

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: P190088

Luminaire Tested: **TRR11-LD4-20W-50-CL-BK-UNV-EDC1**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190088
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27859)
Test Lab: INNOVATION CENTER(G2)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: TRR11-LD4-20W-50-CL-BK-UNV-EDC1
Description: TERRAPIN 11" LED WALL MOUNT WITH OPEN CLEAR LENS AND BRONZE RING
Light Source: (56) NICHIA 5000
NF2L757DRT
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 450mA
OT40W/1

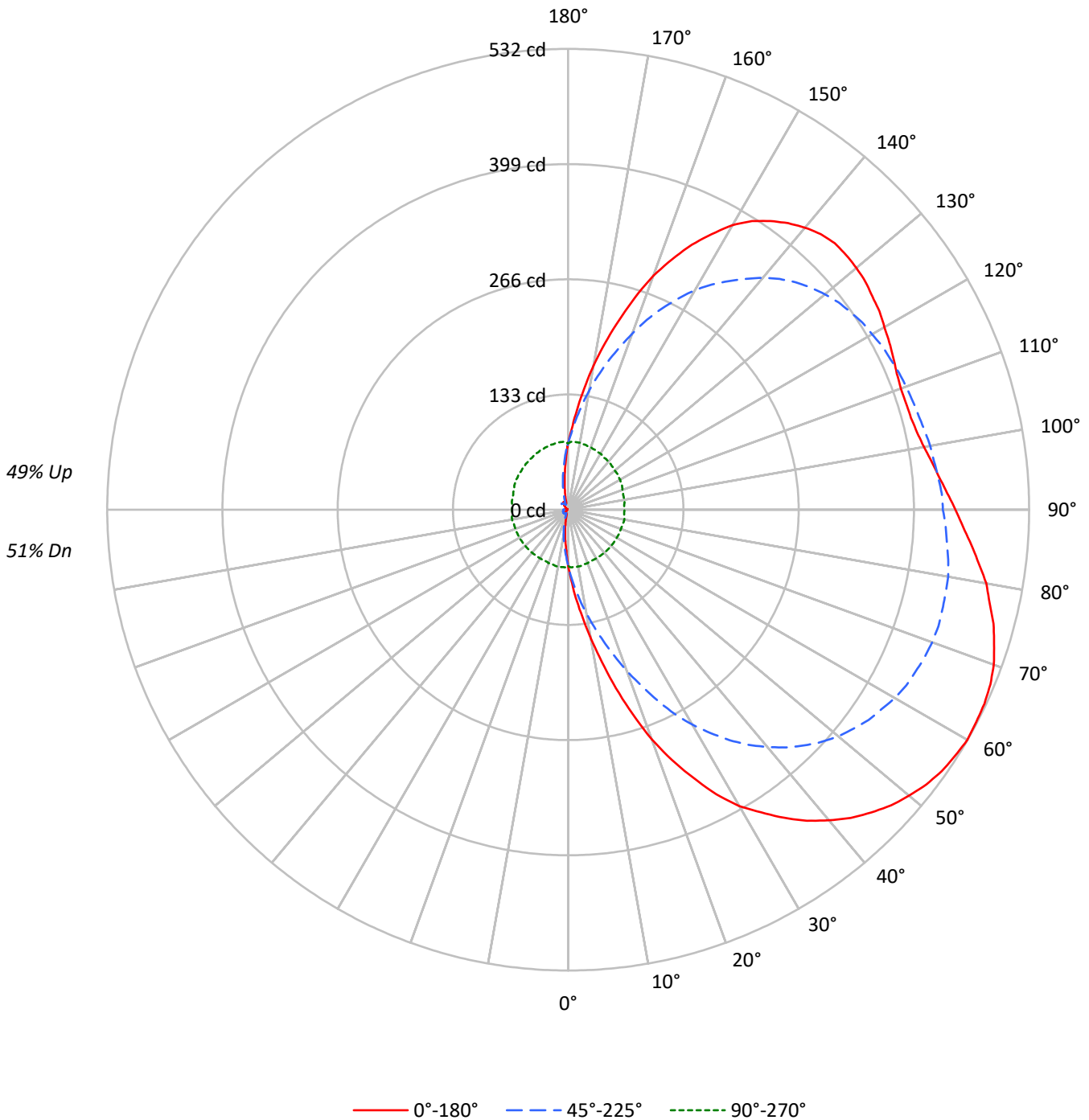
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 2129.0 lumens
Efficiency: N/A
Efficacy: 96.8 lumens/watt
Spacing Criteria (0/90/45): 3.51 / 1.53 / 3.09
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 (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	70	70	70	57	57	57	51
1	93	87	81	76	85	80	74	70	66	62	59	54	51	48	43	41	39	33
2	83	73	65	58	75	67	59	53	55	50	45	45	40	37	35	32	29	24
3	74	62	53	46	68	57	49	42	47	41	35	38	33	29	29	26	22	18
4	67	54	45	37	61	50	41	34	41	34	29	33	27	23	25	21	18	14
5	61	47	38	31	56	43	35	28	36	29	24	29	23	19	22	18	15	11
6	56	42	33	26	51	39	30	24	32	25	20	26	20	16	20	15	12	9
7	51	38	29	22	47	34	26	21	28	22	17	23	18	14	18	14	10	8
8	48	34	25	19	43	31	23	18	26	19	15	21	16	12	16	12	9	6
9	44	31	22	17	40	28	21	15	23	17	13	19	14	10	15	11	8	5
10	41	28	20	15	37	26	18	14	21	15	11	17	12	9	14	10	7	5

