



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 720 4100K (Medium)
Manufacturer: Beghelli North America

Technical Report Number: JI1306325-3-GON
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GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

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June 26, 2013

Summary of Key Test Results

Model# Draco 720 4100K
(Medium)
Manufacturer Beghelli North
America
TÜV Sample# 808-1
Date of Test June 20, 2013



Notes:

Tested in intended orientation (LBU)
(with aperture down)

Parameter	Measured Result
Luminous Flux	2,026 Lumens
Input Power	33.49 Watts
Efficacy	60.49 Lumens/Watt
Beam Angle	26.2°
Stabilization Time	55 minutes
In-Situ Temp Test (ISTMT)**	Not Tested on this Model#

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 720 4100K (Medium)
	Goniophotometer
Total Luminous Flux (Lumens)	2,025.8
Luminous Efficacy (Lumens/Watt)	60.49

Electrical Results	Draco 720 4100K (Medium)
	Goniophotometer
Input Power (Watts)	33.49
Input Voltage (Volts AC)	120.09
Input Current (Amps)	0.280
Power Factor	0.996
Input Frequency (Hertz)	60.0
A-THD (Current %)	10.38%

Additional Parameters	Draco 720 4100K (Medium)
	Goniophotometer
Stabilization Time (Light and Power)	55 minutes
Test Geometry Configuration	Type C
Photometer	Gigahertz Optik P9801
Ambient Temperature	25.0°C
ISTMT (In-Situ Temperature Measurement)	Not Tested on this Model#
Spacing Criteria	0.44 (0° – 180°) / 0.38 (90° – 270°)

Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	1,967.9	97.1 %
60 - 90	57.9	2.9 %
0 - 90	2,025.8	100 %
90 - 180	0.0	0.0 %
0 - 180	2,025.8	100 %

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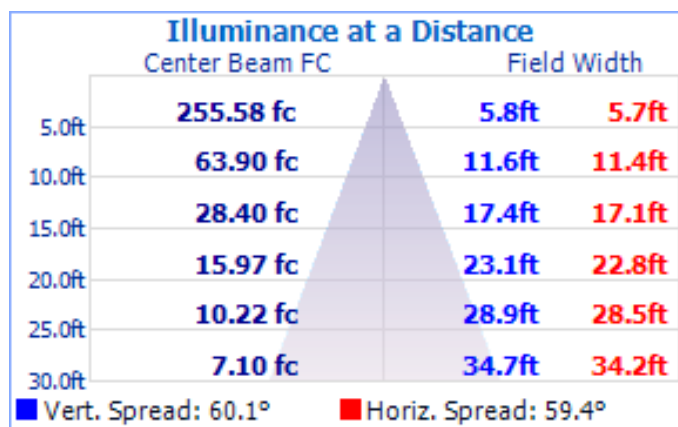
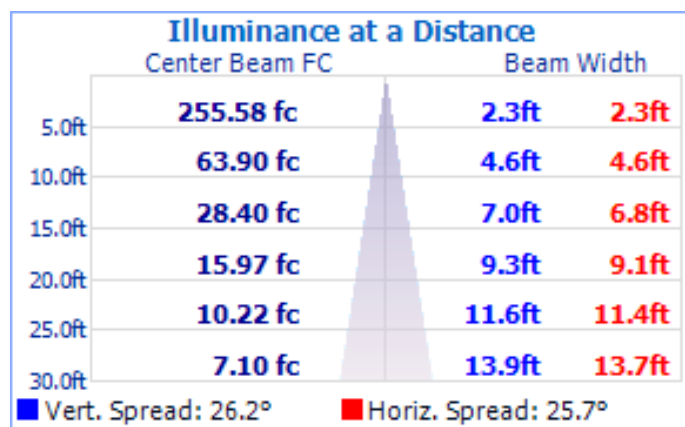


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Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire (Mount Height = 30ft):

