



IESNA LM79-2008 Test Report

TÜV SÜD America

Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

Bill Dixon

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3250 Corporate Way, Unit B

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United States

Telephone: 954-442-6189

Sample Tested:

Girasole 4100K Narrow 40W

Manufacturer:

Beghelli North America

Technical Report Number:

JI302916-17-LM79

Report Issue Date:

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Summary of Key Test Results

Model# Girasole 4100K Narrow 40W
Manufacturer Beghelli North America
TÜV Sample# 712-5
Date of Test June 7, 2013

Notes:

Tested in intended orientation



Parameter	Measured Result
Luminous Flux	2059 Lumens
Input Power	35.91 Watts
Efficacy	57.34 Lumens/Watt
C.C.T.	4345 K
C.R.I. (R _a)	79.88
Beam Angle	10.7°
Stabilization Time	60 minutes
In-Situ Temp Test (ISTMT)**	65.8 °C

The above results are recorded / derived from measurements in accordance with LM79-08

**ISTMT in accordance with "Energy Star Program Requirements for Luminaires – Version 1.2".

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Test Results –

The following results were obtained after stabilization of the sample in accordance with the requirements set forth in section 5.0 of IES LM79-2008. Stability is achieved when the variation of 3 readings of light output and electrical power over a period of 30 minutes, taken 15 minutes apart, is less than 0.5%.

Photometric Results	Girasole 4100K Narrow 40W	
	Integrating Sphere	Goniophotometer
Total Luminous Flux (Lumens)	2059.0	2085.3
Luminous Efficacy (Lumens/Watt)	57.34	58.17
Total Radiant Flux (Watts)	6.3	-
Correlated Color Temperature (CCT)	4345	-
Color Rendering Index (CRI – R _a)	79.88	-
R ₉ Value	2.2	-
Chromaticity (Chroma x / Chroma y)	0.3698 / 0.3844	-
Chromaticity (Chroma u / Chroma v)	0.2152 / 0.3355	-
Chromaticity (Chroma u' / Chroma v')	0.2152 / 0.5033	-
D _{uv} Value	0.00682	-

Electrical Results	Girasole 4100K Narrow 40W	
	Integrating Sphere	Goniophotometer
Input Power (Watts)	35.91	35.85
Input Voltage (Volts AC)	120.00	120.02
Input Current (Amps)	0.313	0.310
Power Factor (120V / 240V)	0.956 / 0.886	0.964
Input Frequency (Hertz)	60.0	60.0
A-THD (Current %) (120V / 240V)	19.08 % / 19.98 %	18.93 %

Additional Parameters	Girasole 4100K Narrow 40W	
	Integrating Sphere	Goniophotometer
Stabilization Time (Light and Power)	60 minutes	63 minutes
Test Geometry Configuration	4 π	Type C
Spectroradiometer	Labsphere CDS1100	Gigahertz Optik P9801
Ambient Temperature	25.3 °C	25.1 °C
ISTMT (In-Situ Temperature Measurement)	65.8 °C	
Spacing Criteria	0.18 (0° – 180°) / 0.18 (90° – 270°)	

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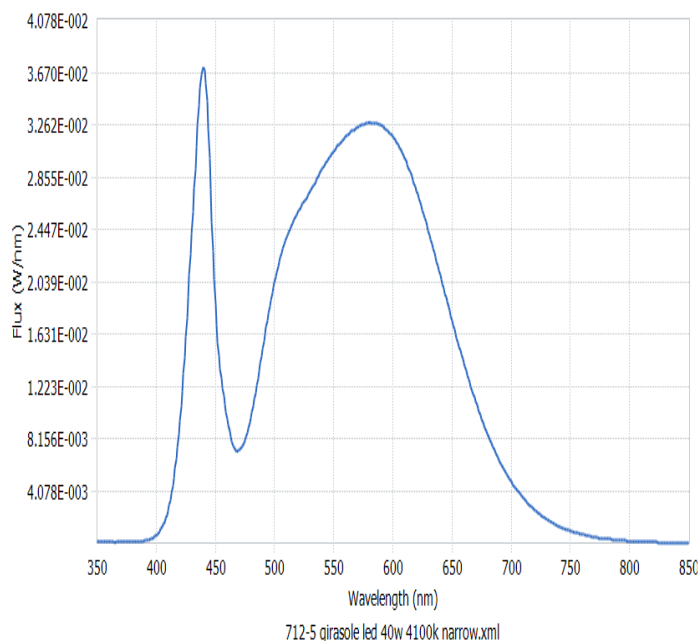
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Spectral Flux and Chromaticity Diagram

