



GONIOPHOTOMETER TEST REPORT

IES LM79-08 Section 9.3

TÜV SÜD America

Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

Bill Dixon

Director of Engineering & Operations

Beghelli North America

3250 Corporate Way, Unit B
Miramar, FL 33025
United States

Telephone: 954-442-6189

Sample Tested: Girasole 4100K Medium 40W
Manufacturer: Beghelli North America

Technical Report Number: JI1302916-18-GONIO
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Report Prepared by:

Byrd Evans

TÜV SÜD Project Handler

Report Reviewed by:

Steve Longo

TÜV SÜD Manager

TÜV SÜD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

Telephone: 678-341-5900 www.tuvamerica.com

Page 1

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GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1302916-18-GONIO

June 13, 2013

Summary of Key Test Results

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

Notes:

Tested in intended orientation (Horizontal)



| Parameter | Measured Result |
|-----------------------------|--------------------------|
| Luminous Flux | 1821.0 Lumens |
| Input Power | 35.69 Watts |
| Efficacy | 51.02 Lumens/Watt |
| Beam Angle | 22.6° |
| Stabilization Time | 58 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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Page 2

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**GONIOPHOTOMETRIC
TEST REPORT
IES LM79-2008
TABLE OF CONTENTS**

Report# JI1302916-18-GONIO

June 13, 2013

| | |
|---------------------------------------|---|
| Test Results | 4 |
| Zonal Lumen Summary | 4 |
| Illuminance Plots..... | 4 |
| Candela Plots | 5 |
| Candela Tabulation | 6 |
| Photometric Testing Information | 7 |
| Equipment List: | 7 |

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Page 3

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Report# JI1302916-18-GONIO

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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 Medium 40W |
|---------------------------------|---------------------------|
| | Goniophotometer |
| Total Luminous Flux (Lumens) | 1821.0 |
| Luminous Efficacy (Lumens/Watt) | 51.02 |

| Electrical Results | Girasole 4100K Medium 40W |
|------------------------------|---------------------------|
| | Goniophotometer |
| Input Power (Watts) | 35.69 |
| Input Voltage (Volts AC) | 120.05 |
| Input Current (Amps) | 0.310 |
| Power Factor (120/240V) | 0.959/0.886 |
| Input Frequency (Hertz) | 60.0 |
| A-THD (Current %) (120/240V) | 19.08/19.98 |

| Additional Parameters | Girasole 4100K Medium 40W |
|---|--------------------------------------|
| | Goniophotometer |
| Stabilization Time (Light and Power) | 58 minutes |
| Test Geometry Configuration | Type C |
| Photometer | Gigahertz Optik P9801 |
| Ambient Temperature | 25.1°C |
| ISTMT (In-Situ Temperature Measurement) | 65.8°C |
| Spacing Criteria | 0.40 (0° – 180°) / 0.42 (90° – 270°) |

Zonal Lumen Summary

| Zone | Lumens | % Lamp / Luminaire |
|----------|--------|--------------------|
| 0 - 60 | 1780.2 | 97.8 % |
| 60 - 90 | 40.8 | 2.2 % |
| 0 - 90 | 1821.0 | 100.0 % |
| 90 - 180 | 0.0 | 0.0 % |
| 0 - 180 | 1821.0 | 100.0 % |

Test Results – Illuminance Plots

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Alpharetta GA 30005

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Page 4

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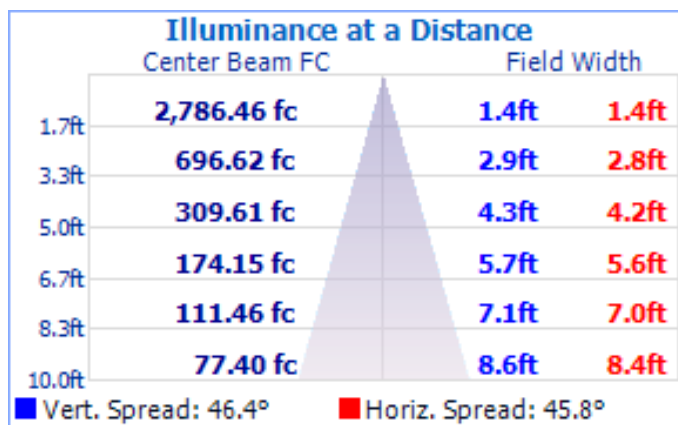
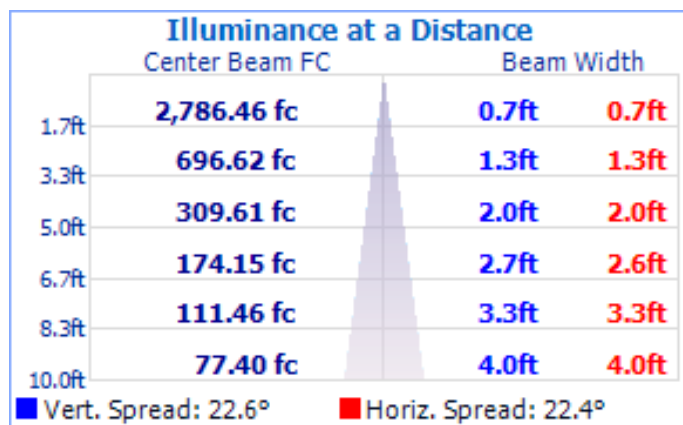


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Report# JI1302916-18-GONIO

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The following images depict the illuminance characteristics of the luminaire.

