



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

Report No: L062014308



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Issue Date: 7/24/2020

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

Model Number: RS20-T3/20W/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-T3/20W/4000K
Driver Model Number:	N/A

Test Summary

Total Lumens:	3438.80
Efficacy:	171.08
Color Redering Index:	72.5
Correlated Color Temperature:	3945
Input Voltage (VDC):	21.80
Input Current (Amp):	0.9222
Input Power (W):	20.10
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

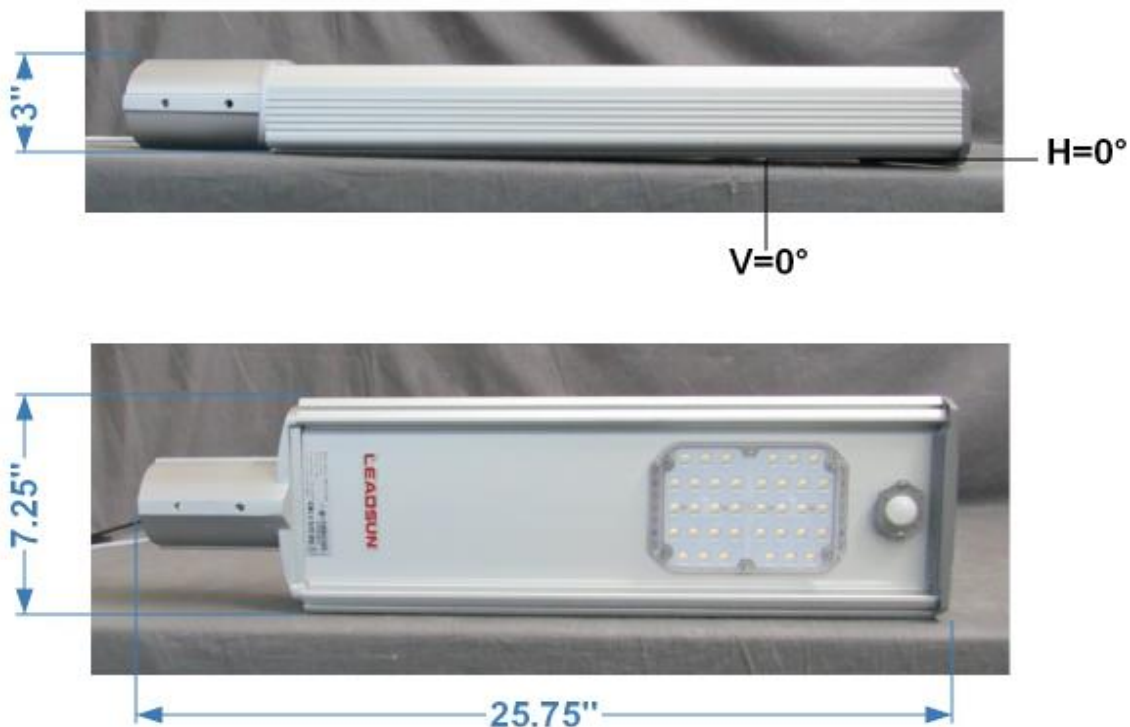
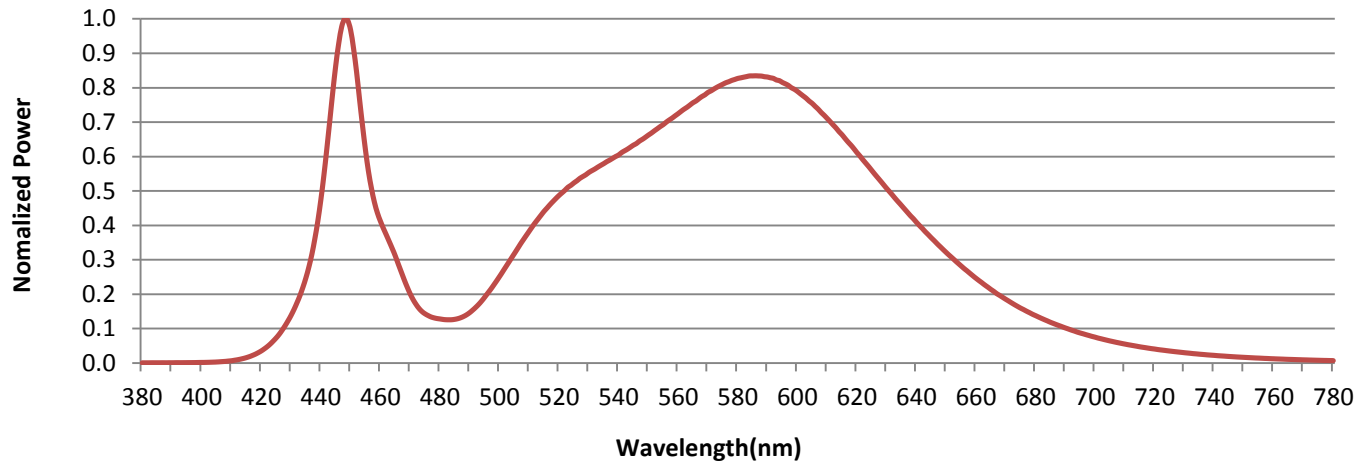


