



# GONIOPHOTOMETER TEST REPORT

## IES LM79-08 Section 9.3

TÜV SÜD America

### Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

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Director of Engineering & Operations

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**Sample Tested:** Draco BS730 4100K Wide 40W  
**Manufacturer:** Beghelli North America

**Technical Report Number:** JI1302916-14-GONIO  
**Report Issue Date:** June 12, 2013  
**Total Number of Pages:** 7 (including this page)

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# GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1302916-14-GONIO

June 12, 2013

## Summary of Key Test Results

Model# **Draco BS730 4100K Wide 40W**  
Manufacturer **Beghelli North America**  
TÜV Sample# **712-7**  
Date of Test **June 10, 2013**

### Notes:

Tested in intended orientation (Horizontal)



Parameter	Measured Result
Luminous Flux	<b>2401.3 Lumens</b>
Input Power	<b>34.64 Watts</b>
Efficacy	<b>69.32 Lumens/Watt</b>
Beam Angle	<b>31.2°</b>
Stabilization Time	<b>60 minutes</b>
In-Situ Temp Test (ISTMT)**	<b>70.7°C</b>

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	Draco BS730 4100K Wide 40W
	Goniophotometer
Total Luminous Flux (Lumens)	2401.3
Luminous Efficacy (Lumens/Watt)	69.32

Electrical Results	Draco BS730 4100K Wide 40W
	Goniophotometer
Input Power (Watts)	34.64
Input Voltage (Volts AC)	120.12
Input Current (Amps)	0.290
Power Factor (120/277V)	0.994/0.915
Input Frequency (Hertz)	60.0
A-THD (Current %) (120/277V)	2.11/5.51

Additional Parameters	Draco BS730 4100K Wide 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)	70.7°C
Spacing Criteria	0.50 (0° – 180°) / 0.60 (90° – 270°)

## Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	2347.6	97.8 %
60 - 90	53.6	2.2 %
0 - 90	2401.3	100.0 %
90 - 180	0.0	0.0 %
0 - 180	2401.3	100.0 %

## Test Results – Illuminance Plots

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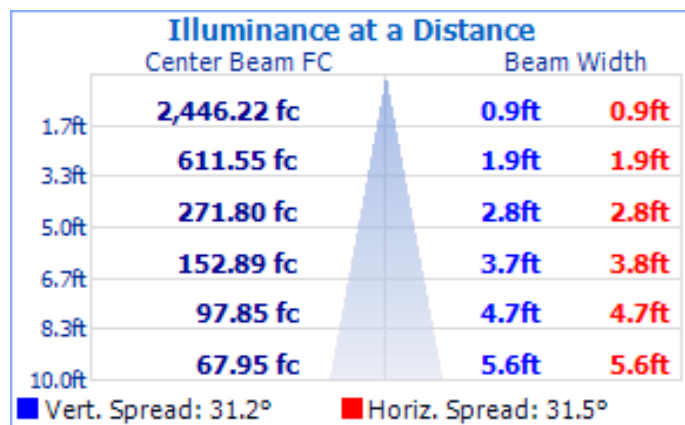


# GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

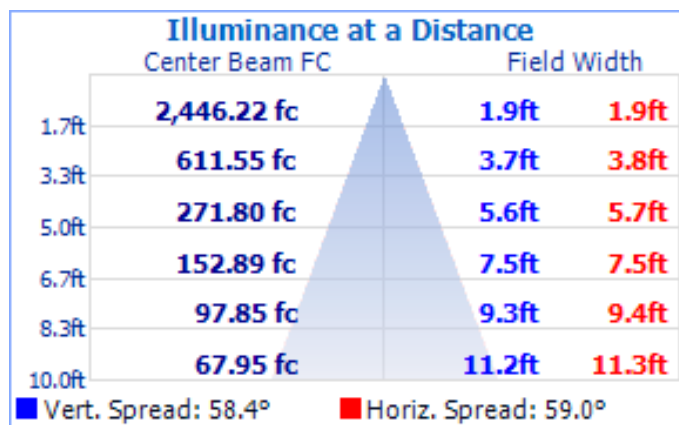
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The following images depict the illuminance characteristics of the luminaire.



