



Product Test Report - Goniometer Luminaire Evaluation

Method: LM-79:2019

Evaluation: Photometric Summary

Test results reported for:

LightArt A 3FORM COMPANY

Product Description: Ribbon Cloud Pendant White 18" 3000K

Issued Report:

LIGT011-010_Ribbon Cloud Pendant White 18" 3000K

Project: 80072634 - TPPPT

Original issue date:

Friday, February 26, 2021

Revision Issue Date:

First Issue

Prepared for:

LightArt A 3FORM COMPANY
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Product Test Report - Goniometer Luminaire Evaluation

Manufacturer: LightArt A 3FORM COMPANY

Report Number: LIGT011-010

Product Description: Ribbon Cloud Pendant White 18" 3000K

Release Date: 2/26/2021

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Product Test Report - Goniometer Luminaire Evaluation

Manufacturer: LightArt A 3FORM COMPANY

Report Number: LIGT011-010

Product Description: Ribbon Cloud Pendant White 18" 3000K

Release Date: 2/26/2021

SAMPLE DESCRIPTION

Lab sample identification: 1

Customer Identification: Configuration A

Manufacturer: LightArt A 3FORM COMPANY

Part number: NA

Model Number: NA

Description: Ribbon Cloud Pendant White 18" 3

Manufacturer's ratings

Max Current (A):	NA
Operating voltage:	120VAC
CCT:	NA
Frequency (Hz):	50-60
Type:	LED

Sample Device Southern Hemisphere



Sample Device Northern Hemisphere

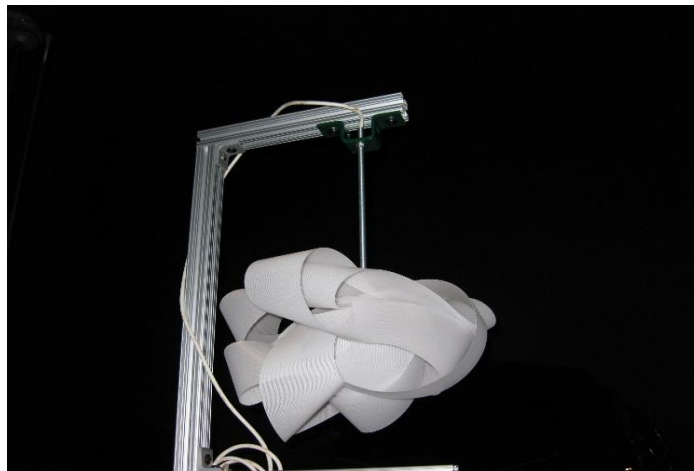
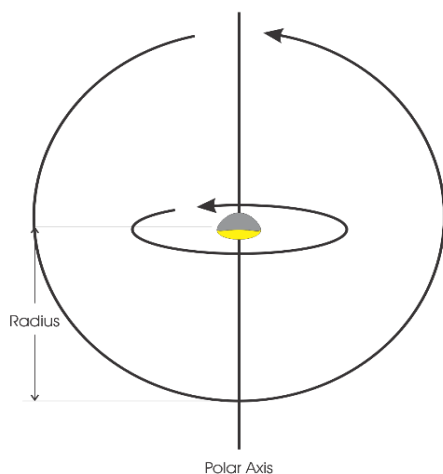
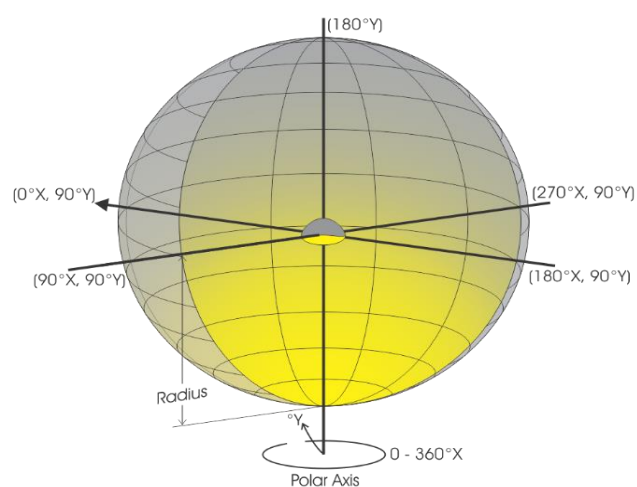


Image At 0° and 0°, See Equipment Geometry

Equipment Geometry - For Sample Device Mounted



Test Geometry - Type C Coordinates



Coordinate System Description

Reference: LM-75-01 Goniophotometer Types and Photometric Coordinates

Type C coordinate system, the polar axis is vertical. The angles measure in the vertical half planes of data are called vertical angles, and the angles to the horizontal half planes are called lateral angles. The vertical V angles range in value from 0° to 180°. The lateral L planes range in value from 0° to 360°.