FIG. 1 LUMINAIRE

Colorimetry Test Results

Spectral Power Distribution



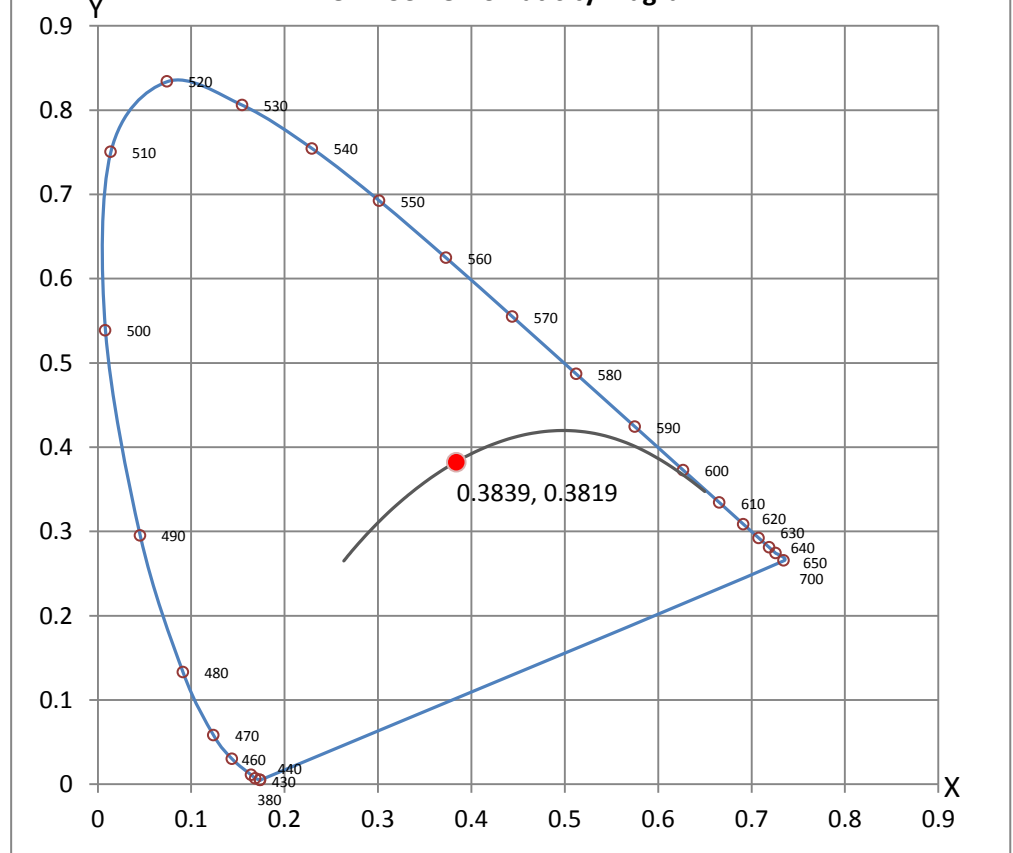
CRI & CCT

x	0.3839
y	0.3819
u'	0.2253
v'	0.5043
CRI	72.50
CCT	3945
Duv	0.00140

R Values

R1	68.83
R2	79.82
R3	88.85
R4	71.04
R5	68.87
R6	71.76
R7	80.67
R8	50.01
R9	-33.81
R10	52.82
R11	66.95
R12	43.78
R13	70.78
R14	93.51
R15	61.93

