



## Product Test Report - Radiometric/Photometric

Method: LM-79:2019

### Test results reported for:

LightArt

Product Description: SLIM RING XL

### Issued Report:

LIGT009-020\_SLIM RING XL

### Original issue date:

Tuesday, March 10, 2020

### Revision Issue Date:

First Issue

### Prepared for:

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Test report prepared by:

A handwritten signature in blue ink that reads 'Aaron Miller'.

Aaron Miller  
Laboratory Manager  
Test & Measurement Services

## Product Test Report - Radiometric/Photometric

**Manufacturer:** LightArt

**Report Number:** LIGT009-020

**Product Description:** SLIM RING XL

**Release Date:** 3/10/2020

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## Product Test Report - Radiometric/Photometric

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### SAMPLE DESCRIPTION

Lab sample identification: 2

Customer Identification: LIGT009

Manufacturer: LightArt

Part number: SLIM RING XL

Model Number: -

Description: -

#### Manufacturer's ratings

Max Current (A):	NA
Operating voltage:	120.0
CCT:	NA
Frequency (Hz):	60
Type:	LED

#### Sample Device as Received

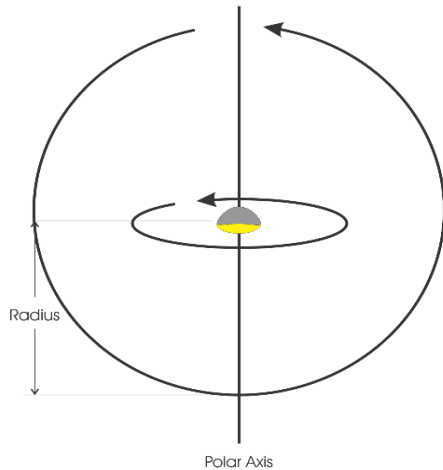