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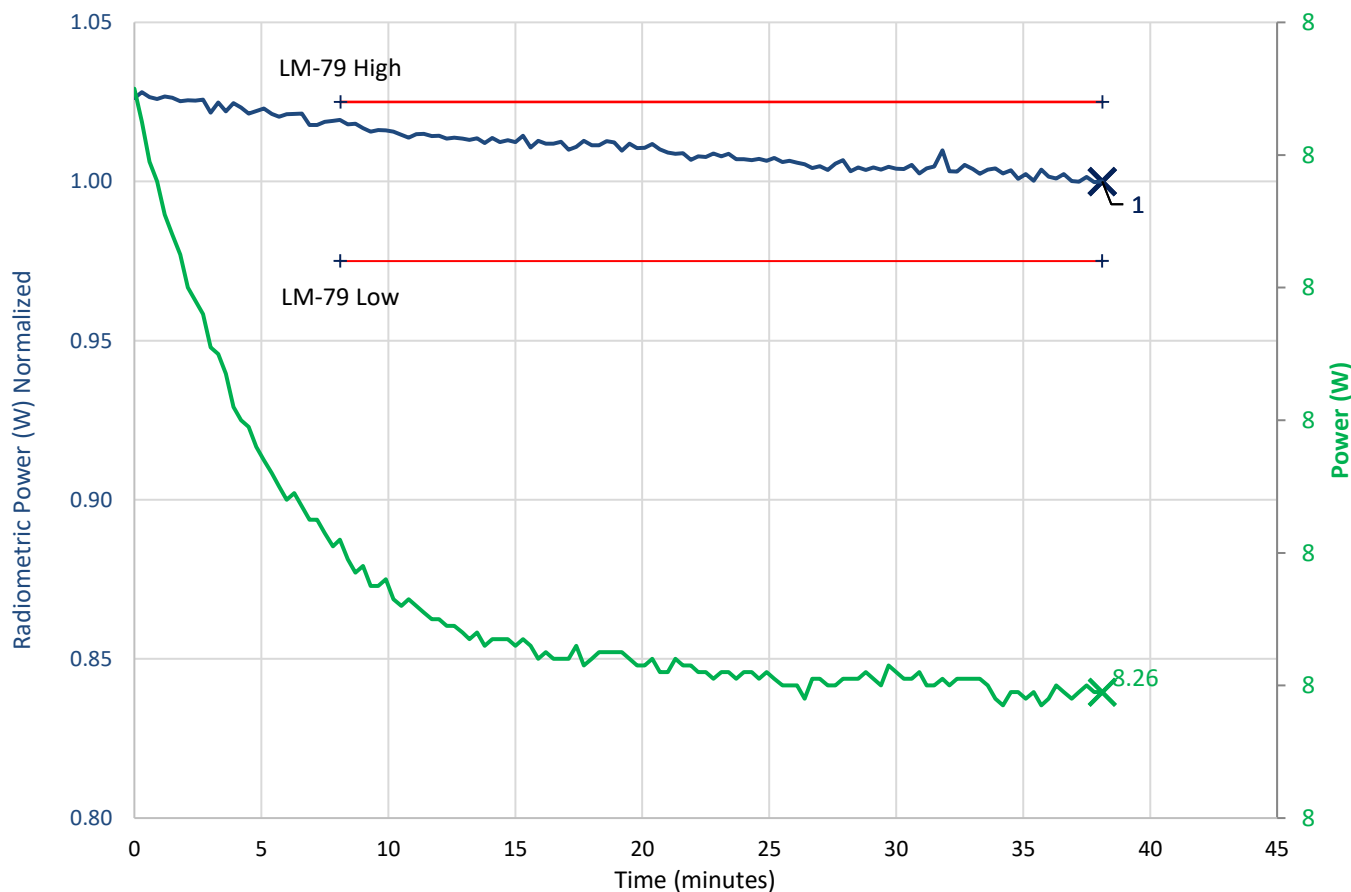
Release Date: 2/26/2021

OPTICAL STABILIZATION

Stabilization Description - A series of 128 measurements are recorded during the stabilization period. The final stabilized measurement of normalized radiant power, as defined by LM-79:2019, is reported after 38 minutes of recorded device runtime. The 'Measurements in Range', provided below, are a histogram of measurements recorded during the 30 minute stabilization window.

% of range	Power (W) Normalized	Measurements in Range
99.980%	1.00	9
100.176%	1.00	13
100.372%	1.00	16
100.567%	1.01	11
100.763%	1.01	8
100.959%	1.01	10
101.154%	1.01	15
101.350%	1.01	11
101.545%	1.02	5
101.741%	1.02	7
100.000%	1.00	Reported

% of range	Power (W)	Measurements in Range
99.976%	8.26	14
100.006%	8.26	41
100.036%	8.26	26
100.067%	8.26	14
100.097%	8.27	9
100.127%	8.27	5
100.157%	8.27	4
100.188%	8.27	4
100.218%	8.28	3
100.248%	8.28	2
100.000%	8.26	Reported



