



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

**Technical Report Number:** JI1302916-13-GONIO  
**Report Issue Date:** June 12, 2013  
**Total Number of Pages:** 7 (including this page)

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Page 1

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# GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1302916-13-GONIO

June 12, 2013

## Summary of Key Test Results

Model# **Draco BS730 4100K Medium 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>2279.5 Lumens</b>
Input Power	<b>34.60 Watts</b>
Efficacy	<b>65.88 Lumens/Watt</b>
Beam Angle	<b>21.6°</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".

## TABLE OF CONTENTS

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Page 2

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# GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1302916-13-GONIO

June 12, 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# JI1302916-13-GONIO

June 12, 2013

## 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 Medium 40W
	Goniophotometer
Total Luminous Flux (Lumens)	2279.5
Luminous Efficacy (Lumens/Watt)	65.88

Electrical Results	Draco BS730 4100K Medium 40W
	Goniophotometer
Input Power (Watts)	34.60
Input Voltage (Volts AC)	120.09
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 Medium 40W
	Goniophotometer
Stabilization Time (Light and Power)	60 minutes
Test Geometry Configuration	Type C
Photometer	Gigahertz Optik P9801
Ambient Temperature	24.9°C
ISTMT (In-Situ Temperature Measurement)	70.7°C
Spacing Criteria	0.34 (0° – 180°) / 0.44 (90° – 270°)

## Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	2227.4	97.7 %
60 - 90	52.1	2.3 %
0 - 90	2279.5	100.0 %
90 - 180	0.0	0.0 %
0 - 180	2279.5	100.0 %

## Test Results – Illuminance Plots

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Page 4

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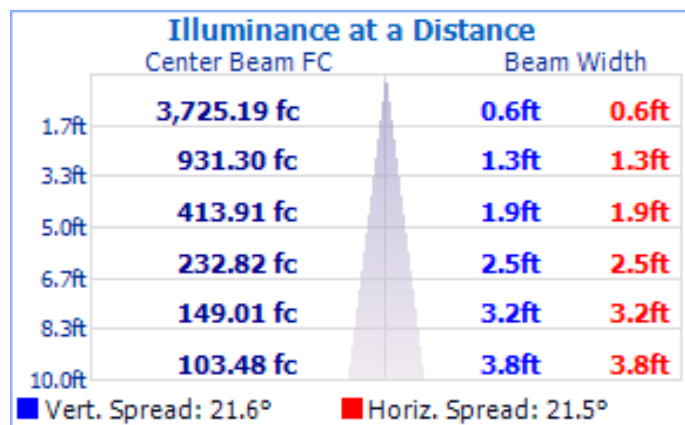


# GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

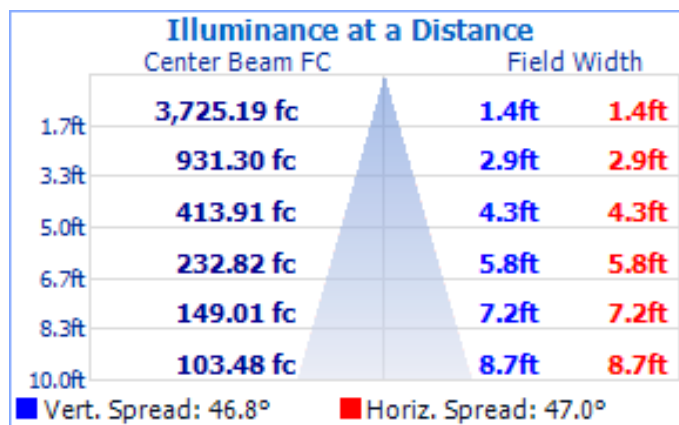
Report# JI1302916-13-GONIO

June 12, 2013

The following images depict the illuminance characteristics of the luminaire.