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	2609	2609	2609
5°	3240	2475	1157
10°	3959	2315	479
15°	4831	2160	186
20°	5633	2064	92
25°	6147	1963	99
30°	6524	1910	91
35°	6667	1873	84
40°	6762	1852	79
45°	6795	1845	49
50°	6779	1852	36
55°	6732	1873	35
60°	6645	1910	22
65°	6523	1963	22
70°	6386	2035	22
75°	6209	2130	22
80°	6034	2283	33
85°	5844	2408	23



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	6.7	0.3
10°-20°	25.6	1.2
20°-30°	56.7	2.7
30°-40°	96.1	4.5
40°-50°	135.8	6.4
50°-60°	169.8	8.0
60°-70°	194.0	9.1
70°-80°	205.8	9.7
80°-90°	205.1	9.6
90°-100°	197.3	9.3
100°-110°	186.2	8.7
110°-120°	173.3	8.1
120°-130°	155.4	7.3
130°-140°	129.6	6.1
140°-150°	95.9	4.5
150°-160°	59.5	2.8
160°-170°	28.4	1.3
170°-180°	7.8	0.4
0°-30°	89.0	4.2
0°-40°	185.1	8.7
0°-60°	490.7	23.1
0°-90°	1095.6	51.5
90°-120°	556.8	26.2
90°-150°	937.7	44.0
90°-180°	1033.0	48.5
0°-180°	2129.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	65	65	65	65	65	
5°	102	91	67	45	36	11
15°	214	157	66	18	8	63
25°	341	243	65	6	6	159
35°	434	325	65	6	6	273
45°	494	385	65	6	4	383
55°	526	423	65	6	3	471
65°	530	442	65	6	2	525
75°	508	447	65	6	2	536
85°	467	439	65	6	2	386
90°	447	432	65	5	2	245
95°	430	429	65	6	2	349
105°	410	419	66	6	1	435
115°	414	410	68	7	2	411
125°	429	398	70	9	3	385
135°	435	371	71	10	6	335
145°	407	322	73	8	10	255
155°	338	256	76	7	9	157
165°	226	177	78	20	9	66
175°	115	105	78	54	44	13
180°	77	77	77	77	77	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
2.5°	81.2	81.2	81.2	80.3	80.3	79.4	80.3	79.4	78.5	78.5	77.5
5°	102.2	101.3	101.3	100.3	99.4	97.6	98.5	97.6	94.9	93.0	91.2
7.5°	124.1	124.1	124.1	122.2	120.4	120.4	118.6	116.8	112.2	109.5	105.8
10°	150.5	149.6	149.6	146.9	143.2	143.2	140.5	136.8	131.4	126.8	121.3
12.5°	179.7	178.8	177.9	174.2	169.7	166.9	166.0	159.6	153.3	146.0	138.7
15°	213.5	210.7	209.8	205.3	198.9	196.1	193.4	185.2	177.0	168.8	156.9
17.5°	247.2	245.4	245.4	239.0	231.7	226.2	223.5	212.5	201.6	190.7	177.0
20°	281.9	277.3	275.5	270.0	262.7	258.2	254.5	241.7	228.1	213.5	198.0
22.5°	312.9	309.2	306.5	301.0	292.8	287.4	283.7	269.1	254.5	239.0	218.9
25°	341.2	340.3	337.5	331.1	322.9	316.5	311.1	297.4	281.0	264.5	242.7
27.5°	370.4	367.6	364.9	359.4	350.3	343.9	337.5	322.9	307.4	288.3	265.5
30°	395.0	392.3	389.5	383.1	374.0	367.6	363.1	346.6	331.1	311.1	286.4
32.5°	414.2	413.2	410.5	404.1	395.0	389.5	384.0	368.5	351.2	330.2	305.6
35°	434.2	433.3	429.7	423.3	415.1	408.7	402.3	387.7	370.4	350.3	324.8
37.5°	452.5	451.6	447.9	441.5	432.4	427.8	420.5	405.9	387.7	366.7	342.1
40°	468.0	468.0	464.3	457.9	448.8	443.3	437.0	421.4	404.1	384.0	357.6
42.5°	482.6	481.7	478.0	471.6	462.5	457.9	450.6	437.0	418.7	398.6	372.2
45°	494.4	494.4	489.9	484.4	475.3	470.7	464.3	448.8	431.5	410.5	385.0
47.5°	505.4	504.5	500.8	495.3	485.3	480.7	474.4	460.7	442.4	421.4	396.8
50°	513.6	512.7	509.0	503.5	495.3	489.9	483.5	469.8	451.6	431.5	406.9
52.5°	520.9	519.1	516.3	509.9	501.7	497.2	490.8	477.1	460.7	439.7	415.1
55°	526.4	524.5	521.8	515.4	508.1	502.6	496.3	483.5	467.1	447.0	423.3
57.5°	529.1	528.2	524.5	519.1	510.8	506.3	500.8	487.1	471.6	452.5	428.7
60°	531.8	530.0	526.4	520.9	512.7	508.1	503.5	490.8	476.2	457.9	435.1
62.5°	530.9	530.0	526.4	520.9	513.6	509.0	504.5	492.6	478.0	460.7	439.7
65°	530.0	529.1	525.4	520.0	512.7	509.0	504.5	492.6	479.8	463.4	442.4
67.5°	527.3	525.4	521.8	517.2	509.9	506.3	502.6	492.6	479.8	464.3	445.2
70°	522.7	520.9	518.1	512.7	507.2	503.5	499.9	490.8	479.8	465.2	447.0
72.5°	515.4	514.5	510.8	507.2	501.7	498.1	494.4	487.1	477.1	464.3	447.9
75°	508.1	506.3	503.5	499.9	495.3	491.7	489.0	482.6	474.4	462.5	447.0
77.5°	498.1	497.2	495.3	491.7	488.0	485.3	483.5	478.0	470.7	460.7	446.1
80°	489.9	488.0	486.2	482.6	479.8	478.0	477.1	472.5	466.1	457.9	445.2
82.5°	478.0	477.1	475.3	472.5	470.7	468.9	468.0	465.2	461.6	453.4	442.4
85°	467.1	467.1	465.2	463.4	461.6	460.7	460.7	457.9	455.2	449.7	438.8
87.5°	456.1	456.1	455.2	453.4	452.5	452.5	451.6	450.6	449.7	445.2	436.0
90°	447.0	446.1	445.2	444.3	444.3	444.3	445.2	445.2	444.3	440.6	432.4
92.5°	437.9	437.0	436.0	436.0	437.9	437.9	438.8	440.6	440.6	438.8	431.5
95°	429.7	428.7	429.7	428.7	430.6	432.4	434.2	436.0	437.0	435.1	428.7
97.5°	423.3	422.4	422.4	423.3	426.0	426.9	428.7	430.6	432.4	431.5	426.0
100°	416.9	416.9	416.9	418.7	420.5	422.4	424.2	426.9	429.7	428.7	424.2
102.5°	412.3	412.3	413.2	414.2	416.9	418.7	420.5	424.2	426.0	426.0	421.4
105°	409.6	409.6	410.5	411.4	414.2	416.9	417.8	421.4	423.3	424.2	418.7
107.5°	408.7	408.7	409.6	411.4	414.2	416.0	417.8	420.5	423.3	422.4	416.9
110°	408.7	409.6	409.6	411.4	414.2	416.0	417.8	420.5	422.4	421.4	415.1