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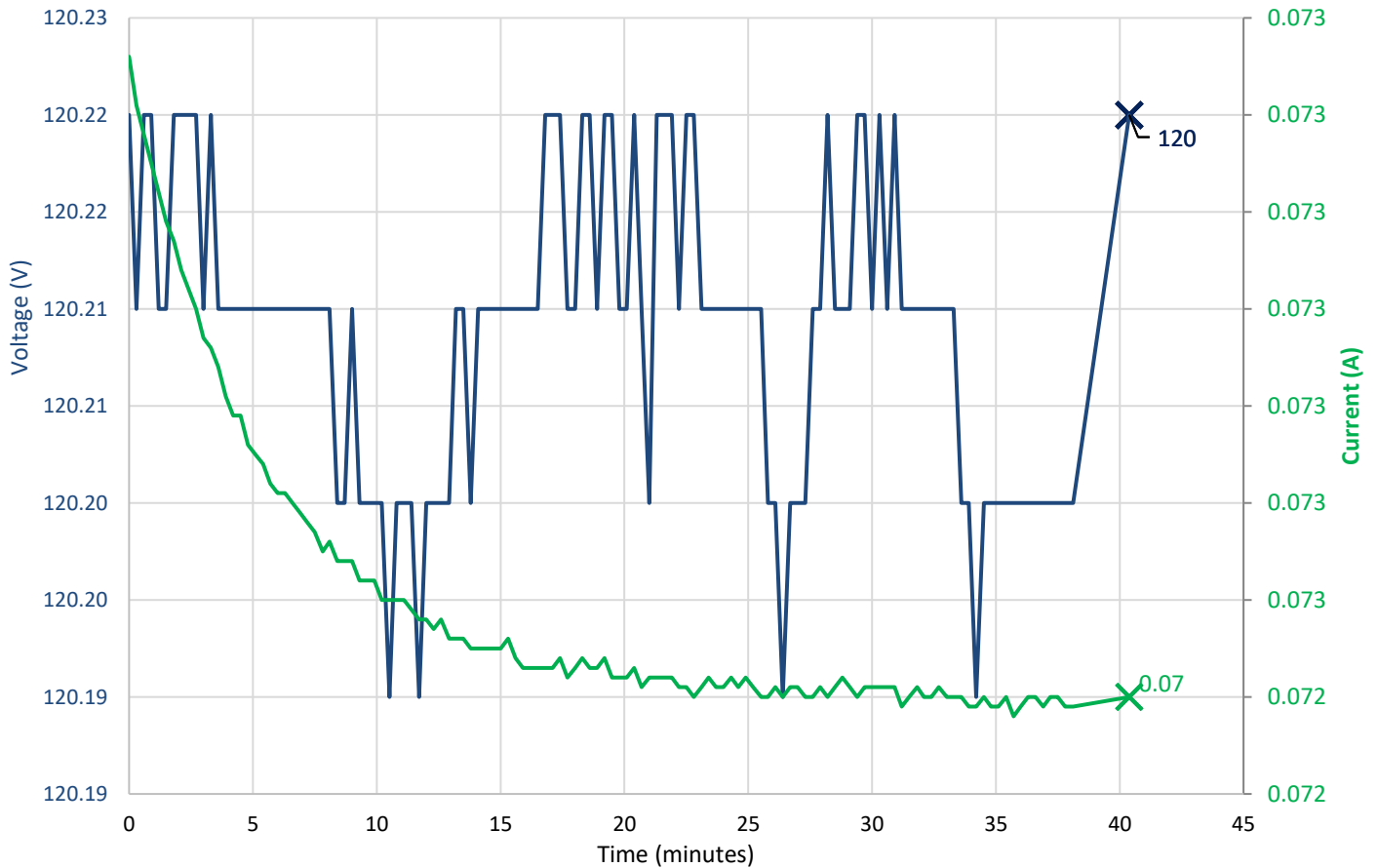
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ELECTRICAL STABILIZATION

Stabilization Description - A series of 129 measurements are recorded during the stabilization period. The final stabilized measurement, as defined by LM-79:2019, is reported after 40 minutes of recorded device runtime. The 'Measurements in Range', provided below, are a histogram of measurements recorded during the 30 minute stabilization window.

% of range	Voltage (V)	Measurements in Range
99.975%	120.19	4
99.978%	120.19	0
99.980%	120.20	0
99.983%	120.20	35
99.985%	120.20	0
99.988%	120.21	0
99.990%	120.21	63
99.993%	120.21	0
99.995%	120.21	0
99.998%	120.22	27
100.000%	120.22	Reported

% of range	Current (A)	Measurements in Range
99.972%	0.072	10
99.989%	0.072	21
100.006%	0.072	21
100.022%	0.072	12
100.039%	0.072	13
100.055%	0.072	9
100.072%	0.072	4
100.088%	0.072	1
100.105%	0.072	3
100.122%	0.072	5
100.000%	0.072	Reported



