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Report No: L041609302

Date: 5/4/2016



NVLAP LAB CODE 200927-0

**Report No:** L041609302

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

**Model Number:** LTR120024-HO-30

**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 LTR120024-HO-30. 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:** 5/3/16 - 5/4/16

**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**

<b>Manufacturer:</b>	GM LIGHTING
<b>Model Number:</b>	LTR120024-HO-30
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	2016.84
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.96
<b>Input Power (W):</b>	23.13
<b>Input Power Factor:</b>	1.00
<b>Current ATHD @ 120V(%):</b>	N/A
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	87
<b>Color Rendering Index (CRI):</b>	83
<b>Correlated Color Temperature (K):</b>	2993
<b>Chromaticity Coordinate x:</b>	0.4379
<b>Chromaticity Coordinate y:</b>	0.4052
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:30
<b>Total Operating Time (Hours):</b>	0:50
<b>Off State Power(W):</b>	0.00

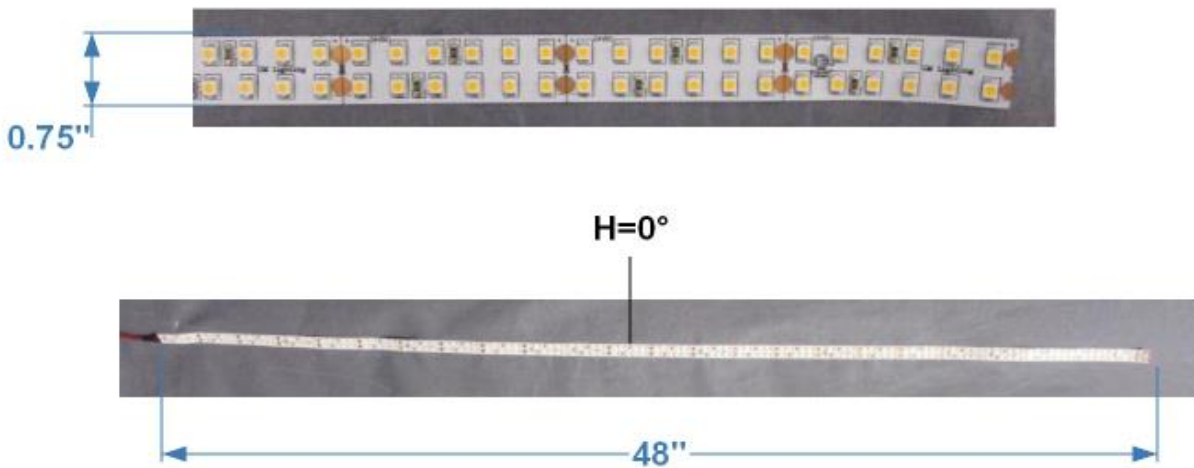
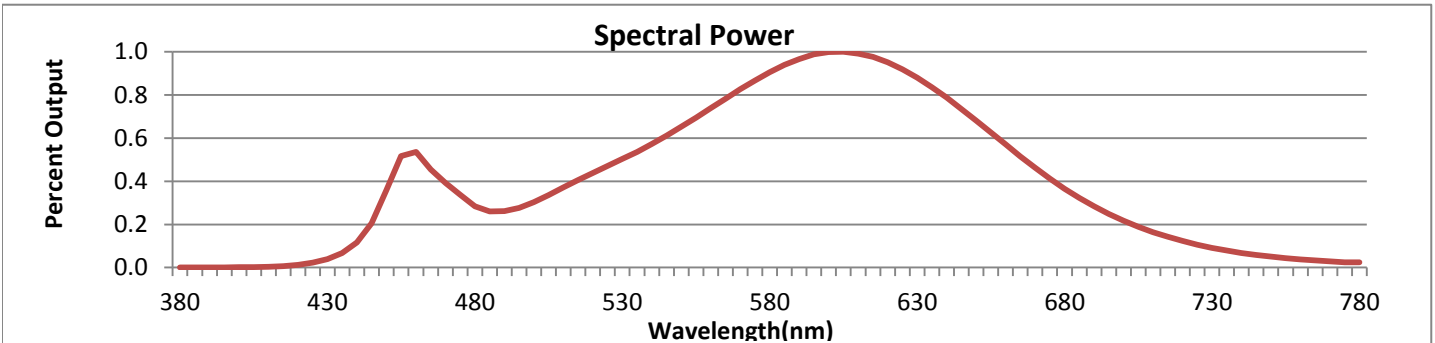