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	410.5	411.4	411.4	414.2	416.0	417.8	418.7	421.4	421.4	420.5	413.2
115°	414.2	414.2	415.1	416.0	418.7	419.6	420.5	422.4	422.4	418.7	410.5
117.5°	417.8	417.8	418.7	419.6	421.4	421.4	422.4	423.3	422.4	417.8	408.7
120°	421.4	421.4	422.4	422.4	423.3	424.2	424.2	424.2	421.4	416.0	405.0
122.5°	426.0	425.1	426.0	426.0	426.9	426.9	426.0	425.1	421.4	415.1	402.3
125°	428.7	428.7	428.7	428.7	428.7	427.8	427.8	425.1	420.5	412.3	397.7
127.5°	432.4	431.5	431.5	430.6	429.7	428.7	427.8	424.2	417.8	407.8	393.2
130°	434.2	433.3	433.3	431.5	429.7	427.8	426.0	421.4	414.2	402.3	386.8
132.5°	435.1	434.2	433.3	431.5	428.7	426.9	424.2	418.7	409.6	396.8	379.5
135°	435.1	434.2	432.4	430.6	426.9	424.2	421.4	414.2	404.1	389.5	371.3
137.5°	431.5	430.6	428.7	426.0	422.4	419.6	416.0	406.9	395.9	380.4	361.2
140°	425.1	425.1	422.4	419.6	415.1	411.4	407.8	397.7	385.0	369.5	349.4
142.5°	416.9	416.0	413.2	409.6	405.0	400.5	396.8	385.9	373.1	356.7	335.7
145°	406.9	405.9	403.2	399.6	393.2	389.5	385.0	373.1	359.4	343.0	322.0
147.5°	395.0	394.1	390.4	386.8	380.4	375.8	371.3	359.4	344.8	328.4	308.3
150°	379.5	377.7	374.9	370.4	363.1	359.4	353.9	342.1	328.4	312.0	292.8
152.5°	358.5	357.6	353.9	350.3	343.0	338.4	334.8	322.0	308.3	292.8	274.6
155°	337.5	335.7	332.1	328.4	321.1	316.5	312.0	301.0	288.3	272.8	256.3
157.5°	312.9	312.0	309.2	304.7	298.3	293.7	289.2	279.1	267.3	252.7	237.2
160°	287.4	286.4	282.8	280.1	273.7	269.1	264.5	256.3	244.5	230.8	216.2
162.5°	257.2	256.3	254.5	250.9	245.4	240.8	238.1	228.1	218.9	208.0	196.1
165°	226.2	224.4	222.6	220.8	215.3	212.5	208.9	202.5	195.2	186.1	177.0
167.5°	197.0	196.1	194.3	192.5	188.8	186.1	183.4	178.8	172.4	166.0	157.8
170°	168.8	167.8	166.9	164.2	162.4	160.6	158.7	155.1	150.5	145.0	139.6
172.5°	140.5	140.5	139.6	137.7	136.8	135.0	134.1	132.3	129.5	125.0	121.3
175°	114.9	114.9	114.9	113.1	113.1	112.2	111.3	110.4	109.5	106.7	104.9
177.5°	93.0	92.1	92.1	93.0	92.1	92.1	91.2	91.2	91.2	90.3	89.4
180°	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6



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CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
2.5°	76.6	75.7	74.8	73.9	73.0	72.1	71.2	69.3	68.4	66.6	64.8
5°	89.4	86.7	83.9	81.2	79.4	78.5	75.7	73.0	69.3	66.6	63.9
7.5°	102.2	97.6	94.0	89.4	86.7	84.8	80.3	75.7	71.2	66.6	62.9
10°	115.9	109.5	103.1	96.7	94.0	90.3	83.9	78.5	72.1	66.6	61.1
12.5°	130.4	122.2	114.0	104.9	101.3	96.7	88.5	81.2	73.0	66.6	59.3
15°	146.9	136.8	125.9	114.0	109.5	104.0	94.0	83.9	74.8	65.7	58.4
17.5°	164.2	151.4	137.7	124.1	116.8	111.3	98.5	86.7	75.7	65.7	56.6
