



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
 f. 714.676.5558

Report No: L041609201

Date: 5/3/2016



NVLAP LAB CODE 200927-0

Report No: L041609201

Report Prepared For: GM LIGHTING
 9830 W 190th St, Torrance, CA 90503

Model Number: LTR30024-90-27

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 LTR30024-90-27. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 5/2/16

Date of Tests: 5/2/16 - 5/3/16

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:	GM LIGHTING
Model Number:	LTR30024-90-27
Driver Model Number:	N/A
Total Lumens:	1679.26
Input Voltage (VDC):	24.00
Input Current (Amp):	0.83
Input Power (W):	20.05
Input Power Factor:	1.00
Current ATHD @ 120V(%):	N/A
Current ATHD @ 277V(%):	N/A
Efficacy:	84
Color Rendering Index (CRI):	92
Correlated Color Temperature (K):	2688
Chromaticity Coordinate x:	0.4568
Chromaticity Coordinate y:	0.4036
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:55
Total Operating Time (Hours):	1:15
Off State Power(W):	0.00

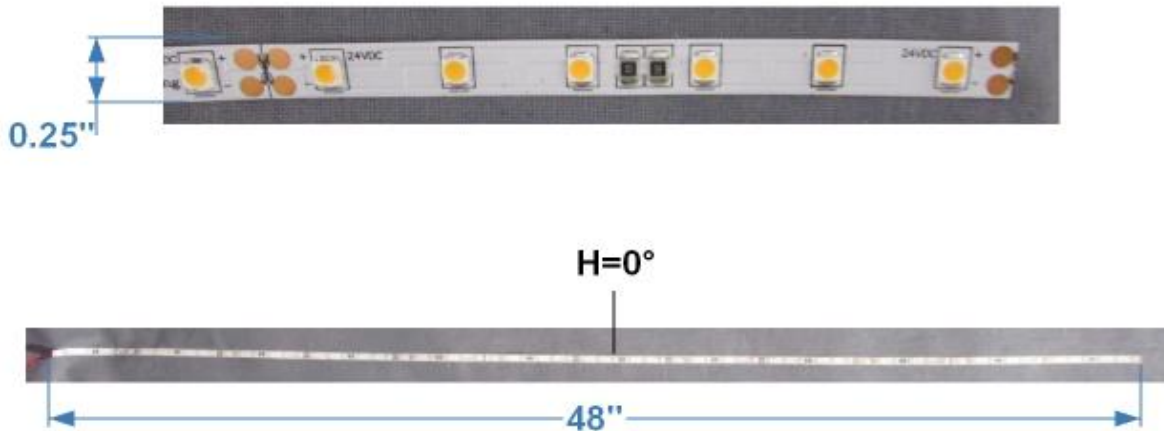
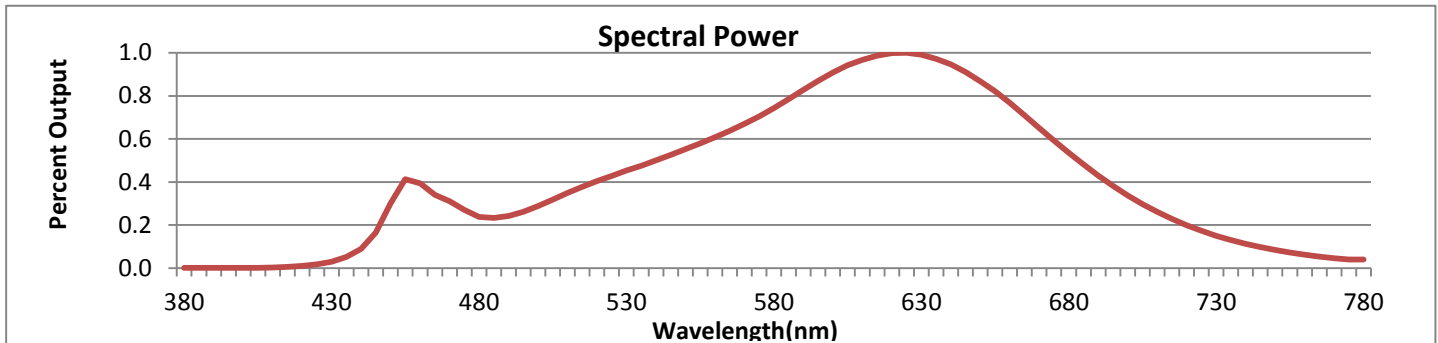


