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Report No: L041609101

Date: 5/2/2016



NVLAP LAB CODE 200927-0

**Report No:** L041609101

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

**Model Number:** LTR300-27

**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 LTR300-27. Received in working and undamaged condition. No modifications were necessary.

**Testing Condition:** Fixture is tested with no special conditions.

**Sample Arrival Date:** 4/28/16

**Date of Tests:** 4/29/16 - 5/2/16

**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>	LTR300-27
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	825.61
<b>Input Voltage (VDC):</b>	12.00
<b>Input Current (Amp):</b>	0.71
<b>Input Power (W):</b>	8.55
<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>	82
<b>Correlated Color Temperature (K):</b>	2727
<b>Chromaticity Coordinate x:</b>	0.4549
<b>Chromaticity Coordinate y:</b>	0.4052
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:50
<b>Total Operating Time (Hours):</b>	1:15
<b>Off State Power(W):</b>	0.00

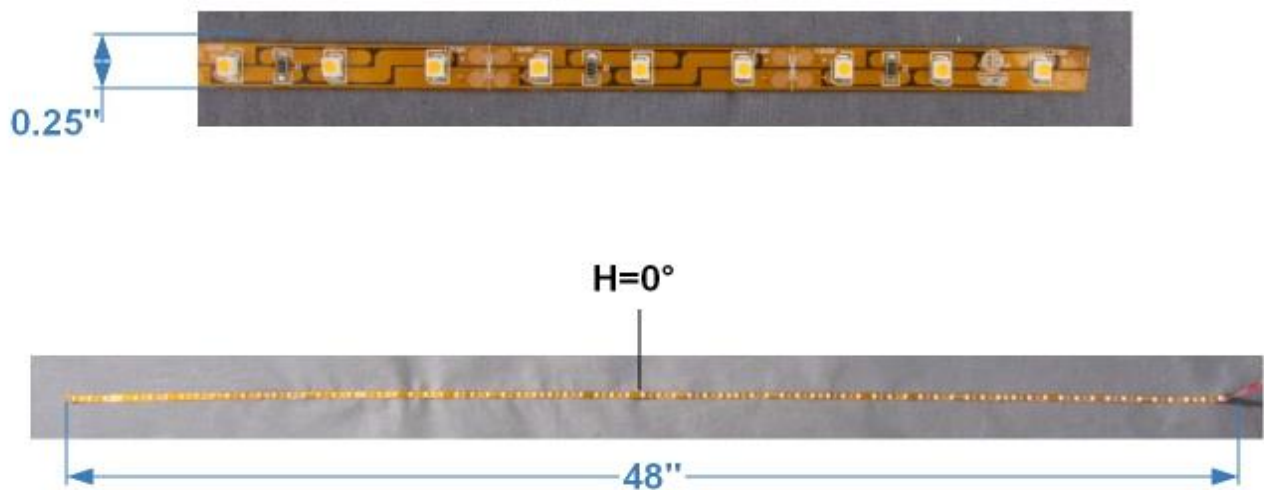
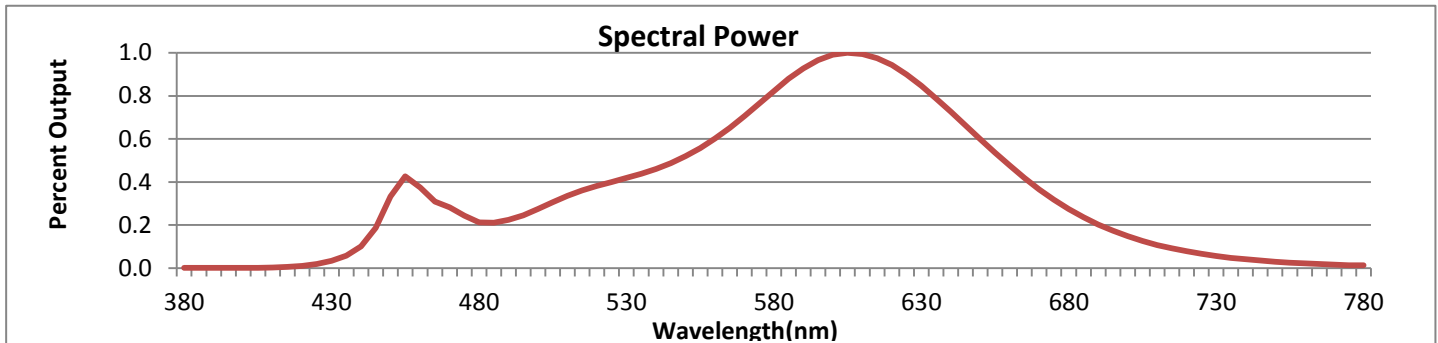