20°	182.4	166.0	148.7	133.2	125.9	117.7	103.1	89.4	76.6	65.7	55.6
22.5°	199.8	181.5	162.4	143.2	134.1	125.0	108.6	92.1	77.5	64.8	53.8
25°	219.8	198.0	176.1	153.3	142.3	133.2	113.1	94.9	79.4	64.8	52.9
27.5°	241.7	214.4	189.7	164.2	152.3	140.5	118.6	98.5	80.3	64.8	51.1
30°	260.0	231.7	202.5	175.1	161.5	148.7	124.1	101.3	82.1	64.8	50.2
32.5°	278.2	250.0	216.2	185.2	170.6	156.0	128.6	104.9	83.0	64.8	49.3
35°	295.6	265.5	229.9	196.1	179.7	164.2	134.1	107.6	84.8	64.8	48.3
37.5°	312.9	280.1	244.5	206.2	188.8	171.5	138.7	110.4	85.7	64.8	47.4
40°	328.4	294.6	257.2	216.2	198.0	179.7	144.1	113.1	86.7	64.8	46.5
42.5°	342.1	308.3	269.1	227.1	206.2	186.1	148.7	115.9	87.6	64.8	45.6
45°	355.8	320.2	281.0	237.2	214.4	193.4	154.2	118.6	89.4	64.8	44.7
47.5°	366.7	332.1	291.0	247.2	222.6	200.7	158.7	121.3	90.3	64.8	44.7
50°	376.7	342.1	301.0	255.4	231.7	207.1	163.3	124.1	91.2	64.8	43.8
52.5°	385.9	351.2	310.2	263.6	239.9	213.5	166.9	126.8	92.1	64.8	42.9
55°	394.1	359.4	318.4	271.8	247.2	219.8	171.5	129.5	93.0	64.8	42.9
57.5°	400.5	365.8	325.7	278.2	253.6	225.3	175.1	131.4	94.9	64.8	42.0
60°	406.9	373.1	333.0	284.6	259.1	231.7	178.8	133.2	94.9	64.8	42.0
62.5°	412.3	378.6	339.3	291.0	265.5	236.3	182.4	135.9	95.8	64.8	41.1
65°	416.9	384.0	344.8	296.5	270.0	242.7	186.1	137.7	97.6	64.8	41.1
67.5°	420.5	388.6	349.4	301.0	275.5	247.2	189.7	139.6	97.6	64.8	40.1
70°	423.3	392.3	353.9	306.5	280.1	251.8	192.5	141.4	98.5	64.8	40.1
72.5°	425.1	395.0	357.6	310.2	283.7	254.5	195.2	142.3	99.4	64.8	40.1
75°	426.0	396.8	359.4	312.9	286.4	257.2	197.0	144.1	99.4	64.8	40.1
77.5°	426.0	397.7	361.2	315.6	289.2	260.9	198.9	145.0	100.3	65.7	39.2
80°	426.0	398.6	363.1	318.4	291.9	262.7	200.7	146.9	101.3	65.7	39.2
82.5°	424.2	398.6	363.1	319.3	292.8	264.5	202.5	147.8	101.3	65.7	39.2
85°	422.4	397.7	364.0	319.3	293.7	265.5	203.4	147.8	101.3	64.8	39.2
87.5°	420.5	396.8	363.1	320.2	294.6	265.5	204.3	147.8	101.3	64.8	38.3
90°	418.7	395.9	363.1	320.2	294.6	266.4	204.3	148.7	102.2	64.8	38.3
92.5°	417.8	395.0	362.2	318.4	292.8	264.5	203.4	147.8	101.3	64.8	38.3
95°	415.1	393.2	361.2	318.4	292.8	264.5	203.4	148.7	101.3	64.8	39.2
97.5°	413.2	392.3	359.4	317.5	291.9	264.5	203.4	148.7	102.2	65.7	39.2
100°	411.4	389.5	357.6	315.6	291.0	263.6	203.4	148.7	102.2	65.7	39.2
102.5°	408.7	387.7	355.8	313.8	289.2	261.8	202.5	148.7	102.2	65.7	39.2
105°	405.9	385.0	353.0	311.1	287.4	260.0	201.6	148.7	102.2	65.7	40.1
107.5°	404.1	382.2	350.3	309.2	284.6	258.2	200.7	148.7	103.1	66.6	40.1
110°	401.4	378.6	347.6	305.6	281.9	256.3	199.8	147.8	103.1	66.6	41.1