FIG. 1 LUMINAIRE

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



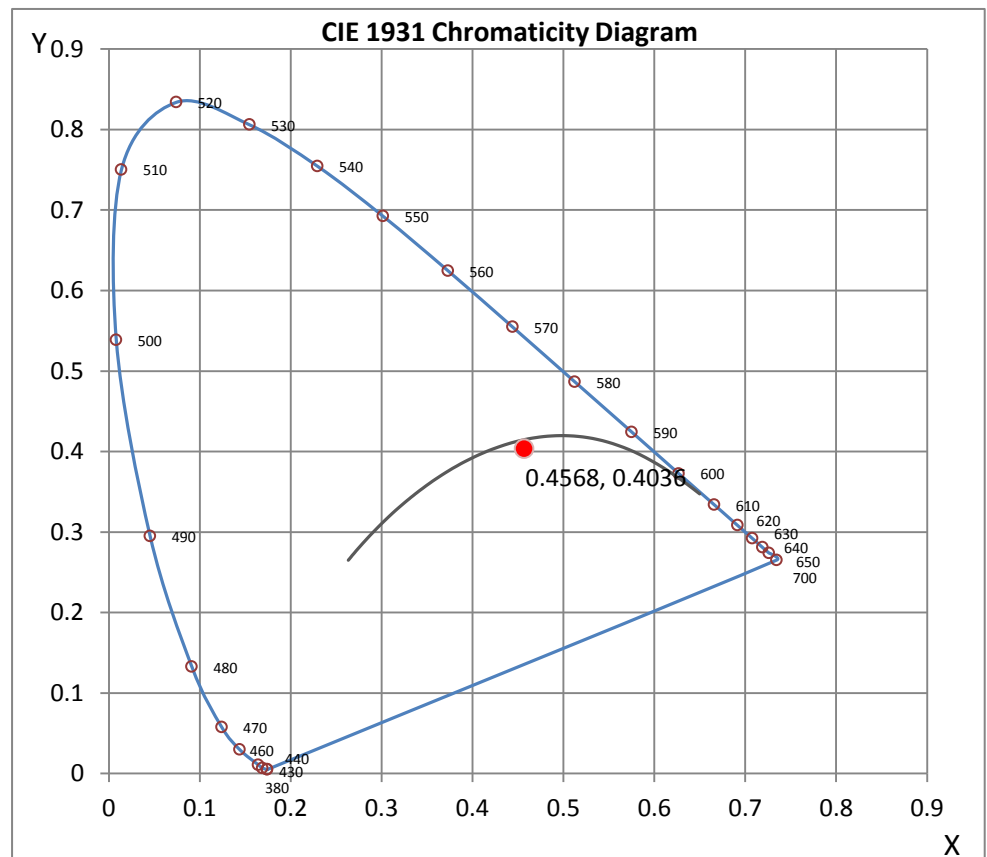
Wavelength	W/m ² nm	440	0.0023	510	0.0091	580	0.0193	650	0.0226	720	0.0052
380	0.0000	450	0.0078	520	0.0105	590	0.0215	660	0.0199	730	0.0039
390	0.0000	460	0.0102	530	0.0118	600	0.0236	670	0.0169	740	0.0029
400	0.0000	470	0.0081	540	0.0130	610	0.0251	680	0.0139	750	0.0022
410	0.0001	480	0.0062	550	0.0144	620	0.0259	690	0.0112	760	0.0016
420	0.0002	490	0.0063	560	0.0158	630	0.0257	700	0.0088	770	0.0012
430	0.0008	500	0.0075	570	0.0174	640	0.0246	710	0.0068	780	0.0010

