

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: P190076

Luminaire Tested: **TRO11-LD4-20W-50-CL-BK-UNV-EDC1**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P190076
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27855)
Test Lab: INNOVATION CENTER(G2)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: TRO11-LD4-20W-50-CL-BK-UNV-EDC1
Description: TERRAPIN 11" LED WALL MOUNT WITH OPEN CLEAR LENS
Light Source: (56) NICHIA 5000
NF2L757DRT
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 450mA
OT40W/1

Summary

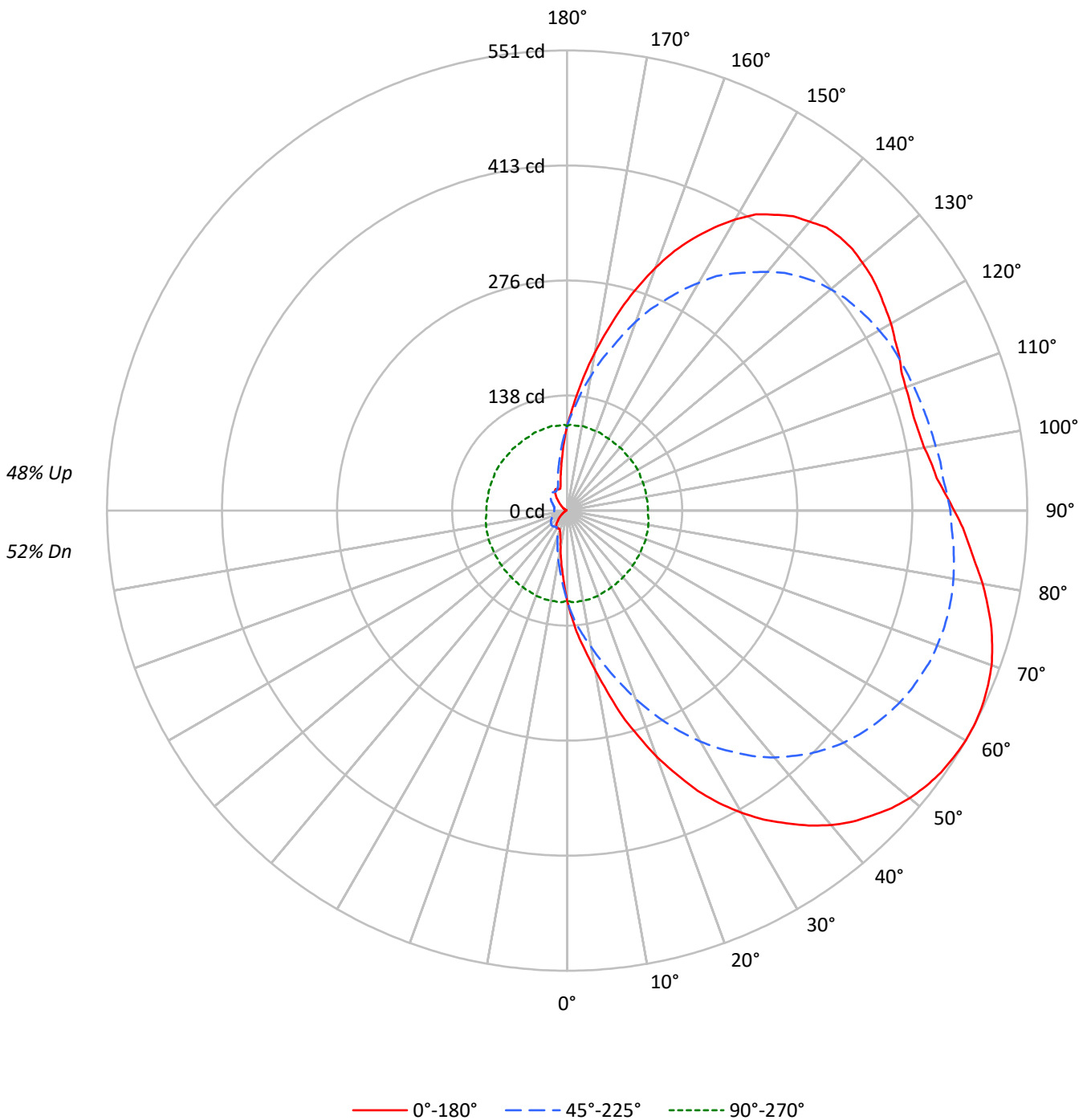
Lumens per Lamp: N/A
Luminaire Lumens: 2402.0 lumens
Efficiency: N/A
Efficacy: 109.2 lumens/watt
Spacing Criteria (0/90/45): 2.81 / 1.5 / 2.58
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