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PHOTOMETRIC SUMMARY

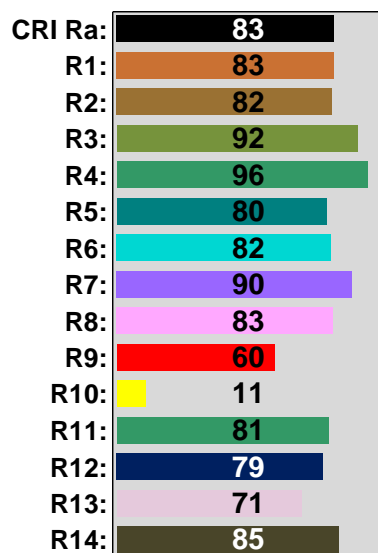
Radiometric Measurements

Peak Wl: 606.9 nm
FWHM: 129.8 nm
Centroid Wl: 581.7 nm

Photometric Measurements

Photopic Power: 725 lm
Luminous Efficacy: 88 lm/W
CCT: 3050 K

Color Rendering Index



Color Coordinates

Cx: 0.4322
Cy: 0.4003
u: 0.2492
v: 0.3461
u': 0.2492
v': 0.5192
Duv: -0.0009
Du'v': 0.0000

Color Purity: - %
Dom Wl: 582.9 nm
Comp Wl: 482.4 nm
Gamut Area: 0.521

Electrical Performance

Voltage: 120.220 V
Current: 0.072 A
Frequency: 59.969 Hz
Active Power (P): 8.261 W
Apparent Power: 8.704 VA
Power Factor: 0.949 W/VA
THD Voltage: 0.1 %
THD Current: 26.5 %

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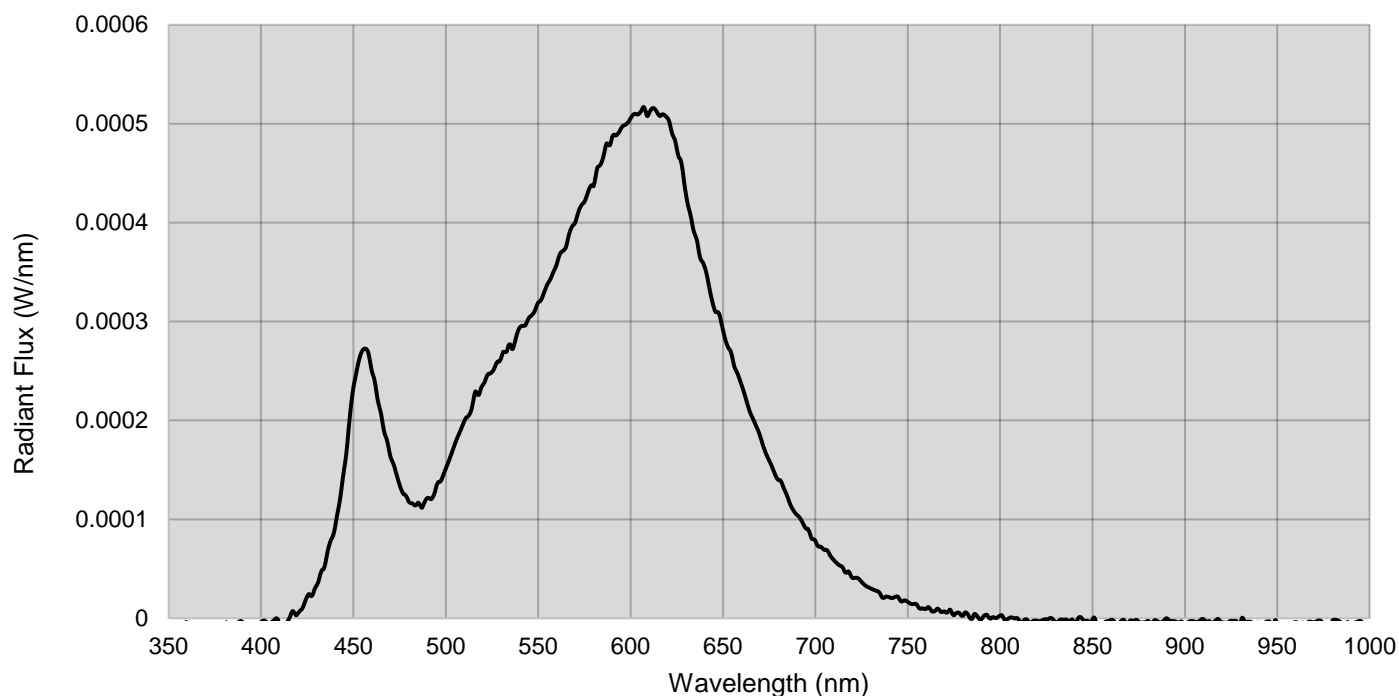
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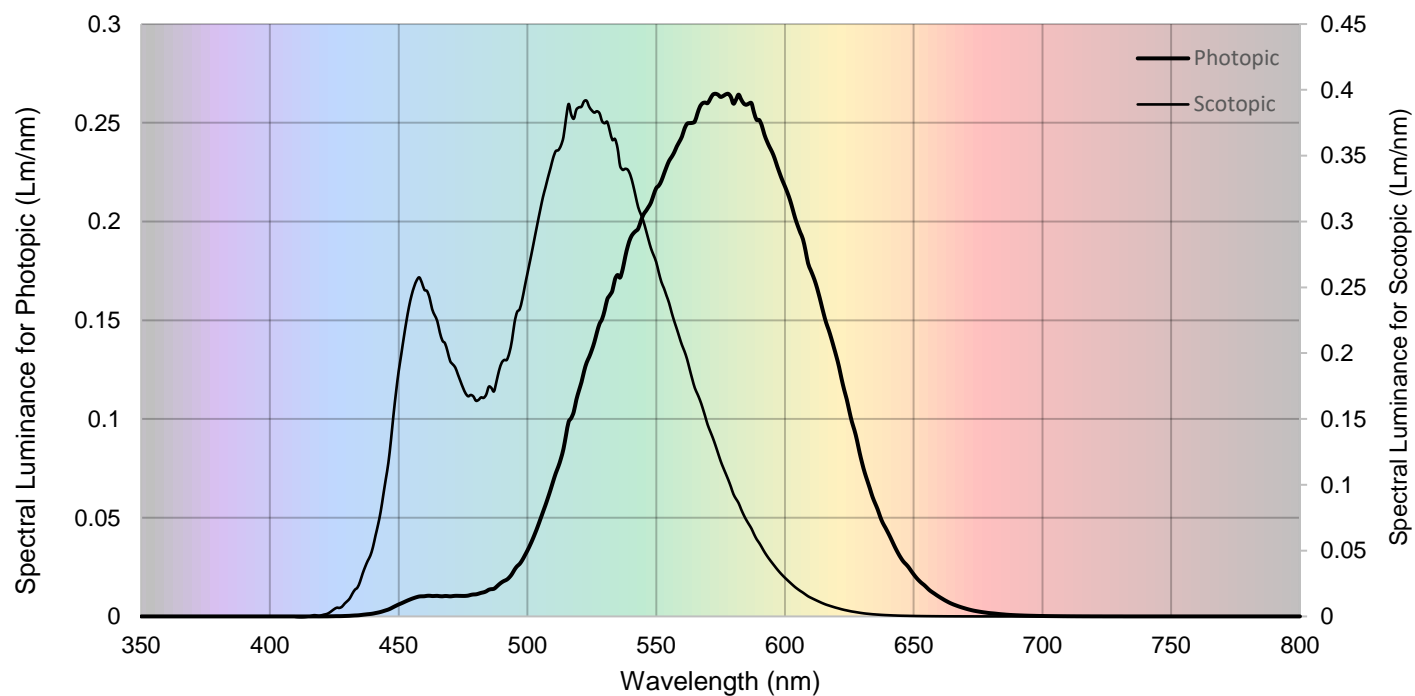
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VISIBLE SPECTRUM