CRI & CCT

x	0.4568
y	0.4036
u'	0.2637
v'	0.5242
CRI	92.30
CCT	2688
Duv	-0.00235

R Values

R1	93.53
R2	98.82
R3	96.59
R4	90.91
R5	93.38
R6	96.49
R7	88.94
R8	79.54
R9	59.38
R10	96.12
R11	91.59
R12	83.31
R13	95.35
R14	99.28



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

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:



Jeff Ahn
Engineering Manager

Test Report Reviewed by:



Steve Kang
Quality Assurance

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



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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041609201.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L041609201
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 5/3/2016
 [MANUFAC] GM LIGHTING
 [LUMCAT] LTR30024-90-27
 [LUMINAIRE] 4 FT HO Flexible LED Linear Ribbon
 [LAMPPOSITION] 0,0
 [LAMPCAT] N/A
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [POWER SUPPLY] 24VDC CONSTANT VOLTAGE SOURCE
 [INPUT] 24VDC, 20.05W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1679
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	84
Total Luminaire Watts	20.05
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.40
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.01 ft
Luminous Width (90-270)	4.00 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	149326	149805	150124
55	144998	146118	145823
65	134983	135543	135836
75	113212	114303	113649
85	68325	67955	64963

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L041609201.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	576.18	576.18	576.18	576.18	576.18
5	573.06	573.60	573.98	574.19	574.40
10	566.18	566.43	566.81	567.02	567.60
15	554.60	554.77	555.31	555.40	556.03
20	538.41	538.78	539.33	539.46	539.92
25	517.18	518.44	518.77	518.98	518.69
30	492.34	493.22	493.48	494.06	494.78
35	463.90	464.07	464.32	464.99	465.83
40	429.92	430.42	431.98	431.51	431.85
45	392.75	393.42	394.01	394.43	394.85
50	352.31	348.41	349.62	349.88	354.16
55	309.35	309.81	311.74	311.45	311.11
60	262.11	261.82	262.99	262.74	263.62
65	212.19	213.37	213.07	213.41	213.53
70	161.18	162.06	161.72	162.60	161.93
75	108.99	110.08	110.04	110.12	109.41
80	62.68	70.52	67.46	65.57	62.59
85	22.15	22.40	22.03	21.65	21.06
90	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	211.30	N.A.	12.60
0-30	450.32	N.A.	26.80
0-40	740.86	N.A.	44.10
0-60	1320.3	N.A.	78.60
0-80	1649.22	N.A.	98.20
0-90	1679.26	N.A.	100.00
10-90	1624.7	N.A.	96.80
20-40	529.56	N.A.	31.50
20-50	832.72	N.A.	49.60
40-70	790.10	N.A.	47.10
60-80	328.91	N.A.	19.60
70-80	118.26	N.A.	7.00
80-90	30.04	N.A.	1.80
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	1679.26	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	54.55
10-20	156.75
20-30	239.02
30-40	290.54
40-50	303.15
50-60	276.29
60-70	210.66
70-80	118.26
80-90	30.04
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

