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Report No: L051603205

Date: 5/18/2016



NVLAP LAB CODE 200927-0

Report No: L051603205

Report Prepared For: Colt LED

Model Number: High Output 32K 40W

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Catalog number is High Output 32K 40W . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 5/16/16

Date of Tests: 5/17/16 - 5/18/16

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/18/16
Xitron Power Analyzer	2503AH	MT-EL01	11/30/16
ITECH DC Power Supply	IT6122	PSDC-03-S1	11/17/16
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/24/16
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

Test Summary

Manufacturer:	Colt LED
Model Number:	High Output 32K 40W
Driver Model Number:	N/A
Total Lumens:	2819.92
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.40
Input Power (W):	45.11
Input Power Factor:	0.94
Current ATHD @ 120V(%):	35%
Current ATHD @ 277V(%):	N/A
Efficacy:	63
Color Rendering Index (CRI):	93
Correlated Color Temperature (K):	2964
Chromaticity Coordinate x:	0.4400
Chromaticity Coordinate y:	0.4059
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:50
Total Operating Time (Hours):	1:25
Off State Power(W):	0.00

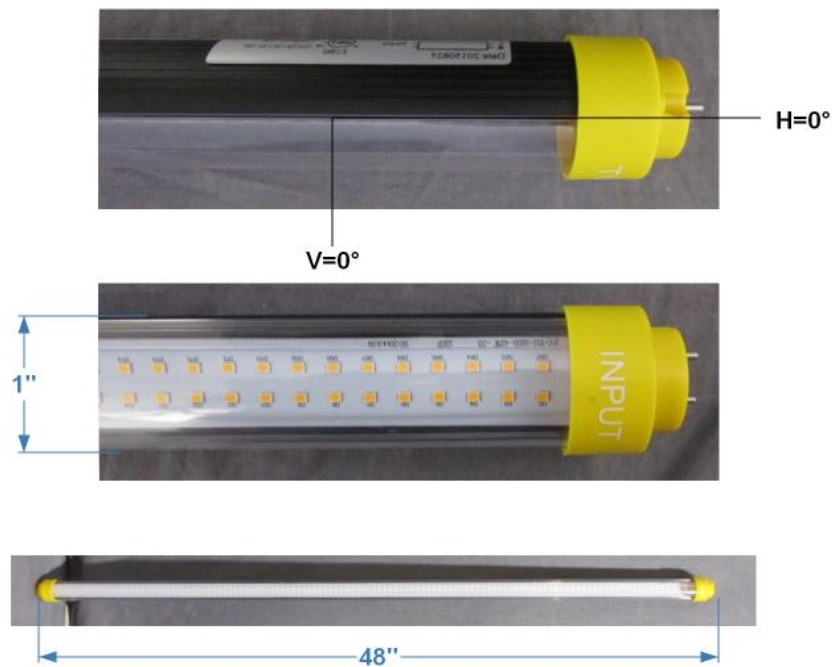
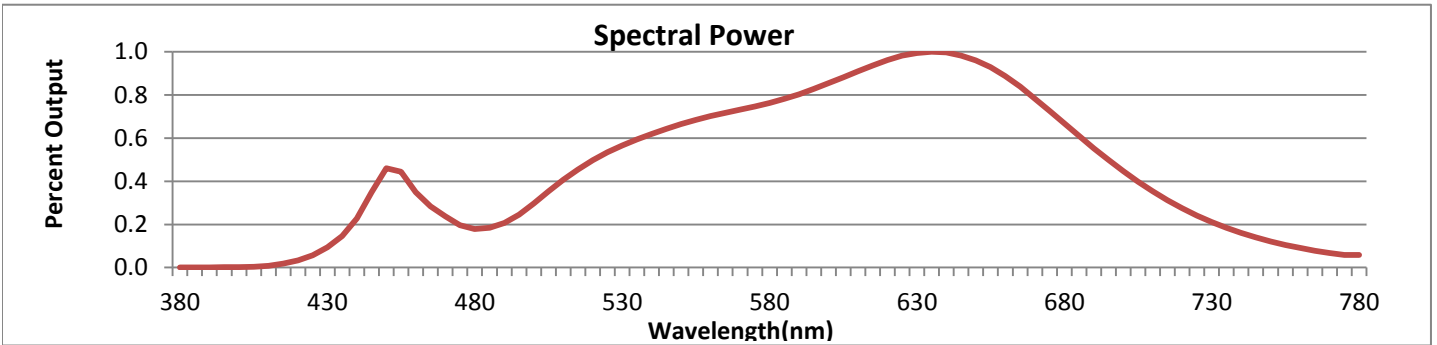