FIG. 1 LUMINAIRE

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



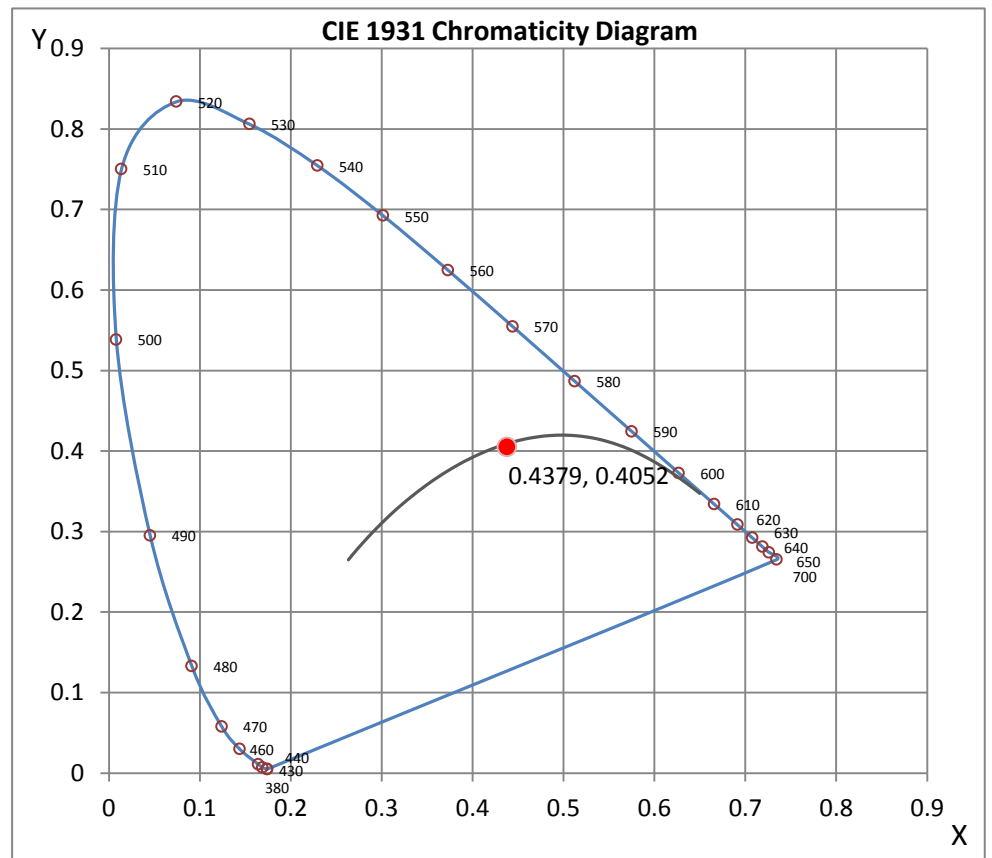
Wavelength	W/m <sup>2</sup> nm	440	0.0032	510	0.0104	580	0.0252	650	0.0190	720	0.0034
380	0.0000	450	0.0100	520	0.0122	590	0.0269	660	0.0159	730	0.0026
390	0.0000	460	0.0150	530	0.0140	600	0.0279	670	0.0129	740	0.0019
400	0.0000	470	0.0109	540	0.0160	610	0.0276	680	0.0102	750	0.0014
410	0.0001	480	0.0079	550	0.0182	620	0.0265	690	0.0079	760	0.0011
420	0.0004	490	0.0073	560	0.0206	630	0.0245	700	0.0060	770	0.0008
430	0.0011	500	0.0084	570	0.0230	640	0.0220	710	0.0046	780	0.0007

