



8165 E Kaiser Blvd.
Anaheim, CA 92808
www.lightlaboratory.com

Report No: L062014302



Report No: L062014302R01

Issue Date: 7/24/2020

Report Prepared For: Leadsun Inc
1920 South Archibald Ave Unit I Ontario CA 91761

Model Number: RS20-T2/20W/4000K

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: Fixture is tested with 0.92A constant current source.

Sample Arrival Date: 7/6/20

Date of Tests: 7/20/20 - 7/24/20

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	1/9/21
BK PRECISION	1747	PS-DC04	1/10/21
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/21
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

General Information

Manufacturer:	Leadsun Inc
Model Number:	RS20-T2/20W/4000K
Driver Model Number:	N/A

Test Summary

Total Lumens:	3505.40
Efficacy:	175.06
Color Redering Index:	72.4
Correlated Color Temperature:	3957
Input Voltage (VDC):	21.83
Input Current (Amp):	0.9175
Input Power (W):	20.02
Input Power Factor:	1.0000
Current ATHD (%):	N/A

Test Condition

Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:00

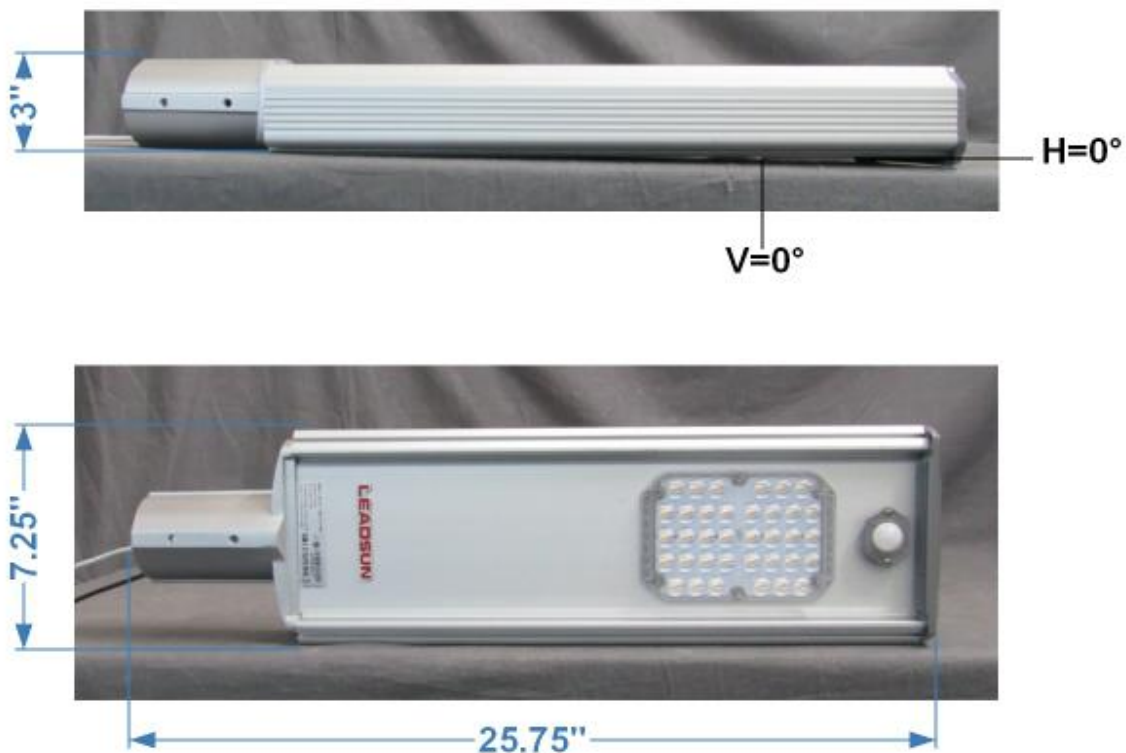
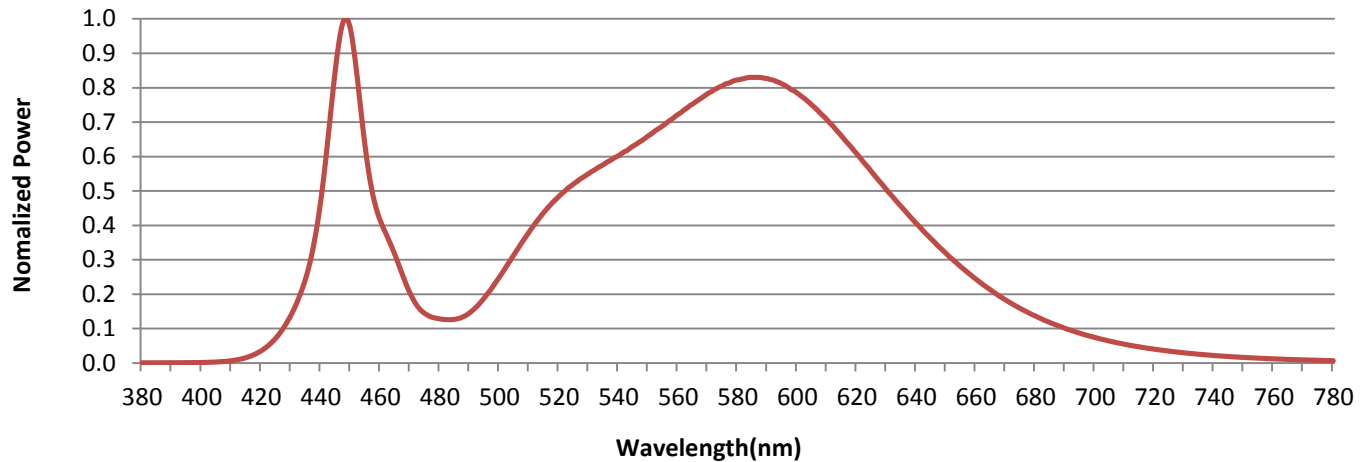


