



Photometric Test Report

Relevant Standards

IES LM-79-2008

Prepared For

ESPEN TECHNOLOGY INC

12257 FLORENCE AVE SANTA FE SPRINGS, CA 90670 USA

Eric Yu 562.529.2938 x 221 eric@espentech.com

Test Laboratory:

UL-CCIC Company Limited

Test Laboratory Address:

No.2, Chengwan Road, Suzhou Industrial Park, Suzhou 21522, China

Catalog Number

L36T8/840/11G-XT 2C N

Project Number

4788554269

Report Number

4788554269_3R02

Test Date

07/28/2018 - 08/06/2018

Issue Date

08/15/2018

Revision Date

10/09/2018

Prepared By

*Jonathan Xu
Elvis Wu*

Approved By

Duff Yang

The results contained in this report pertain only to the tested sample.

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Test List

Test Item	Test	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test for the Lower CCT	08/06/2018	L36T8/840/11G-XT 2C N	Elvis Wu
2	Goniophotometer Test for the Lower CCT	07/28/2018	L36T8/840/11G-XT 2C N	Elvis Wu

Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.

This report replace 4788554269_3R01 (original report number), the report 4788554269_3R01 is terminated.



Production Description

Luminaire Description: T8 Three-Foot Linear Replacement Lamps

Model Number: L36T8/840/11G-XT 2C N

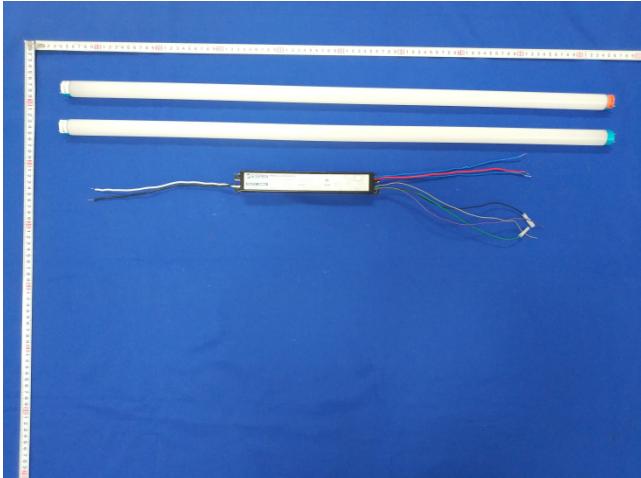
Rated Voltage: 120-277V

Frequency: 50/60Hz

LED Package: L128-4080RA3500xxx

Remark: Housing Model: C 2 25 MVOLT GEB10IS

Photos of Luminaire Characteristics





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LM-79 Measurement and Test Results

Integrating Sphere Test for the Lower CCT

Model No.	L36T8/840/11G-XT 2C N	Sample ID.	1679360-011, 1679360-012, 1722774-001
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

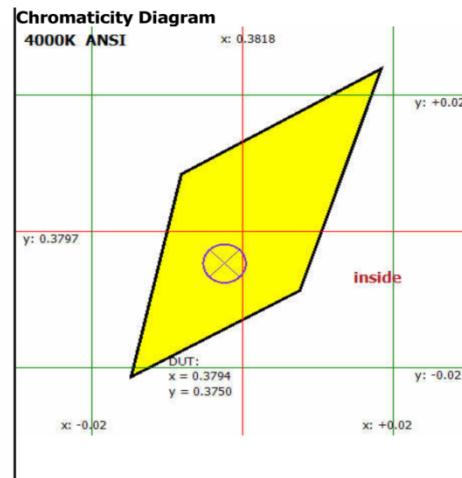
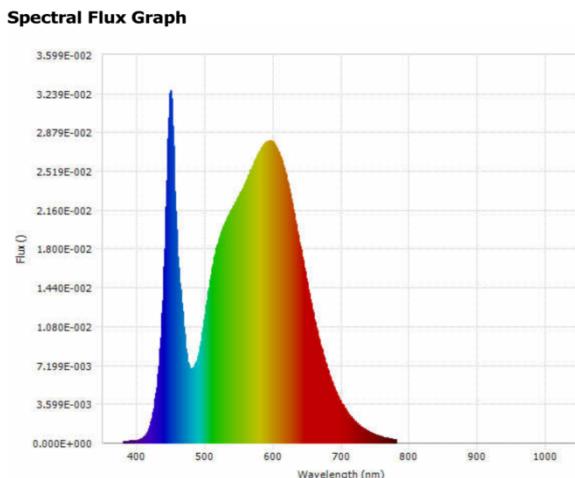
1. The sample was tested according to the IES LM-79-2008, and the product is assumed to be brand new without seasoning.
2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by Labsphere, Inc., Optical Calibration Laboratory.
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm. Testing Orientation of this product is horizontal.

Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
25.1	119.9	60	0.2185	26.082	0.9958	N/A

Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)	Luminous Efficacy (lm/ft)
4013	81.93	-0.0005	1632.15	125.16	N/A



Luminous Flux	1632.15	Chrom x	0.3794
Chrom y	0.3750	Chrom u	0.2251
Chrom v	0.3338	Duv	-0.0005
Chrom u'	0.2251	Chrom v'	0.5007
CCT	4013	Luminous Efficacy	62.58
Ra	81.93	R1	80.6
R2	87.1	R3	91.9
R4	81.9	R5	80.5
R6	82.0	R7	86.0
R8	65.4	R9	8.5
R10	69.1	R11	80.7
R12	60.7	R13	81.9
R14	95.4	R15	75.1
Rf	80.8	Rg	97.2



Goniophotometer Test

Model No.	L36T8/840/11G-XT 2C N	Sample ID.	1679360-011, 1679360-012, 1722774-001
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

1. The sample was tested according to the IES LM-79-2008, and the product is assumed to be brand new without seasoning.
2. Photometric parameters were measured using a type C goniophotometer and software.
3. The ambient temperature shall be maintained at $25^\circ\text{C} \pm 1^\circ\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.875A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
4. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product. Testing Orientation of this product is horizontal.

Goniophotometer Test Conditions

Temperature($^\circ\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.5	119.96	60	0.2168	25.890	0.9959	Horizontal

Test Results

Flux (lm)	Zonal Lumen Requirement	Zonal Lumen Requirement	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
	0°-60°	N/A	Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3023.5	58.7%	N/A	160.9	158.8	154.7	108.6	116.78
SC	SC						
0~180°	90°~270°						
1.26	1.40						

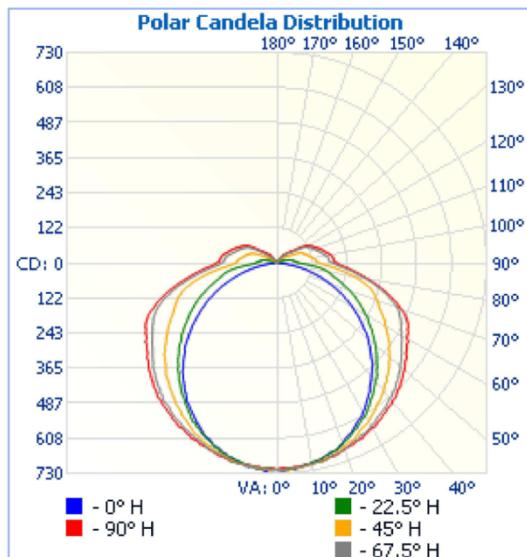


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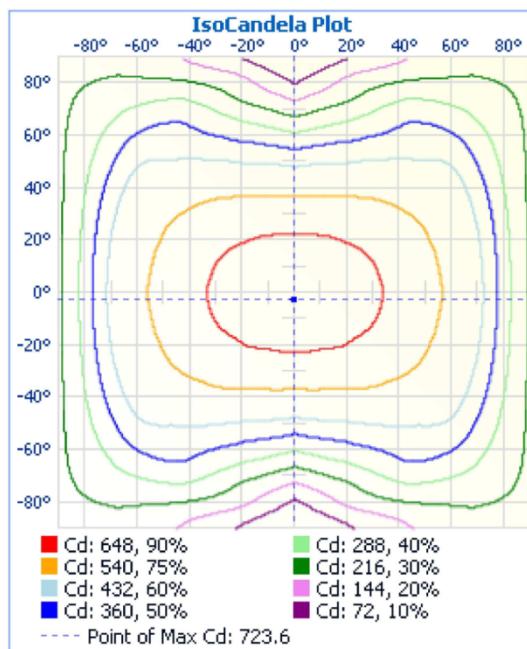


Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot





Zonal Lumen Summary

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	566.7	18.7%
0-40	944.2	31.2%
0-60	1,774.6	58.7%
60-90	888.1	29.4%
70-100	634.3	21%
90-120	301.2	10%
0-90	2,662.7	88.1%
90-180	360.9	11.9%
0-180	3,023.5	100%

Lumens Per Zone

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	17.1	0.6%	90-95	67.4	2.2%
5-10	50.8	1.7%	95-100	62.2	2.1%
10-15	83.1	2.7%	100-105	54.7	1.8%
15-20	113.1	3.7%	105-110	46.6	1.5%
20-25	139.7	4.6%	110-115	39.5	1.3%
25-30	162.8	5.4%	115-120	30.8	1%
30-35	181.6	6.0%	120-125	21.7	0.7%
35-40	195.9	6.5%	125-130	13.9	0.5%
40-45	205.7	6.8%	130-135	9.6	0.3%
45-50	210.2	7.0%	135-140	6.5	0.2%
50-55	209.7	6.9%	140-145	3.9	0.1%
55-60	204.8	6.8%	145-150	1.9	0.1%
60-65	197.3	6.5%	150-155	0.8	0%
65-70	186.2	6.2%	155-160	0.5	0%
70-75	167.9	5.6%	160-165	0.4	0%
75-80	142.5	4.7%	165-170	0.3	0%
80-85	112.3	3.7%	170-175	0.2	0%
85-90	82.0	2.7%	175-180	0.1	0%



