



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 (Wide)
Manufacturer: Beghelli North America

Technical Report Number: JI1306325-4-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
(Wide)
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	2,049 Lumens
Input Power	33.47 Watts
Efficacy	61.22 Lumens/Watt
Beam Angle	33.9°
Stabilization Time	65 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 (Wide)
	Goniophotometer
Total Luminous Flux (Lumens)	2,049
Luminous Efficacy (Lumens/Watt)	61.22

Electrical Results	Draco 720 4100K (Wide)
	Goniophotometer
Input Power (Watts)	33.47
Input Voltage (Volts AC)	120.04
Input Current (Amps)	0.280
Power Factor	0.996
Input Frequency (Hertz)	60.0
A-THD (Current %)	10.22%

Additional Parameters	Draco 720 4100K (Wide)
	Goniophotometer
Stabilization Time (Light and Power)	65 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	0.50 (0° – 180°) / 0.60 (90° – 270°)

Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	1,975.5	96.4 %
60 - 90	73.4	3.6 %
0 - 90	2,048.9	100 %
90 - 180	0.0	0.0 %
0 - 180	2,048.9	100 %

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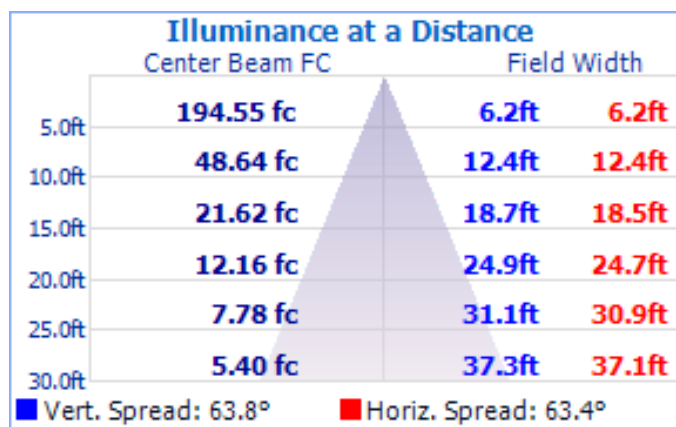
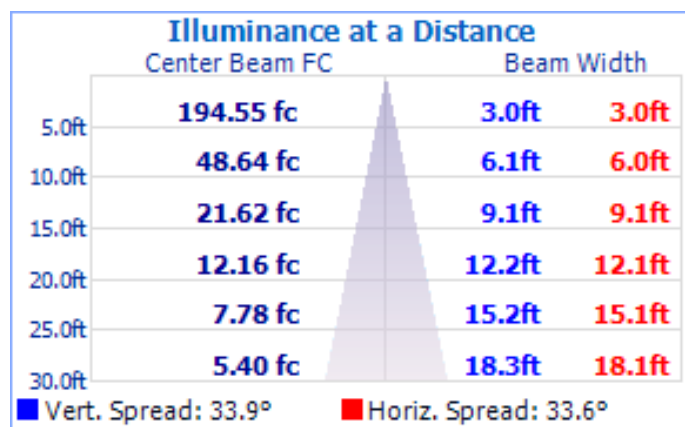
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Test Results – Illuminance Plots