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

TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

Luminous Intensity Polar Plot





TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

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	108	108	108	108	99	99	99	99	84	84	84	70	70	70	58	58	58	52
1	93	87	81	76	86	80	75	70	67	63	59	55	52	49	43	41	39	34
2	83	73	65	58	76	67	60	54	56	50	45	45	41	37	35	32	29	24
3	75	63	54	46	68	58	49	43	48	41	36	38	33	29	30	26	23	19
4	68	55	45	38	61	50	42	35	41	35	29	33	28	24	26	22	18	15
5	62	48	38	31	56	44	35	29	36	30	24	29	24	20	23	19	15	12
6	56	43	33	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	22	18	23	18	14	18	14	11	8
8	48	34	26	20	44	31	24	18	26	20	15	21	16	12	17	13	9	7
9	44	31	23	17	41	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	10	14	10	7	5

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	4332	4332	4332
5°	4742	4103	2225
10°	5111	3805	1199
15°	5758	3599	701
20°	6271	3411	510
25°	6674	3232	427
30°	6901	3118	406
35°	7018	3032	350
40°	7105	2972	277
45°	7096	2935	201
50°	7068	2921	144
55°	6989	2928	93
60°	6885	2986	69
65°	6760	3039	44
70°	6610	3151	22
75°	6422	3267	22
80°	6225	3423	22
85°	6049	3627	23



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	10.6	0.4
10°-20°	35.7	1.5
20°-30°	70.8	2.9
30°-40°	113.1	4.7
40°-50°	155.0	6.5
50°-60°	190.0	7.9
60°-70°	214.6	8.9
70°-80°	226.4	9.4
80°-90°	225.6	9.4
90°-100°	217.1	9.0
100°-110°	205.9	8.6
110°-120°	192.6	8.0
120°-130°	173.8	7.2
130°-140°	146.2	6.1
140°-150°	109.9	4.6
150°-160°	69.8	2.9
160°-170°	34.9	1.5
170°-180°	10.1	0.4
0°-30°	117.1	4.9
0°-40°	230.3	9.6
0°-60°	575.2	23.9
0°-90°	1241.8	51.7
90°-120°	615.6	25.6
90°-150°	1045.5	43.5
90°-180°	1160.0	48.3
0°-180°	2402.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	108	108	108	108	108	
5°	150	138	110	80	70	16
15°	254	201	110	45	31	74
25°	370	280	107	27	24	172
35°	457	354	105	24	23	288
45°	516	411	103	26	15	400
55°	546	448	101	24	7	489
65°	549	467	100	20	4	544
75°	526	473	99	18	2	555
85°	484	464	98	16	2	399
90°	463	459	97	16	2	254
95°	444	452	97	16	2	362
105°	430	444	97	16	1	456
115°	439	437	97	19	3	435
125°	456	423	98	24	6	409
135°	462	396	98	28	14	357
145°	432	347	98	27	25	271
155°	360	278	100	28	28	167
165°	251	200	102	42	30	73
175°	140	130	102	77	67	15
180°	101	101	101	101	101	