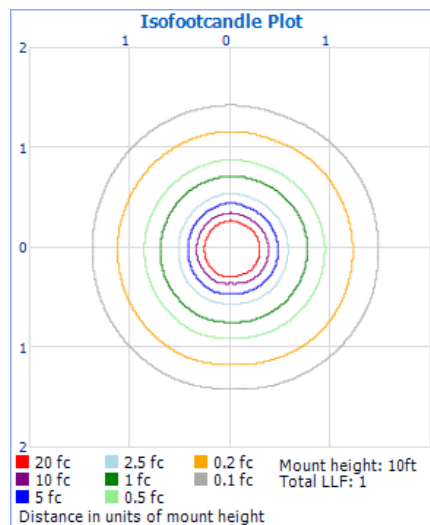


Beam Angle = 22.6°

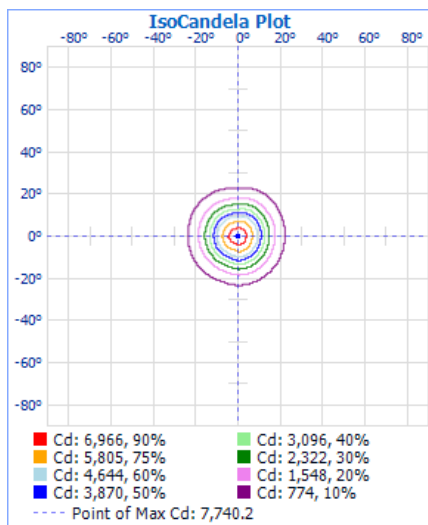
Field Angle = 46.4°

Test Results – Candela Plots

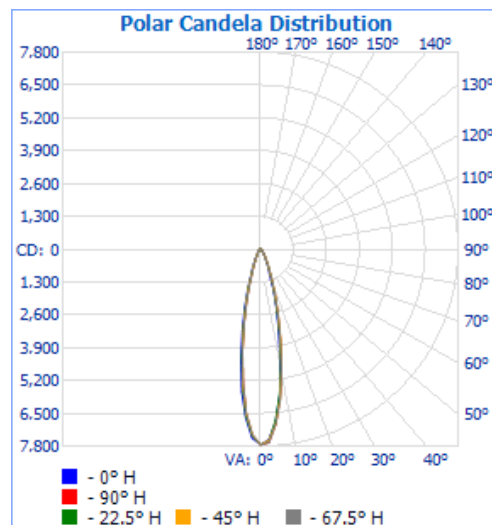
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