FIG. 1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



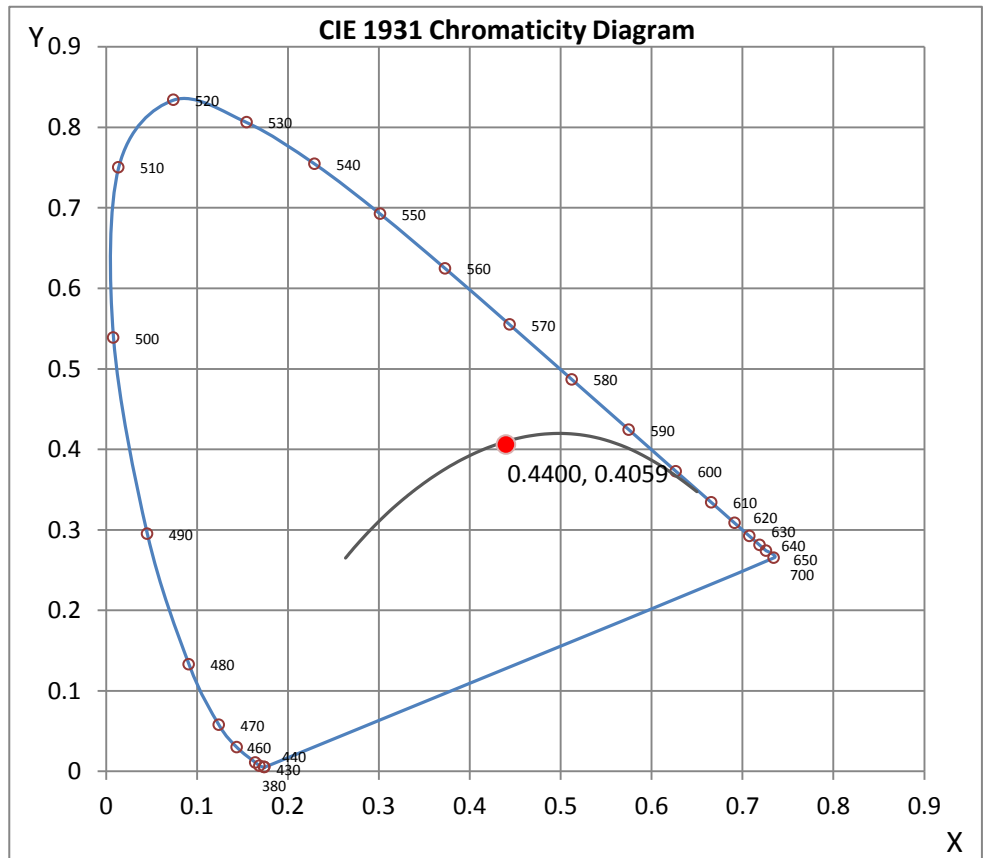
Wavelength	W/m ² nm	440	0.2270	510	0.4067	580	0.7631	650	0.9609	720	0.2747
380	0.0009	450	0.4604	520	0.4979	590	0.8039	660	0.8886	730	0.2116
390	0.0010	460	0.3488	530	0.5659	600	0.8548	670	0.7827	740	0.1605
400	0.0020	470	0.2376	540	0.6193	610	0.9097	680	0.6689	750	0.1212
410	0.0084	480	0.1780	550	0.6650	620	0.9619	690	0.5532	760	0.0906
420	0.0329	490	0.2075	560	0.7017	630	0.9954	700	0.4468	770	0.0676
430	0.0933	500	0.2975	570	0.7321	640	0.9973	710	0.3538	780	0.0582

CRI & CCT

x	0.4400
y	0.4059
u'	0.2518
v'	0.5226
CRI	92.70
CCT	2964
Duv	0.00031

R Values

R1	93.77
R2	93.90
R3	91.55
R4	93.62
R5	91.94
R6	90.41
R7	95.81
R8	90.76
R9	76.51
R10	83.66
R11	92.65
R12	74.66
R13	93.48
R14	94.25



