



IESNA LM79-2008 Test Report

TÜV SÜD America

Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

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3250 Corporate Way, Unit B

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Telephone: 954-442-6189

Sample Tested:

Girasole 5700K Narrow 40W

Manufacturer:

Beghelli North America

Technical Report Number:

JI302916-20-LM79

Report Issue Date:

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Summary of Key Test Results

Model# Girasole 5700K Narrow 40W
Manufacturer Beghelli North America
TÜV Sample# 712-6
Date of Test June 7, 2013

Notes:

Tested in intended orientation



Parameter	Measured Result
Luminous Flux	2581 Lumens
Input Power	35.38 Watts
Efficacy	72.95 Lumens/Watt
C.C.T.	5530 K
C.R.I. (R _a)	72.82
Beam Angle	11.6°
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 5700K Narrow 40W	
	Integrating Sphere	Goniophotometer
Total Luminous Flux (Lumens)	2581.0	2508.8
Luminous Efficacy (Lumens/Watt)	72.95	70.75
Total Radiant Flux (Watts)	7.8	-
Correlated Color Temperature (CCT)	5530	-
Color Rendering Index (CRI – R _a)	72.82	-
R ₉ Value	-38.1	-
Chromaticity (Chroma x / Chroma y)	0.3317 / 0.3550	-
Chromaticity (Chroma u / Chroma v)	0.2011 / 0.3229	-
Chromaticity (Chroma u' / Chroma v')	0.2011 / 0.4843	-
D _{uv} Value	0.00732	-

Electrical Results	Girasole 5700K Narrow 40W	
	Integrating Sphere	Goniophotometer
Input Power (Watts)	35.38	35.46
Input Voltage (Volts AC)	119.99	120.06
Input Current (Amps)	0.307	0.310
Power Factor (120V / 240V)	0.962 / 0.893	0.953
Input Frequency (Hertz)	60.0	60.0
A-THD (Current %) (120V / 240V)	17.57 % / 18.77 %	17.39 %

Additional Parameters	Girasole 5700K Narrow 40W	
	Integrating Sphere	Goniophotometer
Stabilization Time (Light and Power)	60 minutes	57 minutes
Test Geometry Configuration	4 π	Type C
Spectroradiometer	Labsphere CDS1100	Gigahertz Optik P9801
Ambient Temperature	25.2 °C	24.5 °C
ISTMT (In-Situ Temperature Measurement)	65.8 °C	
Spacing Criteria	0.24 (0° – 180°) / 0.22 (90° – 270°)	

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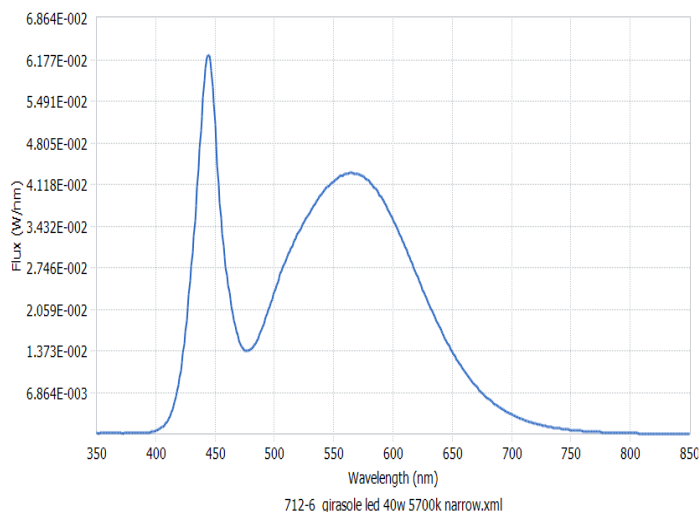
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Spectral Flux and Chromaticity Diagram

Spectral Flux

▼ SPECTRAL FLUX GRAPH:

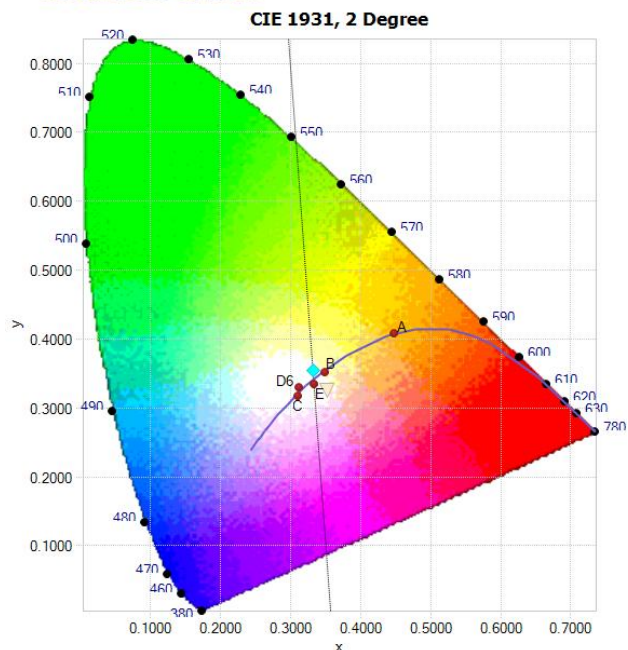


Spectral response of the Radiant Flux

(350nm to 850nm)

Chromaticity Diagram

▼ CHROMATICITY DIAGRAM:



Tristimulus values (from page 5):

$x / y = 0.3317 / 0.3550$

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

Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	2476.6	98.7 %
60 - 90	32.2	1.3 %
0 - 90	2508.8	100.0 %
90 - 180	0.0	0.0 %
0 - 180	2508.8	100.0 %

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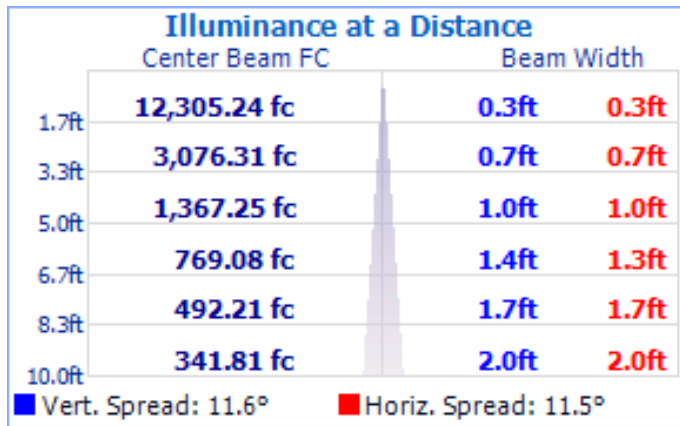
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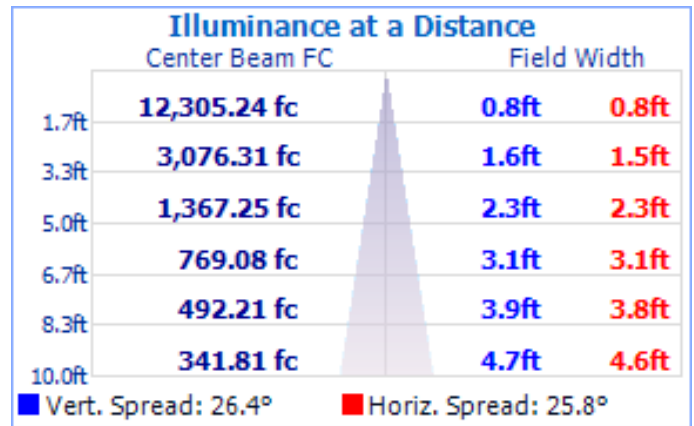
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Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.