FIG. 1 LUMINAIRE

Colorimetry Test Results

Spectral Power Distribution



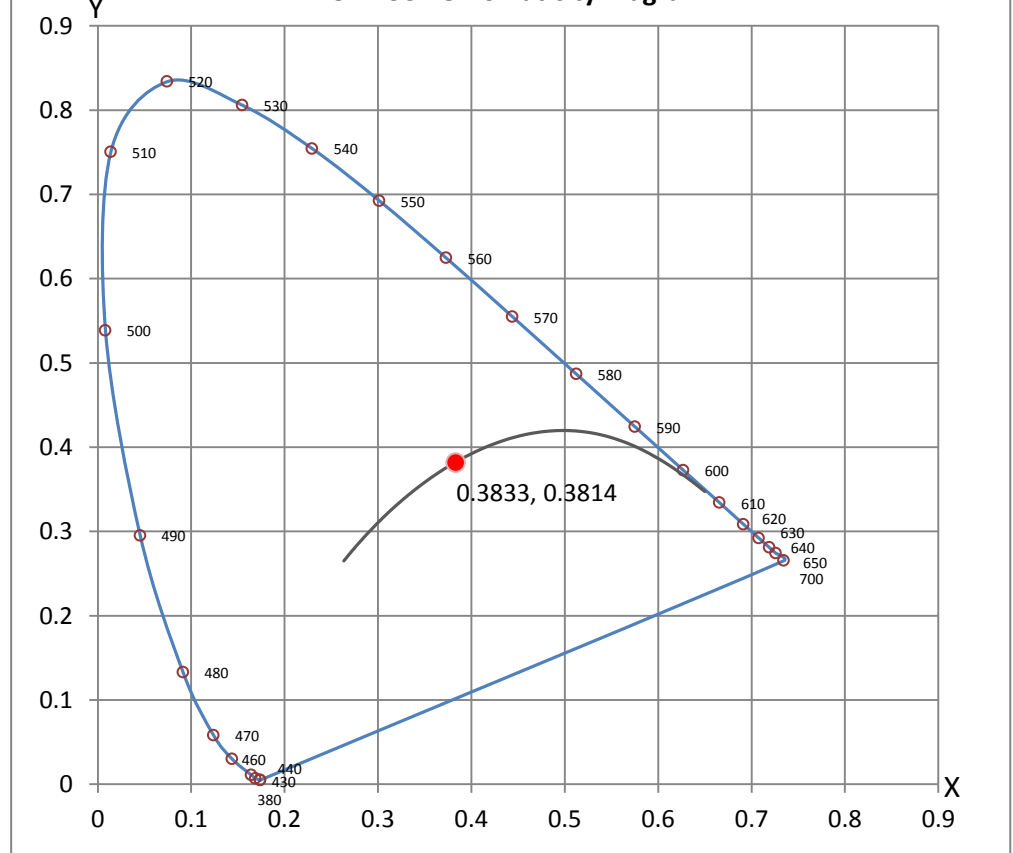
CRI & CCT

x	0.3833
y	0.3814
u'	0.2251
v'	0.5040
CRI	72.40
CCT	3957
Duv	0.00134

R Values

R1	68.76
R2	79.79
R3	88.80
R4	70.95
R5	68.81
R6	71.69
R7	80.64
R8	49.96
R9	-34.10
R10	52.71
R11	66.82
R12	43.69
R13	70.72
R14	93.48
R15	61.88

CIE 1931 Chromaticity Diagram





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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Keyur Patel

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: ?*



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Photometric Test Report

IES ROAD REPORT

PHOTOMETRIC FILENAME : L062014302R01.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062014302R01
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 7/24/2020
[MANUFAC] Leadsun Inc
[LUMCAT] RS20-T2/20W/4000K
[LUMINAIRE] 20W 4000K luminaire with 36 chips and T2 lens
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[POWER SUPPLY] 0.92A CONSTANT CURRENT SOURCE
[INPUT] 21.83VDC, 20.02W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

IES Classification	Type II
Longitudinal Classification	Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3505
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	175
Total Luminaire Watts	20.02
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	2187
Maximum Candela Angle	75H 55V
Maximum Candela (<90 Degrees Vertical)	2187
Maximum Candela Angle (<90 Degrees Vertical)	75H 55V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	145 (4.1% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	512.4	N.A.	14.6
FM - Front-Medium (30-60)	1305.2	N.A.	37.2
FH - Front-High (60-80)	373.9	N.A.	10.7
FVH - Front-Very High (80-90)	10.3	N.A.	0.3
BL - Back-Low (0-30)	340.5	N.A.	9.7
BM - Back-Medium (30-60)	682.1	N.A.	19.5