FIG. 1 LUMINAIRE

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



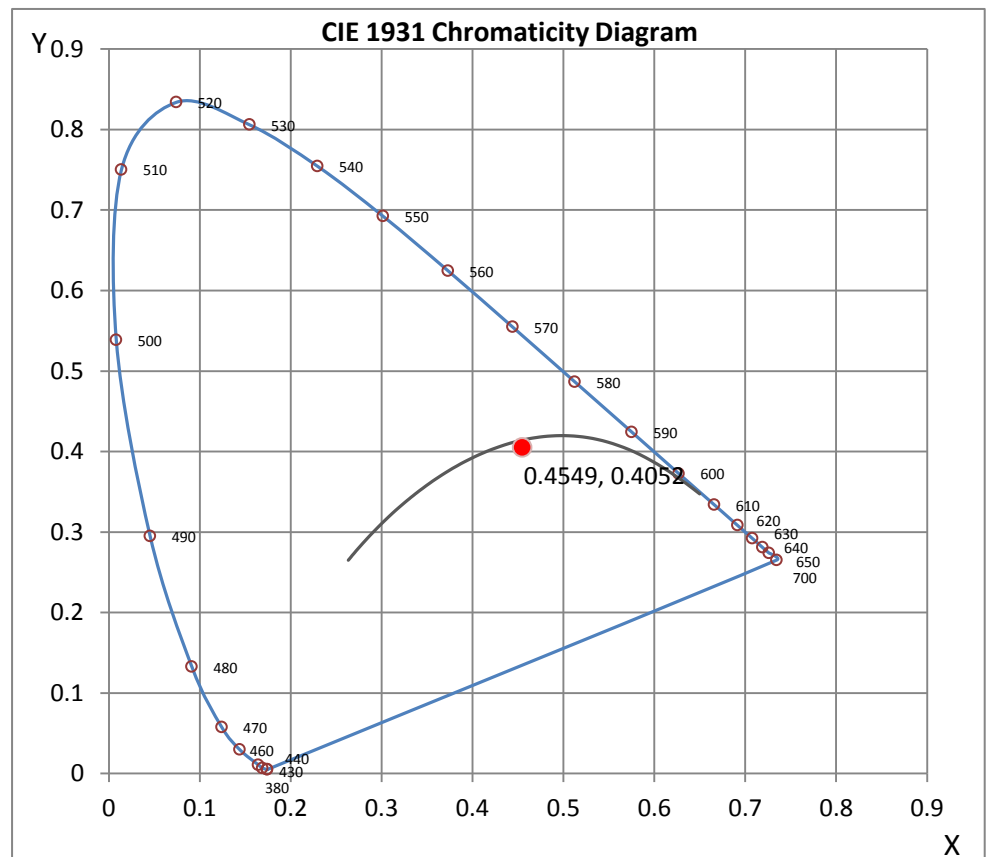
Wavelength	W/m <sup>2</sup> nm	440	0.0011	510	0.0036	580	0.0088	650	0.0064	720	0.0008
380	0.0000	450	0.0035	520	0.0041	590	0.0099	660	0.0051	730	0.0006
390	0.0000	460	0.0040	530	0.0045	600	0.0106	670	0.0039	740	0.0004
400	0.0000	470	0.0030	540	0.0049	610	0.0106	680	0.0029	750	0.0003
410	0.0000	480	0.0023	550	0.0055	620	0.0101	690	0.0022	760	0.0002
420	0.0001	490	0.0024	560	0.0064	630	0.0090	700	0.0016	770	0.0002
430	0.0004	500	0.0029	570	0.0075	640	0.0077	710	0.0011	780	0.0001

**CRI & CCT**

x	0.4549
y	0.4052
u'	0.2617
v'	0.5245
CRI	82.10
CCT	2727
Duv	-0.00158

**R Values**

R1	81.80
R2	94.24
R3	91.46
R4	78.71
R5	82.41
R6	93.89
R7	78.96
R8	55.47
R9	7.01
R10	87.35
R11	78.48
R12	77.90
R13	85.09
R14	96.02



\*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 : L041609101.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
 [TEST] L041609101  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 5/2/2016  
 [MANUFAC] GM LIGHTING  
 [LUMCAT] LTR300-27  
 [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] 12VDC CONSTANT VOLTAGE SOURCE  
 [INPUT] 12VDC, 8.55W  
 [TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	826
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	97
Total Luminaire Watts	8.55
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	73722	73707	73817
55	70987	71241	71419
65	65917	66184	66293
75	55687	56123	55604
85	42692	40255	36492