Spectral Flux

▼ SPECTRAL FLUX GRAPH:

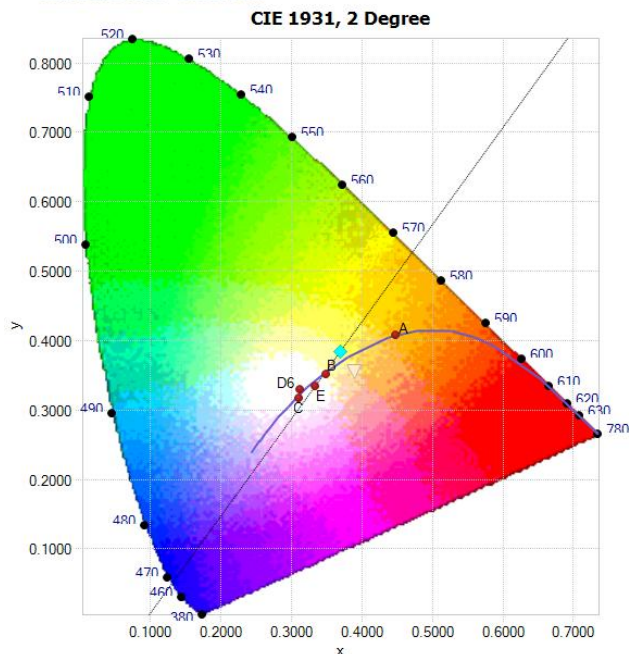


Spectral response of the Radiant Flux

(350nm to 850nm)

Chromaticity Diagram

▼ CHROMATICITY DIAGRAM:



Tristimulus values (from page 5):

$x / y = 0.3698 / 0.3844$

The locations on the diagram of the tristimulus coordinates are indicated by the blue diamond.

Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	2030.5	97.4 %
60 - 90	54.8	2.6 %
0 - 90	2085.3	100.0 %
90 - 180	0.0	0.0 %
0 - 180	2085.3	100.0 %

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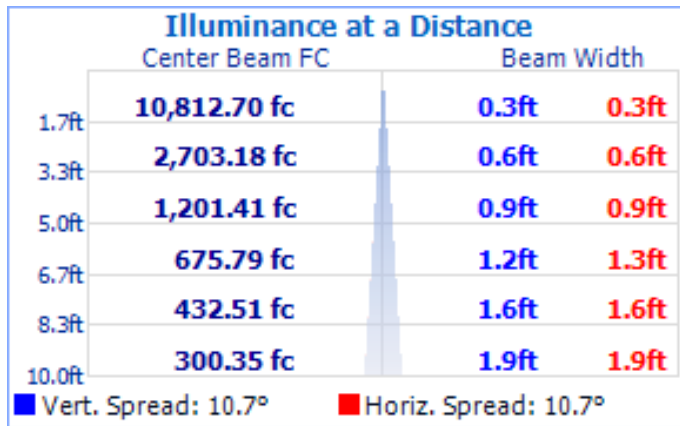
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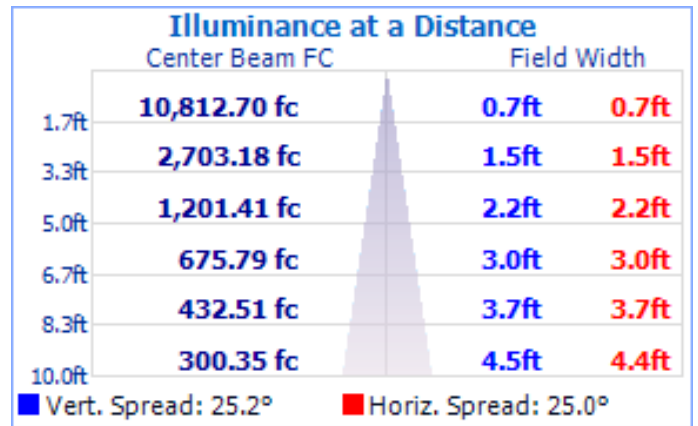
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Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.