#### Sample Device Mounted to Test Apparatus

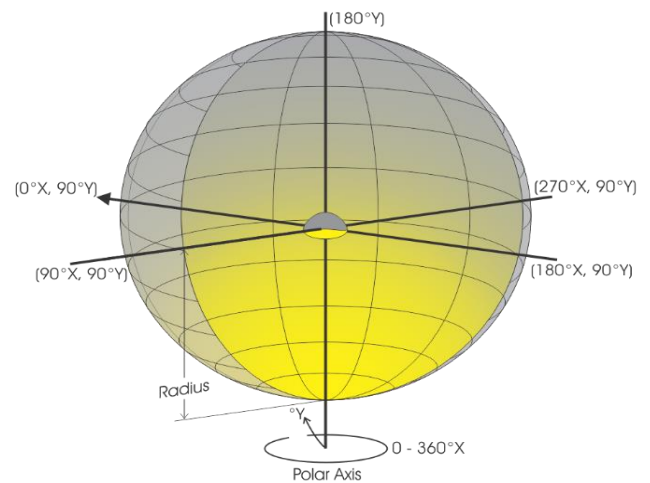


Image At 0° and 0°, See Equipment Geometry

#### 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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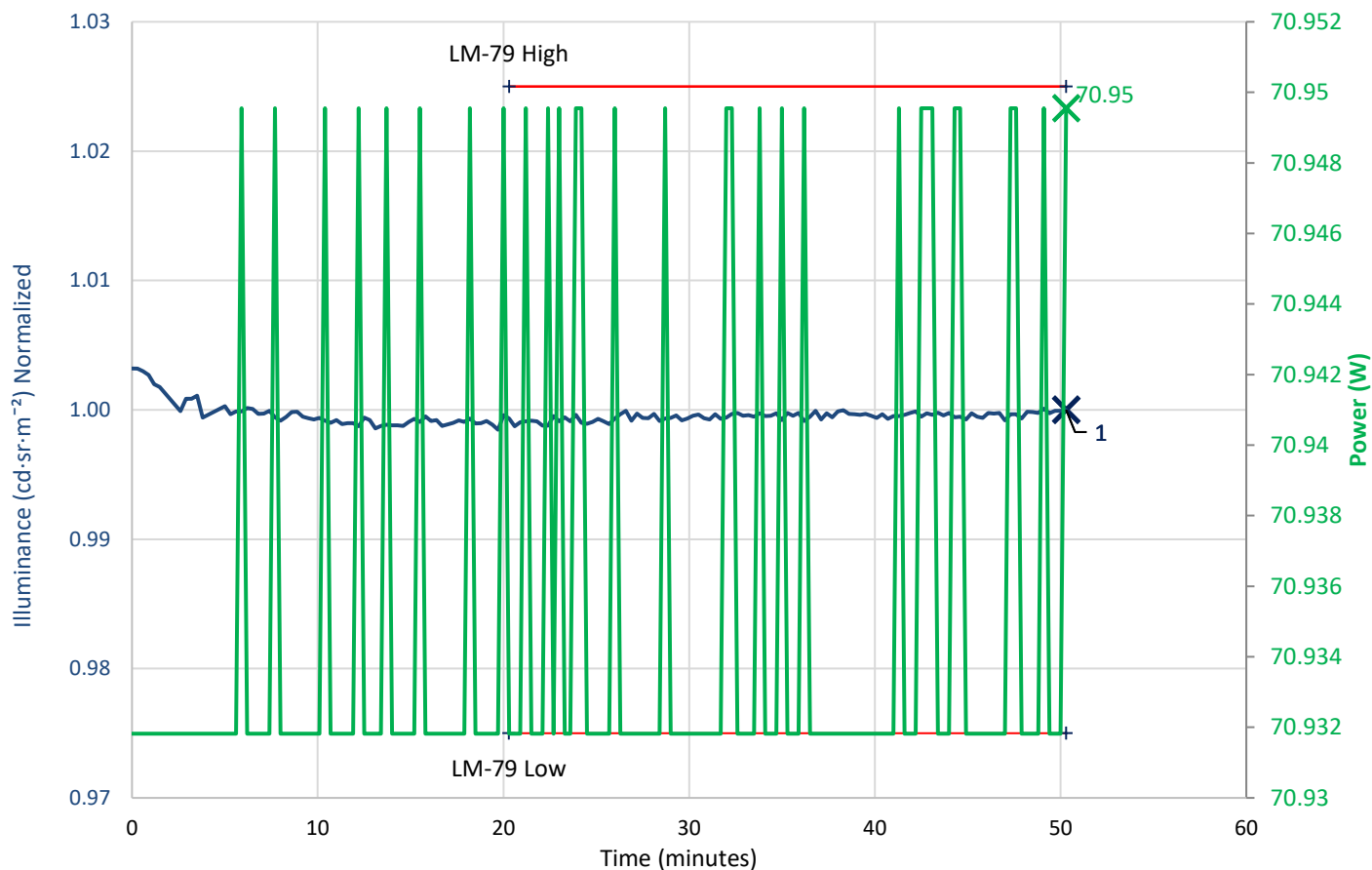
**Release Date:** 3/10/2020

### OPTICAL STABILIZATION

Stabilization Description - A series of 162 measurements are recorded during the stabilization period. The final stabilized measurement, as defined by LM-79:2019, is reported after 50 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	(cd·sr·m <sup>-2</sup> ) Normalized	Measurements in Range
99.874%	1.00	11
99.887%	1.00	10
99.901%	1.00	14
99.915%	1.00	15
99.928%	1.00	23
99.942%	1.00	19
99.956%	1.00	21
99.969%	1.00	20
99.983%	1.00	12
99.997%	1.00	4
100.000%	1.00	Reported

% of range	Power (W)	Measurements in Range
99.975%	70.93	133
99.978%	70.93	0
99.980%	70.94	0
99.983%	70.94	0
99.985%	70.94	0
99.988%	70.94	0
99.990%	70.94	0
99.993%	70.94	0
99.995%	70.95	0
99.998%	70.95	30
100.000%	70.95	Reported



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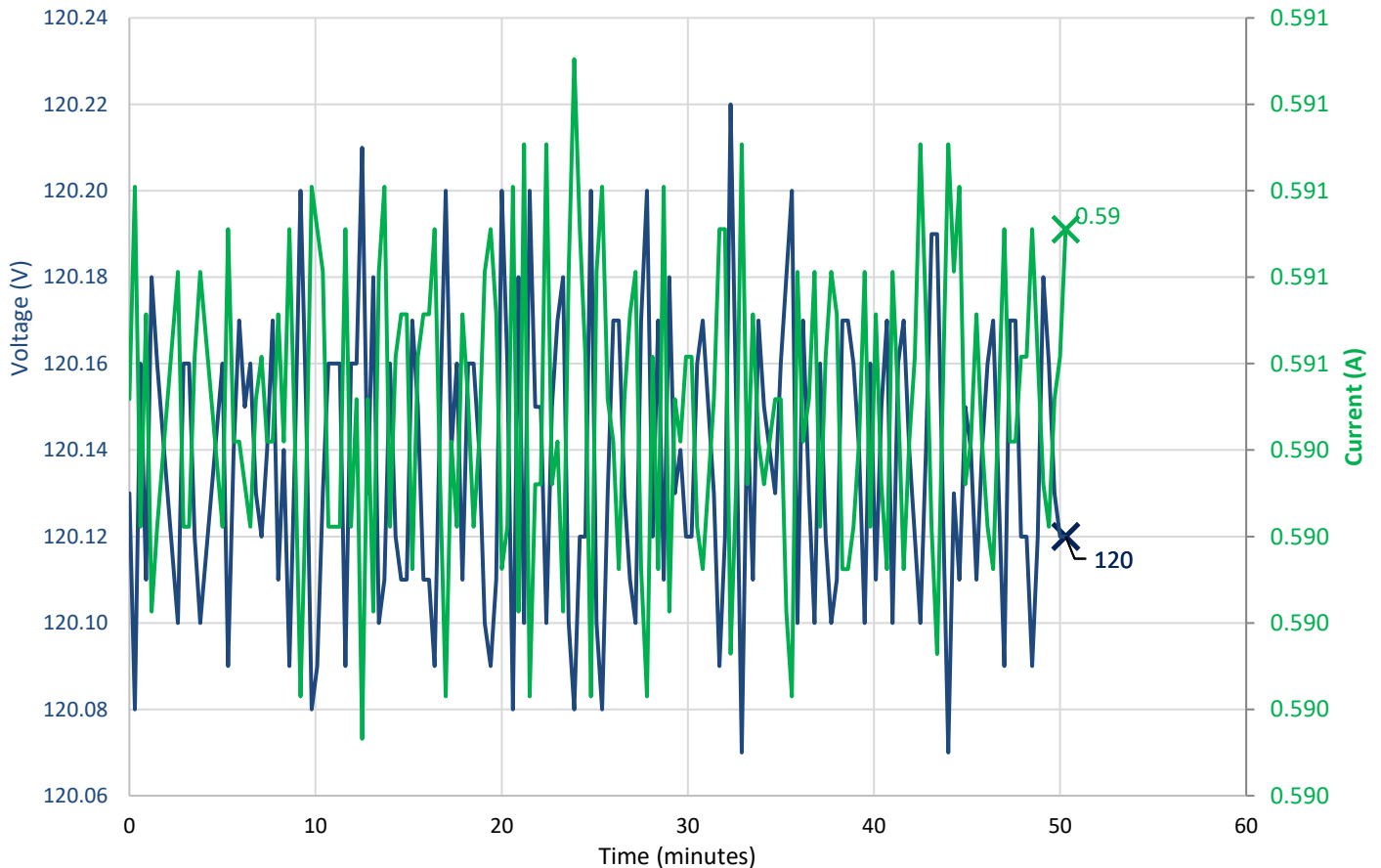
**Release Date:** 3/10/2020