Radiometric Spectrum



Photopic and Scotopic Spectrum



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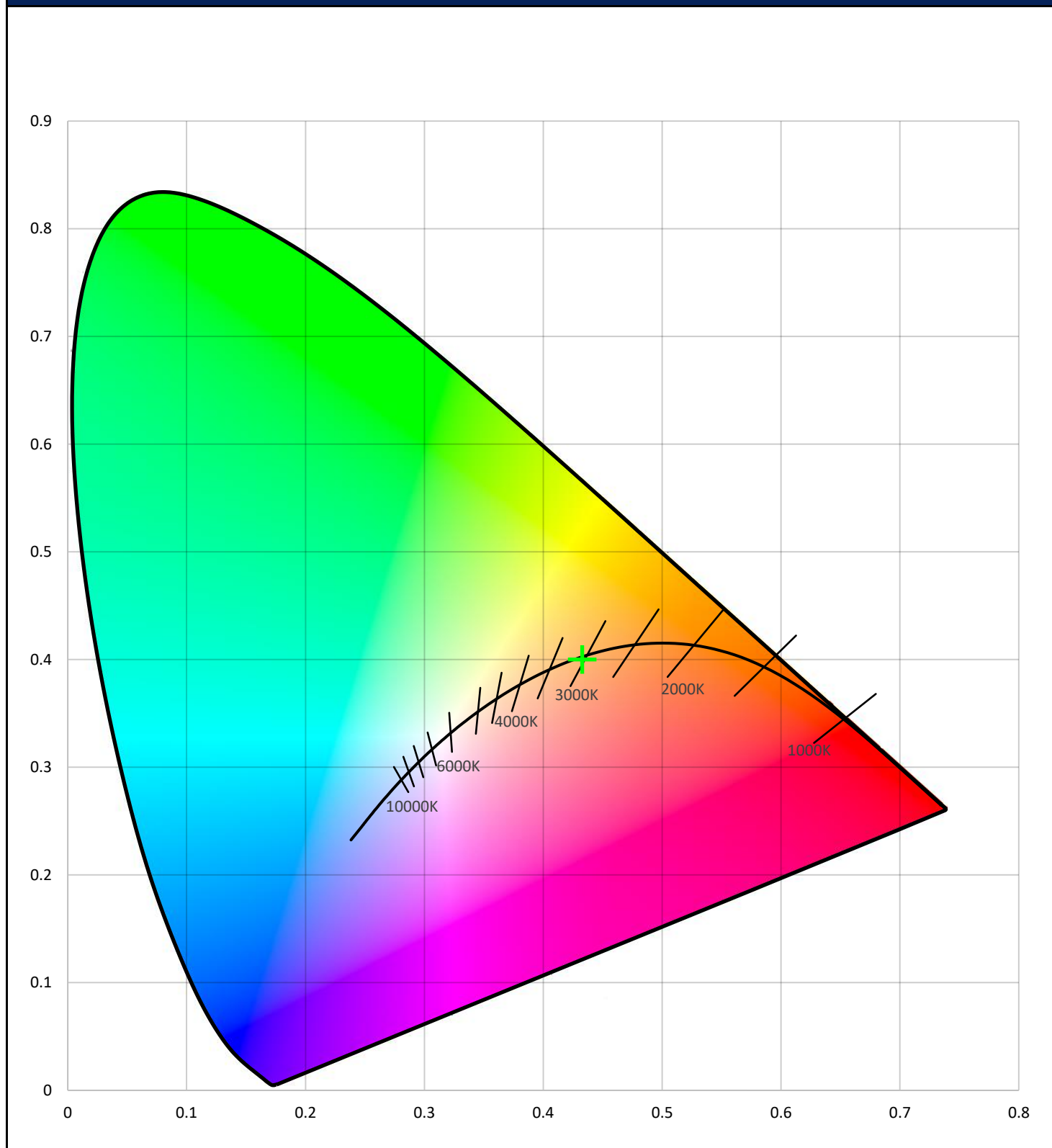
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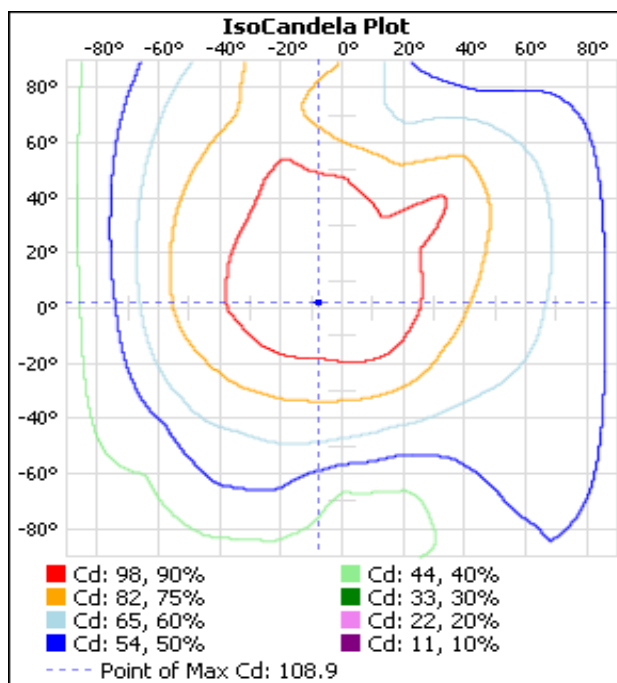