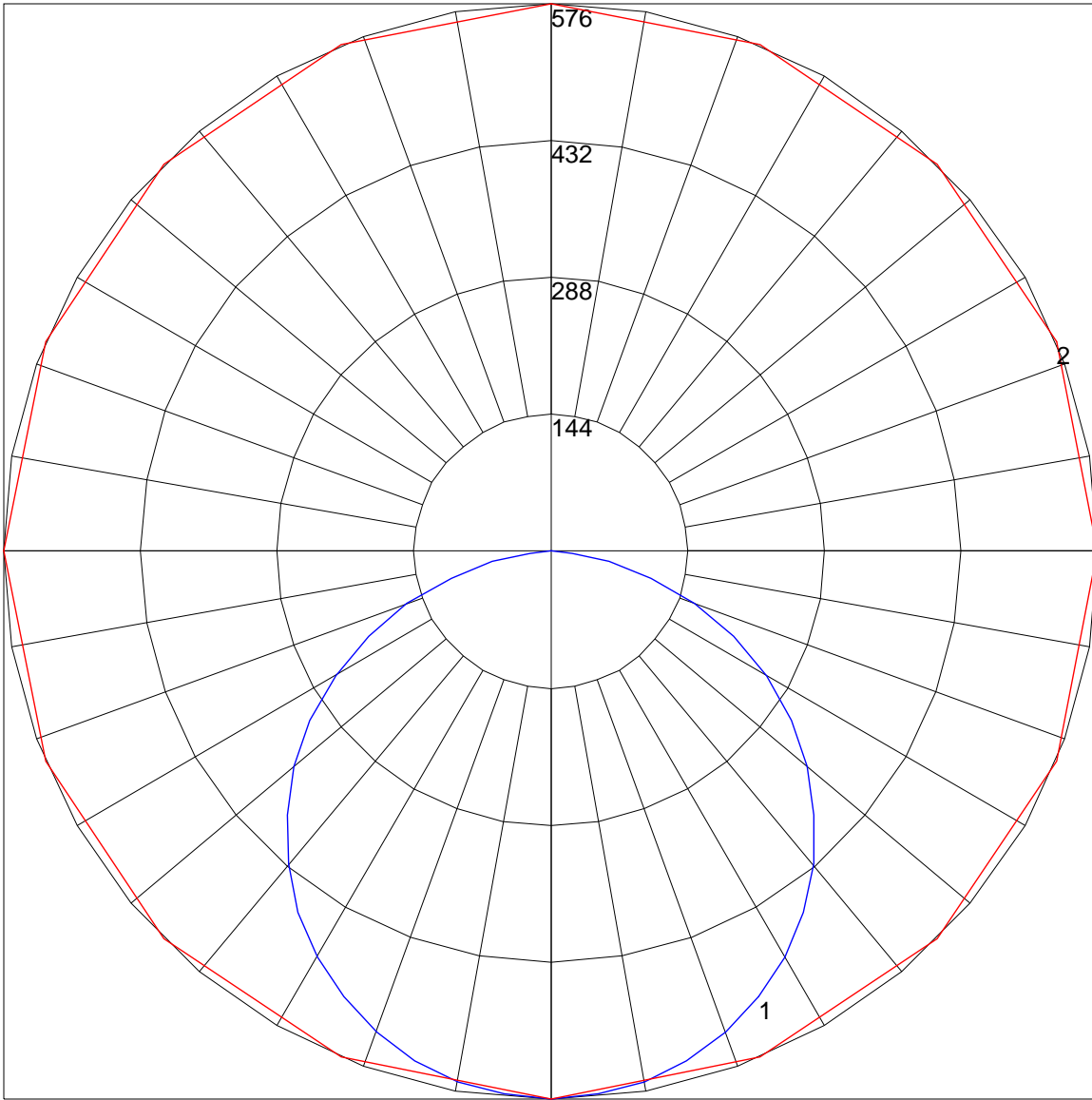
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	100
1	109	104	100	96	106	102	98	94	97	94	91	93	91	88	90	88	86	84
2	99	90	83	78	96	88	82	77	85	80	75	82	77	73	79	75	72	69
3	90	79	71	64	87	78	70	64	75	68	63	72	66	62	69	65	60	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	53	62	56	52	50
5	76	63	53	47	73	61	53	46	59	52	46	57	51	45	55	50	45	43
6	70	56	47	41	68	55	47	41	53	46	40	52	45	40	50	44	39	37
7	65	51	42	36	63	50	42	36	49	41	35	47	40	35	46	40	35	33
8	60	46	38	32	59	46	38	32	44	37	32	43	36	31	42	36	31	29
9	56	43	34	29	55	42	34	29	41	34	28	40	33	28	39	33	28	26
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

POLAR GRAPH



Maximum Candela = 576.18 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)