BH - Back-High (60-80)	270.6	N.A.	7.7
BVH - Back-Very High (80-90)	10.4	N.A.	0.3
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	3505.4	N.A.	100.0
BUG Rating	B1-U0-G1		

ZONAL LUMEN SUMMARY

Zone	%
0-20	11
0-30	24.3
0-40	42
0-60	81
0-80	99.4
0-90	100
10-90	97.2
20-40	31
20-50	51
40-70	53.1
60-80	18.4
70-80	4.3
80-90	0.6
90-110	0
90-120	0
90-130	0
90-150	0
90-180	0
110-180	0
0-180	100

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CANDELA TABULATION

Vert. Angles Horizontal Angles

	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
0.0	1041	1041	1041	1041	1041	1041	1041	1041	1041	1041
5.0	1121	1122	1123	1118	1114	1112	1110	1105	1098	1092
10.0	1172	1172	1173	1169	1161	1156	1153	1146	1134	1125
15.0	1210	1210	1211	1208	1200	1192	1190	1183	1175	1169
20.0	1286	1285	1284	1277	1264	1251	1242	1235	1227	1222
25.0	1347	1347	1348	1349	1345	1342	1337	1333	1322	1309
30.0	1258	1262	1274	1291	1309	1340	1368	1397	1418	1426
35.0	1059	1066	1080	1102	1133	1183	1243	1323	1403	1476
37.5	966	975	991	1014	1050	1098	1156	1239	1346	1443
40.0	838	846	866	900	959	1020	1085	1162	1262	1379
42.5	666	672	694	733	803	889	984	1085	1197	1310
45.0	506	510	525	555	617	706	829	980	1141	1259
47.5	403	405	411	423	455	510	615	782	1008	1210
50.0	329	330	336	345	360	384	439	576	808	1099
52.5	265	268	273	280	290	307	337	401	570	889
55.0	177	182	195	215	229	242	260	297	376	629
57.5	99	102	113	134	161	184	205	232	280	409
60.0	74	75	76	82	101	131	155	179	208	265
62.5	68	68	69	70	71	86	111	131	153	195
65.0	62	62	63	64	64	68	81	95	113	148
67.5	55	55	56	58	59	61	66	73	85	108
70.0	48	48	49	51	53	55	59	64	70	83
72.5	49	47	43	45	46	49	52	57	60	66
75.0	52	43	38	38	39	42	45	49	51	53
77.5	39	33	30	30	31	34	37	39	42	43
80.0	25	23	21	22	23	25	27	29	31	33
85.0	3	3	4	4	4	5	5	6	7	8
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles Horizontal Angles