Intensity Data(cd)

Candela Table - Type C																			
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360		
0	717	717	717	717	717	717	717	717	717	717	717	717	717	717	717	717	717	717	
1	719	718	718	715	712	713	717	714	718	714	717	713	712	715	718	718	719		
2	720	719	716	716	711	715	720	715	718	715	720	715	711	716	716	719	719	720	
3	719	714	722	713	714	714	717	714	724	714	717	714	714	713	722	714	719		
4	716	715	718	714	716	716	714	714	720	714	714	716	716	714	718	715	716		
5	720	716	715	714	709	712	716	717	716	717	716	712	709	714	715	716	720		
6	714	714	714	711	712	710	712	711	716	711	712	710	712	711	714	714	714		
7	711	714	716	712	708	712	711	711	710	711	711	712	708	712	716	714	711		
8	711	708	711	710	707	709	711	712	713	712	711	709	707	710	711	708	711		
9	706	707	710	709	709	714	710	706	713	706	710	714	709	709	710	707	706		
10	703	703	710	710	705	707	708	704	703	704	708	707	705	710	710	703	703		
11	702	700	705	704	706	709	709	700	701	700	709	709	706	704	705	700	702		
12	699	701	704	707	703	707	704	698	698	698	704	707	703	707	704	701	699		
13	695	696	709	705	703	708	703	695	694	695	703	708	703	705	709	696	695		
14	691	692	697	705	702	700	697	692	694	692	697	700	702	705	697	692	691		
15	687	688	698	697	699	698	694	688	685	688	694	698	699	697	698	688	687		
16	683	684	694	695	699	695	690	683	685	683	690	695	699	695	694	684	683		
17	683	682	692	695	698	693	689	681	675	681	689	693	698	695	692	682	683		
18	680	678	688	697	694	692	684	672	672	672	684	692	694	697	688	678	680		
19	671	675	684	691	691	690	685	673	672	673	685	690	691	691	684	675	671		
20	667	666	678	685	689	685	676	664	663	664	676	685	689	685	678	666	667		
25	633	639	660	676	676	671	659	636	630	636	659	671	676	676	660	639	633		
30	598	614	637	655	661	655	629	605	593	605	629	655	661	655	637	614	598		
35	556	573	604	632	643	636	605	566	552	566	605	636	643	632	604	573	556		
40	512	534	579	612	625	616	573	529	507	529	573	616	625	612	579	534	512		
45	464	491	546	587	606	587	546	486	456	486	546	587	606	587	546	491	464		
50	416	449	514	561	579	562	507	442	403	442	507	562	579	561	514	449	416		
55	358	403	478	529	548	527	470	395	346	395	470	527	548	529	478	403	358		
60	302	356	436	499	522	500	434	350	288	350	434	500	522	499	436	356	302		
65	244	311	400	476	503	474	396	304	230	304	396	474	503	476	400	311	244		
70	185	265	370	444	456	437	369	253	170	253	369	437	456	444	370	265	185		
75	127	218	336	383	395	378	326	208	113	208	326	378	395	383	336	218	127		
80	71	183	274	315	323	306	258	176	60	176	258	306	323	315	274	183	71		
85	27	134	204	246	258	238	190	115	18	115	190	238	258	246	204	134	27		
90	3	77	148	195	211	192	143	72	3	72	143	192	211	195	148	77	3		
95	2	64	135	180	197	182	135	61	3	61	135	182	197	180	135	64	2		
100	2	53	121	168	184	166	120	52	3	52	120	166	184	168	121	53	2		
105	2	39	109	152	168	150	108	34	3	34	108	150	168	152	109	39	2		
110	2	24	97	138	152	137	96	23	2	23	96	137	152	138	97	24	2		
115	2	18	79	125	137	123	69	15	2	15	69	123	137	125	79	18	2		
120	2	12	49	107	121	103	39	9	2	9	39	103	121	107	49	12	2		
125	2	7	40	70	87	65	28	5	2	5	28	65	87	70	40	7	2		
130	2	3	32	53	60	45	21	2	3	2	21	45	60	53	32	3	2		
135	2	2	22	40	46	30	14	2	2	2	14	30	46	40	22	2	2		
140	2	3	13	31	37	22	8	2	3	2	8	22	37	31	13	3	2		
145	2	3	5	18	23	11	3	2	3	2	3	11	23	18	5	3	2		
150	3	3	2	8	12	5	2	3	3	3	2	5	12	8	2	3	3		
155	3	3	2	2	3	2	3	3	3	3	2	3	2	2	3	3	3		
160	3	3	3	2	1	2	2	3	3	3	2	2	1	2	3	3	3		
165	3	3	3	2	2	2	3	3	3	3	2	2	2	3	3	3	3		
170	3	4	3	2	2	2	3	3	3	3	2	2	2	3	4	3	3		
175	3	4	3	3	2	3	3	3	3	3	3	3	3	3	3	4	3		
180	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		



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