### ELECTRICAL STABILIZATION

Stabilization Description - A series of 162 measurements are recorded during the stabilization period. The final stabilized measurement, as defined by LM-79:2019, is reported after 50 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
99.958%	120.07	7
99.971%	120.09	24
99.983%	120.10	31
99.996%	120.12	30
100.008%	120.13	27
100.021%	120.15	37
100.033%	120.16	42
100.046%	120.18	9
100.058%	120.19	9
100.071%	120.21	2
100.000%	120.12	Reported

% of range	Current (A)	Measurements in Range
99.908%	0.590	6
99.921%	0.590	13
99.933%	0.590	8
99.946%	0.590	22
99.958%	0.590	11
99.971%	0.590	16
99.983%	0.591	9
99.996%	0.591	10
100.008%	0.591	5
100.021%	0.591	1
100.000%	0.591	Reported



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### PHOTOMETRIC SUMMARY

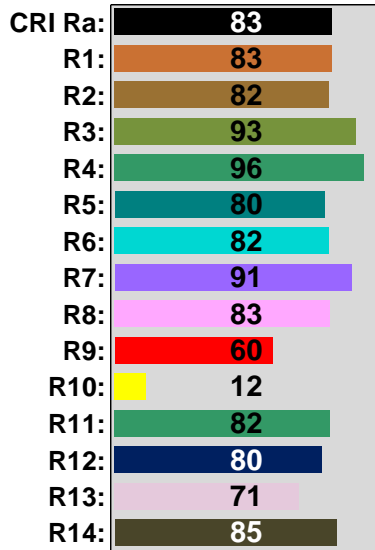
#### Radiometric Measurements

**Peak Wl:** 602.8 nm  
**FWHM:** 127.9 nm  
**Centroid Wl:** 585.2 nm

#### Photometric Measurements

**Photopic Power:** 9378 lm  
**Luminous Efficacy:** 132 lm/W  
**CCT:** 2976 K

#### Color Rendering Index



#### Color Coordinates

**Cx:** 0.4379  
**Cy:** 0.4030  
**u:** 0.2516  
**v:** 0.3474  
**u':** 0.2516  
**v':** 0.5211  
**Duv:** -0.0006  
**Du'v':** 0.0000

**Color Purity:** - %  
**Dom Wl:** 583.1 nm  
**Comp Wl:** 482.6 nm  
**Gamut Area:** 0.498

#### Electrical Performance

**Voltage:** 120.120 V  
**Current:** 0.591 A  
**Frequency:** 99.952 Hz  
**Active Power (P):** 70.932 W  
**Apparent Power:** 72.012 W  
**Power Factor:** 0.985 cos  $\theta$   
**THD Voltage:** 7.9 %  
**THD Current:** - %