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: 13*



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Photometric Test Report

IES ROAD REPORT

PHOTOMETRIC FILENAME : L062014308.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L062014308
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 7/24/2020
[MANUFAC] Leadsun Inc
[LUMCAT] RS20-T3/20W/4000K
[LUMINAIRE] 20W 4000K luminaire with 36 chips and T3 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] 21.80VDC, 20.10W
[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	3439
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	171
Total Luminaire Watts	20.1
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	1638
Maximum Candela Angle	70H 47.5V
Maximum Candela (<90 Degrees Vertical)	1638
Maximum Candela Angle (<90 Degrees Vertical)	70H 47.5V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	77 (2.2% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	475.3	N.A.	13.8
FM - Front-Medium (30-60)	1278.2	N.A.	37.2
FH - Front-High (60-80)	362.8	N.A.	10.5
FVH - Front-Very High (80-90)	11.0	N.A.	0.3
BL - Back-Low (0-30)	350.7	N.A.	10.2
BM - Back-Medium (30-60)	712.1	N.A.	20.7
BH - Back-High (60-80)	237.4	N.A.	6.9
BVH - Back-Very High (80-90)	11.4	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	3438.9	N.A.	100.0
BUG Rating	B1-U0-G1		

ZONAL LUMEN SUMMARY

Zone	%
0-20	10.7
0-30	24
0-40	42.1
0-60	81.9
0-80	99.3
0-90	100
10-90	97.3
20-40	31.4
20-50	52.2
40-70	52.9
60-80	17.5
70-80	4.3
80-90	0.7
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	977	977	977	977	977	977	977	977	977	977
5.0	1043	1045	1046	1043	1040	1039	1037	1033	1027	1022
10.0	1079	1080	1082	1078	1073	1072	1071	1066	1057	1052
15.0	1109	1111	1113	1110	1105	1103	1102	1096	1087	1083
20.0	1180	1181	1183	1178	1170	1158	1153	1144	1135	1130
25.0	1213	1212	1216	1218	1220	1219	1221	1219	1213	1202
30.0	1198	1199	1202	1211	1222	1233	1249	1267	1281	1291
35.0	1101	1103	1111	1125	1146	1180	1219	1267	1309	1343
37.5	1035	1039	1049	1064	1087	1125	1172	1236	1300	1348
40.0	959	962	973	988	1016	1058	1113	1181	1259	1337
42.5	885	888	898	914	941	980	1033	1105	1205	1303
45.0	805	808	819	841	878	918	970	1040	1146	1249
47.5	729	732	744	771	805	849	905	977	1071	1185
50.0	637	642	657	685	723	769	837	920	1013	1113
52.5	532	537	553	582	624	677	760	852	953	1047
55.0	419	424	435	462	504	562	649	757	861	954
57.5	324	325	331	346	380	431	522	635	748	853
60.0	257	258	261	268	285	318	386	471	590	724
62.5	209	210	214	218	226	244	274	324	419	563
65.0	169	170	174	179	185	196	209	240	302	408
67.5	131	133	138	144	152	157	168	191	230	293
70.0	95	99	106	112	117	121	134	158	189	230
72.5	74	76	80	87	93	98	107	122	145	180
75.0	60	62	65	70	75	81	86	95	111	132
77.5	47	49	51	53	59	64	69	74	80	84
80.0	32	34	36	38	41	46	49	50	53	54
85.0	4	4	4	5	5	6	7	8	9	11
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	977	977	977	977	977	977	977	977	977	977
5.0	1018	1015	1009	1006	998	993	988	980	976	968
10.0	1048	1042	1036	1026	1018	1009	1001	989	979	965
15.0	1077	1067	1062	1050	1040	1030	1018	1003	983	966
20.0	1120	1109	1106	1091	1082	1070	1057	1035	1007	982
25.0	1186	1172	1166	1153	1142	1130	1112	1087	1058	1022
30.0	1289	1280	1266	1248	1229	1212	1182	1143	1102	1055
35.0	1375	1400	1399	1374	1331	1291	1243	1189	1129	1061
37.5	1397	1442	1462	1453	1416	1359	1296	1230	1150	1075
40.0	1409	1476	1518	1531	1507	1433	1352	1271	1184	1099
42.5	1401	1495	1566	1593	1580	1492	1390	1289	1190	1094
45.0	1370	1489	1591	1625	1621	1553	1434	1313	1198	1084
47.5	1320	1450	1585	1628	1638	1590	1466	1314	1185	1074
50.0	1221	1346	1506	1595	1621	1597	1474	1316	1176	1055
52.5	1129	1232	1398	1539	1592	1589	1480	1308	1162	1044
55.0	1040	1129	1281	1456	1548	1565	1491	1288	1140	1025
57.5	949	1034	1148	1365	1503	1531	1472	1292	1139	1027
60.0	853	964	1052	1246	1442	1500	1447	1248	1103	1001
62.5	715	859	961	1107	1327	1419	1356	1179	1034	947
65.0	557	713	822	926	1124	1255	1223	1074	933	852
67.5	400	535	646	722	859	997	1004	886	777	711

