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Report No: L041609303

Date: 5/4/2016



NVLAP LAB CODE 200927-0

**Report No:** L041609303

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

**Model Number:** LTR120024-HO-35

**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-35. 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-35
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	2192.21
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.94
<b>Input Power (W):</b>	22.68
<b>Input Power Factor:</b>	1.00
<b>Current ATHD @ 120V(%):</b>	N/A
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	97
<b>Color Rendering Index (CRI):</b>	87
<b>Correlated Color Temperature (K):</b>	3390
<b>Chromaticity Coordinate x:</b>	0.4095
<b>Chromaticity Coordinate y:</b>	0.3884
<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

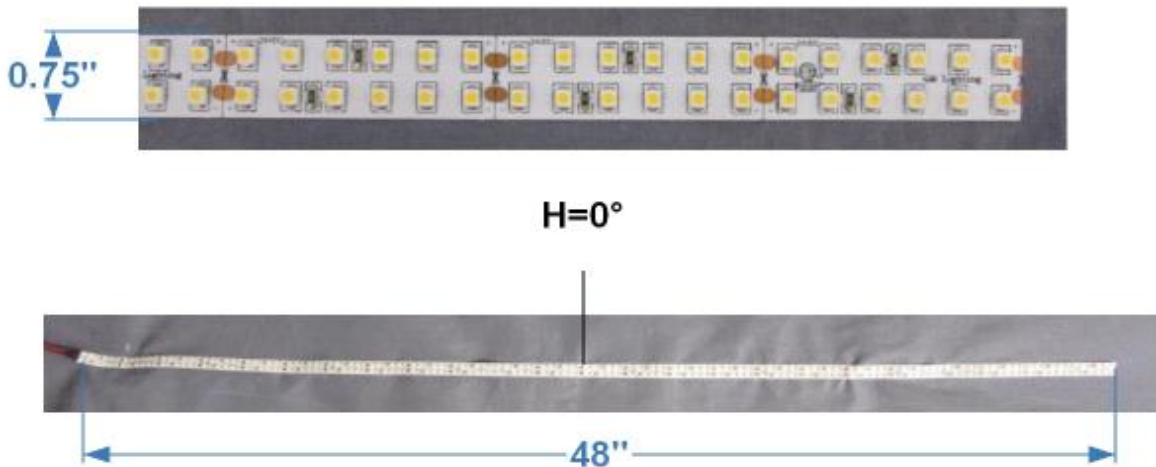
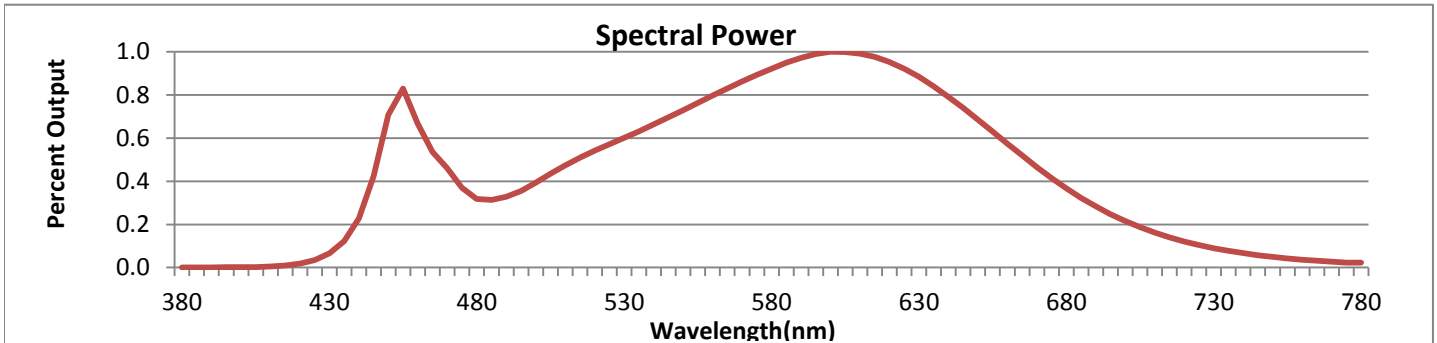