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Page 5

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Report# JI1302916-18-GONIO

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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 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 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 | 7740 |
| 2.5 | 7545 | 7590 | 7575 | 7666 | 7662 | 7567 | 7465 | 7257 | 7490 | 7403 | 7351 | 7333 | 7398 | 7390 | 7482 | 7618 | 7545 |
| 5.0 | 6857 | 6804 | 6944 | 6944 | 6943 | 6796 | 6618 | 6508 | 6689 | 6626 | 6521 | 6508 | 6527 | 6657 | 6801 | 6910 | 6857 |
| 7.5 | 5817 | 5790 | 5963 | 5992 | 5909 | 5802 | 5592 | 5290 | 5680 | 5466 | 5354 | 5279 | 5318 | 5459 | 5662 | 5946 | 5817 |
| 10.0 | 4468 | 4622 | 4753 | 4782 | 4748 | 4553 | 4366 | 4097 | 4459 | 4286 | 4090 | 4077 | 4130 | 4266 | 4489 | 4734 | 4468 |
| 12.5 | 3316 | 3465 | 3680 | 3653 | 3566 | 3418 | 3238 | 3038 | 3318 | 3130 | 3024 | 2945 | 2997 | 3142 | 3316 | 3621 | 3316 |
| 15.0 | 2443 | 2553 | 2697 | 2696 | 2654 | 2476 | 2348 | 2157 | 2398 | 2256 | 2139 | 2072 | 2129 | 2225 | 2405 | 2622 | 2443 |
| 17.5 | 1729 | 1821 | 1962 | 1920 | 1890 | 1756 | 1658 | 1544 | 1678 | 1598 | 1524 | 1384 | 1462 | 1591 | 1704 | 1866 | 1729 |
| 20.0 | 1025 | 1288 | 1405 | 1396 | 1313 | 1235 | 1045 | 969 | 1088 | 979 | 954 | 923 | 946 | 972 | 1005 | 1266 | 1025 |
| 22.5 | 857 | 900 | 941 | 936 | 919 | 878 | 827 | 767 | 828 | 768 | 715 | 699 | 699 | 757 | 839 | 901 | 857 |
| 25.0 | 611 | 676 | 727 | 730 | 690 | 648 | 603 | 536 | 601 | 534 | 505 | 493 | 489 | 523 | 601 | 659 | 611 |
| 27.5 | 444 | 487 | 517 | 518 | 500 | 465 | 434 | 400 | 429 | 391 | 365 | 361 | 354 | 380 | 439 | 467 | 444 |
| 30.0 | 337 | 367 | 393 | 380 | 372 | 357 | 332 | 309 | 319 | 296 | 285 | 275 | 276 | 299 | 328 | 353 | 337 |
| 32.5 | 270 | 287 | 305 | 296 | 296 | 284 | 263 | 250 | 248 | 238 | 226 | 221 | 227 | 243 | 261 | 280 | 270 |
| 35.0 | 218 | 233 | 247 | 240 | 241 | 236 | 215 | 204 | 197 | 191 | 184 | 179 | 184 | 197 | 208 | 227 | 218 |
| 37.5 | 175 | 189 | 196 | 198 | 201 | 191 | 175 | 162 | 162 | 155 | 147 | 146 | 151 | 157 | 167 | 185 | 175 |
| 40.0 | 143 | 153 | 161 | 164 | 164 | 156 | 145 | 133 | 132 | 126 | 121 | 119 | 122 | 127 | 135 | 150 | 143 |
| 42.5 | 116 | 127 | 132 | 136 | 136 | 128 | 121 | 109 | 112 | 105 | 100 | 99 | 102 | 104 | 111 | 123 | 116 |
| 45.0 | 98 | 105 | 113 | 114 | 113 | 106 | 102 | 93 | 94 | 90 | 86 | 84 | 85 | 88 | 94 | 101 | 98 |
| 47.5 | 82 | 90 | 97 | 98 | 96 | 90 | 88 | 79 | 82 | 79 | 75 | 72 | 73 | 75 | 79 | 85 | 82 |
| 50.0 | 70 | 76 | 84 | 83 | 81 | 78 | 76 | 69 | 70 | 68 | 66 | 63 | 63 | 65 | 68 | 72 | 70 |
| 52.5 | 59 | 65 | 71 | 72 | 70 | 68 | 66 | 60 | 62 | 61 | 57 | 55 | 54 | 56 | 59 | 61 | 59 |
| 55.0 | 50 | 55 | 59 | 62 | 59 | 59 | 57 | 52 | 54 | 53 | 51 | 48 | 47 | 49 | 51 | 52 | 50 |
| 57.5 | 43 | 47 | 50 | 53 | 51 | 51 | 49 | 45 | 47 | 46 | 44 | 42 | 41 | 42 | 44 | 45 | 43 |
| 60.0 | 36 | 39 | 42 | 44 | 43 | 43 | 42 | 39 | 40 | 40 | 39 | 36 | 35 | 36 | 37 | 38 | 36 |
| 62.5 | 31 | 33 | 35 | 37 | 36 | 36 | 35 | 33 | 35 | 34 | 33 | 31 | 30 | 31 | 32 | 32 | 31 |
| 65.0 | 25 | 27 | 29 | 30 | 30 | 30 | 29 | 28 | 29 | 29 | 28 | 26 | 26 | 26 | 26 | 27 | 25 |
| 67.5 | 21 | 22 | 23 | 24 | 24 | 24 | 24 | 22 | 24 | 24 | 23 | 22 | 21 | 21 | 22 | 22 | 21 |
| 70.0 | 16 | 17 | 18 | 19 | 19 | 19 | 19 | 18 | 20 | 19 | 19 | 17 | 17 | 17 | 17 | 18 | 16 |
| 72.5 | 13 | 13 | 14 | 14 | 15 | 15 | 14 | 14 | 16 | 15 | 14 | 14 | 13 | 13 | 13 | 14 | 13 |
| 75.0 | 9 | 10 | 10 | 11 | 11 | 11 | 11 | 10 | 12 | 11 | 11 | 10 | 10 | 10 | 10 | 10 | 9 |
| 77.5 | 6 | 7 | 7 | 7 | 8 | 8 | 7 | 7 | 9 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 6 |
| 80.0 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 |
| 82.5 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| 85.0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 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 = **7740.2** at Horizontal: 0.0°, Vertical: 0.0°

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Page 6

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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 a goniophotometer, located in an accredited, temperature and humidity-controlled, draft free photometric laboratory.

Sample Stabilization

The sample (UUT) is placed on a goniophotometer 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.

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 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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Alpharetta GA 30005

Telephone: 678-341-5900 www.tuvamerica.com