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L041609101.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>	283.15	283.15	283.15	283.15	283.15
<b>5</b>	281.91	281.91	282.12	282.04	282.08
<b>10</b>	278.56	278.47	278.64	278.73	278.64
<b>15</b>	272.94	272.85	272.94	273.11	273.19
<b>20</b>	265.05	265.13	265.30	265.39	265.39
<b>25</b>	254.98	255.07	255.28	255.23	255.15
<b>30</b>	242.73	242.48	242.77	243.28	242.98
<b>35</b>	228.47	228.64	228.47	229.10	229.14
<b>40</b>	211.69	212.11	212.36	212.36	212.44
<b>45</b>	193.90	193.61	193.86	194.40	194.15
<b>50</b>	173.85	173.47	173.76	174.69	174.10
<b>55</b>	151.45	152.03	151.99	152.24	152.37
<b>60</b>	127.45	128.37	128.58	128.25	128.96
<b>65</b>	103.62	103.87	104.04	104.63	104.21
<b>70</b>	79.37	78.79	78.83	79.33	78.45
<b>75</b>	53.61	53.91	54.03	53.03	53.53
<b>80</b>	31.55	31.93	31.42	30.63	30.88
<b>85</b>	13.84	13.72	13.05	12.25	11.83
<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	103.89	N.A.	12.60
0-30	221.50	N.A.	26.80
0-40	364.52	N.A.	44.20
0-60	649.78	N.A.	78.70
0-80	810.03	N.A.	98.10
0-90	825.61	N.A.	100.00
10-90	798.80	N.A.	96.80
20-40	260.63	N.A.	31.60
20-50	410.19	N.A.	49.70
40-70	388.13	N.A.	47.00
60-80	160.25	N.A.	19.40
70-80	57.39	N.A.	7.00
80-90	15.58	N.A.	1.90
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	825.61	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	26.81
10-20	77.08
20-30	117.61
30-40	143.02
40-50	149.56
50-60	135.70
60-70	102.87
70-80	57.39
80-90	15.58
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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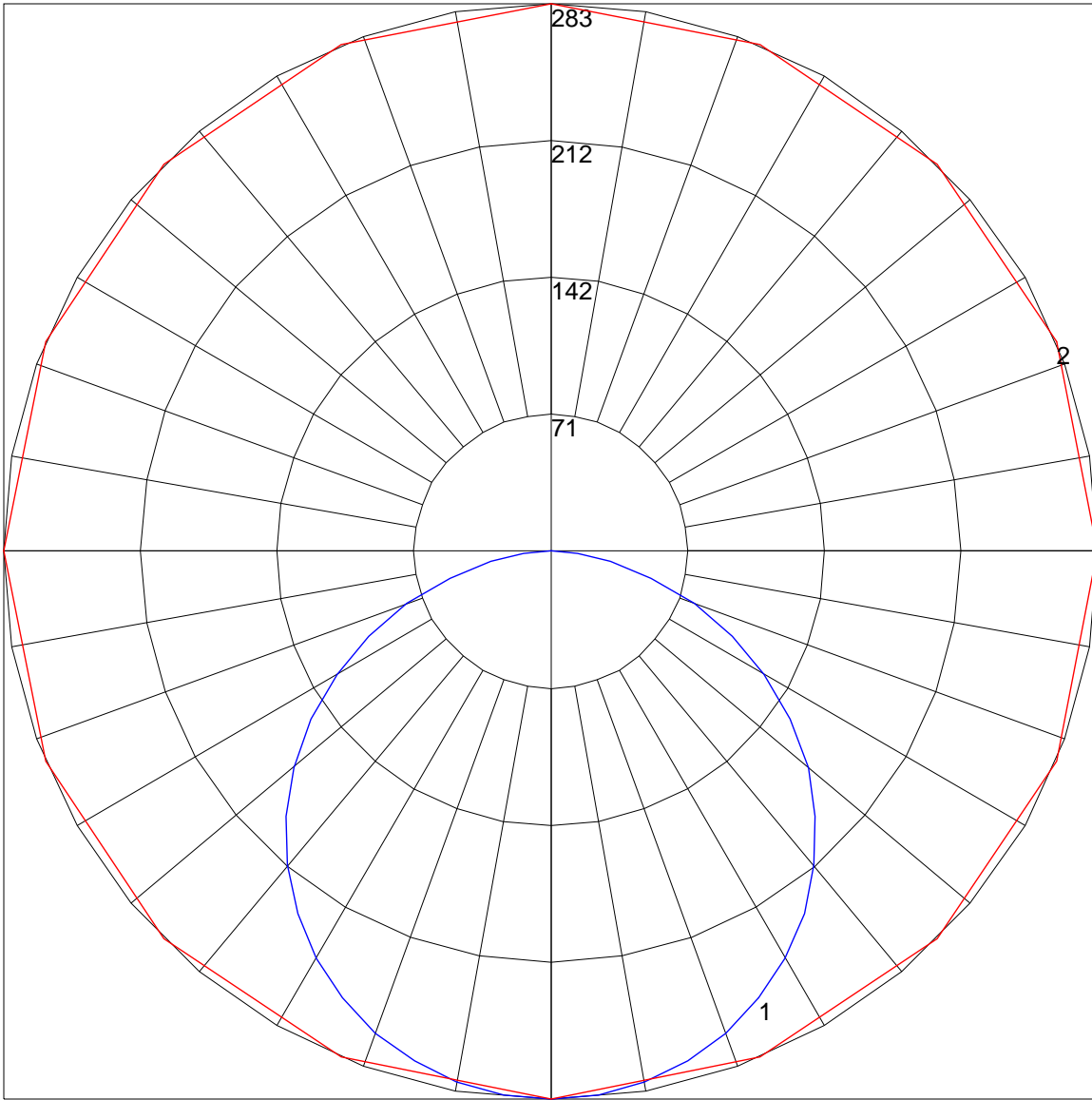
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	99	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	58	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 = 283.15 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.)