FIG. 1 LUMINAIRE

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



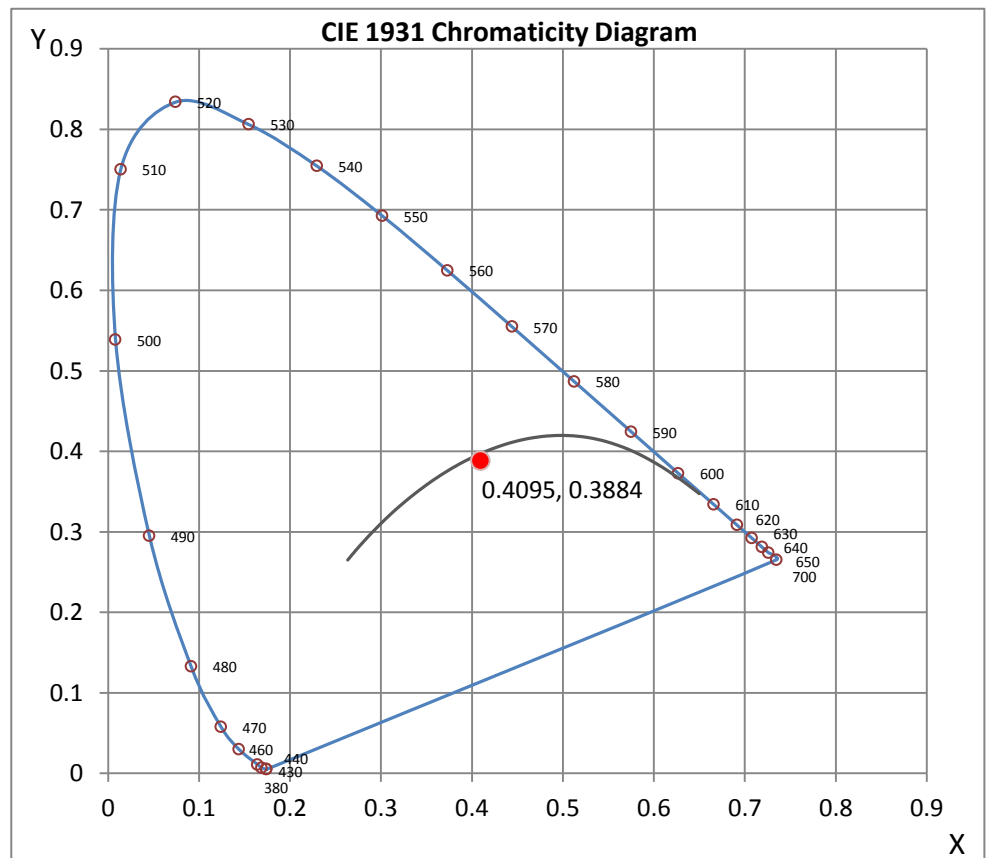
Wavelength	W/m <sup>2</sup> nm	440	0.0064	510	0.0133	580	0.0259	650	0.0193	720	0.0034
380	0.0000	450	0.0199	520	0.0152	590	0.0273	660	0.0162	730	0.0025
390	0.0000	460	0.0187	530	0.0169	600	0.0281	670	0.0131	740	0.0019
400	0.0000	470	0.0129	540	0.0186	610	0.0279	680	0.0103	750	0.0014
410	0.0001	480	0.0089	550	0.0205	620	0.0268	690	0.0080	760	0.0010
420	0.0005	490	0.0092	560	0.0224	630	0.0249	700	0.0061	770	0.0008
430	0.0018	500	0.0111	570	0.0242	640	0.0222	710	0.0046	780	0.0007

**CRI & CCT**

x	0.4095
y	0.3884
u'	0.2394
v'	0.5109
CRI	86.50
CCT	3390
Duv	-0.00191

**R Values**

R1	85.84
R2	93.98
R3	96.55
R4	83.17
R5	85.10
R6	90.60
R7	86.48
R8	70.02
R9	31.86
R10	84.44
R11	81.43
R12	69.11
R13	88.08
R14	98.63



\*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 : L041609303.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
 [TEST] L041609303  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 5/4/2016  
 [MANUFAC] GM LIGHTING  
 [LUMCAT] LTR120024-HO-35  
 [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, 22.68W  
 [TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2192
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	97
Total Luminaire Watts	22.68
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	48903	49055	49015
55	47448	47561	47605
65	44408	44687	44608
75	37434	37062	37563
85	24137	23937	23420