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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

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

Report Prepared by : Keyur Patel

Test Report Released by:

Test Report Reviewed by:

Jeff Ahn
 Engineering Manager

Steve Kang
 Quality Assurance

**Attached are photometric data reports. Total number of pages: 9*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L051603205.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L051603205
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 5/18/2016
 [MANUFAC] COLT LED
 [LUMCAT] High Output 32K 40W
 [LUMINAIRE] LED 4 FOOT LAMP
 [BALLASTCAT] N/A
 [LAMPPOSITION] 0,0
 [LAMPCAT] N/A
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [INPUT] 120VAC, 45.11W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2820
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	63
Total Luminaire Watts	45.11
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.30
Spacing Criterion (Diagonal)	1.42
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	3.71 ft
Luminous Width (90-270)	0.13 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	20509	21278	21660
55	19247	20778	20457
65	16649	19451	21319
75	11435	15822	12859
85	3262	5636	5754

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L051603205.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	971.08	971.08	971.08	971.08	971.08
5	966.90	966.90	968.07	971.51	974.12
10	956.16	957.29	966.14	966.23	961.70
15	941.98	950.41	943.15	927.63	925.37
20	909.93	922.81	904.94	905.44	910.18
25	873.26	883.04	874.73	881.07	884.17
30	832.15	827.24	837.56	847.76	838.78
35	779.71	773.00	792.97	790.24	791.96
40	719.22	719.64	733.98	741.96	730.29
45	650.42	662.71	674.79	679.87	686.91
50	579.60	591.22	599.40	619.00	625.33
55	495.11	516.93	534.51	531.44	526.24
60	407.52	431.72	459.33	462.31	463.56
65	315.56	343.75	368.67	378.07	404.08
70	221.67	261.86	291.69	277.38	243.66
75	132.74	177.58	183.66	131.02	149.26
80	67.29	99.30	95.19	50.51	43.13
85	12.75	21.02	22.03	23.58	22.49
90	1.43	8.18	12.88	13.01	11.33
95	0.92	5.87	7.93	7.59	7.05
100	0.00	4.28	5.71	6.08	5.37
105	0.00	3.52	4.95	4.74	4.03
110	0.00	3.27	4.24	4.28	3.94
115	0.00	3.19	4.03	4.15	3.86
120	0.00	0.00	3.94	4.11	3.86
125	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L051603205.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	357.47	N.A.	12.70
0-30	762.44	N.A.	27.00
0-40	1254.24	N.A.	44.50
0-60	2240.56	N.A.	79.50
0-80	2769.89	N.A.	98.20
0-90	2804.54	N.A.	99.50
10-90	2712.25	N.A.	96.20
20-40	896.76	N.A.	31.80
20-50	1413.82	N.A.	50.10
40-70	1342.33	N.A.	47.60
60-80	529.32	N.A.	18.80
70-80	173.33	N.A.	6.10
80-90	34.65	N.A.	1.20
90-110	11.67	N.A.	0.40
90-120	14.80	N.A.	0.50
90-130	15.38	N.A.	0.50
90-150	15.38	N.A.	0.50
90-180	15.38	N.A.	0.50
110-180	3.70	N.A.	0.10
0-180	2819.92	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	92.29
10-20	265.19
20-30	404.97
30-40	491.79
40-50	517.05
50-60	469.27
60-70	356.00
70-80	173.33
80-90	34.65
90-100	7.50
100-110	4.17
110-120	3.13
120-130	0.58
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

