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7
30°	3.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7
32.5°	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
35°	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8
37.5°	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8
40°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
42.5°	2.7	1.8	1.8	1.8	1.8	1.8	0.9	0.9
45°	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9
47.5°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
50°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
52.5°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
55°	1.8	1.8	1.8	0.9	0.9	0.9	0.9	0.9
57.5°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
60°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
62.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
65°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
67.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
70°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
72.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
75°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
77.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
80°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
82.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
85°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
87.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
90°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
92.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
95°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
97.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
100°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
102.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
105°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
107.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
110°	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0



TEST NUMBER: P190097

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

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	1.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
115°	1.8	1.8	0.9	0.9	0.9	0.9	0.9	0.9
117.5°	1.8	1.8	1.8	1.8	0.9	0.9	0.9	0.9
120°	2.7	1.8	1.8	1.8	0.9	0.9	0.9	0.9
122.5°	2.7	1.8	1.8	1.8	1.8	0.9	0.9	0.9
125°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
127.5°	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8
130°	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8
132.5°	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8
135°	3.6	2.7	2.7	2.7	2.7	2.7	1.8	1.8
137.5°	3.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7
140°	3.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
142.5°	3.6	3.6	3.6	3.6	3.6	2.7	2.7	2.7
145°	4.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
147.5°	4.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
150°	4.6	4.6	4.6	4.6	3.6	3.6	3.6	3.6
152.5°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
155°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
157.5°	5.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
160°	6.4	5.5	5.5	5.5	4.6	4.6	4.6	4.6
162.5°	7.3	6.4	6.4	6.4	5.5	5.5	5.5	5.5
165°	9.1	8.2	8.2	8.2	7.3	7.3	7.3	7.3
167.5°	10.9	10.9	10.9	10.0	10.0	9.1	9.1	9.1
170°	14.6	13.7	13.7	12.8	12.8	11.8	11.8	11.8
172.5°	17.3	16.4	16.4	16.4	15.5	15.5	15.5	15.5
175°	21.0	20.1	20.1	20.1	19.1	19.1	19.1	19.1
177.5°	24.6	24.6	24.6	24.6	24.6	23.7	24.6	23.7
180°	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2

(END OF REPORT)