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CANDELA TABULATION - (Cont.)

70.0	288	372	453	514	611	719	730	671	584	535
72.5	227	277	318	338	374	417	414	374	325	315
75.0	155	177	190	201	217	226	217	198	190	191
77.5	94	109	121	127	132	127	122	121	125	120
80.0	56	64	71	75	77	75	74	72	75	71
85.0	13	15	17	19	20	21	21	21	20	20
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	977	977	977	977	977	977	977	977	977	977
5.0	960	956	952	945	939	936	931	923	918	915
10.0	953	943	934	921	912	902	896	884	877	870
15.0	950	934	917	898	882	866	854	839	830	821
20.0	957	933	907	882	861	839	818	802	787	776
25.0	982	943	907	874	841	811	783	761	740	724
30.0	1010	958	910	862	816	772	736	711	687	670
35.0	1004	941	886	831	777	731	688	659	637	619
37.5	1009	944	885	824	764	706	661	632	610	592
40.0	1024	953	880	814	746	686	638	606	585	564
42.5	1017	949	883	813	736	668	614	580	552	528
45.0	1006	936	877	809	731	656	594	554	520	497
47.5	992	924	861	782	695	622	560	515	484	458
50.0	968	898	831	744	650	573	517	475	438	416
52.5	950	870	795	705	602	515	459	422	395	375
55.0	930	851	767	666	542	453	399	370	352	334
57.5	926	840	741	625	505	407	350	324	307	296
60.0	912	813	706	584	449	361	312	281	265	257
62.5	869	762	648	525	400	331	282	252	227	216
65.0	790	676	560	444	358	293	250	219	195	182
67.5	667	576	473	379	302	249	212	187	171	159
70.0	510	454	375	307	256	208	178	159	147	136
72.5	328	300	256	217	190	163	144	131	117	107
75.0	199	179	152	131	119	110	105	98	91	84
77.5	118	110	96	85	78	67	64	65	65	64
80.0	68	63	56	51	48	45	44	44	44	45
85.0	19	19	18	17	17	16	16	16	16	16
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Horizontal Angles
Angles