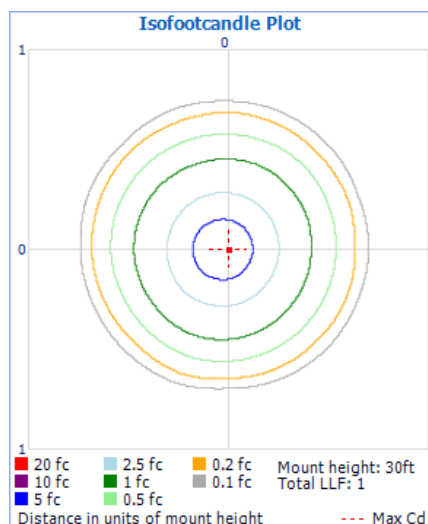


Beam Angle = 26.2°

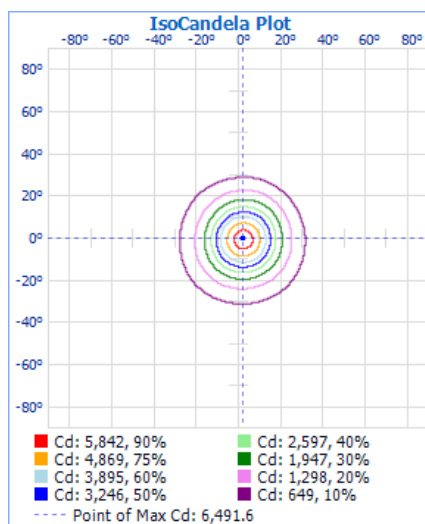
Field Angle = 60.1°

Test Results – Candela Plots

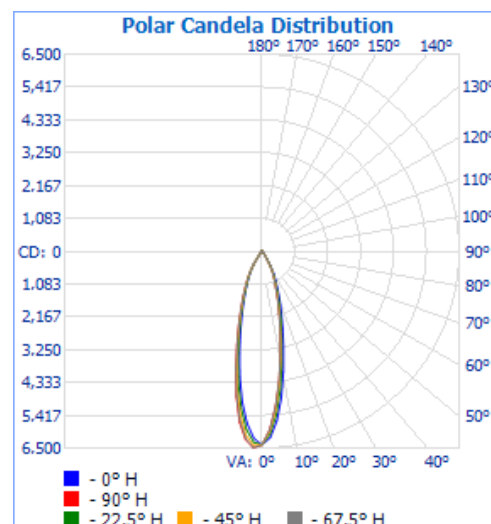
The following images depict the luminous intensity distribution characteristics of the luminaire:



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	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390	6390
2.5	6163	6047	5952	5895	5879	5905	5975	6074	6175	6311	6415	6487	6492	6465	6401	6292	6161
5.0	5616	5415	5255	5150	5128	5213	5339	5499	5687	5901	6083	6200	6240	6179	6038	5841	5614
7.5	4873	4600	4390	4306	4314	4388	4550	4768	5010	5246	5461	5618	5682	5568	5398	5124	4873
10.0	4053	3765	3556	3473	3492	3585	3770	3965	4210	4460	4673	4830	4862	4762	4583	4308	4052
12.5	3286	3024	2833	2776	2797	2872	3039	3215	3429	3663	3844	3962	3966	3908	3758	3514	3285
15.0	2636	2424	2255	2201	2202	2282	2441	2588	2738	2929	3069	3163	3186	3154	3041	2818	2634
17.5	2119	1946	1781	1754	1749	1815	1939	2077	2212	2334	2449	2533	2554	2500	2452	2255	2119
20.0	1712	1551	1441	1402	1404	1469	1550	1656	1772	1856	1951	2026	2034	1969	1958	1823	1711
22.5	1357	1235	1148	1113	1107	1189	1256	1351	1429	1474	1551	1609	1632	1563	1550	1468	1357
25.0	1072	973	907	880	892	952	1012	1095	1148	1184	1258	1287	1287	1230	1199	1173	1072
27.5	839	765	715	693	704	749	816	886	913	952	1014	1031	1022	969	929	918	839
30.0	572	505	485	479	480	544	630	672	704	749	793	808	778	710	668	655	572
32.5	319	301	276	286	270	325	352	434	534	518	551	529	529	442	374	401	319
35.0	136	148	147	136	159	161	203	234	284	297	332	315	276	231	209	197	135
37.5	69	60	56	60	80	86	103	127	130	166	148	165	123	111	102	82	69
40.0	53	50	47	48	51	55	58	63	66	66	67	64	60	58	55	52	54
42.5	48	47	46	46	48	53	53	55	58	58	56	57	55	53	51	51	48
45.0	44	39	38	39	44	48	49	52	57	57	59	58	56	50	46	45	44
47.5	35	31	30	32	36	40	41	43	47	49	52	51	47	43	37	35	35
50.0	27	26	25	26	30	32	33	35	37	39	42	43	37	34	29	28	27
52.5	24	23	22	24	27	29	28	29	31	32	34	34	31	28	25	24	24
55.0	22	21	20	22	26	27	26	26	28	28	30	30	27	25	22	22	22
57.5	20	20	19	21	24	25	25	25	25	26	26	27	25	23	21	20	20
60.0	19	19	18	20	22	24	23	23	23	24	24	25	23	22	20	19	19
62.5	18	18	18	19	21	23	23	22	22	23	22	23	22	21	19	19	18
65.0	17	17	17	19	20	22	22	22	22	22	21	22	21	20	18	18	17
67.5	17	17	17	19	21	22	23	23	21	21	20	21	21	20	18	17	17
70.0	16	17	17	22	23	25	26	25	21	21	20	21	20	19	18	17	16
72.5	16	18	17	22	20	28	36	28	22	22	20	20	20	19	17	17	16
75.0	16	17	17	18	17	24	35	28	24	23	21	21	19	19	16	17	16
77.5	14	16	14	16	16	21	20	28	25	33	19	21	19	18	15	16	15
80.0	14	14	14	15	15	17	17	20	21	23	19	19	17	16	15	14	14
82.5	13	14	14	14	15	16	16	17	18	18	17	17	16	15	14	13	13
85.0	13	13	14	14	15	15	15	15	16	16	15	15	15	14	13	13	13
87.5	13	13	14	14	15	15	15	15	14	14	14	14	14	13	13	13	13
90.0	15	32	22	28	15	15	15	15	14	14	13	13	13	13	13	14	15

Maximum Candela = **6,491.6** at Horizontal: 270.0°, 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 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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