TEST NUMBER: P190088

CATALOG NUMBER: TRR11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	398.6	375.8	343.9	302.9	279.1	253.6	198.0	146.9	103.1	67.5	41.1
115°	395.9	371.3	339.3	299.2	275.5	250.0	196.1	146.0	103.1	68.4	42.0
117.5°	392.3	367.6	335.7	294.6	270.9	247.2	193.4	145.0	103.1	68.4	42.9
120°	387.7	363.1	330.2	290.1	267.3	242.7	190.7	144.1	102.2	69.3	43.8
122.5°	383.1	357.6	324.8	283.7	261.8	238.1	187.9	142.3	102.2	69.3	44.7
125°	378.6	352.1	318.4	278.2	256.3	231.7	184.3	140.5	102.2	70.2	45.6
127.5°	372.2	344.8	312.0	271.8	250.0	225.3	180.6	138.7	101.3	70.2	46.5
130°	364.9	337.5	303.8	264.5	243.6	219.8	177.0	136.8	100.3	70.2	47.4
132.5°	356.7	328.4	295.6	257.2	237.2	214.4	172.4	134.1	100.3	71.2	48.3
135°	347.6	320.2	287.4	250.0	228.1	208.0	168.8	132.3	99.4	71.2	49.3
137.5°	337.5	309.2	277.3	240.8	219.8	201.6	164.2	129.5	98.5	72.1	50.2
140°	325.7	297.4	266.4	230.8	211.6	194.3	158.7	126.8	97.6	72.1	52.0
142.5°	312.0	285.5	255.4	219.8	203.4	187.0	154.2	124.1	96.7	73.0	52.9
145°	299.2	272.8	244.5	210.7	195.2	180.6	149.6	121.3	95.8	73.0	54.7
147.5°	285.5	260.0	231.7	201.6	187.9	173.3	145.0	119.5	94.9	73.9	55.6
150°	270.0	246.3	218.9	192.5	179.7	166.0	140.5	115.9	94.0	74.8	57.5
152.5°	253.6	229.9	206.2	181.5	170.6	158.7	135.0	113.1	93.0	74.8	59.3
155°	236.3	214.4	193.4	171.5	161.5	151.4	129.5	110.4	92.1	75.7	61.1
157.5°	218.0	200.7	181.5	162.4	153.3	143.2	125.0	107.6	91.2	75.7	62.9
160°	200.7	185.2	168.8	152.3	145.0	135.9	119.5	104.9	90.3	76.6	64.8
162.5°	182.4	169.7	156.0	142.3	135.0	128.6	114.0	101.3	88.5	76.6	66.6
165°	165.1	155.1	143.2	132.3	126.8	120.4	108.6	97.6	87.6	77.5	68.4
167.5°	148.7	140.5	131.4	122.2	117.7	113.1	104.0	94.9	86.7	77.5	70.2
170°	133.2	126.8	119.5	113.1	109.5	105.8	98.5	91.2	84.8	78.5	72.1
172.5°	117.7	113.1	107.6	103.1	100.3	98.5	93.0	87.6	83.0	78.5	73.0
175°	102.2	99.4	96.7	94.0	92.1	91.2	87.6	84.8	81.2	78.5	75.7
177.5°	89.4	87.6	86.7	85.7	84.8	83.9	83.0	81.2	80.3	78.5	77.5
180°	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6