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Manufacturer: LightArt

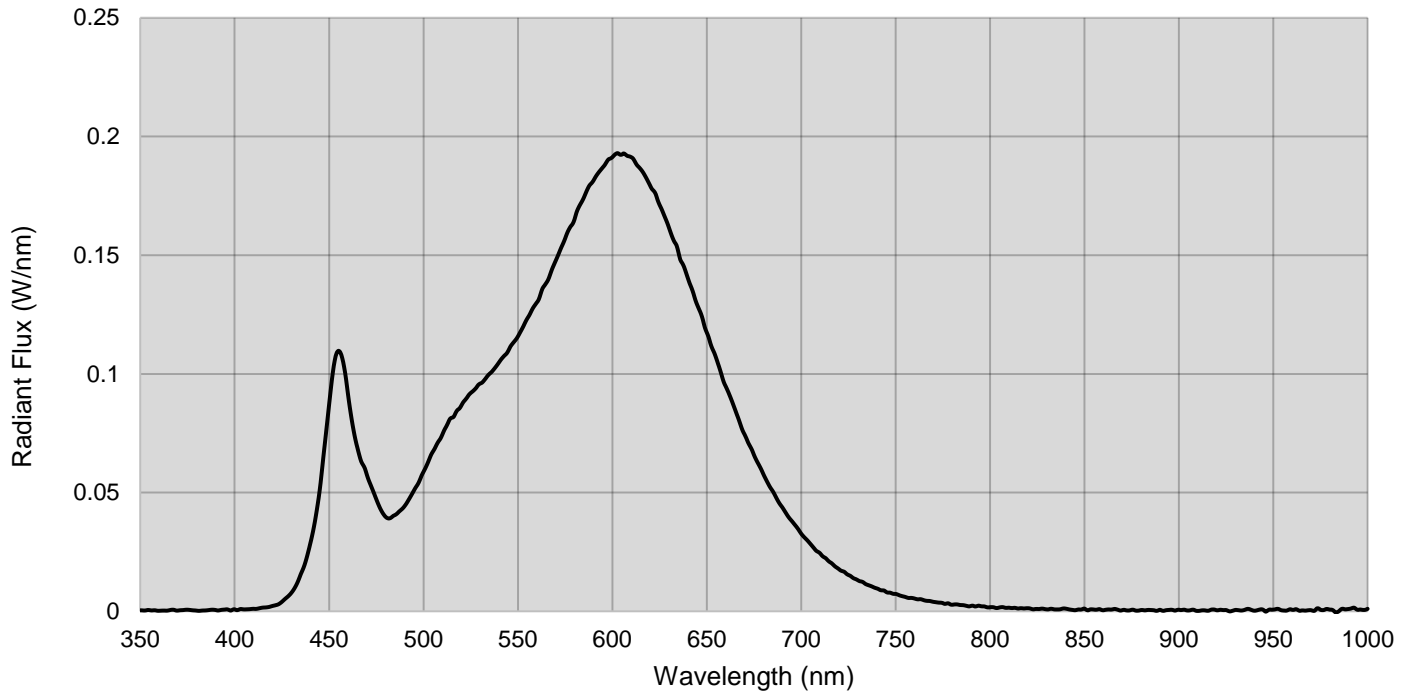
Report Number: LIGT009-020

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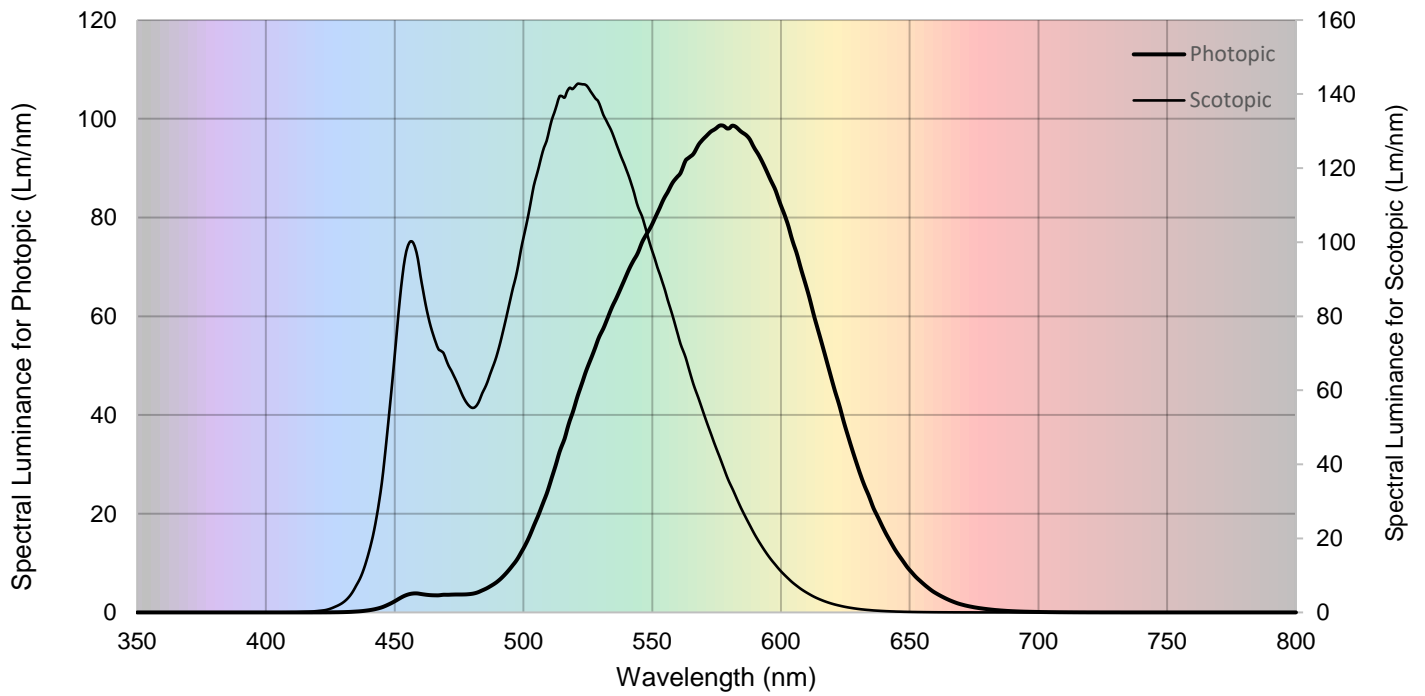
Release Date: 3/10/2020