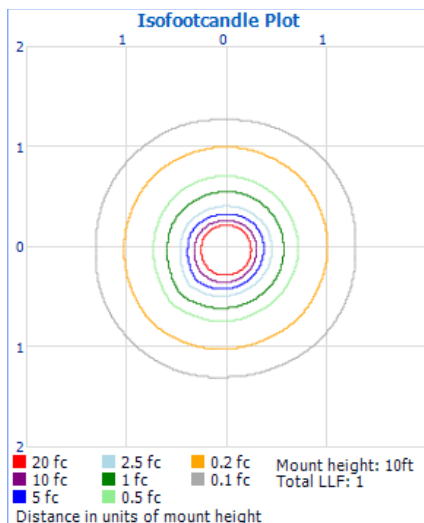
Beam Angle = 10.7°



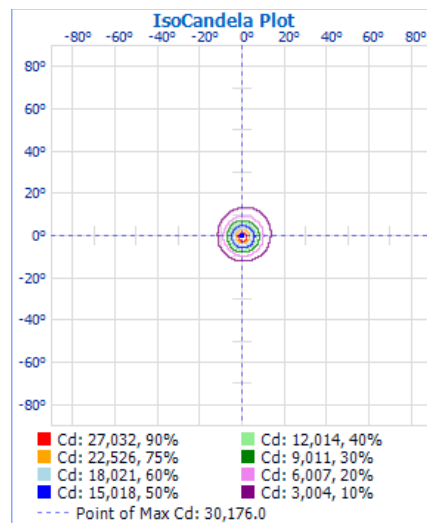
Field Angle = 25.2°

Test Results – Candela Plots

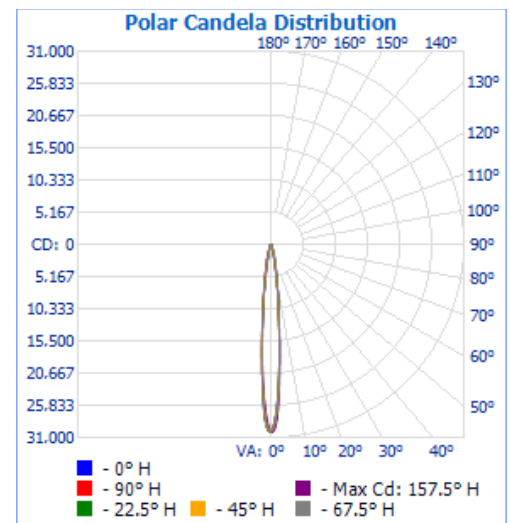
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

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Test Results – Candela Tabulation

The table below displays the tabulated Candela measurements from the IES file:

Horizontal (lateral) angles are shown in **red** across the top of the table, in increments of 22.5°.

Vertical (longitudinal) angles are shown in **blue** down the side of the table, in increments of 0.5° and 2.5°.