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6
2.5°	127.7	126.8	127.7	126.8	126.8	125.9	125.9	125.0	125.0	124.1	123.2
5°	149.6	147.8	147.8	146.9	146.9	146.0	145.1	143.2	142.3	140.5	137.8
7.5°	169.7	169.7	168.8	167.9	166.9	165.1	164.2	161.5	159.6	155.1	151.4
10°	194.3	193.4	193.4	189.8	187.9	186.1	185.2	181.5	177.0	172.4	166.0
12.5°	221.7	218.9	218.0	215.3	213.5	210.7	208.9	203.4	197.1	188.8	182.5
15°	254.5	251.8	250.0	247.2	242.7	239.0	237.2	227.2	218.9	209.8	200.7
17.5°	282.8	281.9	280.1	275.5	270.9	267.3	262.7	253.6	243.6	231.7	218.9
20°	313.8	312.0	310.2	305.6	298.3	294.7	291.0	279.2	267.3	254.5	239.9
22.5°	341.2	339.4	336.6	333.0	325.7	321.1	316.6	303.8	291.0	276.4	260.0
25°	370.4	367.6	364.0	358.5	352.1	346.7	341.2	329.3	314.7	298.3	280.1
27.5°	395.0	393.2	390.5	384.1	376.8	371.3	364.9	353.0	338.5	320.2	300.1
30°	417.8	416.9	413.3	406.9	398.7	394.1	387.7	374.9	359.4	341.2	319.3
32.5°	438.8	437.0	434.2	427.9	419.6	414.2	408.7	395.0	378.6	359.4	337.5
35°	457.0	456.1	452.5	447.0	437.9	433.3	426.9	413.3	396.8	376.8	354.0
37.5°	475.3	475.3	471.6	465.3	457.0	451.6	445.2	431.5	414.2	394.1	371.3
40°	491.7	489.9	487.2	480.8	471.6	467.1	460.7	447.0	429.7	408.7	385.9
42.5°	505.4	503.6	500.8	494.5	486.2	480.8	474.4	460.7	443.4	423.3	398.7
45°	516.3	516.3	512.7	507.2	498.1	492.6	487.2	473.5	456.1	436.1	411.4
47.5°	527.3	526.4	522.7	517.3	508.1	503.6	498.1	484.4	467.1	447.0	422.4
50°	535.5	533.7	530.9	524.6	517.3	511.8	506.3	492.6	476.2	456.1	432.4
52.5°	541.9	541.0	537.3	531.9	524.6	520.0	513.6	500.8	484.4	464.3	440.6
55°	546.5	545.5	541.9	537.3	529.1	524.6	519.1	506.3	489.9	471.6	447.9
57.5°	549.2	548.3	545.5	540.1	531.9	527.3	522.7	510.0	495.4	477.1	454.3
60°	551.0	550.1	546.5	541.9	534.6	530.0	525.5	513.6	499.0	481.7	459.8
62.5°	551.0	550.1	546.5	541.0	534.6	530.0	525.5	514.5	501.7	485.3	464.3
65°	549.2	548.3	544.6	539.2	533.7	530.0	525.5	515.4	503.6	487.2	467.1
67.5°	545.5	544.6	541.0	536.4	530.9	528.2	524.6	514.5	503.6	489.0	470.7
70°	541.0	540.1	536.4	531.9	527.3	524.6	520.9	512.7	502.7	489.9	471.6
72.5°	533.7	532.8	530.0	525.5	521.8	519.1	515.4	509.0	499.9	489.0	472.6
75°	525.5	524.6	521.8	518.2	514.5	512.7	510.0	504.5	497.2	487.2	472.6
77.5°	515.4	516.3	513.6	510.0	507.2	506.3	503.6	499.9	493.5	484.4	471.6
80°	505.4	505.4	502.7	500.8	498.1	497.2	496.3	493.5	489.0	481.7	469.8
82.5°	493.5	495.4	492.6	490.8	489.9	489.0	488.1	487.2	483.5	478.0	467.1
85°	483.5	484.4	482.6	481.7	481.7	480.8	480.8	479.9	478.9	473.5	464.3
87.5°	474.4	473.5	471.6	471.6	472.6	472.6	472.6	473.5	472.6	469.8	460.7
90°	463.4	463.4	462.5	462.5	464.3	464.3	465.3	467.1	467.1	465.3	458.9
92.5°	453.4	453.4	453.4	454.3	456.1	457.0	458.0	460.7	461.6	460.7	455.2
95°	444.3	445.2	446.1	447.0	448.8	450.7	452.5	456.1	458.0	457.0	451.6
97.5°	439.7	439.7	440.6	441.5	444.3	446.1	447.9	451.6	454.3	454.3	450.7
100°	434.2	435.2	436.1	437.9	440.6	442.5	444.3	448.8	451.6	452.5	447.9
102.5°	431.5	431.5	432.4	434.2	437.0	439.7	441.5	446.1	448.8	449.8	446.1
105°	429.7	430.6	430.6	433.3	436.1	438.8	440.6	445.2	447.9	448.8	444.3
107.5°	430.6	430.6	431.5	434.2	437.0	438.8	440.6	445.2	447.0	447.0	442.5
110°	431.5	432.4	433.3	435.2	437.9	439.7	441.5	445.2	447.0	446.1	440.6