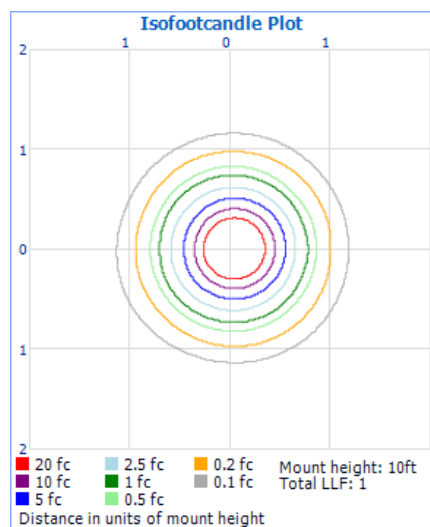
Beam Angle = 21.6°



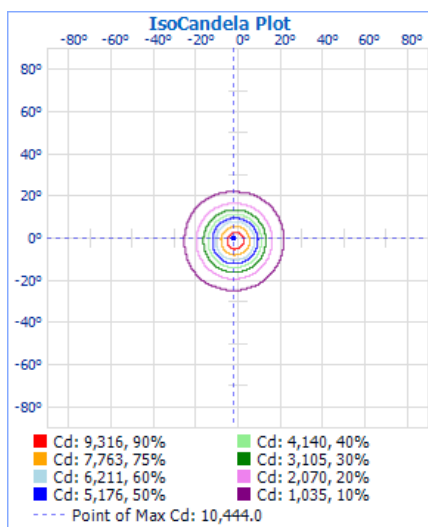
Field Angle = 46.8°

## Test Results – Candela Plots

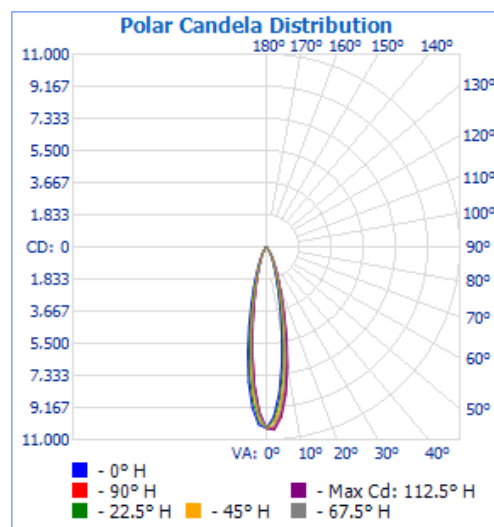
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

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Page 5

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Report# JI1302916-13-GONIO

June 12, 2013

## 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	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348	10348
2.5	9666	9837	10043	10236	10351	<b>10444</b>	10440	10336	10155	9970	9768	9572	9455	9373	9390	9476	9662
5.0	8351	8677	9040	9371	9592	9752	9737	9551	9222	8856	8477	8146	7932	7824	7864	8037	8347
7.5	6690	7090	7558	7979	8277	8477	8452	8204	7772	7302	6818	6418	6165	6055	6113	6329	6688
10.0	5025	5416	5921	6366	6691	6902	6871	6594	6132	5639	5144	4747	4516	4425	4483	4694	5022
12.5	3620	3945	4426	4830	5148	5324	5288	5025	4595	4150	3714	3376	3216	3141	3185	3363	3616
15.0	2581	2819	3216	3536	3810	3934	3898	3688	3327	2977	2629	2365	2260	2233	2250	2392	2578
17.5	1854	2030	2337	2570	2786	2856	2832	2666	2395	2132	1873	1681	1616	1607	1623	1718	1852
20.0	1354	1485	1707	1891	2042	2090	2068	1933	1731	1531	1349	1224	1174	1184	1200	1256	1353
22.5	995	1108	1266	1413	1520	1549	1522	1407	1282	1110	986	921	878	889	913	930	994
25.0	745	832	939	1052	1129	1155	1129	1028	950	829	747	709	674	681	701	701	744
27.5	578	638	707	783	834	858	839	764	709	634	588	563	542	554	549	548	577
30.0	454	494	547	588	633	654	638	594	546	508	474	449	438	447	436	426	454
32.5	331	340	393	409	444	467	445	426	385	356	339	317	322	303	301	305	332
35.0	209	237	266	283	280	317	291	296	251	257	234	213	193	202	197	202	209
37.5	130	154	173	180	208	196	205	186	179	160	148	134	130	127	131	133	129
40.0	89	95	105	115	123	127	116	117	112	101	94	86	83	76	75	80	89
42.5	62	66	72	76	79	78	75	76	73	68	63	59	58	58	56	58	62
45.0	47	50	54	56	56	60	59	57	54	52	48	45	46	45	44	44	47
47.5	36	39	42	43	44	45	45	44	43	40	39	37	37	38	36	35	36
50.0	30	31	34	35	36	36	36	36	35	33	32	31	32	33	31	29	30
52.5	26	27	29	29	29	29	30	30	29	28	27	27	28	29	27	26	26
55.0	24	24	26	26	26	26	26	26	26	25	25	24	25	26	25	23	24
57.5	22	23	24	24	24	24	24	24	24	23	23	22	23	23	23	22	22
60.0	21	22	22	22	23	22	23	23	23	22	22	21	22	22	21	21	21
62.5	20	20	21	21	21	21	22	22	21	21	20	20	20	20	20	20	20
65.0	19	19	20	20	20	20	20	20	20	20	19	19	19	19	19	19	19
67.5	18	18	19	19	19	19	19	20	19	19	18	18	18	18	18	18	18
70.0	17	17	18	18	19	19	19	19	18	18	17	17	17	18	18	18	17
72.5	17	17	17	17	18	18	18	18	18	17	16	16	16	17	17	17	17
75.0	16	16	16	17	17	18	18	18	17	17	16	16	16	16	16	16	16
77.5	15	15	16	16	16	17	17	17	17	16	15	15	15	15	15	15	15
80.0	14	15	15	16	16	17	17	16	16	15	15	14	14	14	14	14	14
82.5	14	14	15	15	15	16	16	16	15	15	14	13	13	13	14	13	13
85.0	13	13	14	14	14	15	15	15	14	14	13	13	13	13	14	13	13
87.5	13	13	13	14	14	14	14	14	14	13	13	12	12	13	13	12	13
90.0	13	12	13	13	13	13	13	13	13	13	12	12	12	13	13	13	13

Maximum Candela = **10,444.0** at Horizontal: 112.5°, Vertical: 2.5°

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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 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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