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

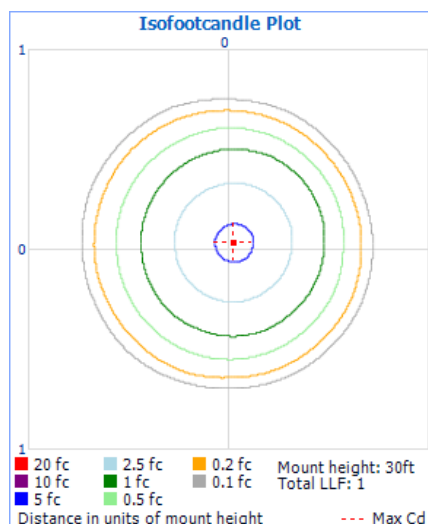


Beam Angle = 33.9°

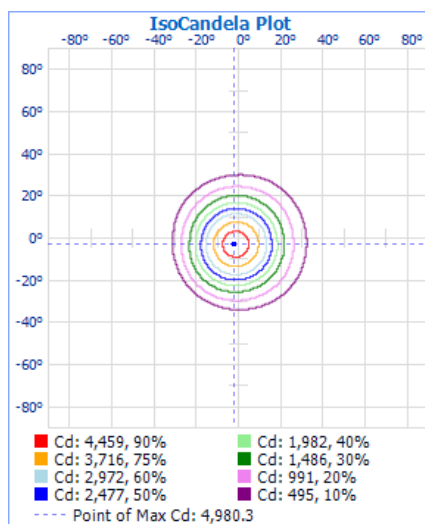
Field Angle = 63.8°

Test Results – Candela Plots

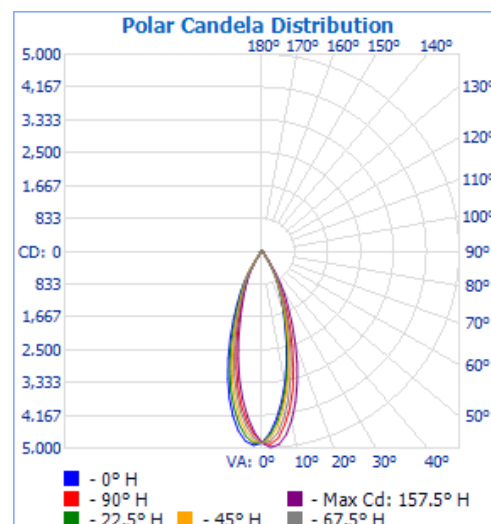
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela



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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	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864	4864
2.5	4618	4666	4751	4828	4901	4960	4976	4980	4931	4879	4818	4743	4654	4602	4582	4587	4617
5.0	4258	4348	4469	4623	4761	4890	4924	4926	4834	4714	4596	4464	4349	4272	4232	4214	4257
7.5	3842	3931	4052	4257	4437	4615	4714	4695	4598	4431	4279	4111	3975	3873	3808	3780	3842
10.0	3369	3469	3595	3818	4050	4228	4344	4345	4246	4056	3877	3683	3516	3389	3310	3298	3368
12.5	2880	2967	3111	3330	3597	3788	3891	3918	3818	3642	3454	3238	3023	2906	2814	2798	2880
15.0	2374	2472	2595	2832	3076	3310	3413	3451	3340	3157	2969	2752	2520	2410	2326	2304	2373
17.5	1928	2015	2102	2336	2544	2792	2908	2954	2843	2666	2459	2263	2047	1943	1876	1850	1927
20.0	1571	1622	1698	1885	2076	2286	2411	2441	2349	2166	1994	1810	1622	1545	1494	1492	1571
22.5	1244	1293	1336	1487	1629	1830	1947	1978	1889	1724	1566	1426	1299	1234	1222	1200	1244
25.0	988	1020	1039	1152	1258	1430	1524	1570	1502	1368	1246	1137	1044	993	978	963	988
27.5	773	790	808	887	957	1100	1189	1239	1180	1091	1003	921	837	797	777	764	773
30.0	542	538	562	618	647	779	890	934	894	835	774	710	631	594	559	560	542
32.5	302	314	327	368	381	434	484	570	628	559	536	489	452	377	343	343	303
35.0	138	154	165	187	194	211	248	296	328	343	333	288	238	199	196	166	138
37.5	68	60	57	73	99	96	117	147	145	188	170	158	116	107	95	81	68
40.0	58	55	51	53	53	59	60	65	72	80	86	83	71	66	59	57	58
42.5	55	56	56	55	54	59	57	58	60	61	62	64	60	58	54	55	55
45.0	51	49	48	49	52	56	54	55	55	54	53	55	54	52	49	49	51
47.5	42	39	38	39	43	45	44	45	45	46	46	48	47	44	40	41	42
50.0	34	32	31	32	33	35	35	35	36	36	38	40	40	38	34	33	34
52.5	30	29	28	28	29	30	29	29	30	30	32	36	36	34	30	30	30
55.0	28	27	26	26	27	27	26	26	27	27	29	32	33	32	28	28	28
57.5	26	25	24	24	25	25	24	24	25	25	27	30	32	30	27	26	26
60.0	24	24	23	23	23	23	23	23	24	25	25	28	30	30	26	25	24
62.5	23	23	21	21	22	22	22	22	23	24	24	27	28	28	26	24	23
65.0	22	22	20	21	21	21	21	22	23	26	24	29	28	27	25	25	22
67.5	23	21	19	20	20	21	21	22	26	29	29	32	34	32	26	25	23
70.0	24	22	19	19	20	21	21	23	29	39	33	39	42	36	31	29	24
72.5	23	21	18	18	19	21	23	29	24	33	34	44	29	31	39	33	23
75.0	20	21	18	18	18	20	26	26	28	47	40	55	36	35	24	25	20
77.5	19	17	16	17	17	19	20	38	23	55	43	80	28	39	21	25	19
80.0	17	16	15	15	16	17	18	21	34	33	28	32	29	24	19	19	17
82.5	16	15	14	14	15	15	16	19	21	25	22	26	23	21	18	17	16
85.0	15	15	14	14	14	14	15	17	18	20	21	22	20	19	17	16	15
87.5	15	14	14	14	14	14	15	16	17	18	18	19	19	18	17	16	15
90.0	17	27	19	29	15	14	14	15	16	17	17	18	18	18	17	17	16

Maximum Candela = **4,980.3** at Horizontal: 157.5°, 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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