TEST NUMBER: P190088

CATALOG NUMBER: TRR11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
2.5°	63.9	62.0	60.2	59.3	59.3	57.5	55.6	54.7	53.8	52.0	51.1
5°	61.1	58.4	55.6	54.7	52.9	51.1	48.3	46.5	44.7	42.9	42.0
7.5°	58.4	54.7	51.1	49.3	47.4	44.7	42.0	39.2	37.4	34.7	32.8
10°	55.6	51.1	46.5	44.7	42.9	39.2	35.6	32.8	30.1	27.4	25.5
12.5°	52.9	47.4	42.0	40.1	37.4	33.8	30.1	26.5	23.7	21.0	18.2
15°	51.1	43.8	38.3	35.6	33.8	29.2	24.6	21.0	18.2	15.5	13.7
17.5°	48.3	41.1	34.7	31.9	29.2	24.6	20.1	16.4	13.7	11.9	10.0
20°	46.5	38.3	31.9	28.3	25.5	20.1	15.5	12.8	10.0	8.2	6.4
22.5°	43.8	35.6	28.3	25.5	21.9	16.4	12.8	10.0	7.3	6.4	4.6
25°	42.0	32.8	25.5	21.9	18.2	13.7	10.0	7.3	5.5	4.6	4.6
27.5°	40.1	30.1	22.8	19.2	15.5	10.9	8.2	5.5	4.6	4.6	4.6
30°	38.3	28.3	20.1	16.4	13.7	9.1	6.4	4.6	4.6	4.6	5.5
32.5°	36.5	26.5	17.3	14.6	11.9	7.3	5.5	4.6	4.6	5.5	5.5
35°	34.7	24.6	15.5	12.8	10.0	6.4	4.6	4.6	5.5	5.5	5.5
37.5°	33.8	22.8	13.7	10.9	8.2	5.5	4.6	5.5	5.5	5.5	6.4
40°	31.9	21.0	12.8	10.0	7.3	4.6	4.6	5.5	5.5	6.4	6.4
42.5°	31.0	19.2	10.9	8.2	6.4	4.6	5.5	5.5	6.4	6.4	6.4
45°	30.1	18.2	10.0	7.3	5.5	4.6	5.5	5.5	6.4	6.4	6.4
47.5°	29.2	17.3	9.1	7.3	5.5	5.5	5.5	6.4	6.4	6.4	6.4
50°	27.4	15.5	8.2	6.4	5.5	5.5	6.4	6.4	6.4	6.4	5.5
52.5°	26.5	14.6	8.2	5.5	5.5	5.5	6.4	6.4	6.4	6.4	5.5
55°	26.5	14.6	7.3	5.5	5.5	6.4	6.4	7.3	6.4	6.4	5.5
57.5°	25.5	13.7	7.3	5.5	5.5	6.4	6.4	7.3	6.4	6.4	5.5
60°	24.6	12.8	6.4	5.5	5.5	6.4	7.3	7.3	6.4	5.5	4.6
62.5°	23.7	11.9	6.4	5.5	6.4	6.4	7.3	7.3	6.4	5.5	4.6
65°	23.7	11.9	6.4	5.5	6.4	7.3	7.3	7.3	6.4	5.5	4.6
67.5°	22.8	10.9	6.4	5.5	6.4	7.3	7.3	7.3	6.4	5.5	3.6
70°	22.8	10.9	6.4	6.4	6.4	7.3	7.3	7.3	6.4	4.6	3.6
72.5°	21.9	10.9	6.4	6.4	6.4	7.3	8.2	7.3	6.4	4.6	3.6
75°	21.9	10.0	6.4	6.4	7.3	7.3	8.2	7.3	6.4	4.6	3.6
77.5°	21.0	10.0	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	3.6
80°	21.0	10.0	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	3.6
82.5°	21.0	10.0	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	3.6
85°	21.0	9.1	6.4	6.4	7.3	7.3	7.3	6.4	5.5	3.6	2.7
87.5°	20.1	9.1	5.5	6.4	6.4	7.3	7.3	6.4	4.6	3.6	2.7
90°	20.1	9.1	5.5	6.4	6.4	7.3	7.3	6.4	4.6	3.6	2.7
92.5°	20.1	9.1	6.4	7.3	7.3	8.2	8.2	7.3	5.5	3.6	2.7
95°	20.1	10.0	6.4	7.3	7.3	8.2	8.2	7.3	5.5	4.6	3.6
97.5°	21.0	9.1	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	2.7
100°	21.0	10.0	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	2.7
102.5°	21.0	10.0	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	3.6
105°	21.0	10.0	6.4	6.4	7.3	8.2	8.2	7.3	5.5	4.6	3.6
107.5°	21.9	10.0	6.4	6.4	7.3	8.2	8.2	7.3	6.4	4.6	3.6
110°	21.9	10.9	6.4	6.4	7.3	8.2	8.2	7.3	6.4	4.6	3.6