### VISIBLE SPECTRUM

#### Radiometric Spectrum



#### Photopic and Scotopic Spectrum



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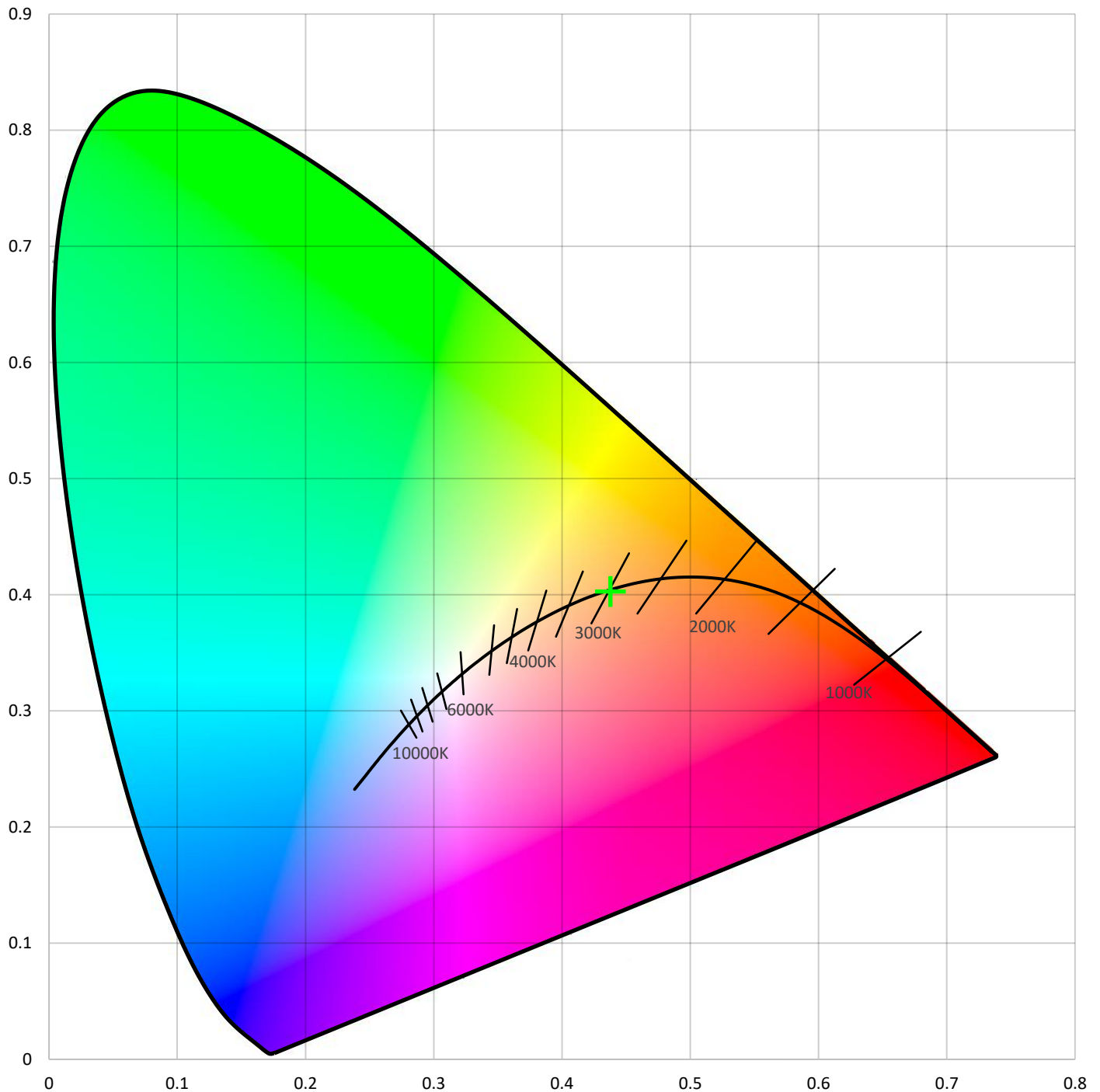
Manufacturer: LightArt