	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>70</u>	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>	<u>95</u>
0.0	1041	1041	1041	1041	1041	1041	1041	1041	1041	1041
5.0	1087	1082	1077	1071	1063	1058	1052	1045	1039	1030
10.0	1116	1110	1103	1092	1082	1073	1065	1055	1041	1026
15.0	1158	1147	1138	1123	1111	1099	1087	1073	1048	1029
20.0	1209	1198	1186	1170	1153	1137	1122	1099	1067	1041
25.0	1288	1269	1253	1235	1212	1194	1172	1142	1104	1065
30.0	1419	1396	1360	1329	1301	1279	1248	1213	1161	1103
35.0	1531	1560	1545	1492	1426	1382	1338	1291	1230	1152
37.5	1547	1623	1641	1604	1521	1448	1392	1339	1271	1186
40.0	1519	1658	1727	1723	1647	1534	1457	1393	1319	1232
42.5	1457	1644	1788	1838	1792	1643	1531	1453	1367	1268
45.0	1393	1572	1800	1940	1938	1804	1634	1528	1429	1310
47.5	1360	1530	1777	2003	2064	1964	1745	1595	1469	1350
50.0	1339	1495	1691	1966	2138	2076	1861	1642	1502	1369
52.5	1274	1485	1619	1857	2139	2154	1965	1680	1517	1379
55.0	1080	1439	1586	1736	2034	2187	2054	1719	1516	1367
57.5	760	1231	1529	1669	1930	2169	2106	1814	1532	1371
60.0	536	1010	1449	1609	1773	2093	2135	1836	1515	1352
62.5	349	753	1251	1521	1628	1905	2063	1829	1484	1322
65.0	253	550	941	1349	1419	1594	1824	1705	1426	1257
67.5	170	342	644	1011	1148	1224	1446	1401	1226	1093

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CANDELA TABULATION - (Cont.)

70.0	107	176	336	643	827	898	1018	1041	951	868
72.5	83	117	186	302	464	535	618	676	606	570
75.0	62	76	98	132	186	268	340	331	298	295
77.5	44	53	66	82	112	168	212	185	180	180
80.0	33	39	51	68	98	134	145	114	110	101
85.0	9	11	15	20	20	18	19	19	19	18
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Horizontal Angles
Angles

	<u>100</u>	<u>105</u>	<u>110</u>	<u>115</u>	<u>120</u>	<u>125</u>	<u>130</u>	<u>135</u>	<u>140</u>	<u>145</u>
0.0	1041	1041	1041	1041	1041	1041	1041	1041	1041	1041
5.0	1022	1016	1012	1003	996	992	984	975	968	963
10.0	1013	1001	989	972	959	945	933	915	905	893
15.0	1010	990	967	941	920	894	871	845	827	808
20.0	1010	982	945	910	875	837	801	770	742	715
25.0	1022	976	926	876	824	772	728	686	649	621
30.0	1050	987	919	845	773	703	646	604	569	543
35.0	1081	1002	905	810	717	640	574	531	502	479
37.5	1102	1011	911	802	698	611	539	497	470	450
40.0	1134	1032	913	781	665	575	508	468	445	423
42.5	1161	1045	908	773	644	547	479	443	417	397
45.0	1196	1067	912	760	623	519	453	418	391	368
47.5	1228	1090	930	748	598	487	428	391	361	343
50.0	1240	1099	919	736	574	460	402	363	337	321
52.5	1243	1082	906	707	545	435	375	340	313	301
55.0	1222	1062	876	667	498	395	349	312	292	285
57.5	1212	1037	842	632	463	363	317	290	273	266
60.0	1204	1025	821	612	413	319	283	267	255	244
62.5	1178	1014	806	576	388	296	257	240	231	212
65.0	1132	969	765	558	381	281	238	214	198	165
67.5	1010	862	678	508	348	258	218	193	165	121
70.0	784	655	521	406	292	218	185	164	133	90
72.5	516	425	367	272	184	149	132	127	102	68
75.0	284	266	209	126	105	105	81	70	63	52
77.5	171	157	102	56	53	52	46	44	43	41
80.0	92	67	46	38	37	35	32	32	31	31
85.0	17	16	16	15	15	14	13	13	12	13
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Horizontal Angles
Angles