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
112.5°	433.3	434.2	435.2	437.9	439.7	441.5	443.4	446.1	447.0	445.2	438.8
115°	438.8	437.9	439.7	440.6	443.4	444.3	446.1	447.0	447.0	444.3	437.0
117.5°	442.5	443.4	444.3	445.2	446.1	447.0	448.8	448.8	448.8	444.3	435.2
120°	447.9	447.9	447.9	448.8	449.8	450.7	450.7	449.8	447.9	442.5	431.5
122.5°	451.6	451.6	452.5	453.4	453.4	453.4	453.4	451.6	447.9	440.6	427.9
125°	456.1	456.1	456.1	456.1	455.2	455.2	455.2	451.6	447.0	437.9	423.3
127.5°	459.8	458.9	458.9	458.0	457.0	456.1	455.2	450.7	444.3	434.2	418.7
130°	461.6	461.6	460.7	459.8	457.0	456.1	453.4	448.8	440.6	428.8	412.3
132.5°	463.4	462.5	461.6	459.8	457.0	455.2	452.5	446.1	436.1	422.4	405.0
135°	462.5	462.5	460.7	458.0	454.3	451.6	448.8	440.6	429.7	415.1	395.9
137.5°	459.8	458.9	457.0	453.4	449.8	446.1	443.4	434.2	421.5	406.0	385.9
140°	451.6	451.6	449.8	446.1	440.6	437.0	433.3	423.3	410.5	394.1	373.1
142.5°	444.3	443.4	440.6	436.1	430.6	426.0	422.4	411.4	397.8	380.4	359.4
145°	432.4	432.4	429.7	425.1	418.7	415.1	410.5	398.7	384.1	366.7	346.7
147.5°	420.6	418.7	416.0	411.4	405.0	400.5	395.9	384.1	369.5	352.1	333.0
150°	402.3	401.4	398.7	393.2	386.8	382.2	377.7	364.9	352.1	333.9	314.7
152.5°	382.2	380.4	377.7	373.1	365.8	361.3	357.6	344.8	331.2	314.7	297.4
155°	360.3	357.6	355.8	350.3	343.9	339.4	334.8	322.9	311.1	296.5	278.2
157.5°	336.6	333.9	332.1	326.6	320.2	316.6	312.0	301.0	289.2	276.4	260.9
160°	309.3	307.4	305.6	301.0	294.7	291.0	287.4	278.2	267.3	255.4	240.8
162.5°	280.1	278.2	277.3	272.8	267.3	263.6	260.9	252.7	243.6	233.5	219.9
165°	250.9	249.1	248.1	244.5	239.9	237.2	234.5	225.3	218.0	209.8	199.8
167.5°	219.9	218.9	218.0	214.4	211.6	208.9	207.1	202.5	195.2	189.8	182.5
170°	192.5	190.7	190.7	187.9	186.1	184.3	182.5	179.7	174.2	169.7	163.3
172.5°	166.0	164.2	164.2	162.4	160.6	159.6	158.7	156.9	153.3	149.6	146.9
175°	140.5	138.7	139.6	136.8	137.8	136.8	136.8	135.9	133.2	132.3	129.5
177.5°	118.6	116.8	117.7	116.8	116.8	116.8	116.8	116.8	115.9	115.9	114.9
180°	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6
2.5°	121.3	120.4	119.5	118.6	117.7	116.8	114.9	113.1	112.2	109.5	107.6
5°	135.0	132.3	130.5	126.8	125.0	124.1	120.4	116.8	113.1	110.4	106.7
7.5°	148.7	144.1	140.5	135.9	133.2	130.5	125.9	120.4	114.9	109.5	104.9
10°	161.5	156.0	149.6	144.1	140.5	137.8	130.5	124.1	116.8	109.5	103.1
12.5°	175.2	167.9	159.6	151.4	147.8	144.1	135.0	126.8	117.7	109.5	100.3
15°	190.7	180.6	170.6	160.6	155.1	150.5	140.5	129.5	119.5	109.5	99.4
17.5°	207.1	194.3	181.5	168.8	162.4	156.9	145.1	133.2	121.3	108.6	97.6
20°	223.5	208.0	192.5	177.9	170.6	163.3	149.6	135.9	122.2	108.6	94.9
22.5°	242.7	221.7	204.3	186.1	177.9	169.7	154.2	138.7	123.2	107.6	93.1
25°	260.0	239.9	217.1	195.2	186.1	176.1	158.7	141.4	124.1	106.7	91.2
27.5°	279.2	255.4	229.9	205.3	194.3	183.4	163.3	144.1	125.9	106.7	89.4
30°	296.5	270.9	244.5	215.3	202.5	190.7	167.9	146.9	126.8	105.8	87.6
32.5°	313.8	285.5	257.3	226.2	210.7	197.1	172.4	149.6	127.7	105.8	85.8
35°	328.4	300.1	269.1	236.3	219.9	204.3	177.0	152.3	128.6	104.9	83.9
37.5°	344.8	315.6	281.9	247.2	229.9	211.6	181.5	155.1	129.5	104.9	82.1
40°	358.5	328.4	292.8	257.3	239.0	218.9	186.1	156.9	130.5	104.0	80.3
42.5°	372.2	340.3	303.8	266.4	247.2	227.2	190.7	159.6	131.4	104.0	79.4
45°	384.1	352.1	315.6	276.4	255.4	234.5	195.2	161.5	132.3	103.1	77.5
47.5°	395.0	362.2	324.8	284.6	262.7	241.8	198.9	164.2	133.2	103.1	76.6
50°	404.1	372.2	333.9	291.9	270.9	247.2	203.4	166.0	134.1	102.2	74.8
52.5°	413.3	380.4	343.0	300.1	277.3	254.5	207.1	167.9	135.0	102.2	73.9
55°	420.6	387.7	350.3	307.4	283.7	260.0	210.7	170.6	135.0	101.3	73.0
57.5°	426.9	394.1	356.7	312.9	289.2	264.6	214.4	172.4	135.9	101.3	72.1
60°	433.3	400.5	363.1	318.4	295.6	270.0	218.0	174.2	136.8	101.3	71.2
62.5°	438.8	406.0	368.6	323.9	300.1	274.6	221.7	175.2	136.8	100.3	70.2
65°	442.5	411.4	374.0	329.3	304.7	279.2	224.4	177.0	137.8	100.3	70.2
67.5°	446.1	416.0	378.6	333.9	310.2	283.7	228.1	178.8	138.7	100.3	69.3
70°	448.8	419.6	382.2	338.5	313.8	287.4	230.8	179.7	138.7	100.3	68.4
72.5°	450.7	422.4	385.0	342.1	316.6	290.1	233.5	181.5	138.7	99.4	68.4
75°	451.6	423.3	387.7	343.9	319.3	292.8	236.3	182.5	139.6	99.4	67.5
77.5°	451.6	425.1	389.5	346.7	322.0	295.6	238.1	183.4	139.6	99.4	67.5
80°	451.6	425.1	390.5	347.6	322.9	296.5	239.0	183.4	139.6	98.5	66.6
82.5°	449.8	425.1	391.4	349.4	323.9	297.4	240.8	184.3	138.7	98.5	66.6
85°	448.8	424.2	391.4	349.4	325.7	298.3	241.8	184.3	138.7	97.6	65.7
87.5°	447.0	424.2	391.4	349.4	325.7	298.3	241.8	184.3	137.8	96.7	65.7
90°	445.2	422.4	390.5	349.4	324.8	299.2	241.8	184.3	137.8	96.7	64.8
92.5°	442.5	420.6	389.5	347.6	324.8	298.3	241.8	184.3	137.8	96.7	64.8
95°	440.6	418.7	387.7	346.7	323.9	297.4	240.8	184.3	136.8	96.7	64.8
97.5°	437.9	416.9	385.9	345.8	322.0	296.5	239.9	184.3	136.8	96.7	64.8
100°	436.1	415.1	384.1	343.9	321.1	295.6	239.9	183.4	136.8	95.8	64.8
102.5°	434.2	413.3	382.2	342.1	318.4	292.8	237.2	182.5	136.8	96.7	64.8
105°	431.5	410.5	379.5	339.4	316.6	291.0	236.3	182.5	135.9	96.7	65.7
107.5°	429.7	407.8	376.8	336.6	313.8	289.2	234.5	180.6	135.9	96.7	65.7
110°	426.9	405.0	374.0	333.9	311.1	286.5	232.6	179.7	135.9	96.7	66.6