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5	225.0	247.5	270.0	292.5	315.0	337.5	360.0
0.0	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035	30035
0.5	29514	29552	29658	29784	29916	30033	30136	30176	30099	30092	30015	29851	29701	29556	29516	29465	29506
1.0	28741	28797	28991	29227	29475	29690	29854	29909	29784	29765	29632	29352	29108	28894	28770	28679	28728
1.5	27675	27769	28003	28323	28619	28951	29193	29210	29075	29083	28872	28492	28174	27863	27706	27618	27667
2.0	26357	26485	26749	27036	27338	27758	28045	28075	27964	27952	27694	27269	26922	26593	26386	26266	26333
2.5	24800	24879	25123	25357	25654	26062	26428	26474	26426	26392	26120	25783	25426	25076	24865	24721	24779
3.0	23037	23075	23218	23374	23669	24041	24364	24492	24489	24521	24337	24106	23768	23458	23227	23069	23015
3.5	21211	21145	21167	21251	21514	21896	22148	22340	22364	22440	22388	22269	22006	21709	21505	21305	21176
4.0	19330	19189	19123	19181	19412	19733	19945	20187	20249	20332	20368	20357	20179	19921	19766	19510	19311
4.5	17474	17229	17122	17177	17411	17658	17855	18045	18131	18258	18347	18404	18323	18124	17954	17666	17449
5.0	15669	15384	15282	15347	15591	15796	15956	16127	16189	16338	16471	16580	16538	16365	16152	15846	15653
5.5	13984	13706	13625	13693	13925	14087	14212	14363	14425	14568	14747	14878	14836	14660	14420	14116	13971
6.0	12497	12251	12190	12246	12439	12543	12642	12777	12862	13008	13217	13345	13296	13105	12868	12594	12482
6.5	11197	10967	10910	10943	11080	11152	11240	11363	11460	11618	11830	11963	11912	11731	11512	11284	11183
7.5	10062	9838	9764	9766	9827	9884	9973	10090	10169	10350	10561	10699	10648	10509	10343	10159	10049
8.0	9081	8852	8742	8683	8692	8730	8819	8936	9000	9190	9385	9534	9502	9428	9333	9185	9062
8.5	8197	7960	7824	7718	7648	7667	7750	7836	7895	8100	8303	8467	8485	8490	8445	8324	8194
9.0	7416	7170	7019	6863	6731	6725	6788	6842	6896	7117	7337	7534	7607	7668	7648	7557	7412
10.0	6722	6460	6285	6086	5907	5883	5921	5957	6005	6245	6480	6701	6836	6928	6936	6870	6718
12.5	6106	5841	5630	5387	5176	5149	5155	5145	5204	5447	5715	5975	6152	6268	6301	6260	6101
15.0	5560	5294	5056	4759	4531	4494	4472	4439	4492	4734	5031	5329	5540	5673	5730	5706	5548
17.5	3551	3320	2998	2618	2360	2289	2233	2139	2144	2362	2754	3099	3376	3563	3716	3725	3550
20.0	2349	2110	1795	1489	1310	1269	1246	1137	1112	1237	1579	1897	2106	2328	2510	2534	2348
22.5	1535	1318	1079	907	825	806	782	705	684	737	958	1220	1335	1531	1740	1725	1535
25.0	955	798	664	599	565	559	516	477	465	493	611	795	843	1008	1219	1134	955
27.5	582	479	423	412	384	384	339	325	321	337	403	516	533	650	852	733	582
30.0	374	307	281	283	252	257	231	228	230	241	281	343	348	420	582	471	374
32.5	248	213	198	196	176	180	172	174	176	184	205	240	244	285	397	312	248
35.0	177	158	148	141	136	134	136	138	140	145	157	176	179	202	276	213	177
37.5	132	120	115	110	109	108	110	110	115	119	127	133	134	150	196	153	132
40.0	104	94	92	91	93	90	91	93	96	100	105	106	107	116	142	116	104
42.5	87	78	78	78	80	78	78	79	84	85	89	89	91	94	110	94	87
45.0	75	68	68	68	71	68	69	69	75	74	78	78	80	80	90	80	74
47.5	65	60	61	60	62	61	63	62	65	66	68	69	71	70	77	69	65
50.0	58	55	56	55	56	56	58	56	58	59	61	61	62	63	68	63	58
52.5	52	50	52	51	50	52	53	51	51	53	55	56	56	58	60	56	52
55.0	47	46	48	47	46	48	48	46	46	49	50	51	51	53	54	51	48
57.5	43	43	44	44	41	44	44	43	42	45	46	47	46	49	49	47	43
60.0	39	40	41	40	38	41	41	40	38	41	42	43	42	44	44	43	39
62.5	36	36	37	36	35	37	38	37	35	37	38	39	38	40	40	39	36
65.0	33	33	34	33	32	34	34	33	31	34	35	35	33	35	36	35	33
67.5	29	30	30	30	28	30	31	30	28	30	31	31	30	31	32	31	29



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Test Results – Candela Tabulation (Continued....)