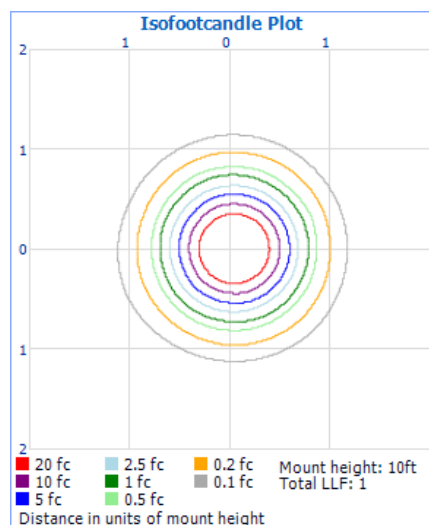
Beam Angle = 31.2°



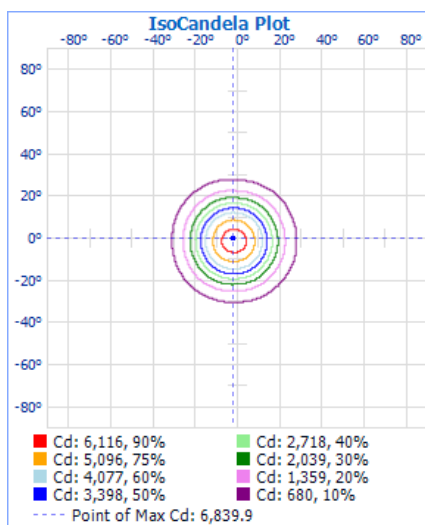
Field Angle = 58.4°

## Test Results – Candela Plots

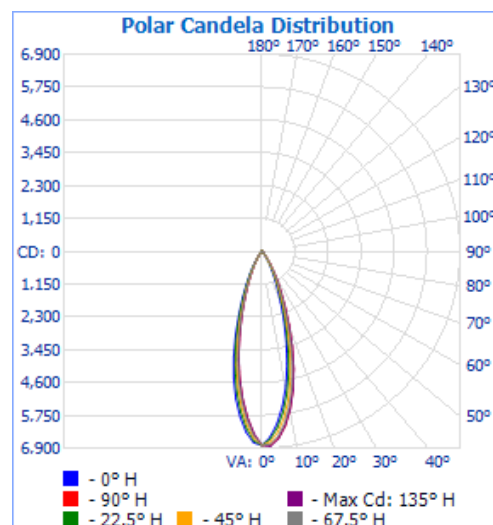
The following images depict the luminous intensity distribution characteristics of the luminaire:



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 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		0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
2.5	0	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795	6795
5.0	2.5	6507	6582	6679	6765	6795	6838	<b>6840</b>	6794	6713	6642	6562	6474	6431	6395	6392	6425
7.5	5	6046	6188	6346	6499	6579	6629	6590	6499	6367	6231	6087	5948	5847	5809	5842	5899
10.0	7.5	5464	5658	5880	6067	6184	6252	6167	6038	5850	5672	5485	5326	5214	5154	5193	5291
12.5	10	4791	5018	5272	5496	5625	5717	5632	5448	5248	5036	4819	4631	4517	4458	4499	4596
15.0	12.5	4030	4296	4573	4833	4969	5071	4982	4767	4564	4326	4091	3889	3777	3703	3747	3843
17.5	15	3256	3522	3813	4084	4237	4331	4266	4051	3815	3586	3340	3142	3022	2946	2999	3082
20.0	17.5	2530	2787	3034	3310	3478	3525	3500	3290	3060	2862	2602	2449	2340	2262	2317	2384
22.5	20	1903	2135	2330	2584	2743	2759	2757	2570	2356	2202	1956	1851	1756	1688	1740	1797
25.0	22.5	1401	1605	1751	1959	2095	2096	2099	1941	1773	1652	1441	1380	1298	1242	1298	1316
27.5	25	1016	1183	1296	1460	1567	1560	1565	1435	1299	1214	1052	1014	953	896	942	951
30.0	27.5	736	855	943	1072	1147	1141	1142	1042	939	879	760	734	691	655	680	686
32.5	30	528	614	685	780	840	837	828	754	677	636	555	528	494	469	489	489
35.0	32.5	347	374	434	507	549	565	528	493	450	411	361	345	325	298	299	310
37.5	35	199	243	279	330	323	356	331	324	282	261	222	213	187	178	188	191
40.0	37.5	128	145	175	191	219	219	209	189	179	162	143	129	117	114	118	119
42.5	40	82	89	102	121	124	143	121	120	107	102	89	81	77	71	70	77
45.0	42.5	58	62	69	73	75	77	74	72	69	64	60	56	55	54	53	54
47.5	45	44	47	51	53	54	57	57	55	51	49	45	42	43	43	42	42
50.0	47.5	34	37	40	40	42	43	42	41	40	38	37	35	36	36	35	34
52.5	50	29	30	32	33	34	34	34	34	33	32	31	30	31	32	30	29
55.0	52.5	26	26	28	28	28	28	28	28	28	27	27	27	28	28	27	26
57.5	55	24	24	25	25	25	25	25	25	25	25	24	24	25	26	24	23
60.0	57.5	22	23	23	23	23	23	23	24	24	23	23	23	23	24	23	22
62.5	60	21	22	22	22	22	22	22	22	22	22	22	21	22	22	22	21
65.0	62.5	20	20	21	21	21	21	21	21	21	21	20	20	20	21	21	20
67.5	65	20	20	20	20	20	20	20	21	20	20	20	19	19	20	20	19
70.0	67.5	19	19	19	19	19	20	20	20	19	19	19	18	18	19	19	19
72.5	70	18	18	18	19	19	19	19	19	19	18	18	18	18	18	18	18
75.0	72.5	17	17	17	18	18	19	19	19	18	18	17	17	17	18	18	17
77.5	75	17	17	17	17	18	19	18	18	17	17	16	16	16	17	17	17
80.0	77.5	16	16	16	17	17	18	18	18	17	16	16	15	15	16	16	16
82.5	80	15	15	16	16	17	17	17	17	16	16	15	15	15	15	15	15
85.0	82.5	14	15	15	16	16	17	17	17	16	15	14	14	14	14	14	14
87.5	85	14	14	15	15	15	16	15	16	15	14	14	13	13	14	14	14
90.0	87.5	13	14	14	14	15	15	15	15	14	14	13	13	13	13	13	13

Maximum Candela = **6839.9** at Horizontal: 135.0°, Vertical: 2.5°

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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 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 3<sup>rd</sup> 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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