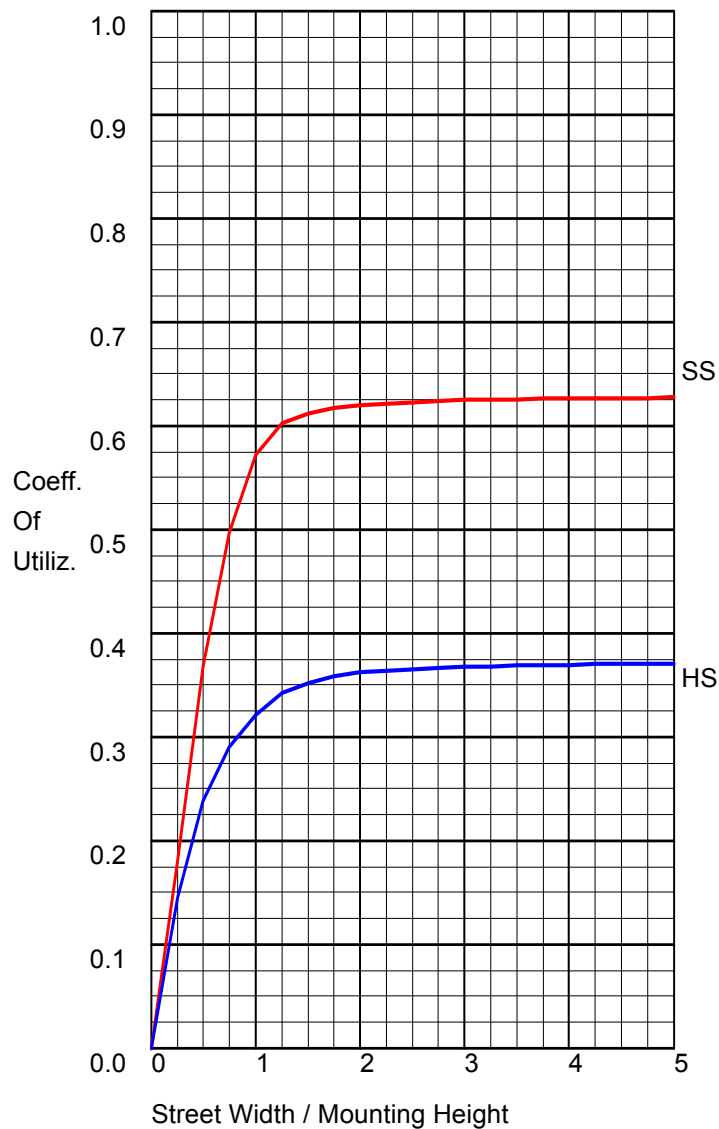
	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0.0	1041	1041	1041	1041	1041	1041	1041
5.0	959	958	954	949	945	944	944
10.0	886	879	869	862	856	853	851
15.0	793	780	764	754	748	744	742
20.0	693	675	659	649	643	638	636
25.0	599	584	570	563	559	556	554
30.0	522	511	502	493	488	484	483
35.0	461	448	440	434	428	426	426
37.5	433	421	414	409	405	404	403
40.0	406	395	389	385	382	381	380
42.5	381	370	363	360	360	359	358
45.0	354	347	343	342	340	340	339
47.5	333	327	323	321	321	321	321

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CANDELA TABULATION - (Cont.)