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L041609303.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>	746.51	746.51	746.51	746.51	746.51
<b>5</b>	743.89	743.89	743.63	743.68	743.47
<b>10</b>	734.82	734.87	735.03	735.03	734.57
<b>15</b>	720.06	720.73	720.60	720.73	719.89
<b>20</b>	699.50	700.47	700.38	700.63	700.26
<b>25</b>	674.58	674.33	674.83	674.79	674.83
<b>30</b>	641.86	642.24	643.33	642.70	642.53
<b>35</b>	604.69	606.12	606.41	606.87	605.61
<b>40</b>	562.15	563.24	562.82	564.04	563.16
<b>45</b>	514.49	514.83	516.09	515.88	515.67
<b>50</b>	462.05	462.52	464.49	463.52	463.48
<b>55</b>	404.92	406.22	405.88	407.18	406.26
<b>60</b>	342.58	340.44	341.70	340.56	340.48
<b>65</b>	279.23	279.69	280.99	280.66	280.49
<b>70</b>	211.60	212.02	214.21	213.66	212.53
<b>75</b>	144.15	142.47	142.72	143.01	144.65
<b>80</b>	81.89	82.85	81.47	83.78	83.48
<b>85</b>	31.30	31.34	31.04	30.88	30.37
<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	274.14	N.A.	12.50
0-30	585.06	N.A.	26.70
0-40	964.04	N.A.	44.00
0-60	1723.34	N.A.	78.60
0-80	2152.82	N.A.	98.20
0-90	2192.21	N.A.	100.00
10-90	2121.5	N.A.	96.80
20-40	689.90	N.A.	31.50
20-50	1087.4	N.A.	49.60
40-70	1035.26	N.A.	47.20
60-80	429.48	N.A.	19.60
70-80	153.52	N.A.	7.00
80-90	39.40	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	2192.21	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	70.71
10-20	203.43
20-30	310.92
30-40	378.98
40-50	397.50
50-60	361.80
60-70	275.96
70-80	153.52
80-90	39.40
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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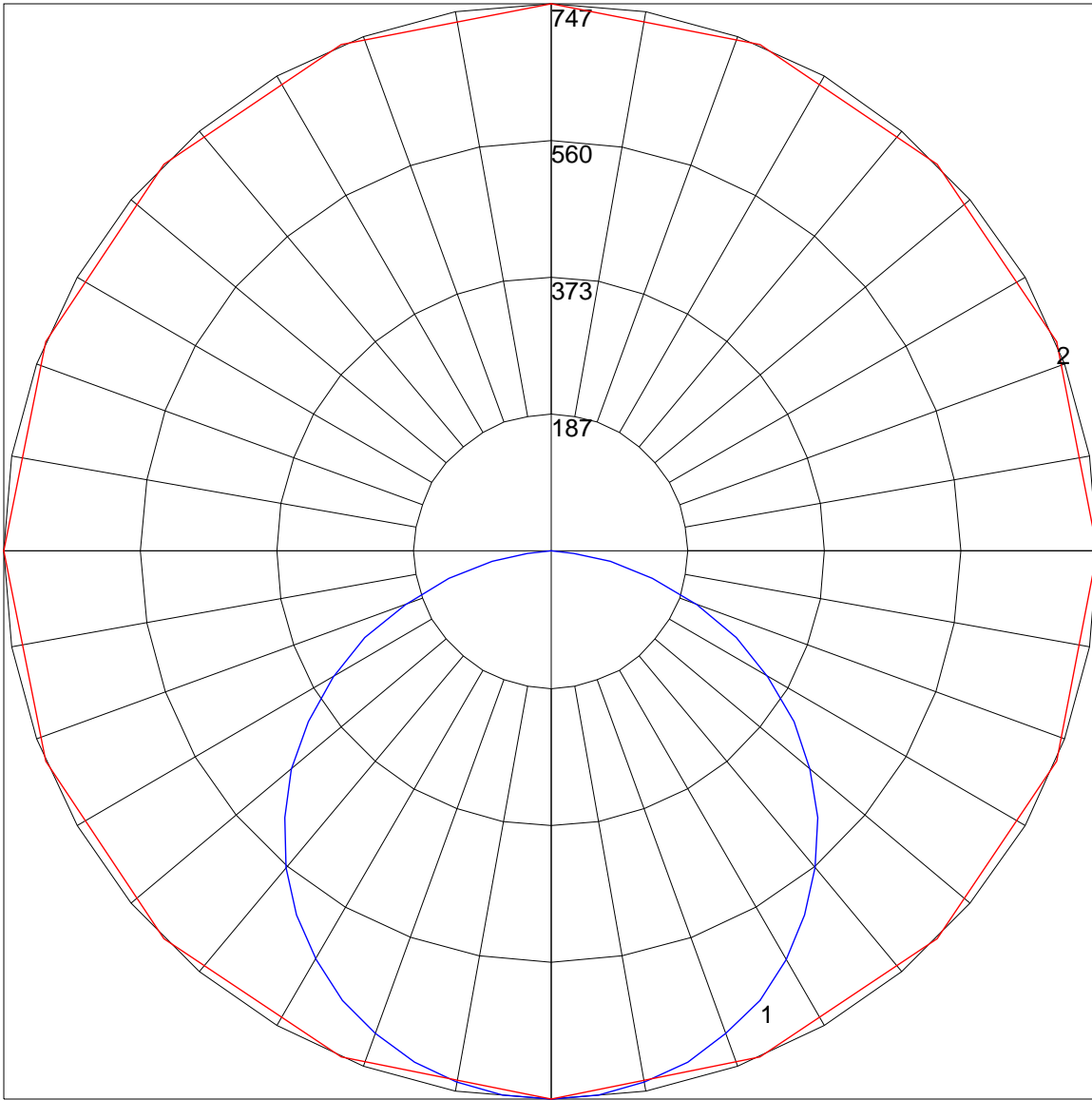
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	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	49	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	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 = 746.51 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.)