



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: Draco 720 5700K (Medium)
Manufacturer: Beghelli North America

Technical Report Number: JI1306325-6-GON
Report Issue Date: June 26, 2013
Total Number of Pages: 7 (including this page)

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

Confidential Report



Lab Code: 500065-0

TÜV SÜD America is
accredited under the
NVLAP EEL program.





GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1306325-6-GON

June 26, 2013

Summary of Key Test Results

Model# Draco 720 5700K
(Medium)
Manufacturer Beghelli North
America
TÜV Sample# 808-2
Date of Test June 25, 2013



Notes:

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

Parameter	Measured Result
Luminous Flux	2,795 Lumens
Input Power	35.04 Watts
Efficacy	79.76 Lumens/Watt
Beam Angle	21.8°
Stabilization Time	57 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".

TÜV SÜD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

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

Page 2

Confidential Report



TÜV SÜD America is
accredited under the
NVLAP EEL program.





GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1306325-6-GON

June 26, 2013

TABLE OF CONTENTS

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

TÜV SÜD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

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

Page 3

Confidential Report



Lab Code: 500065-0

TÜV SÜD America is
accredited under the
NVLAP EEL program.





GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1306325-6-GON

June 26, 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 720 5700K (Medium)
	Goniophotometer
Total Luminous Flux (Lumens)	2,794.7
Luminous Efficacy (Lumens/Watt)	79.76

Electrical Results	Draco 720 5700K (Medium)
	Goniophotometer
Input Power (Watts)	35.04
Input Voltage (Volts AC)	120.07
Input Current (Amps)	0.290
Power Factor	0.997
Input Frequency (Hertz)	60.0
A-THD (Current %)	3.49%

Additional Parameters	Draco 720 5700K (Medium)
	Goniophotometer
Stabilization Time (Light and Power)	57 minutes
Test Geometry Configuration	Type C
Photometer	Gigahertz Optik P9801
Ambient Temperature	25.1°C
ISTMT (In-Situ Temperature Measurement)	Not Tested on this Model#
Spacing Criteria	0.38 (0° – 180°) / 0.34 (90° – 270°)

Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	2,733.3	97.8 %
60 - 90	61.4	2.2 %
0 - 90	2,794.7	100 %
90 - 180	0.0	0.0 %
0 - 180	2,794.7	100 %

TÜV SÜD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

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

Page 4

Confidential Report

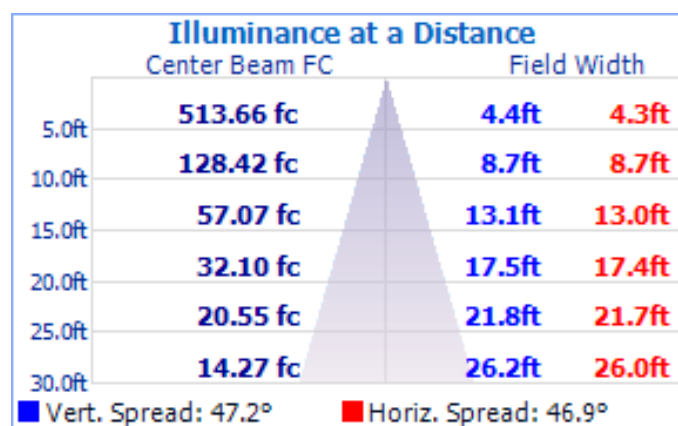
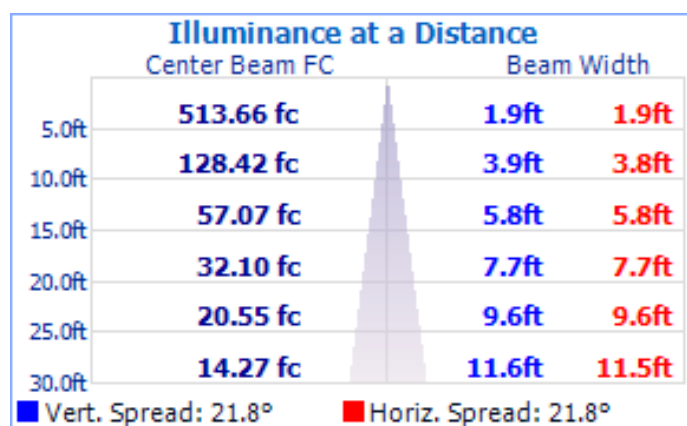


TÜV SÜD America is
accredited under the
NVLAP EEL program.