50.0	312	308	308	307	308	309	308
52.5	296	295	296	291	280	270	265
55.0	282	278	262	232	208	198	196
57.5	258	231	195	171	151	137	132
60.0	216	171	136	111	103	102	102
62.5	168	117	91	88	86	84	84
65.0	113	80	79	78	75	72	71
67.5	78	70	70	70	69	68	68
70.0	62	62	63	64	64	64	64
72.5	57	55	56	58	59	61	60
75.0	50	49	48	50	54	57	54
77.5	42	42	42	41	45	46	45
80.0	33	35	35	34	36	36	35
85.0	13	14	16	18	17	17	17
90.0	0	0	0	0	0	0	0

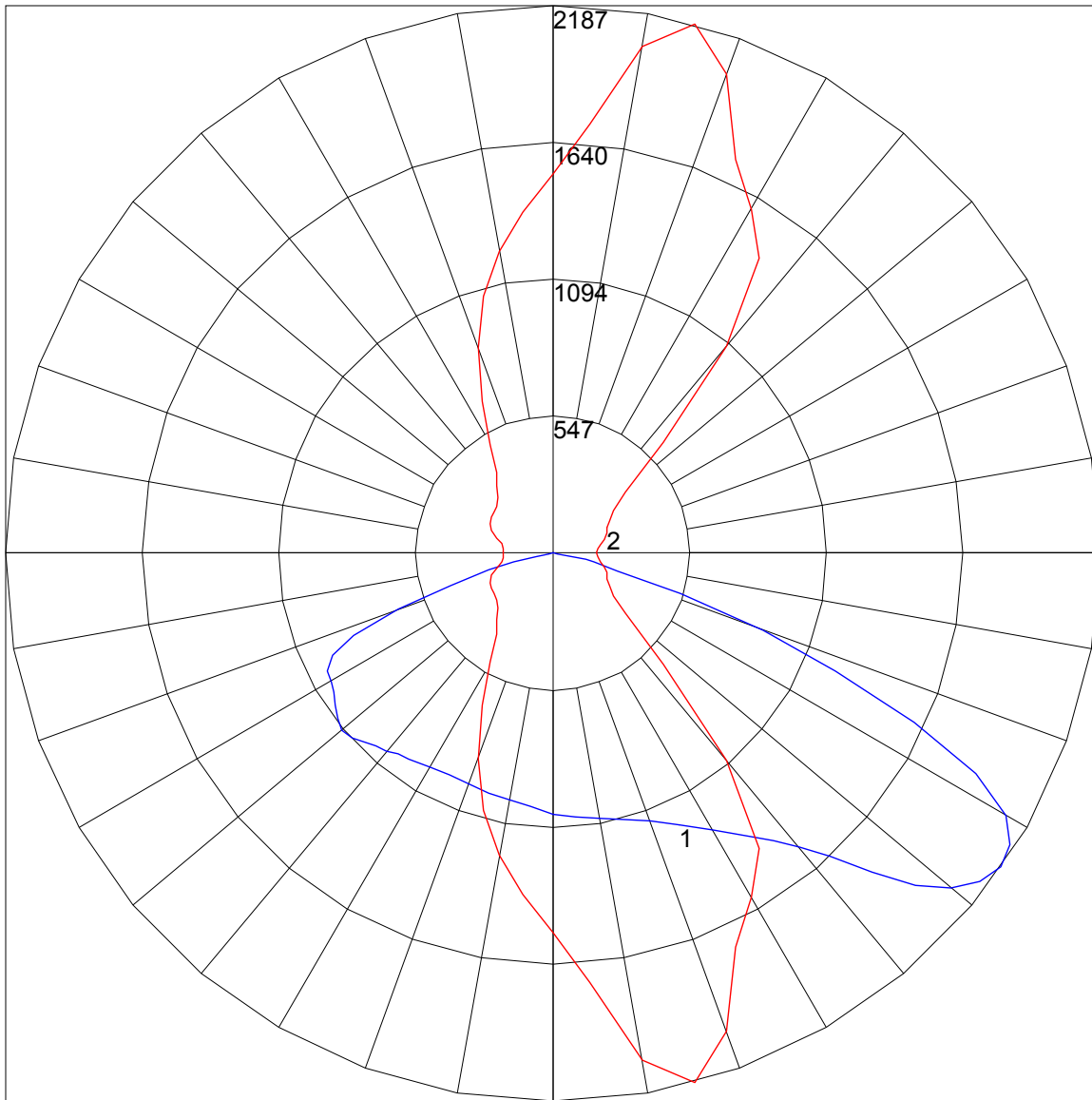
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