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
112.5°	424.2	401.4	369.5	329.3	307.4	282.8	229.9	178.8	135.0	96.7	66.6
115°	421.5	397.8	365.8	325.7	303.8	279.2	226.2	177.0	135.0	96.7	67.5
117.5°	417.8	394.1	361.3	322.0	299.2	275.5	223.5	176.1	134.1	97.6	68.4
120°	414.2	388.6	356.7	316.6	294.7	270.9	219.9	174.2	134.1	97.6	68.4
122.5°	409.6	384.1	351.2	311.1	289.2	266.4	216.2	171.5	132.3	97.6	69.3
125°	403.2	376.8	343.9	304.7	282.8	260.0	212.6	169.7	131.4	97.6	70.2
127.5°	397.8	370.4	337.5	297.4	276.4	254.5	208.0	166.9	130.5	97.6	71.2
130°	389.5	362.2	329.3	291.0	270.0	249.1	204.3	164.2	129.5	97.6	71.2
132.5°	382.2	354.0	321.1	282.8	263.6	242.7	199.8	162.4	128.6	97.6	72.1
135°	373.1	344.8	312.0	274.6	255.4	235.4	195.2	159.6	126.8	97.6	73.9
137.5°	362.2	333.9	302.0	266.4	248.1	227.2	190.7	156.9	125.9	98.5	74.8
140°	350.3	322.0	291.0	257.3	239.9	219.9	185.2	153.3	125.0	98.5	75.7
142.5°	336.6	310.2	279.2	247.2	229.0	211.6	179.7	150.5	123.2	98.5	76.6
145°	322.9	297.4	268.2	238.1	220.8	205.3	175.2	147.8	122.2	98.5	78.5
147.5°	310.2	284.6	257.3	226.2	212.6	198.0	170.6	145.1	121.3	99.4	80.3
150°	294.7	270.0	244.5	216.2	203.4	190.7	165.1	142.3	120.4	99.4	81.2
152.5°	277.3	255.4	230.8	206.2	195.2	182.5	160.6	138.7	118.6	99.4	83.0
155°	260.9	239.9	217.1	195.2	185.2	175.2	155.1	135.9	117.7	100.3	84.8
157.5°	243.6	224.4	205.3	187.0	177.0	167.9	150.5	133.2	116.8	101.3	86.7
160°	224.4	208.9	192.5	176.1	168.8	160.6	145.1	129.5	114.9	101.3	88.5
162.5°	207.1	194.3	179.7	166.9	159.6	153.3	139.6	126.8	114.0	101.3	90.3
165°	189.8	178.8	167.9	156.9	150.5	145.1	134.1	123.2	112.2	102.2	92.1
167.5°	174.2	165.1	156.0	147.8	143.2	137.8	128.6	119.5	111.3	102.2	94.0
170°	157.8	150.5	145.1	137.8	134.1	130.5	123.2	116.8	109.5	103.1	95.8
172.5°	142.3	136.8	133.2	128.6	125.9	123.2	117.7	112.2	107.6	102.2	97.6
175°	127.7	124.1	121.3	119.5	116.8	115.9	112.2	108.6	105.8	102.2	99.4
177.5°	114.0	112.2	111.3	110.4	109.5	108.6	106.7	105.8	104.0	103.1	101.3
180°	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6
2.5°	105.8	104.0	102.2	100.3	99.4	98.5	96.7	94.0	93.1	92.1	90.3
5°	102.2	98.5	95.8	94.0	92.1	88.5	85.8	83.0	80.3	78.5	76.6
7.5°	99.4	94.0	89.4	86.7	84.8	80.3	76.6	73.0	69.3	67.5	64.8
10°	95.8	89.4	83.9	80.3	77.5	73.0	68.4	63.9	60.2	57.5	54.7
12.5°	92.1	84.8	77.5	73.9	71.2	65.7	60.2	55.6	52.0	48.4	45.6