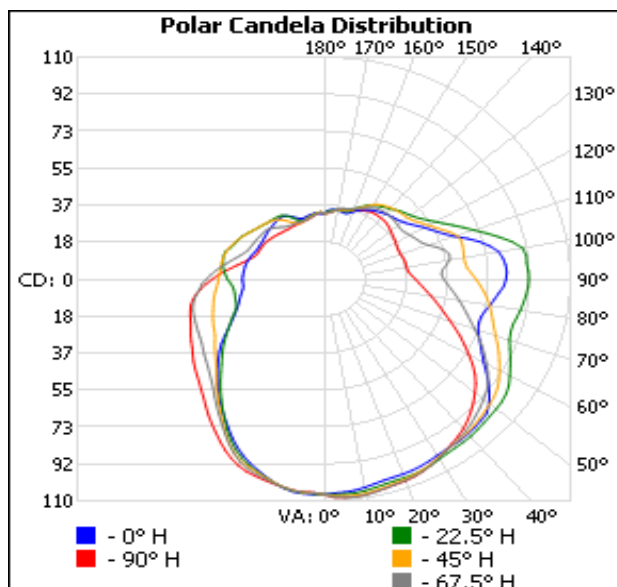
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CANDELA PLOTS



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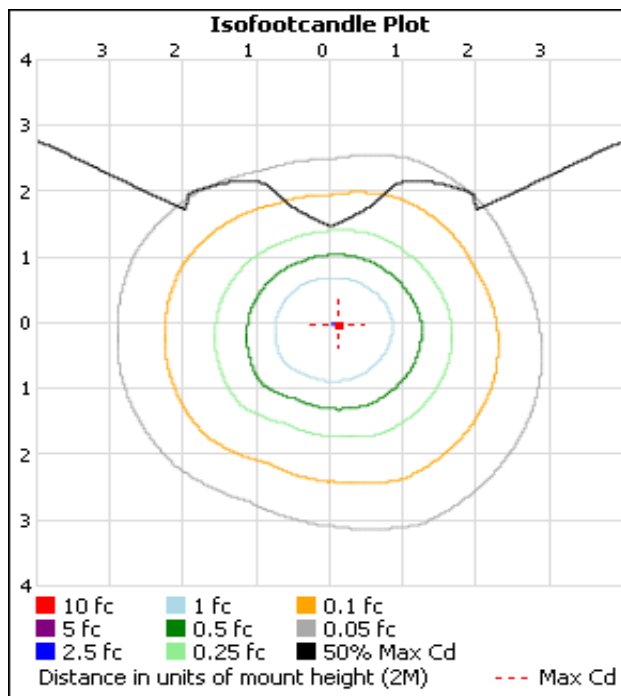
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ILLUMINANCE PLOTS