Report Number: LIGT009-020

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CIE 1931





## Product Test Report - Radiometric/Photometric

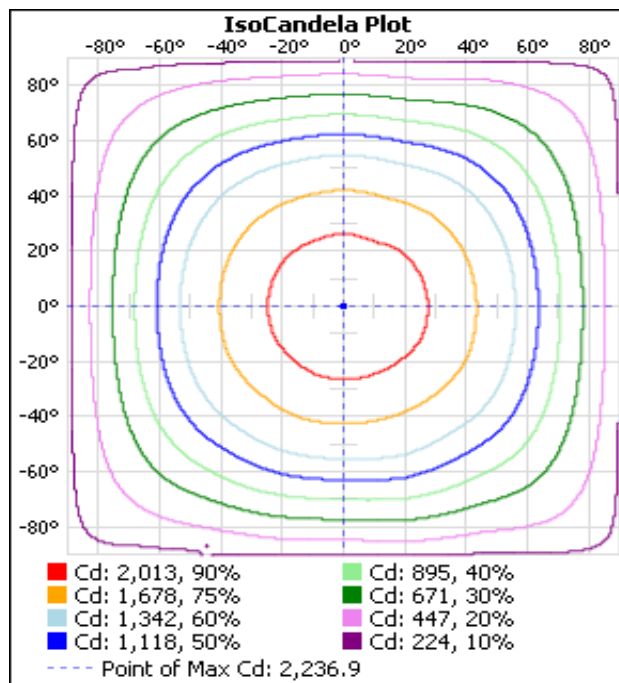
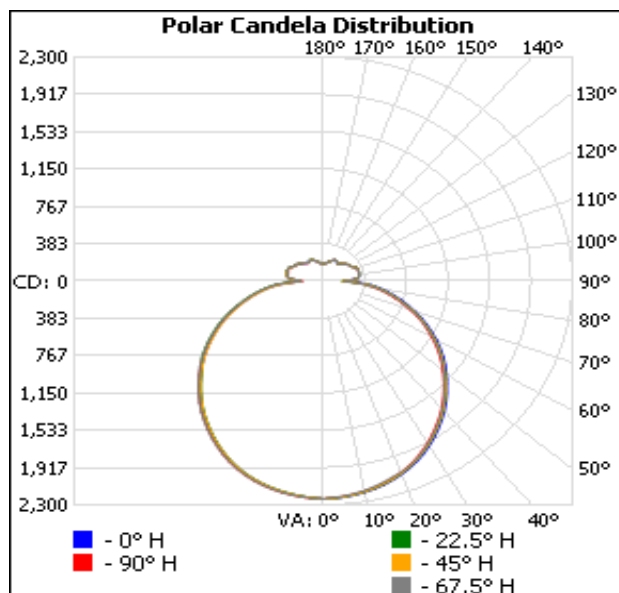
Manufacturer: LightArt

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### CANDELA PLOTS



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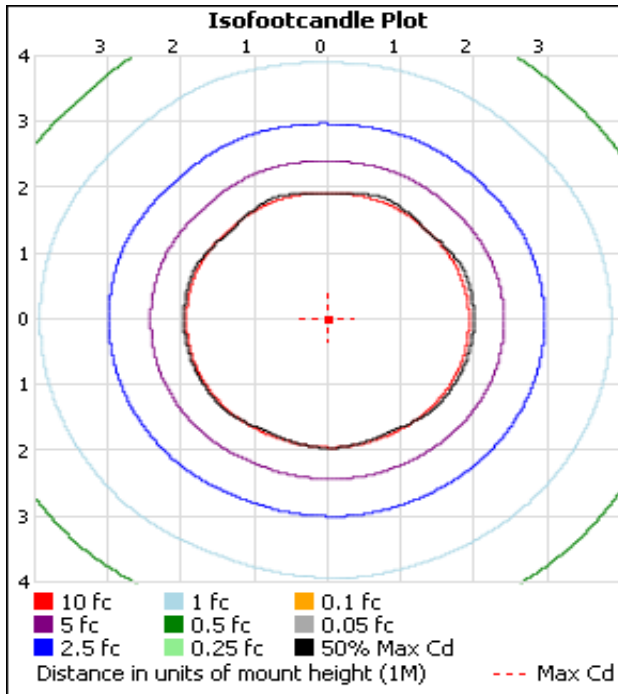
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### ILLUMINANCE PLOTS



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
1.67M	74.8 fc	6.47 M	6.34 M
3.33M	18.7 fc	12.94 M	12.69 M
5.00M	8.32 fc	19.40 M	19.02 M
6.67M	4.68 fc	25.88 M	25.36 M
8.33M	2.99 fc	32.35 M	31.70 M
10.00M	2.08 fc	38.82 M	38.05 M