Test Results – Illuminance Plots

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

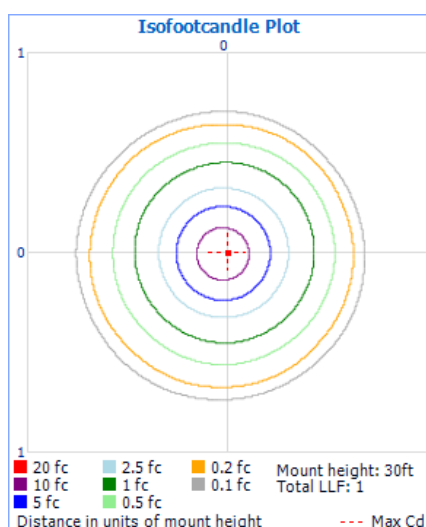


Beam Angle = 21.8°

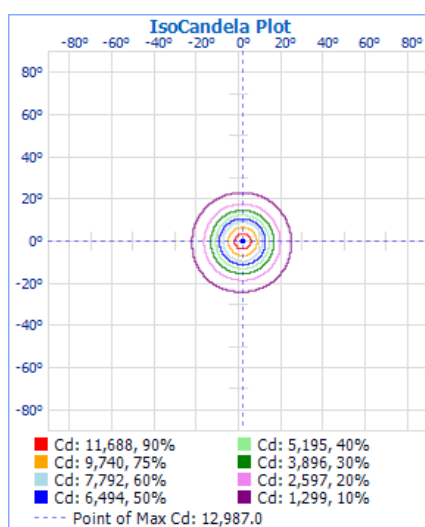
Field Angle = 47.2°

Test Results – Candela Plots

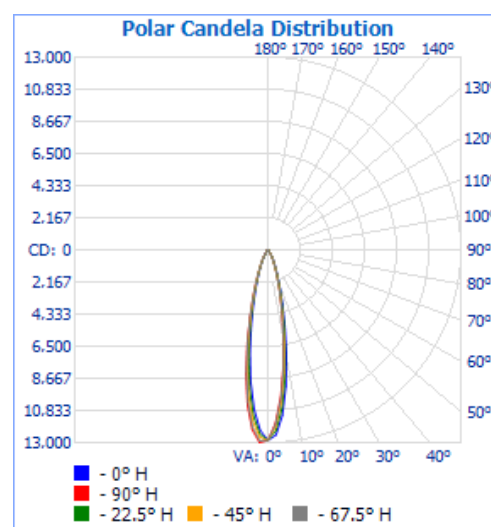
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela



GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1306325-6-GON

June 26, 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	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842	12842
2.5	12479	12207	11945	11776	11680	11658	11756	11900	12149	12417	12635	12870	12987	12985	12914	12698	12470
5.0	11191	10739	10322	10067	9922	9906	10062	10352	10759	11208	11599	11967	12162	12143	11986	11596	11189
7.5	9273	8778	8333	8036	7916	7914	8083	8461	8915	9453	9945	10330	10546	10502	10250	9783	9271
10.0	7194	6725	6325	6060	5994	6007	6182	6546	6963	7490	7955	8316	8498	8429	8125	7682	7188
12.5	5290	4923	4600	4408	4409	4410	4586	4854	5197	5631	6001	6302	6440	6338	6066	5675	5282
15.0	3782	3547	3290	3171	3203	3197	3350	3552	3792	4124	4374	4602	4679	4547	4363	4071	3782
17.5	2699	2543	2374	2288	2325	2348	2458	2595	2760	2991	3135	3311	3349	3215	3084	2900	2697
20.0	1939	1840	1745	1684	1710	1742	1817	1918	2017	2159	2261	2363	2381	2270	2178	2070	1938
22.5	1438	1336	1285	1249	1265	1294	1352	1427	1502	1557	1648	1700	1692	1621	1552	1501	1435
25.0	1069	986	951	939	942	964	1010	1060	1112	1134	1200	1238	1230	1189	1135	1095	1067
27.5	800	743	715	708	709	706	752	796	823	844	890	921	912	896	849	824	800
30.0	614	555	500	464	476	453	502	517	550	615	670	695	696	690	656	642	614
32.5	412	363	299	279	256	237	268	306	319	370	451	459	487	506	475	461	411
35.0	234	188	164	146	118	116	113	154	187	198	233	280	305	315	283	274	234
37.5	106	95	77	57	55	57	58	61	70	94	108	147	170	156	161	141	105
40.0	50	50	51	53	53	59	62	57	53	56	58	66	80	81	79	62	50
42.5	45	51	51	54	55	61	64	60	53	55	53	52	50	49	47	45	45
45.0	45	50	47	46	46	50	53	52	49	52	50	49	47	45	44	44	45
47.5	39	41	39	37	38	40	44	43	41	43	41	42	42	41	41	39	39
50.0	32	33	32	31	31	33	37	37	34	34	34	35	35	35	35	33	32
52.5	28	29	29	28	28	30	32	31	29	30	29	30	29	29	29	28	28
55.0	26	27	27	26	25	27	29	28	27	27	27	27	26	27	27	26	26
57.5	24	25	25	24	23	25	26	26	25	26	25	25	24	25	25	24	24
60.0	23	23	23	23	22	23	23	24	23	24	24	24	23	24	24	23	23
62.5	22	22	22	21	21	22	22	23	22	23	23	22	22	23	23	22	22
65.0	21	21	22	21	20	21	22	22	21	22	22	22	21	22	22	22	21
67.5	20	21	21	21	20	21	21	22	21	22	22	22	21	22	22	21	20
70.0	20	21	21	21	20	21	21	21	20	22	21	22	20	21	21	21	20
72.5	20	21	20	21	20	21	20	21	21	21	21	21	20	21	21	21	20
75.0	20	21	20	20	19	20	20	21	20	21	20	21	20	20	20	21	20
77.5	19	19	19	19	18	19	19	20	19	20	20	20	20	20	20	20	19
80.0	18	18	18	17	17	18	18	18	19	20	19	20	19	20	19	19	18
82.5	17	17	17	17	17	17	17	17	17	18	19	18	18	18	18	18	17
85.0	17	16	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17
87.5	17	16	16	16	16	16	16	16	16	17	17	17	17	16	17	17	17
90.0	16	16	17	17	18	18	17	17	16	16	16	16	16	16	16	16	16

Maximum Candela = **12,987.0** at Horizontal: 270.0°, Vertical: 2.5°

TUV SUD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

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

Page 6

Confidential Report



Lab Code: 500065-0

TUV SUD America is
accredited under the
NVLAP EEL program.





GONIOPHOTOMETRIC TEST REPORT IES LM79-2008

Report# JI1306325-6-GON

June 26, 2013

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

This technical report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government

TÜV SÜD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

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