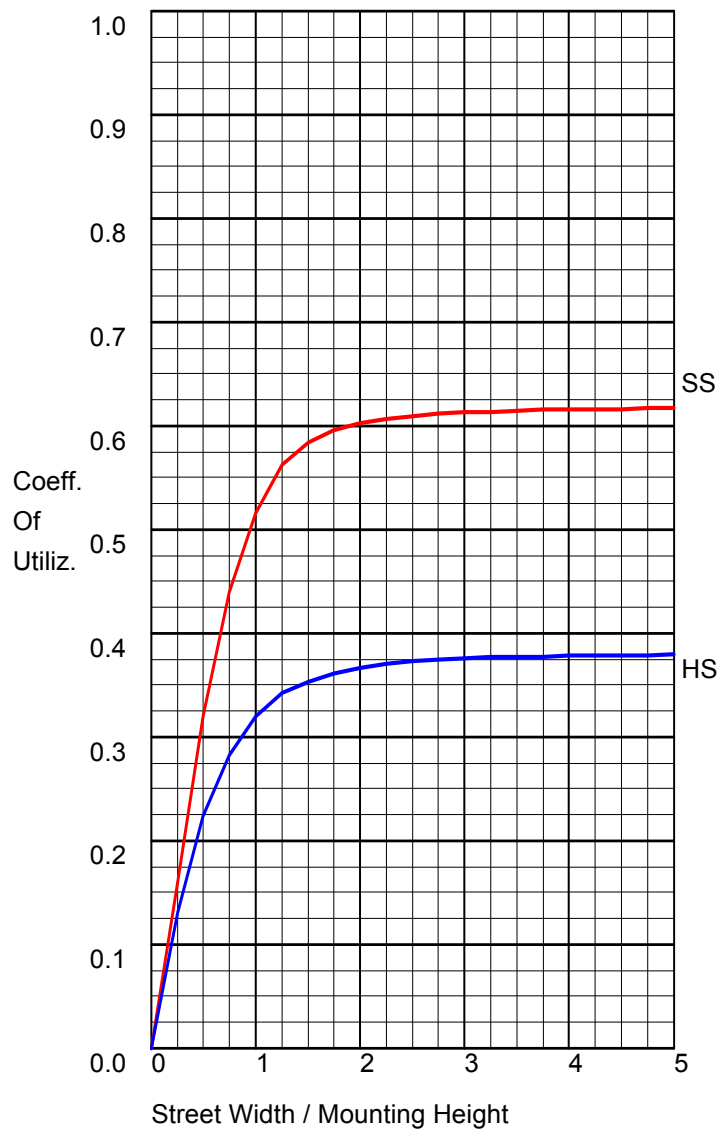
	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0.0	977	977	977	977	977	977	977
5.0	913	913	910	907	904	903	902
10.0	867	862	856	851	849	846	844
15.0	816	807	800	796	794	793	792
20.0	768	759	751	746	745	742	742
25.0	712	703	693	690	688	685	684
30.0	654	646	641	638	636	635	634
35.0	605	596	591	587	582	582	581
37.5	578	567	559	552	548	546	545
40.0	543	529	522	518	516	515	514
42.5	509	496	489	483	480	477	476
45.0	478	464	454	449	446	445	445
47.5	437	424	417	412	409	408	407

IES ROAD REPORT
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CANDELA TABULATION - (Cont.)

50.0	401	387	379	372	368	365	364
52.5	360	348	339	332	328	324	323
55.0	320	308	300	294	289	286	285
57.5	282	271	262	256	251	248	247
60.0	249	237	228	222	217	214	213
62.5	212	205	200	195	192	189	188
65.0	179	180	176	172	169	166	164
67.5	151	151	150	145	138	132	129
70.0	126	116	115	107	91	80	78
72.5	99	92	86	76	70	67	65
75.0	79	74	67	61	58	56	56
77.5	62	59	54	49	49	48	47
80.0	45	45	41	40	40	39	38
85.0	16	16	16	18	19	20	19
90.0	0	0	0	0	0	0	0