**CRI & CCT**

x	0.4379
y	0.4052
u'	0.2507
v'	0.5220
CRI	82.90
CCT	2993
Duv	0.00031

**R Values**

R1	81.54
R2	92.52
R3	95.69
R4	77.81
R5	80.63
R6	89.67
R7	83.34
R8	62.39
R9	17.76
R10	81.65
R11	74.71
R12	68.30
R13	84.18
R14	98.37



\*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 : L041609302.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L041609302  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 5/4/2016  
 [MANUFAC] GM LIGHTING  
 [LUMCAT] LTR120024-HO-30  
 [LUMINAIRE] 4 FT Super 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, 23.13W  
 [TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2017
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	87
Total Luminaire Watts	23.13
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)	0.04 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	45044	44979	45028
55	43564	43644	43919
65	40778	40885	41031
75	33881	34458	34143
85	20837	21415	20767

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L041609302.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
<b>0</b>	687.67	687.67	687.67	687.67	687.67
<b>5</b>	685.24	684.99	685.53	685.53	684.99
<b>10</b>	677.10	676.76	676.93	676.97	676.85
<b>15</b>	663.42	663.30	663.42	663.17	663.34
<b>20</b>	644.38	644.33	644.67	644.80	644.29
<b>25</b>	620.21	619.83	620.46	620.72	620.30
<b>30</b>	590.76	590.47	590.43	590.68	590.26
<b>35</b>	556.53	556.57	555.98	556.32	557.12
<b>40</b>	516.17	517.14	517.39	518.10	518.35
<b>45</b>	473.89	472.75	473.21	473.76	473.72
<b>50</b>	425.72	425.22	425.01	425.60	425.64
<b>55</b>	371.77	370.89	372.45	373.20	374.80
<b>60</b>	314.80	316.69	317.11	317.91	318.08
<b>65</b>	256.41	256.74	257.08	257.83	258.00
<b>70</b>	195.91	195.54	194.74	195.41	197.26
<b>75</b>	130.47	132.36	132.69	133.15	131.48
<b>80</b>	79.62	76.14	80.72	77.15	77.19
<b>85</b>	27.02	28.36	27.77	27.31	26.93
<b>90</b>	0.00	0.00	0.00	0.00	0.00