TEST NUMBER: P190088

CATALOG NUMBER: TRR11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	22.8	10.9	6.4	6.4	7.3	8.2	8.2	8.2	6.4	5.5	3.6
115°	23.7	11.9	6.4	6.4	7.3	8.2	9.1	8.2	7.3	5.5	4.6
117.5°	24.6	12.8	7.3	6.4	7.3	8.2	9.1	9.1	8.2	6.4	5.5
120°	25.5	12.8	7.3	6.4	7.3	8.2	9.1	9.1	8.2	6.4	5.5
122.5°	26.5	13.7	7.3	6.4	7.3	8.2	9.1	9.1	8.2	7.3	6.4
125°	27.4	14.6	8.2	6.4	6.4	8.2	9.1	9.1	9.1	8.2	6.4
127.5°	28.3	15.5	9.1	7.3	6.4	8.2	9.1	10.0	9.1	8.2	7.3
130°	29.2	16.4	9.1	7.3	6.4	7.3	9.1	9.1	10.0	9.1	8.2
132.5°	31.0	17.3	10.0	8.2	6.4	7.3	8.2	9.1	10.0	9.1	9.1
135°	31.9	19.2	10.9	8.2	7.3	7.3	8.2	9.1	10.0	10.0	9.1
137.5°	33.8	21.0	11.9	10.0	7.3	6.4	7.3	9.1	9.1	10.0	10.0
140°	35.6	22.8	13.7	10.9	8.2	6.4	7.3	8.2	9.1	10.0	10.0
142.5°	37.4	24.6	15.5	11.9	10.0	7.3	7.3	8.2	9.1	10.0	10.0
145°	39.2	26.5	17.3	13.7	10.9	7.3	6.4	7.3	8.2	9.1	10.0
147.5°	41.1	29.2	19.2	15.5	12.8	9.1	6.4	7.3	7.3	8.2	9.1
150°	42.9	31.9	21.9	18.2	14.6	10.0	7.3	6.4	7.3	8.2	8.2
152.5°	45.6	34.7	24.6	21.0	17.3	12.8	9.1	7.3	6.4	7.3	8.2
155°	48.3	37.4	28.3	23.7	21.0	15.5	10.9	9.1	7.3	6.4	7.3
157.5°	51.1	41.1	31.9	28.3	24.6	18.2	13.7	10.9	9.1	7.3	7.3
160°	53.8	43.8	36.5	31.9	28.3	22.8	17.3	13.7	11.9	10.0	8.2
162.5°	56.6	47.4	40.1	36.5	32.8	27.4	21.9	18.2	15.5	12.8	10.9
165°	59.3	52.0	44.7	41.1	38.3	32.8	28.3	23.7	20.1	17.3	15.5
167.5°	62.9	55.6	50.2	46.5	43.8	39.2	34.7	30.1	27.4	23.7	21.9
170°	65.7	60.2	54.7	52.0	50.2	45.6	42.0	38.3	34.7	31.9	30.1
172.5°	68.4	64.8	60.2	58.4	55.6	52.9	49.3	46.5	43.8	41.1	39.2
175°	72.1	69.3	65.7	64.8	62.9	60.2	58.4	55.6	53.8	51.1	50.2
177.5°	75.7	73.9	72.1	72.1	70.2	69.3	67.5	66.6	65.7	63.9	63.9
180°	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6