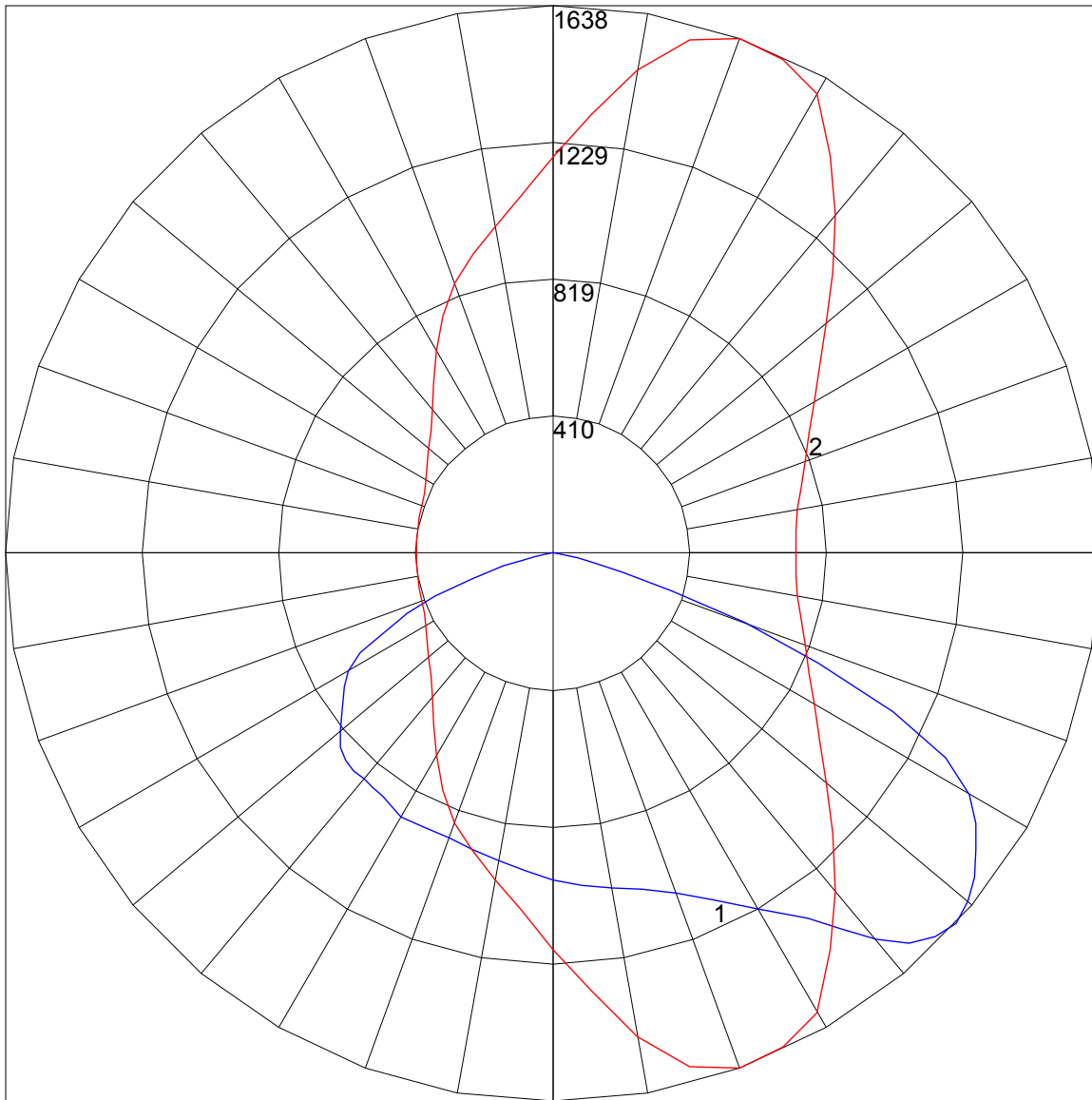
COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