Illuminance at a Distance			
	Center Beam fc	Beam Width	
0.33M	89.9 fc	33.49 M	3.84 M
0.67M	22.3 fc	67.30 M	7.71 M
1.00M	9.93 fc	100.79 M	11.55 M
1.33M	5.59 fc	134.28 M	15.39 M
1.67M	3.57 fc	168.09 M	19.27 M
2.00M	2.48 fc	201.58 M	23.11 M
<div> <div>■</div> Vert. Spread: 177.7° <div>■</div> Horiz. Spread: 160.4° </div>			

ZONAL LUMEN SUMMARY

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	85.1	11.70%
0-40	142.5	19.70%
0-60	275.4	38.00%
60-90	187.7	25.90%
70-100	175.8	24.30%
90-120	144.7	20.00%
0-90	463.2	63.90%
90-180	261.3	36.10%
0-180	724.5	100.00%

Lumens Per Zone		
Zone	Lumens	% Total
0-10	10.2	1.40%
44489	29.3	4.00%
20-30	45.7	6.30%
30-40	57.4	7.90%
40-50	65	9.00%
50-60	67.9	9.40%
60-70	65.9	9.10%
70-80	62.9	8.70%
80-90	59	8.10%
90-100	53.9	7.40%
100-110	48.7	6.70%
110-120	42	5.80%
120-130	35.6	4.90%
130-140	29.5	4.10%
140-150	23.2	3.20%
150-160	15.9	2.20%
160-170	9.3	1.30%
170-180	3.1	0.40%

Lower Hemisphere

Upper Hemisphere

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CANDELA TABLE

LOWER HEMISPHERE

South Pole

Equator

0	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107
2.5	106	107	108	108	108	108	108	107	107	106	106	106	106	106	106	106	106
5	106	107	108	109	109	108	107	107	107	106	106	106	106	106	105	105	106
7.5	106	107	108	109	109	108	107	107	106	106	106	106	106	105	105	105	106
10	105	106	108	109	108	107	106	105	105	105	105	105	105	105	104	104	105
12.5	104	106	107	108	108	106	104	103	103	103	103	104	104	104	103	103	104
15	103	105	107	107	107	106	103	101	101	102	102	102	103	103	102	102	103
17.5	103	105	106	107	107	105	101	99	99	100	100	101	102	102	101	102	103
20	103	105	106	106	106	104	100	97	97	98	99	100	101	102	101	101	103
22.5	103	105	105	106	106	103	99	95	95	96	98	98	100	101	101	101	103
25	102	104	104	105	105	102	97	93	92	93	95	95	98	100	100	101	102
27.5	102	104	103	104	104	100	94	90	89	90	92	92	96	98	100	100	102
30	101	103	102	102	102	98	92	87	85	86	88	88	93	97	100	99	101
32.5	101	102	101	101	101	96	89	85	82	83	84	85	90	95	99	99	101
35	100	102	100	100	99	94	87	82	79	79	81	82	87	93	99	98	101
37.5	100	102	100	99	98	92	84	79	76	75	77	79	85	92	100	97	101
40	100	102	99	98	97	89	81	77	73	72	74	76	82	90	100	97	100
42.5	100	101	99	97	95	86	78	74	70	68	71	73	80	89	100	96	100
45	99	101	98	96	93	83	75	71	67	65	68	71	77	87	100	94	99
47.5	98	100	97	94	90	80	72	69	64	62	65	69	76	85	100	91	99
50	96	100	96	93	88	77	69	66	62	59	63	68	74	83	99	88	96
52.5	93	100	96	91	85	75	67	64	59	57	61	66	73	82	97	84	93
55	90	99	94	89	82	71	64	62	56	54	59	65	71	80	94	81	91
57.5	86	98	93	87	79	68	62	60	53	52	58	64	70	78	91	77	88
60	82	96	90	84	75	64	60	58	49	49	56	63	68	76	88	73	84
62.5	79	94	88	81	71	60	59	57	47	47	55	62	67	74	84	70	81
65	77	92	86	78	67	57	58	55	45	45	54	62	66	72	81	68	78
67.5	75	90	84	75	63	54	56	54	43	43	54	62	64	70	77	66	76
70	73	88	81	71	60	50	55	53	41	42	53	61	63	68	72	64	74
72.5	72	87	80	69	56	48	53	53	40	41	52	61	63	67	68	62	73
75	72	87	78	66	54	45	52	52	39	41	51	60	62	65	65	61	72
77.5	73	88	76	64	51	44	50	51	38	41	51	60	61	63	61	60	73
80	75	89	75	61	49	42	48	48	37	40	50	59	60	61	58	59	74
82.5	77	90	73	59	46	40	45	45	36	41	49	57	58	58	54	57	76
85	78	90	72	57	44	38	43	43	36	41	48	56	55	55	50	56	78
87.5	80	91	70	55	42	36	41	41	36	42	47	55	53	52	47	55	80
90	81	91	68	53	41	34	39	40	36	43	47	53	50	49	44	54	81