TEST NUMBER: P190088

CATALOG NUMBER: TRR11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
2.5°	50.2	50.2	49.3	49.3	48.3	48.3	47.4	47.4
5°	40.1	39.2	38.3	38.3	37.4	37.4	36.5	36.5
7.5°	31.9	30.1	29.2	29.2	28.3	27.4	26.5	26.5
10°	23.7	21.9	21.0	21.0	20.1	19.2	18.2	18.2
12.5°	17.3	15.5	14.6	14.6	13.7	12.8	11.9	12.8
15°	11.9	10.9	10.0	10.0	9.1	8.2	8.2	8.2
17.5°	8.2	7.3	7.3	6.4	5.5	5.5	5.5	5.5
20°	5.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
22.5°	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
25°	4.6	4.6	4.6	5.5	5.5	5.5	5.5	5.5
27.5°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
30°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
32.5°	5.5	5.5	6.4	5.5	5.5	5.5	5.5	5.5
35°	6.4	6.4	6.4	6.4	6.4	5.5	5.5	5.5
37.5°	6.4	6.4	6.4	6.4	5.5	5.5	5.5	5.5
40°	6.4	6.4	5.5	5.5	5.5	5.5	5.5	5.5
42.5°	6.4	5.5	5.5	5.5	4.6	4.6	4.6	4.6
45°	5.5	5.5	5.5	4.6	4.6	4.6	3.6	3.6
47.5°	5.5	5.5	4.6	4.6	3.6	3.6	3.6	3.6
50°	5.5	4.6	4.6	3.6	3.6	3.6	2.7	2.7
52.5°	4.6	4.6	3.6	3.6	2.7	2.7	2.7	2.7
55°	4.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
57.5°	4.6	3.6	3.6	2.7	2.7	1.8	1.8	1.8
60°	3.6	3.6	2.7	2.7	1.8	1.8	1.8	1.8
62.5°	3.6	2.7	2.7	2.7	1.8	1.8	1.8	1.8
65°	3.6	2.7	2.7	2.7	1.8	1.8	1.8	1.8
67.5°	3.6	2.7	2.7	1.8	1.8	1.8	1.8	1.8
70°	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8
72.5°	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8
75°	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8
77.5°	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8
80°	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
82.5°	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1.8
85°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
87.5°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
90°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
92.5°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
95°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
97.5°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
100°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
102.5°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
105°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	0.9
107.5°	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
110°	2.7	1.8	1.8	1.8	1.8	1.8	0.9	1.8



TEST NUMBER: P190088

CATALOG NUMBER: TRR11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	2.7	2.7	1.8	1.8	1.8	0.9	0.9	0.9
115°	3.6	2.7	2.7	2.7	1.8	1.8	1.8	1.8
117.5°	3.6	3.6	2.7	2.7	2.7	2.7	1.8	1.8
120°	4.6	3.6	3.6	2.7	2.7	2.7	1.8	2.7
122.5°	4.6	3.6	3.6	3.6	2.7	2.7	2.7	2.7
125°	5.5	4.6	4.6	3.6	3.6	2.7	2.7	2.7
127.5°	6.4	5.5	4.6	4.6	3.6	3.6	3.6	3.6
130°	6.4	5.5	5.5	5.5	4.6	3.6	3.6	3.6
132.5°	7.3	6.4	6.4	6.4	5.5	4.6	4.6	4.6
135°	8.2	7.3	7.3	7.3	6.4	5.5	5.5	5.5
137.5°	9.1	8.2	8.2	8.2	7.3	6.4	6.4	6.4
140°	10.0	9.1	9.1	9.1	8.2	8.2	7.3	7.3
142.5°	10.0	10.0	10.0	10.0	9.1	9.1	9.1	9.1
145°	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
147.5°	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
150°	9.1	10.0	10.0	10.0	10.0	10.0	10.0	10.0
152.5°	8.2	9.1	9.1	9.1	9.1	10.0	10.0	10.0
155°	7.3	8.2	8.2	8.2	8.2	9.1	9.1	9.1
157.5°	6.4	7.3	7.3	7.3	7.3	7.3	8.2	8.2
160°	7.3	7.3	6.4	6.4	6.4	6.4	6.4	7.3
162.5°	10.0	9.1	8.2	8.2	7.3	7.3	7.3	7.3
165°	13.7	11.9	11.9	10.9	10.9	10.0	10.0	9.1
167.5°	19.2	17.3	17.3	16.4	15.5	14.6	14.6	13.7
170°	27.4	25.5	24.6	24.6	22.8	21.9	21.9	21.0
172.5°	37.4	35.6	34.7	34.7	33.8	31.9	31.9	31.0
175°	48.3	47.4	46.5	46.5	45.6	44.7	44.7	43.8
177.5°	62.0	61.1	61.1	61.1	60.2	60.2	59.3	59.3
180°	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6

(END OF REPORT)