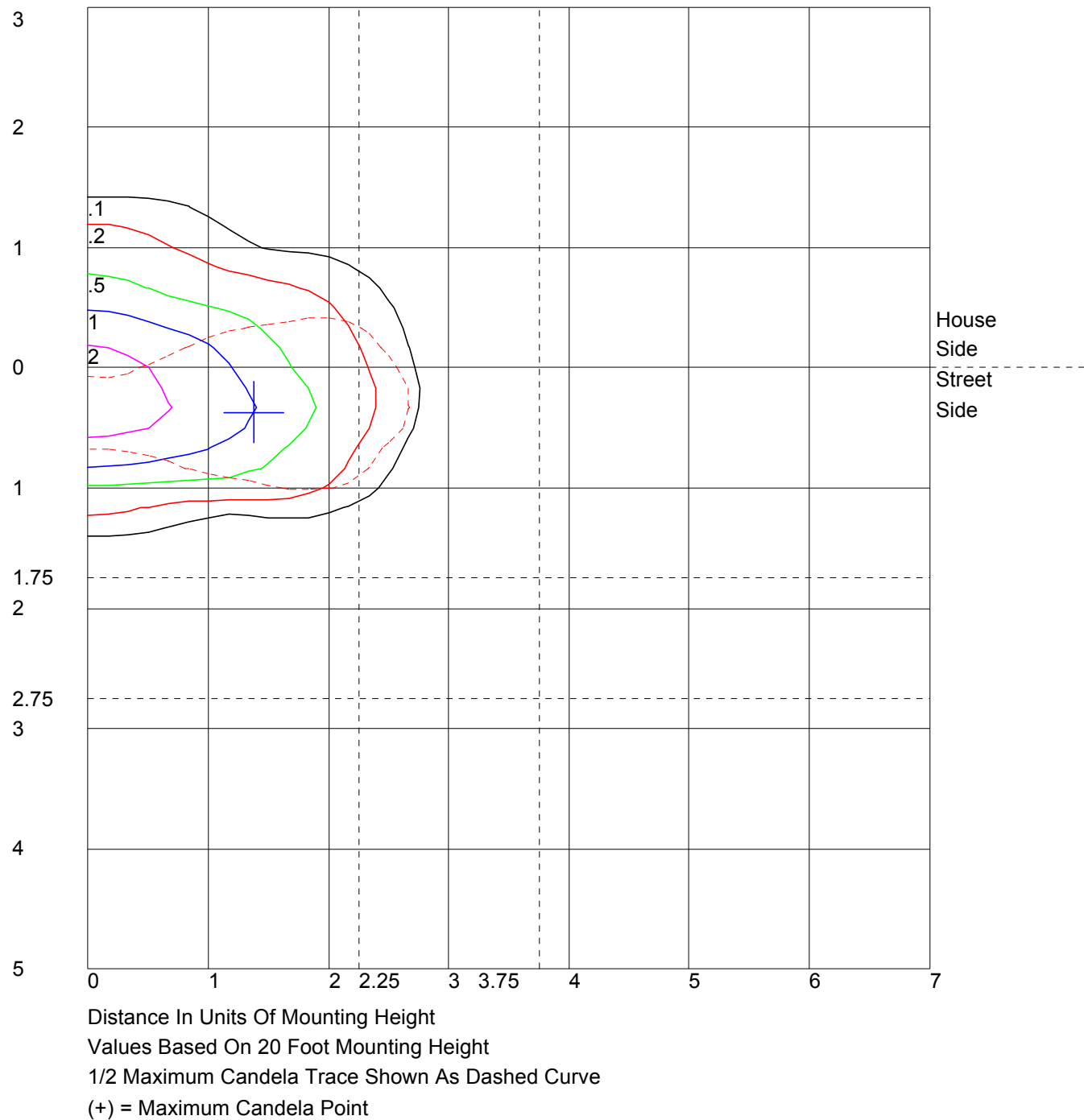
	Lumens	Percent Of Luminaire
Downward Street Side	2201.7	62.8
Downward House Side	1303.7	37.2
Downward Total	3505.4	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	3505.4	100.0