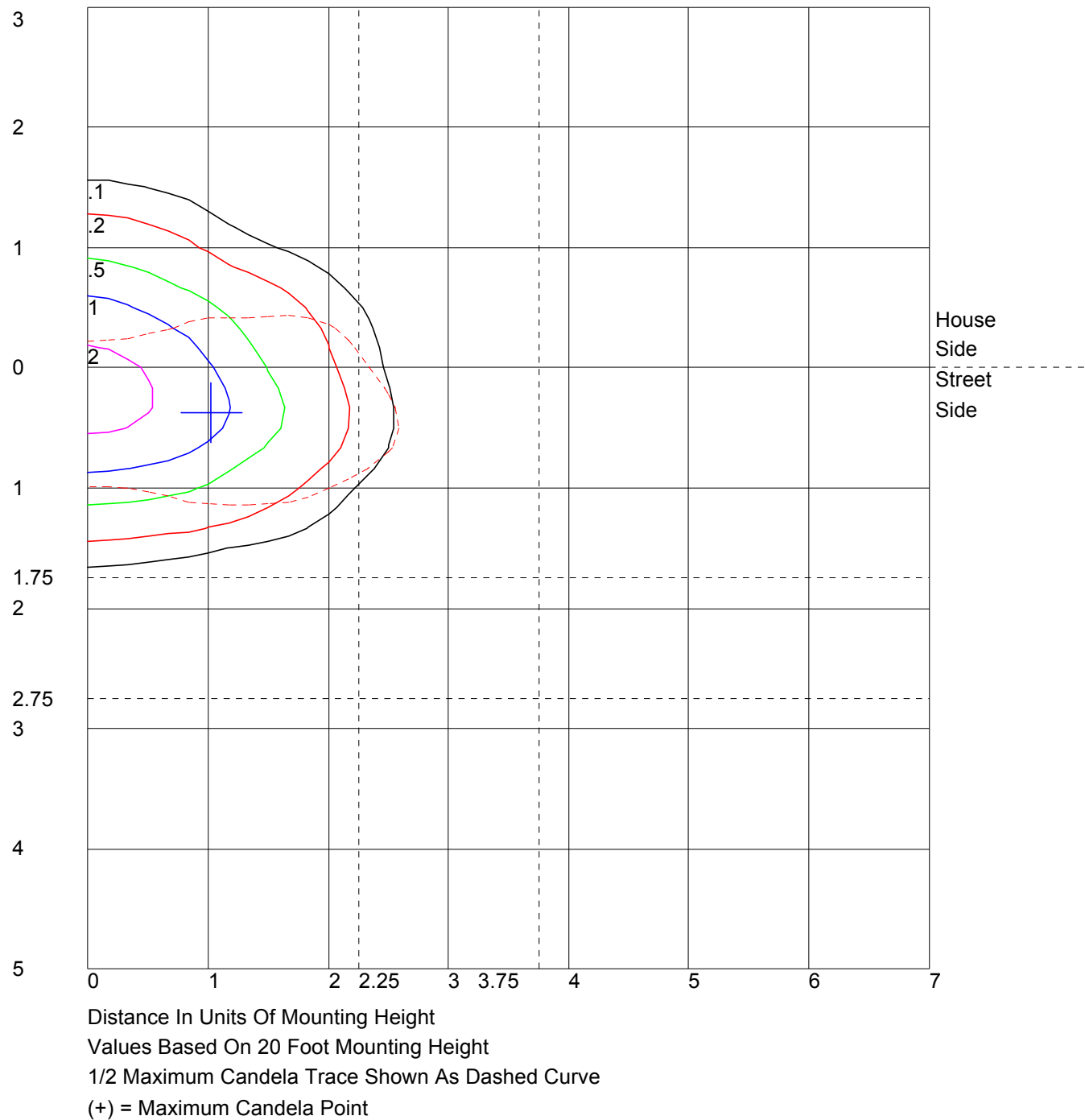
	Lumens	Percent Of Luminaire
Downward Street Side	2127.2	61.9
Downward House Side	1311.6	38.1
Downward Total	3438.8	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	3438.8	100.0