15°	89.4	80.3	72.1	68.4	64.8	59.3	52.9	48.4	44.7	41.1	38.3
17.5°	85.8	75.7	67.5	63.9	59.3	52.9	47.4	42.0	38.3	35.6	32.8
20°	83.0	72.1	62.9	58.4	54.7	47.4	42.0	37.4	33.8	31.0	29.2
22.5°	79.4	67.5	58.4	53.8	49.3	42.9	37.4	32.8	30.1	28.3	26.5
25°	76.6	63.9	53.8	49.3	45.6	38.3	33.8	30.1	27.4	26.5	25.5
27.5°	73.9	61.1	50.2	45.6	41.1	34.7	30.1	27.4	25.5	24.6	23.7
30°	71.2	57.5	46.5	42.0	38.3	31.9	28.3	26.5	24.6	23.7	23.7
32.5°	68.4	54.7	43.8	39.2	35.6	30.1	26.5	24.6	23.7	23.7	24.6
35°	65.7	52.0	41.1	36.5	32.8	28.3	25.5	24.6	23.7	24.6	24.6
37.5°	63.9	49.3	38.3	34.7	31.0	27.4	25.5	24.6	24.6	24.6	24.6
40°	62.0	47.4	36.5	32.8	30.1	26.5	24.6	24.6	24.6	25.5	24.6
42.5°	60.2	44.7	34.7	31.0	28.3	25.5	24.6	24.6	25.5	25.5	23.7
45°	57.5	42.9	32.8	30.1	27.4	25.5	24.6	25.5	25.5	24.6	22.8
47.5°	56.6	42.0	31.9	29.2	27.4	25.5	24.6	25.5	25.5	23.7	21.9
50°	54.7	40.1	31.0	28.3	26.5	25.5	25.5	26.5	24.6	22.8	21.0
52.5°	53.8	38.3	30.1	27.4	26.5	25.5	25.5	26.5	24.6	21.9	19.2
55°	52.0	37.4	29.2	27.4	26.5	25.5	26.5	25.5	23.7	21.0	17.3
57.5°	51.1	36.5	28.3	27.4	25.5	25.5	26.5	25.5	22.8	20.1	16.4
60°	50.2	35.6	28.3	26.5	25.5	26.5	26.5	25.5	21.9	19.2	15.5
62.5°	49.3	34.7	28.3	26.5	26.5	26.5	27.4	24.6	21.0	17.3	14.6
65°	48.4	33.8	28.3	26.5	26.5	27.4	26.5	24.6	20.1	16.4	13.7
67.5°	47.4	33.8	27.4	26.5	26.5	27.4	26.5	23.7	20.1	15.5	12.8
70°	46.5	32.8	27.4	26.5	26.5	27.4	26.5	22.8	19.2	15.5	11.9
72.5°	46.5	32.8	27.4	26.5	26.5	27.4	26.5	22.8	18.2	14.6	10.9
75°	45.6	32.8	27.4	26.5	26.5	28.3	26.5	21.9	18.2	13.7	10.0
77.5°	45.6	31.9	27.4	26.5	26.5	28.3	26.5	21.9	17.3	13.7	10.0
80°	44.7	31.9	27.4	26.5	27.4	28.3	25.5	21.0	16.4	12.8	9.1
82.5°	44.7	31.9	27.4	26.5	27.4	28.3	25.5	21.0	16.4	11.9	9.1
85°	43.8	31.0	27.4	26.5	26.5	27.4	25.5	20.1	15.5	11.9	8.2
87.5°	43.8	31.0	26.5	26.5	26.5	27.4	24.6	20.1	15.5	10.9	8.2
90°	43.8	31.0	26.5	26.5	26.5	27.4	24.6	20.1	15.5	10.9	7.3
92.5°	43.8	31.0	27.4	26.5	26.5	27.4	24.6	20.1	15.5	10.9	8.2
95°	43.8	31.0	27.4	26.5	26.5	27.4	24.6	20.1	15.5	10.9	8.2
97.5°	43.8	31.0	26.5	26.5	26.5	27.4	24.6	20.1	15.5	10.9	8.2
100°	43.8	31.0	26.5	26.5	26.5	27.4	24.6	20.1	15.5	11.9	8.2
102.5°	43.8	31.0	26.5	26.5	26.5	27.4	25.5	21.0	15.5	11.9	8.2
105°	43.8	31.0	26.5	26.5	26.5	27.4	25.5	21.0	16.4	11.9	9.1
107.5°	44.7	31.9	26.5	26.5	26.5	27.4	25.5	21.0	16.4	12.8	9.1
110°	44.7	31.9	27.4	26.5	26.5	27.4	26.5	21.9	17.3	12.8	10.0