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**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	252.43	N.A.	12.50
0-30	538.32	N.A.	26.70
0-40	886.39	N.A.	43.90
0-60	1584.31	N.A.	78.60
0-80	1980.56	N.A.	98.20
0-90	2016.84	N.A.	100.00
10-90	1951.69	N.A.	96.80
20-40	633.96	N.A.	31.40
20-50	999.03	N.A.	49.50
40-70	952.17	N.A.	47.20
60-80	396.24	N.A.	19.60
70-80	141.99	N.A.	7.00
80-90	36.28	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	2016.84	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	65.14
10-20	187.29
20-30	285.89
30-40	348.07
40-50	365.07
50-60	332.85
60-70	254.25
70-80	141.99
80-90	36.28
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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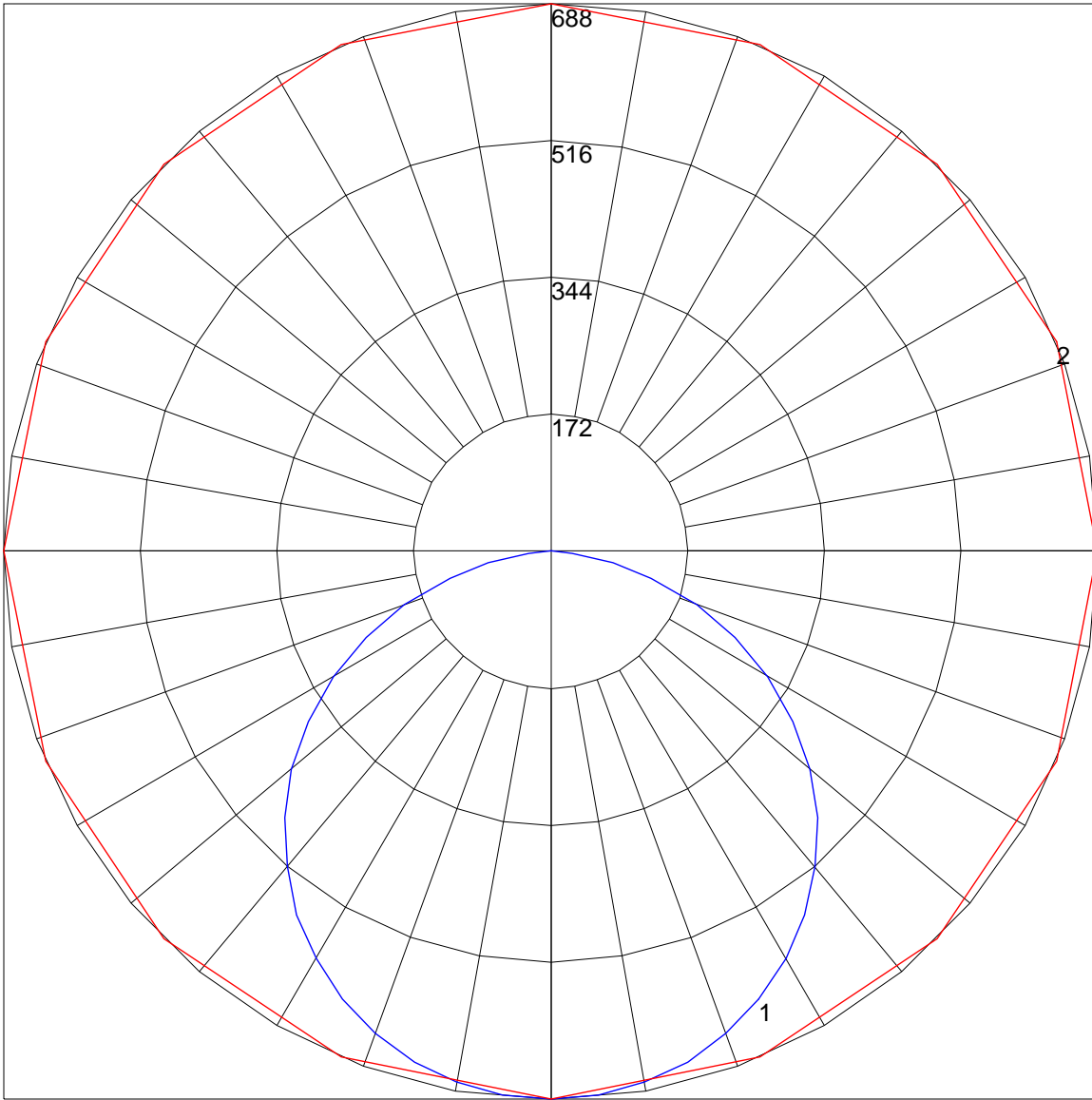
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	61	69	64	60	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	52	62	56	52	50
5	75	62	53	47	73	61	53	46	59	52	46	57	51	45	55	50	45	43
6	70	56	47	41	68	55	47	40	53	46	40	52	45	40	50	44	39	37
7	65	51	42	36	63	50	42	36	48	41	35	47	40	35	46	40	35	33
8	60	46	38	32	58	46	37	32	44	37	32	43	36	31	42	36	31	29
9	56	43	34	29	55	42	34	29	41	33	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	25	24



POLAR GRAPH



Maximum Candela = 687.67 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.)