■ Vert. Spread: 125.5°  
■ Horiz. Spread: 124.5°

### ZONAL LUMEN SUMMARY

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1757.0	18.70%
0-40	2907.9	31.00%
0-60	5339.0	56.90%
60-90	2234.2	23.80%
70-100	1525.7	16.30%
90-120	1008.5	10.80%
0-90	7573.3	80.70%
90-180	1805.7	19.30%
0-180	9379.0	100.00%

Lumens Per Zone		
Zone	Lumens	% Total
0-10	211.2	2.30%
10-20	4412.4	6.50%
20-30	936.6	10.00%
30-40	1150.9	12.30%
40-50	1236.1	13.20%
50-60	1195	12.70%
60-70	1029.6	11.00%
70-80	768.5	8.20%
80-90	436.2	4.70%
90-100	321	3.40%
100-110	359.9	3.80%
110-120	327.6	3.50%
120-130	263	2.80%
130-140	199.4	2.10%
140-150	147.9	1.60%
150-160	109.4	1.20%
160-170	59.6	0.60%
170-180	17.8	0.20%

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CANDELA TABLE

LOWER HEMISPHERE

South Pole

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	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237	2237
2.5	2235	2234	2233	2226	2229	2229	2226	2230	2230	2229	2229	2234	2234	2235	2232	2232	2234
5	2227	2224	2224	2215	2219	2219	2217	2221	2220	2219	2220	2226	2226	2227	2223	2222	2225
7.5	2216	2212	2211	2201	2206	2206	2204	2210	2209	2208	2209	2216	2216	2217	2211	2211	2214
10	2202	2197	2197	2184	2190	2190	2187	2196	2195	2194	2195	2204	2204	2204	2197	2196	2200
12.5	2186	2180	2178	2163	2170	2171	2168	2178	2178	2177	2178	2188	2188	2188	2179	2178	2183
15	2166	2159	2156	2139	2147	2148	2145	2158	2158	2156	2158	2169	2169	2170	2158	2157	2163
17.5	2142	2134	2131	2110	2121	2122	2118	2133	2133	2131	2133	2147	2147	2147	2133	2131	2138
20	2114	2104	2102	2091	2089	2092	2087	2104	2105	2103	2104	2120	2119	2120	2102	2101	2110
22.5	2082	2071	2068	2060	2055	2057	2052	2071	2072	2069	2070	2089	2087	2087	2082	2066	2076
25	2044	2032	2029	2022	2015	2017	2011	2033	2034	2030	2031	2052	2050	2050	2049	2026	2038
27.5	2002	1989	1985	1977	1969	1972	1966	1989	1990	1986	1988	2010	2007	2008	2007	1982	1994
30	1955	1942	1938	1928	1921	1924	1917	1943	1943	1940	1942	1964	1961	1962	1961	1934	1947
32.5	1905	1890	1887	1876	1869	1872	1864	1892	1893	1890	1890	1916	1912	1911	1912	1883	1897
35	1852	1836	1834	1822	1813	1817	1810	1838	1840	1837	1837	1865	1860	1860	1859	1829	1844
37.5	1798	1782	1779	1767	1758	1761	1755	1784	1786	1783	1784	1811	1807	1806	1804	1774	1789
40	1741	1725	1721	1709	1700	1704	1697	1728	1731	1726	1727	1755	1751	1750	1748	1717	1733
42.5	1680	1664	1659	1648	1637	1642	1634	1669	1670	1664	1666	1696	1690	1689	1688	1653	1671
45	1615	1599	1596	1582	1571	1576	1569	1605	1606	1600	1601	1633	1627	1625	1623	1589	1607
47.5	1550	1532	1529	1516	1506	1511	1504	1539	1541	1535	1536	1568	1561	1559	1557	1522	1541
50	1484	1467	1463	1453	1441	1445	1438	1474	1476	1470	1471	1503	1496	1494	1492	1458	1476
52.5	1419	1403	1399	1388	1375	1379	1372	1409	1410	1407	1405	1438	1432	1430	1427	1392	1411
55	1352	1334	1330	1317	1305	1310	1302	1340	1341	1371	1335	1369	1362	1360	1358	1321	1342
57.5	1280	1262	1259	1246	1234	1238	1229	1270	1270	1299	1262	1297	1290	1289	1287	1249	1271
60	1207	1188	1185	1172	1158	1162	1153	1195	1196	1225	1187	1224	1217	1216	1213	1173	1198
62.5	1131	1111	1107	1095	1083	1087	1079	1119	1120	1150	1111	1146	1140	1139	1136	1097	1121
65	1055	1037	1032	1020	1010	1014	1004	1046	1047	1077	1037	1070	1064	1063	1061	1023	1045
67.5	980	961	957	943	931	935	924	967	968	1001	958	995	988	988	986	943	970
70	900	879	877	861	848	854	843	886	887	919	877	915	907	906	904	862	888
72.5	820	801	796	781	769	775	765	807	807	838	798	834	827	825	825	786	810
75	744	725	718	705	692	698	688	729	730	761	723	756	750	748	749	709	733
77.5	668	651	645	631	617	623	615	654	655	686	649	681	675	672	673	634	658
80	594	577	571	554	542	548	541	580	580	612	572	607	599	597	598	560	584
82.5	519	500	495	478	465	472	463	505	504	535	496	531	521	521	522	483	509
85	439	419	414	396	394	383	366	423	422	456	412	451	444	442	444	397	428
87.5	324	289	281	253	304	239	223	292	291	348	272	341	332	330	330	293	302
90	187	177	179	189	184	205	225	204	205	217	207	204	195	195	190	188	178