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
112.5°	45.6	31.9	27.4	26.5	26.5	27.4	26.5	22.8	18.2	13.7	10.0
115°	46.5	32.8	27.4	26.5	26.5	27.4	26.5	23.7	19.2	14.6	11.9
117.5°	47.4	33.8	28.3	26.5	26.5	27.4	27.4	24.6	20.1	16.4	12.8
120°	48.4	34.7	28.3	27.4	26.5	27.4	28.3	25.5	21.9	17.3	13.7
122.5°	49.3	34.7	28.3	27.4	26.5	27.4	28.3	26.5	22.8	18.2	15.5
125°	50.2	36.5	29.2	27.4	26.5	27.4	28.3	26.5	23.7	20.1	16.4
127.5°	51.1	37.4	29.2	27.4	27.4	26.5	28.3	27.4	25.5	21.9	18.2
130°	52.0	38.3	30.1	28.3	27.4	26.5	27.4	28.3	26.5	23.7	20.1
132.5°	53.8	39.2	31.0	28.3	27.4	26.5	27.4	28.3	27.4	24.6	21.9
135°	54.7	41.1	31.9	29.2	27.4	26.5	27.4	28.3	28.3	26.5	23.7
137.5°	56.6	42.9	32.8	30.1	28.3	26.5	26.5	27.4	28.3	27.4	25.5
140°	58.4	43.8	34.7	31.0	29.2	27.4	26.5	27.4	28.3	28.3	27.4
142.5°	59.3	46.5	36.5	32.8	30.1	27.4	26.5	26.5	27.4	28.3	28.3
145°	62.0	48.4	38.3	34.7	31.9	28.3	26.5	26.5	27.4	28.3	28.3
147.5°	63.9	51.1	41.1	36.5	33.8	29.2	27.4	26.5	26.5	27.4	28.3
150°	66.6	53.8	43.8	39.2	35.6	31.0	28.3	27.4	26.5	27.4	27.4
152.5°	68.4	56.6	46.5	42.0	38.3	32.8	30.1	27.4	27.4	27.4	27.4
155°	71.2	59.3	50.2	45.6	42.0	36.5	31.9	29.2	28.3	27.4	27.4
157.5°	73.9	62.9	53.8	50.2	46.5	40.1	35.6	31.9	29.2	28.3	27.4
160°	77.5	66.6	58.4	53.8	50.2	44.7	39.2	34.7	31.9	30.1	29.2
162.5°	80.3	71.2	62.9	59.3	55.6	49.3	43.8	40.1	36.5	33.8	31.9
165°	83.0	74.8	67.5	63.9	61.1	54.7	50.2	45.6	42.0	39.2	36.5
167.5°	86.7	79.4	73.0	69.3	66.6	61.1	56.6	52.9	49.3	45.6	43.8
170°	89.4	83.9	78.5	75.7	73.0	68.4	63.9	60.2	56.6	53.8	52.0
172.5°	92.1	87.6	83.9	81.2	79.4	75.7	72.1	68.4	65.7	63.9	61.1
175°	95.8	93.1	89.4	87.6	86.7	83.9	81.2	78.5	76.6	74.8	73.0
177.5°	99.4	97.6	95.8	94.9	94.9	93.1	91.2	90.3	88.5	87.6	87.6
180°	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	107.6	107.6	107.6	107.6	107.6	107.6	107.6	107.6
2.5°	88.5	87.6	88.5	87.6	86.7	85.8	84.8	85.8
5°	74.8	73.0	73.0	72.1	71.2	70.2	69.3	70.2
7.5°	62.9	60.2	60.2	59.3	57.5	57.5	55.6	56.6
10°	52.0	50.2	49.3	48.4	47.4	46.5	45.6	45.6
12.5°	42.9	41.1	40.1	39.2	38.3	37.4	36.5	36.5
15°	36.5	34.7	33.8	33.8	31.9	31.9	31.0	31.0
17.5°	31.0	30.1	29.2	29.2	28.3	27.4	27.4	27.4
20°	28.3	27.4	26.5	26.5	25.5	25.5	25.5	25.5
22.5°	25.5	24.6	24.6	24.6	24.6	23.7	23.7	23.7
25°	24.6	23.7	23.7	23.7	23.7	23.7	23.7	23.7
27.5°	23.7	23.7	23.7	23.7	23.7	24.6	24.6	23.7
30°	23.7	24.6	24.6	24.6	24.6	24.6	24.6	24.6
32.5°	24.6	24.6	24.6	24.6	24.6	23.7	23.7	23.7
35°	24.6	24.6	24.6	23.7	23.7	22.8	22.8	22.8
37.5°	24.6	23.7	23.7	22.8	21.9	21.0	21.0	21.0
40°	23.7	22.8	21.9	21.0	20.1	19.2	19.2	19.2
42.5°	22.8	21.0	20.1	20.1	18.2	17.3	16.4	16.4
45°	21.0	19.2	18.2	17.3	16.4	15.5	14.6	14.6
47.5°	20.1	18.2	17.3	16.4	14.6	13.7	12.8	12.8
50°	18.2	16.4	14.6	14.6	12.8	11.9	10.9	10.9
52.5°	16.4	14.6	13.7	12.8	10.9	10.0	9.1	9.1
55°	15.5	12.8	11.9	10.9	10.0	8.2	8.2	7.3
57.5°	13.7	11.9	10.0	9.1	8.2	7.3	6.4	6.4
60°	12.8	10.0	9.1	8.2	7.3	6.4	5.5	5.5
62.5°	11.9	9.1	8.2	7.3	6.4	4.6	4.6	4.6
65°	10.9	8.2	7.3	6.4	5.5	3.6	3.6	3.6
67.5°	10.0	7.3	6.4	5.5	4.6	3.6	2.7	2.7
70°	9.1	6.4	5.5	4.6	3.6	2.7	1.8	1.8
72.5°	8.2	6.4	5.5	4.6	2.7	1.8	1.8	1.8
75°	7.3	5.5	4.6	3.6	2.7	1.8	1.8	1.8
77.5°	7.3	4.6	4.6	3.6	2.7	1.8	2.7	1.8
80°	6.4	4.6	3.6	2.7	2.7	1.8	1.8	1.8
82.5°	6.4	4.6	3.6	2.7	1.8	1.8	1.8	1.8
85°	5.5	3.6	2.7	2.7	1.8	1.8	1.8	1.8
87.5°	5.5	2.7	2.7	1.8	1.8	1.8	1.8	1.8
90°	5.5	2.7	2.7	1.8	1.8	1.8	1.8	1.8
92.5°	5.5	3.6	2.7	1.8	1.8	1.8	1.8	1.8
95°	5.5	3.6	2.7	1.8	1.8	1.8	1.8	1.8
97.5°	5.5	3.6	2.7	1.8	1.8	1.8	1.8	1.8
100°	5.5	3.6	2.7	1.8	1.8	1.8	1.8	0.9
102.5°	5.5	3.6	2.7	1.8	1.8	0.9	0.9	0.9
105°	6.4	4.6	3.6	2.7	1.8	0.9	0.9	0.9
107.5°	6.4	4.6	3.6	2.7	1.8	0.9	0.9	0.9
110°	7.3	5.5	4.6	3.6	2.7	1.8	0.9	0.9