POLAR GRAPH

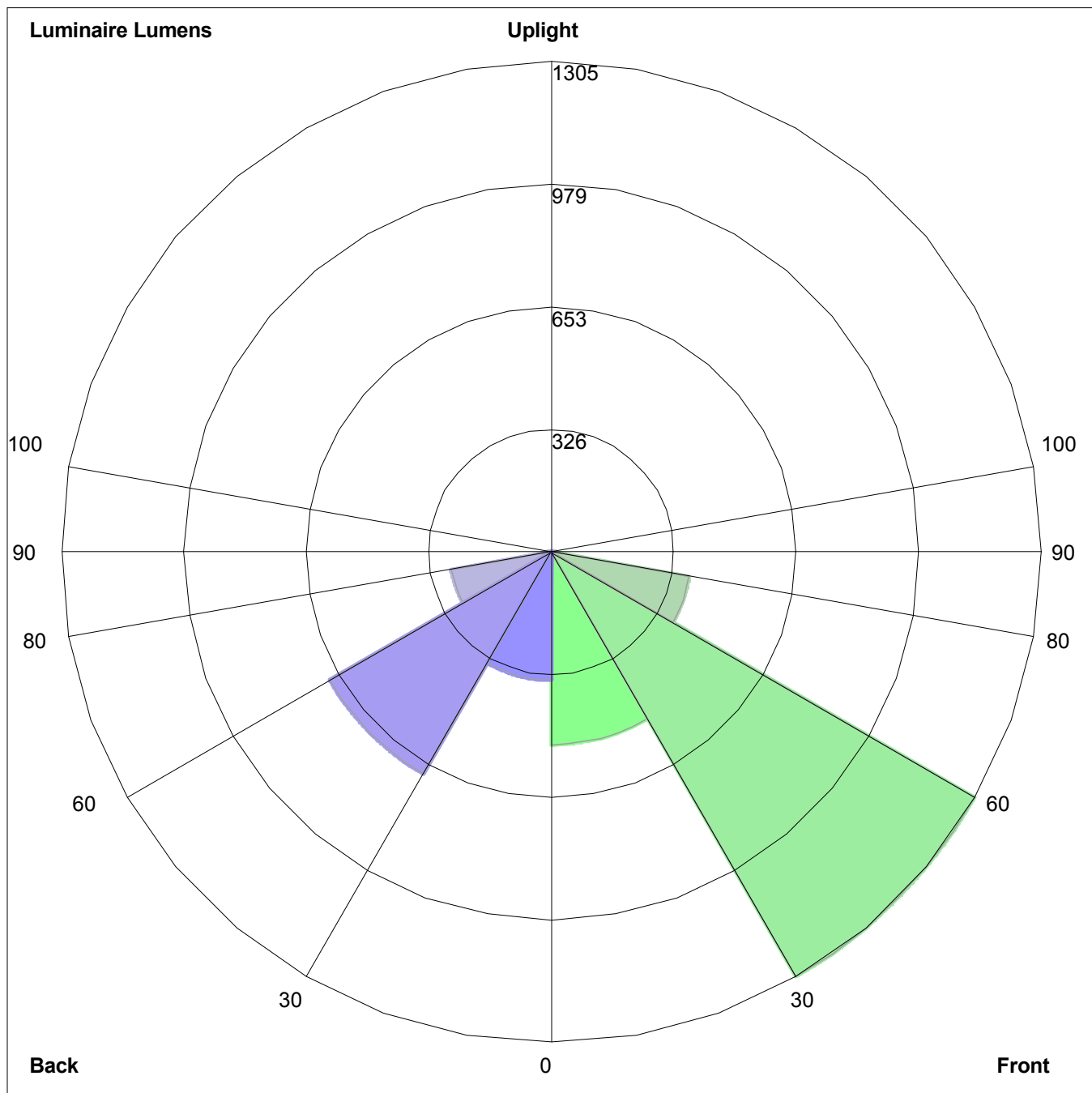


Maximum Candela = 2187 Located At Horizontal Angle = 75, Vertical Angle = 55
1 - Vertical Plane Through Horizontal Angles (75 - 255) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (55) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=512.4, Medium=1305.2, High=373.9, Very High=10.3
Back: Low=340.5, Medium=682.1, High=270.6, Very High=10.4
Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G1