Equator

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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	187	177	179	189	184	205	225	204	205	217	207	204	195	195	190	188	178
92.5	238	259	262	279	249	294	306	275	281	247	287	241	243	239	238	235	252
95	318	320	318	320	315	324	327	323	328	320	328	313	314	315	314	316	321
97.5	331	330	328	328	326	329	332	335	336	335	337	329	328	328	329	330	331
100	335	334	333	333	331	332	334	337	340	339	341	334	332	333	334	335	336
102.5	338	337	337	336	333	334	336	339	343	343	345	339	334	336	337	337	338
105	340	339	339	338	335	336	340	343	348	348	349	342	336	338	339	339	340
107.5	342	342	341	340	337	339	342	347	351	352	351	347	340	338	340	341	342
110	342	342	342	340	338	340	344	349	351	352	351	349	344	339	340	341	342
112.5	340	341	341	340	339	337	342	349	349	351	349	348	347	339	340	340	340
115	336	335	333	328	333	322	326	337	336	344	333	341	342	336	337	336	334
117.5	319	317	314	308	313	304	310	318	317	325	314	323	324	320	320	320	317
120	303	303	301	296	297	297	303	309	308	312	310	310	309	306	301	302	301
122.5	295	295	295	292	291	294	299	304	304	305	304	304	303	300	293	293	294
125	290	290	291	287	286	289	294	300	300	301	300	300	299	297	290	288	290
127.5	284	284	285	281	281	283	286	294	294	296	295	295	293	291	286	282	284
130	274	274	275	269	273	270	273	282	283	287	287	287	285	283	278	274	274
132.5	260	259	261	256	260	259	262	271	271	275	275	274	272	269	265	261	260
135	249	251	251	248	251	251	254	262	262	265	265	264	261	258	254	252	250
137.5	243	243	243	240	244	243	245	253	253	256	256	254	252	249	245	243	242
140	235	235	234	232	235	235	238	244	244	247	246	245	243	239	237	235	234
142.5	229	230	229	228	231	231	232	239	239	242	241	238	236	232	230	228	228
145	224	224	224	224	225	231	237	236	238	237	236	232	230	227	224	224	224
147.5	229	232	233	237	235	244	247	248	249	246	245	241	237	233	229	228	230
150	242	243	242	242	244	244	244	247	248	249	248	245	244	242	241	242	243
152.5	241	241	240	240	242	242	240	243	243	246	245	242	241	240	240	241	241
155	237	236	236	235	237	237	233	237	237	240	239	237	236	236	236	237	239
157.5	232	231	230	229	231	230	226	230	230	233	232	231	230	230	231	232	234
160	225	224	223	222	224	223	218	222	223	226	225	224	224	224	224	225	228
162.5	218	216	216	215	216	216	211	214	215	219	217	216	216	216	217	218	220
165	210	209	209	207	209	208	203	206	207	211	209	209	208	209	209	210	213
167.5	203	202	201	200	201	201	196	199	200	203	202	201	201	201	202	203	206
170	196	194	194	193	194	194	189	192	193	196	194	194	193	194	195	196	198
172.5	189	188	188	187	188	188	183	186	187	189	188	187	186	187	188	189	192
175	184	183	184	183	183	183	181	182	182	183	182	182	181	182	183	184	186
177.5	182	182	182	182	182	182	181	181	181	181	180	180	179	180	181	181	182
180	181	181	182	182	182	182	182	182	182	181	180	180	180	180	181	181	181

North Pole

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### EQUIPMENT

Item	Description/use	Manufacturer	Model	Serial #	Calibration Due
Spectrometer	Spectrum	Orb Optronix	SP-75	4013726	7/16/2020
Power Supply	DUT power supply	Chroma	31015	QT3101500128	-
Type C Goniometer	Light Distribution	Orb Optronix		GONI003	at use
Power Meter	Luminous Intensity	Newport	2936-R	18963	-
Power Analyzer	Electrical Power	Yokogawa	WT210	91L127852	8/16/2020

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### REVISION HISTORY

REVISION	DATE	APPROVED	DESCRIPTION OF REVISION
020	3/10/2020	ACM	① ORIGINAL

END OF REPORT