TEST NUMBER: P190076

CATALOG NUMBER: TRO11-LD4-20W-50-CL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
112.5°	8.2	5.5	4.6	3.6	2.7	1.8	1.8	1.8
115°	9.1	6.4	5.5	5.5	3.6	2.7	2.7	2.7
117.5°	10.0	8.2	7.3	6.4	4.6	4.6	3.6	3.6
120°	10.9	9.1	8.2	7.3	6.4	5.5	4.6	4.6
122.5°	11.9	10.0	9.1	8.2	7.3	6.4	5.5	5.5
125°	13.7	10.9	10.0	9.1	8.2	7.3	6.4	6.4
127.5°	15.5	12.8	11.9	10.9	10.0	8.2	8.2	8.2
130°	17.3	14.6	13.7	12.8	10.9	10.0	9.1	9.1
132.5°	19.2	16.4	15.5	14.6	12.8	11.9	10.9	10.9
135°	21.9	19.2	18.2	17.3	15.5	13.7	13.7	13.7
137.5°	23.7	21.0	20.1	19.2	18.2	16.4	16.4	15.5
140°	25.5	23.7	22.8	21.9	21.0	19.2	19.2	19.2
142.5°	27.4	25.5	25.5	24.6	23.7	22.8	21.9	21.9
145°	28.3	28.3	27.4	27.4	26.5	25.5	24.6	24.6
147.5°	28.3	29.2	28.3	28.3	28.3	27.4	27.4	27.4
150°	28.3	28.3	29.2	29.2	29.2	29.2	28.3	28.3
152.5°	27.4	27.4	28.3	28.3	28.3	29.2	29.2	29.2
155°	27.4	27.4	27.4	27.4	27.4	27.4	27.4	28.3
157.5°	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4
160°	28.3	27.4	27.4	27.4	27.4	27.4	27.4	27.4
162.5°	30.1	29.2	29.2	28.3	28.3	28.3	27.4	27.4
165°	34.7	32.8	32.8	31.9	31.0	31.0	30.1	30.1
167.5°	41.1	39.2	38.3	37.4	36.5	36.5	35.6	35.6
170°	49.3	47.4	46.5	45.6	44.7	44.7	43.8	43.8
172.5°	59.3	57.5	56.6	55.6	54.7	54.7	53.8	53.8
175°	71.2	69.3	69.3	69.3	67.5	67.5	66.6	66.6
177.5°	85.8	84.8	84.8	83.9	83.9	83.9	83.0	83.0
180°	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3

(END OF REPORT)