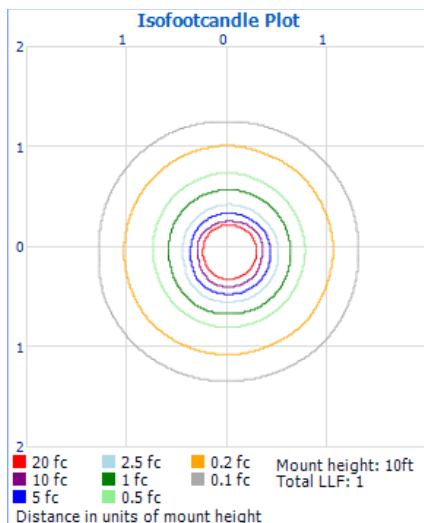
Beam Angle = 11.6°



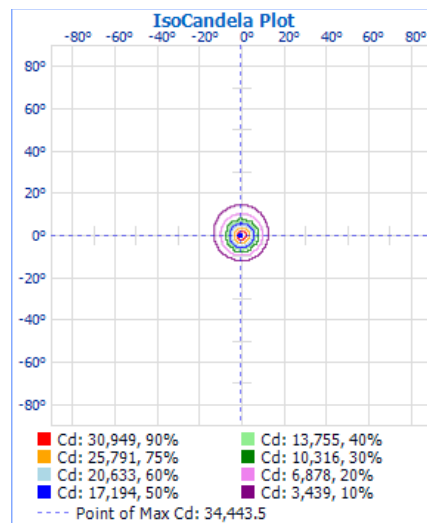
Field Angle = 26.4°

Test Results – Candela Plots

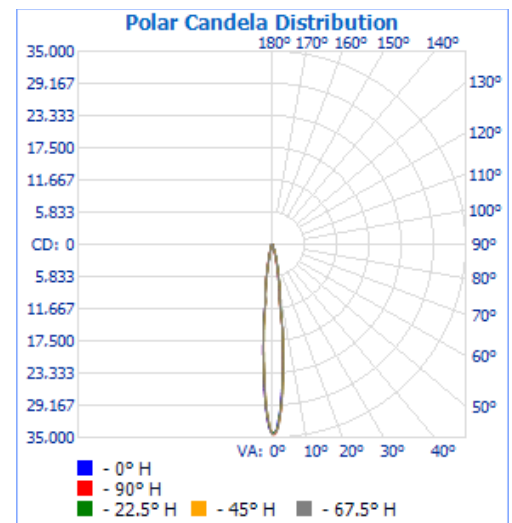
The following images depict the luminous intensity distribution characteristics of the luminaire:



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	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181	34181
0.5	34211	34170	34417	34402	34444	34364	34362	34130	33785	33624	33454	33605	33683	33812	33823	34091	34211
1.0	34002	34004	34096	34195	34388	34207	33830	33647	32940	32449	32254	32331	32873	33163	33361	33755	34002
1.5	33391	33618	33693	33845	33663	33380	32860	32470	31525	31075	31055	30998	31503	31923	32477	32807	33391
2.0	32027	32630	32986	33043	32622	32231	31830	31054	29993	29648	29398	29490	29814	30428	31133	31523	32027
2.5	31023	31212	31658	31645	31574	31104	30432	29566	28369	27809	27352	27546	28156	28919	29652	30367	31023
3.0	29670	29868	30086	30174	30152	29560	28515	27728	26351	25595	25253	25397	26324	27219	28143	28929	29670
3.5	27812	28485	28627	28731	28268	27534	26392	25458	24057	23466	23364	23409	24132	25132	26369	27054	27812
4.0	25928	26710	27038	26995	26291	25406	24403	23222	22003	21545	21450	21552	21962	23011	24222	25105	25928
4.5	24294	24810	25086	24927	24423	23407	22402	21224	20150	19611	19374	19585	20064	21131	22205	23375	24294
5.0	22656	23127	23055	22919	22533	21448	20279	19267	18222	17673	17469	17641	18238	19244	20373	21552	22656
5.5	20705	21384	21219	21074	20458	19431	18270	17321	16375	15948	15845	15967	16397	17293	18479	19539	20705
6.0	18839	19339	19324	19067	18368	17525	16560	15596	14806	13758	12076	14460	14722	15516	16517	17649	18839
6.5	16925	17298	17349	17106	16592	15845	13515	11280	10832	10258	10197	10259	10381	10885	14757	15975	16925
7.5	15294	15579	15538	15423	14975	12372	10333	10159	9972	9828	9842	9838	9996	10161	10377	12016	15294
8.0	11410	13229	10804	11880	11595	10180	9938	9688	9438	9372	9339	9400	9490	9706	9992	10217	11410
8.5	10033	10086	10152	10122	9934	9735	9520	9098	8843	8721	8651	8762	8897	9173	9510	9835	10033
9.0	9652	9646	9719	9665	9558	9285	8934	8389	8002	7779	7724	7874	8173	8572	9008	9416	9652
10.0	9129	9242	9224	9177	9041	8640	8095	7419	6933	6719	6756	6886	7229	7716	8387	8840	9129
12.5	8523	8738	8728	8660	8346	7740	7002	6342	5918	5832	5908	6077	6286	6776	7534	8118	8523
15.0	7837	8075	8104	7939	7466	6775	6066	5434	5103	5006	5058	5280	5504	6017	6720	7335	7837
17.5	7163	7307	7337	7105	6686	5999	5295	4713	4368	4230	4337	4542	4861	5411	6069	6676	7163
20.0	6495	6699	6607	6399	6003	5314	4566	4039	3695	3616	3771	3938	4254	4817	5486	6042	6495
22.5	5868	6141	6049	5802	5308	4657	3936	3427	3146	3123	3250	3443	3746	4283	4924	5478	5868
25.0	5412	5570	5552	5241	4734	4141	3456	2946	2701	2655	2776	2982	3349	3860	4455	5040	5412
27.5	5024	5106	5039	4717	4294	3724	3032	2551	2306	2266	2408	2610	2971	3475	4077	4644	5024
30.0	4614	4736	4601	4299	3861	3317	2656	2190	1966	1966	2118	2329	2623	3103	3702	4245	4614
32.5	4237	4353	4246	3932	3461	2952	2360	1899	1712	1706	1857	2073	2337	2778	3355	3897	4237
35.0	3948	3985	3902	3562	3146	2683	2118	1676	1497	1478	1639	1836	2104	2525	3083	3632	3948
37.5	3675	3698	3555	3229	2871	2445	1886	1477	1162	1267	1472	1645	1882	2282	2833	3355	3675
40.0	3374	3439	3269	2969	2594	2201	1678	1127	1002	1006	1153	1493	1681	2048	2571	3083	3374
42.5	2333	2325	2174	1913	1628	1386	950	798	736	724	809	889	948	1127	1715	2136	2333
45.0	1572	1573	1450	1052	964	861	627	536	507	502	532	592	635	785	1002	1469	1572
47.5	954	960	930	819	674	550	414	375	356	348	357	391	418	502	758	937	954
50.0	654	685	627	544	443	362	289	266	255	253	258	277	288	331	501	646	654
52.5	422	443	414	372	303	254	214	203	195	194	201	207	216	239	337	428	422
55.0	279	292	278	258	205	182	166	158	156	154	158	161	163	177	230	286	279
57.5	192	205	195	177	152	140	131	127	126	127	130	128	130	139	164	197	192
60.0	140	148	145	130	121	112	109	106	108	106	108	107	110	113	125	139	140
62.5	113	112	111	103	102	94	91	89	94	91	92	91	95	94	104	109	113
65.0	95	91	92	87	88	81	79	76	81	78	79	78	83	82	89	91	95
67.5	81	77	79	75	75	70	69	66	70	68	68	68	71	73	77	79	81



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

70.0	15	16	16	16	15	15	15	14	13	14	14	14	13	15	16	15	15
72.5	11	12	12	12	11	11	11	10	10	10	11	10	10	11	11	11	11
75.0	8	8	9	8	8	8	8	7	7	7	8	7	7	8	8	8	8
77.5	5	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5
80.0	3	3	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3
82.5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
85.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
87.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Maximum Candela = **34,443.5** at Horizontal: 90.0°, 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 “4 π 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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