70.0	20	20	21	21	20	21	21	21	20	21	21	21	21	21	21	21	20
72.5	17	18	18	18	17	18	18	18	17	18	18	18	17	18	18	18	17
75.0	15	15	16	15	15	16	16	15	15	16	16	15	15	15	15	15	15
77.5	13	13	14	14	14	14	14	14	13	13	14	13	13	14	14	13	13
80.0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
82.5	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
85.0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
87.5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
90.0	10	10	10	10	10	9	9	10	9	10	9	9	9	10	10	10	10

Maximum Candela = **30,176.0** at Horizontal: 157.5°, Vertical: 0.5°

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TÜV SÜD Photometric Testing Information

Testing is performed in accordance with the procedures outlined in IESNA LM79-2008. The sample is evaluated for photometric and electrical characteristics using an integrating sphere and a goniophotometer, located in an accredited, temperature and humidity-controlled, draft free photometric laboratory.

Sphere Geometry

The integrating spheres used for measurement utilize a “ 4π geometry” configuration in accordance with section 9 of IES LM-79-2008 and is applicable for all types of SSL products (directional and non-directional light projections). The spectroradiometer is an array-type detector manufactured and calibrated by Labsphere (Model# CDS1100).

Self-Absorption Correction

The integrating sphere uses self-absorption correction to eliminate errors due to mismatches between the standard reference lamp and the test samples being measured. This auxiliary correction lamp is a halogen type lamp powered by a calibrated Lamp Power Supply manufactured and calibrated by Labsphere (model LPS150). Ambient temperature is measured using a thermocouple located inside the integrating sphere at the same height as the sample under test (UUT) and not more than 1 meter in horizontal distance away from the sample (section 2.2 of LM79-2008). The thermocouple is located behind a baffle in order to eliminate any direct optical radiation from the sample under test.

Sample Stabilization

The sample (UUT) is placed inside the integrating sphere and powered by a regulated and conditioned alternating or direct current supply. The stabilization times shown on the results pages of this report denote the time of the 3rd measurement (of the 3 consecutive readings) since this is the minimum time that the sample is assumed to have taken to reach stabilization in accordance with section 5.0 of LM79-2008.

Sphere Calibration

The integrating sphere is calibrated using a quartzline halogen lamp with the following specifications:

Manufacturer: EYE Lighting International

Model# J94/JD28V75W

Voltage = 28.0 Volts DC

Wattage = 75.0 Watts

Calibration Current = 2.679 Amperes

Luminous Flux = 1685 Lumens

Calibration Date = 2-17-2011 (calibrated by Labsphere – NIST traceable).

Continued.....

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TÜV SÜD Photometric Testing Information (continued)

Goniophotometer

The Goniophotometer is a Mirror based Type C optical measurement system in accordance with section 9.3.1 of IESNA LM79-2008.

Goniophotometer Calibration

The Goniophotometer is calibrated using a frosted tungsten filament FDS/DZE lamp with the following specifications:

Manufacturer: General Electric
Part Number: CSB-110
Lamp Number: 112-A
Voltage: 16.52 Volts DC
Wattage: 150.0 Watts
Calibration Current: 4.816 Amperes
Luminous Intensity: 151.5 Candelas
Calibration Date: 02-13-2011 (NIST traceable)

TÜV SÜD Test Equipment List:

TÜV SÜD Sphere System – contains the following:			
Description	Manufacturer / Model#	TÜV SÜD Ref#	Calibration Due Date
Integrating Sphere	Labsphere LM760	SPH003	weekly
Spectroradiometer	Labsphere CDS1100	ATLE0048	9/7/2016
Power Analyzer	Yokogawa WT210	ATLE0058	3/7/2014
Power Source	Chroma 61602	AC003	N/A
Thermometer	Fluke 52-II	ATLE0008	11/17/2013
TÜV SÜD Mirror Goniophotometer System – contains the following:			
Goniophotometer	M.E. GONC02	GON002	weekly
Spectroradiometer	Gigahertz Optik P9801	GIG002	weekly
Power Analyzer	Yokogawa WT210	ATLE0031	11/16/2013
Power Source	Chroma 61603	AC007	N/A

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