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CANDELA TABLE

LOWER HEMISPHERE

Equator

0	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
90	81	91	68	53	41	34	39	40	36	43	47	53	50	49	44	54	81
92.5	82	91	66	52	39	33	37	38	36	44	47	51	47	45	42	53	82
95	81	91	64	53	38	32	36	37	36	45	47	49	45	42	40	52	82
97.5	81	91	63	55	37	32	35	36	36	45	46	46	42	40	39	50	80
100	79	90	63	57	37	32	34	34	36	46	46	44	40	38	39	49	78
102.5	76	86	64	57	37	33	35	34	36	46	46	42	37	37	39	48	75
105	72	81	64	56	37	33	35	34	35	46	46	41	36	36	39	47	71
107.5	67	76	64	53	37	34	35	34	35	46	46	39	34	35	40	47	66
110	62	71	63	50	36	35	36	34	34	45	45	38	33	35	41	46	61
112.5	58	67	61	47	36	35	36	34	34	44	44	37	32	35	42	46	57
115	56	63	58	46	36	36	36	34	34	43	44	37	32	34	42	45	54
117.5	53	60	56	45	36	36	37	34	33	43	43	36	32	34	43	44	51
120	51	57	54	44	37	37	37	34	33	42	42	36	32	34	43	43	49
122.5	49	55	52	43	37	37	37	34	33	41	41	36	32	34	42	42	47
125	47	52	50	42	38	37	36	34	33	41	41	36	32	33	40	41	45
127.5	46	51	49	42	38	37	36	34	34	40	40	36	31	33	39	40	43
130	45	50	48	42	38	38	36	34	34	39	39	36	31	32	38	39	42
132.5	44	49	48	43	39	38	37	35	34	39	39	36	31	32	37	38	41
135	43	48	47	43	39	38	37	35	35	38	38	35	31	32	36	37	40
137.5	43	47	47	43	40	38	37	35	35	38	38	34	30	31	35	37	40
140	42	45	46	43	40	38	37	35	35	38	37	33	30	31	34	36	39
142.5	42	45	46	43	40	38	37	36	36	37	37	32	30	30	34	36	39
145	41	44	45	42	40	38	37	36	36	37	36	32	30	29	34	36	38
147.5	40	43	44	42	40	38	37	36	36	37	35	31	29	29	33	35	37
150	40	42	42	41	39	38	37	36	36	36	33	31	30	29	32	35	36
152.5	39	41	41	40	38	37	36	35	35	35	32	30	30	29	31	34	36
155	38	40	39	39	38	37	35	34	34	34	31	30	30	29	30	33	35
157.5	36	38	38	38	37	36	35	33	33	32	30	30	30	29	29	31	33
160	35	36	37	37	36	36	35	33	32	31	30	30	30	29	29	30	32
162.5	34	35	36	37	36	36	35	33	32	30	30	30	30	30	29	30	31
165	34	35	36	36	36	36	35	33	32	31	31	30	30	30	30	30	31
167.5	34	35	35	36	35	35	34	33	32	32	31	31	31	31	31	31	31
170	35	35	35	35	35	35	34	33	33	32	32	31	31	31	32	32	32
172.5	35	35	34	34	34	34	34	33	33	33	32	32	32	32	32	32	32
175	34	34	33	33	33	34	34	33	33	33	33	33	33	33	32	32	31
177.5	34	34	33	33	33	33	33	32	33	33	33	33	33	33	32	32	31
180	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33

North Pole

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EQUIPMENT

Item	Description/use	Manufacturer	Model	Serial #	Calibration Due
Spectrometer	Spectrum	Orb Optronix	SP-75	4013726	7/16/2021
Radiometer	Power Meter	Newport	2936R	18953	3/25/2021
Quantum Sensor	PAR vs Angle	Gigahertz-Optik	PS-3701	44466	3/25/2021
AC Power Supply	DUT AC Voltage	QuadTech	31015	QT3101500128	Not Applicable
Power Analyzer	Electrical	Yokogawa	WT310E	C25K10003V	8/16/2021
Goniometer	Angular & IES data	Orb Optronix	Gono 7_M	GONO007	8/16/2021
Spectral Suite	Software - Spectrum	Orb Optronix	SS V3	3.1.17.901	Not Applicable
Spectral Suite	Software - IES	Orb Optronix	SS V3	3.0.16.951	Not Applicable

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REVISION HISTORY

REVISION	DATE	APPROVED	DESCRIPTION OF REVISION
010	2/26/2021	ACM	① ORIGINAL

END OF REPORT