POLAR GRAPH

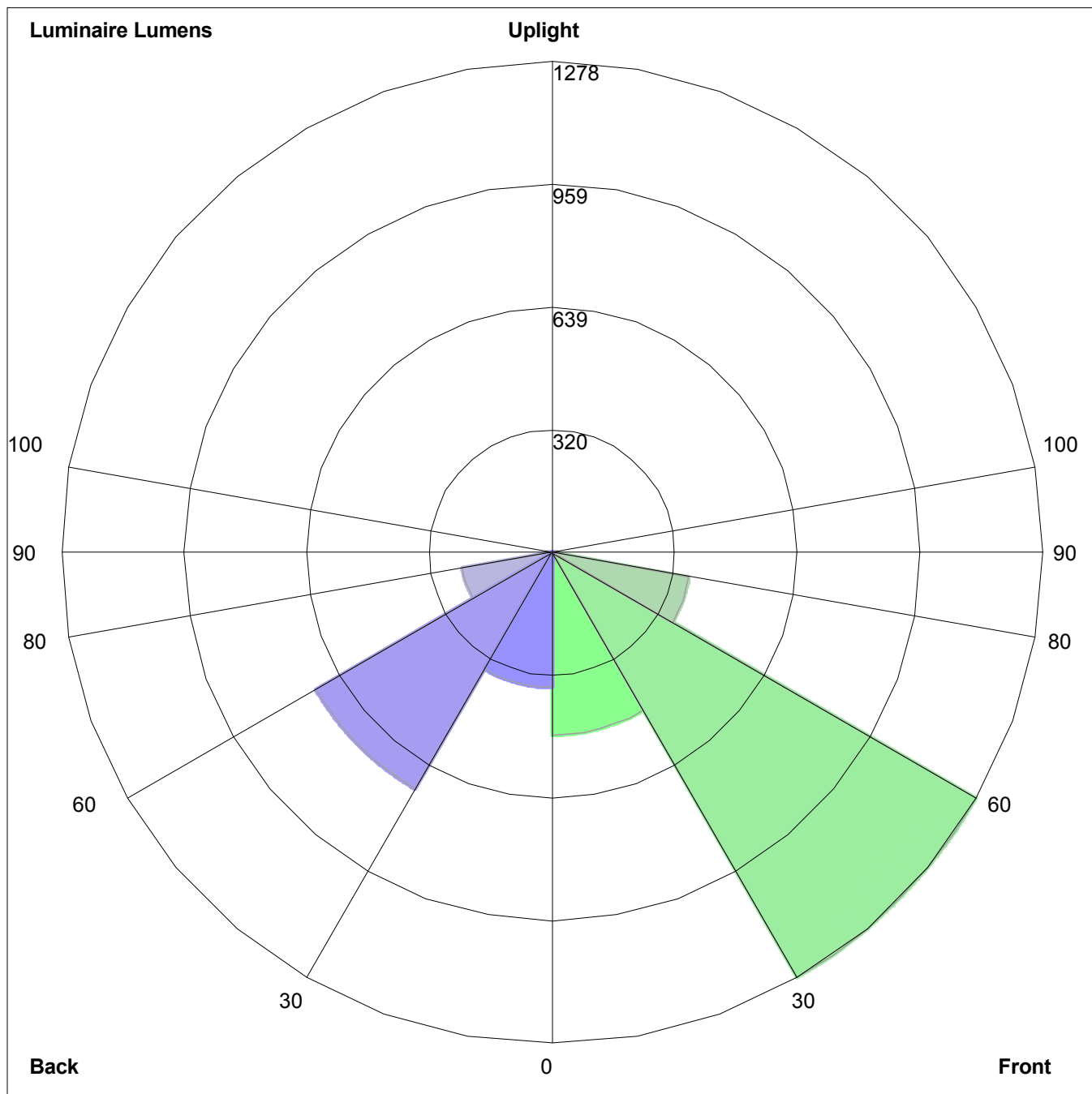


Maximum Candela = 1638 Located At Horizontal Angle = 70, Vertical Angle = 47.5
1 - Vertical Plane Through Horizontal Angles (70 - 250) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (47.5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=475.3, Medium=1278.2, High=362.8, Very High=11.0
Back: Low=350.7, Medium=712.1, High=237.4, Very High=11.4
Uplight: Low=0.0, High=0.0

BUG Rating : B1-U0-G1