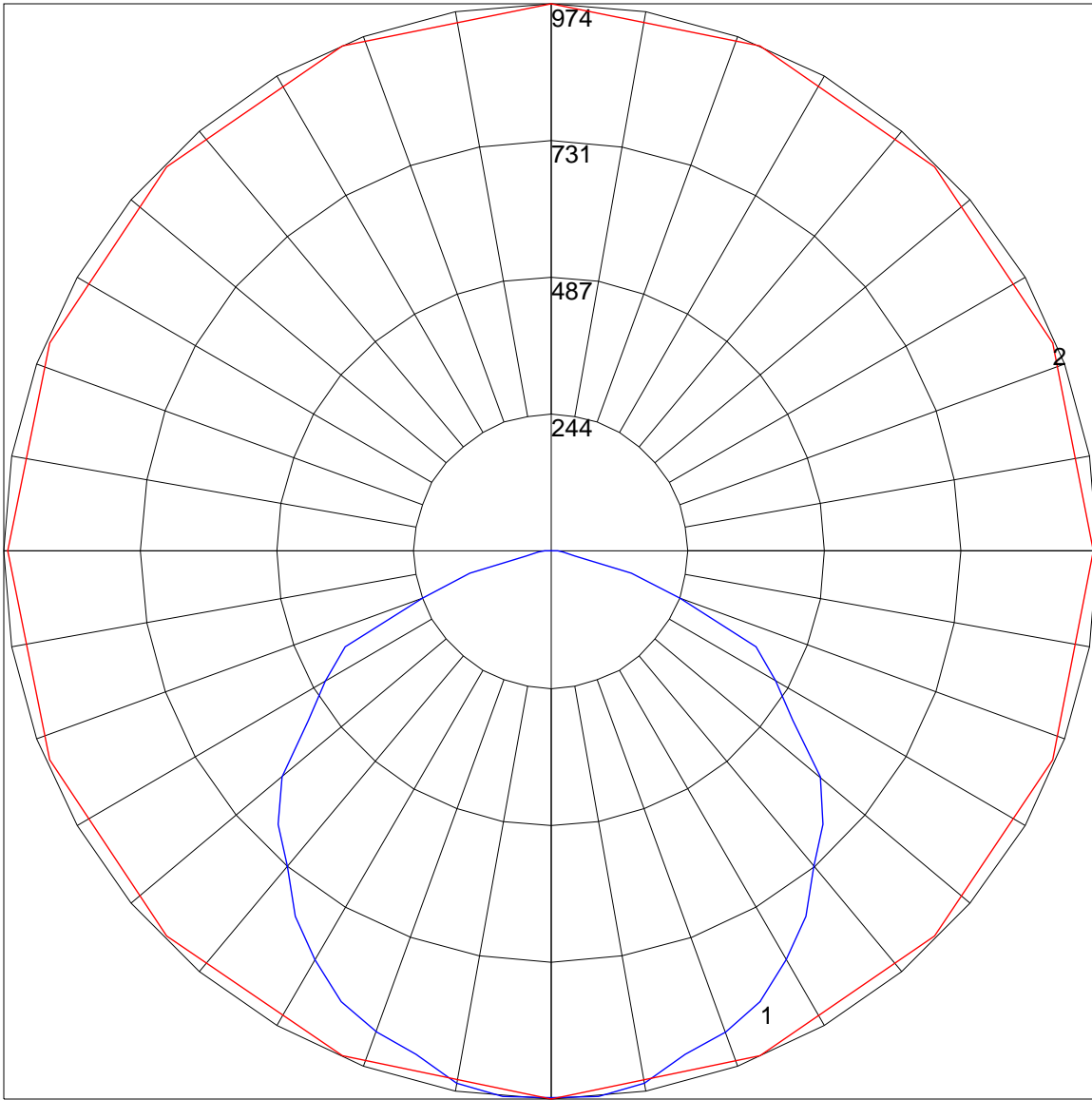
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	99
1	109	104	100	96	106	102	98	95	98	94	92	94	91	89	90	88	86	84
2	99	91	84	78	96	89	83	77	85	80	76	82	78	74	79	75	72	70
3	90	80	72	65	88	78	71	65	75	69	63	72	67	62	70	65	61	59
4	83	71	62	55	80	69	61	55	67	59	54	64	58	53	62	57	52	50
5	76	63	54	47	74	62	53	47	60	52	46	58	51	46	56	50	45	43
6	70	57	48	41	68	56	47	41	54	46	41	52	45	40	50	44	40	38
7	65	51	42	36	63	50	42	36	49	41	36	47	41	36	46	40	35	33
8	60	47	38	32	59	46	38	32	45	37	32	43	37	32	42	36	32	30
9	56	43	35	29	55	42	34	29	41	34	29	40	33	29	39	33	28	27
10	53	40	32	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

POLAR GRAPH



Maximum Candela = 974.12 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)