



Photometric Test Report

Relevant Standards

☒ IES LM-79-2008

Prepared For

ESPEN TECHNOLOGY ,INC

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Catalog Number

VEKT1X4L-840

Project Number

4788813688

Report Number

4788813688_2a

Test Date

4/13/2018

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Revision Date

N/A

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

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2.0 Test List

Test Item	Test	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test	2018/4/13	VEKT1X4L-840	Gavin Yang
2	Goniophotometer Test	2018/4/13	VEKT1X4L-840	Gavin Yang

Remark (if any)

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



3.0 Production Description

Luminaire Description: Integrated Retrofit Kits for 1x4 Luminaires

Model Number: VEKT1X4L-840

Rated Voltage: 120-277V

Frequency: 50/60Hz

LED Package: STW8A2PD-XX

Housing Model: Lithonia GT8 2 32 A12 MVOLT GEB10IS

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

Model No.	VEKT1X4L-840	Sample ID.	1523263
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method

1.The sample was tested according to the IES LM-79-2008.

2.Photometric paramters 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 2.6A omni-directional Incandescent lamp and was calibrated by china seprei 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.

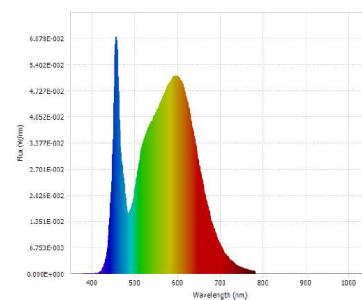
Integrating Sphere Test Conditions

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.2	120.01	60	0.1869	22.322	0.9953

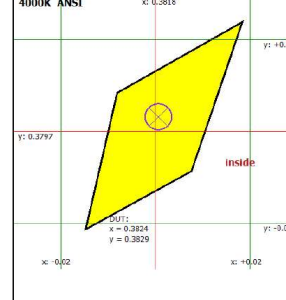
Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3989	83.38	0.0023	2852.55	127.79

Spectral Flux Graph



Chromaticity Diagram



Spectral Result

Luminous Flux $\Phi(v)$	2852.55 (lm)	Chrom x	0.3824
Chrom y	0.3829	Chrom u	0.2240
Chrom v	0.3364	Duv	0.0023
Chrom u'	0.2240	Chrom v'	0.5045
CCT	3989.0 (K)	Luminous Efficacy η	127.79 (lm/W)
Ra	83.38	R1	81.8
R2	90.2	R3	95.6
R4	80.7	R5	81.0
R6	85.7	R7	86.5
R8	65.6	R9	12.4
R10	75.9	R11	79.2
R12	56.8	R13	84.1
R14	97.7	R15	75.9
Rf	81.3	Rg	93.5



5.0 LM-79 Measurement and Test Results

Model No.	VEKT1X4L-840	Sample ID.	1523263
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

1.The sample was tested according to the IES LM-79-2008.
2.Photometric parameters were measured using a type C goniophotometer and software.
3.The ambient temperature shall be maintained at 25° C ± 1° 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 3.865A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.
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 0.5° vertical intervals and 22.5° horizontal intervals..Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.1	120.08	60	0.18643	22.315	0.9969

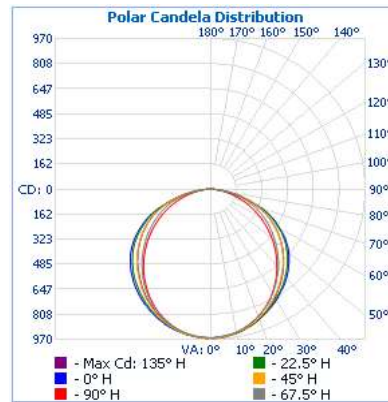
Test Result

Flux (lm)	Zonal Lumen Requirement (0°-60°)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
2812.7	77.2%	157.5	162.2	103.6	122.8	126.05
SC: 0-180°	SC: 90-270°					
1.3	1.22					

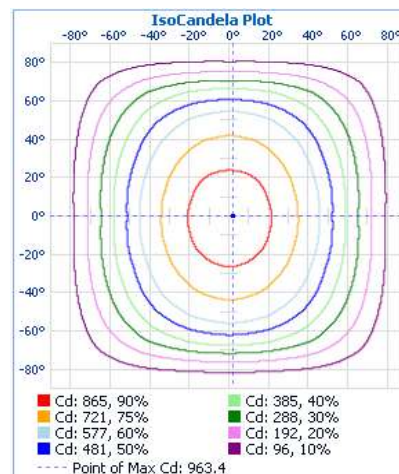


5.2 Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot





5.2 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	741.4	26.4%
0-40	1,213.3	43.1%
0-60	2,170.3	77.2%
60-90	634.3	22.6%
70-100	267.9	9.5%
90-120	2.7	0.1%
0-90	2,804.6	99.7%
90-180	8.2	0.3%
0-180	2,812.7	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	22.9	0.8%	90-95	0.6	0%
5-10	67.9	2.4%	95-100	0.5	0%
10-15	110.4	3.9%	100-105	0.4	0%
15-20	148.9	5.3%	105-110	0.4	0%
20-25	182.1	6.5%	110-115	0.4	0%
25-30	209.2	7.4%	115-120	0.4	0%
30-35	229.4	8.2%	120-125	0.5	0%
35-40	242.5	8.6%	125-130	0.5	0%
40-45	248.6	8.8%	130-135	0.6	0%
45-50	247.3	8.8%	135-140	0.6	0%
50-55	238.7	8.5%	140-145	0.6	0%
55-60	222.5	7.9%	145-150	0.6	0%
60-65	199.1	7.1%	150-155	0.6	0%
65-70	168.4	6.0%	155-160	0.5	0%
70-75	128.9	4.6%	160-165	0.4	0%
75-80	85.1	3.0%	165-170	0.3	0%
80-85	43.1	1.5%	170-175	0.2	0%
85-90	9.7	0.3%	175-180	0.1	0%



5.2 Goniophotometer Test (Cont'd)

Intensity Data(cd)

	0	22.5	45	67.5	90	113	135	158	180	203	225	247.5	270	292.5	315	338	360
0	961	961	961	961	961	961	961	961	961	961	961	961	961	961	961	961	961
1	960	961	962	958	962	957	963	963	960	963	963	957	962	958	962	961	960
2	959	959	962	958	962	957	963	960	960	960	963	957	962	958	962	959	959
3	956	959	961	956	961	957	961	959	958	959	961	957	961	956	961	959	956
4	957	956	959	953	960	954	958	958	957	958	958	954	960	953	959	956	957
5	954	956	957	951	958	953	959	956	957	956	959	953	958	951	957	956	954
6	953	953	955	950	953	951	957	957	954	957	957	951	953	950	955	953	953
7	949	951	951	946	951	948	953	954	953	954	953	948	951	946	951	951	949
8	948	950	949	944	949	947	950	951	951	951	950	947	949	944	949	950	948
9	945	945	946	940	947	941	948	948	950	948	948	941	947	940	946	945	945
10	939	941	942	937	942	938	945	946	948	946	945	938	942	937	942	941	939
11	939	939	938	932	937	934	941	942	943	942	941	934	937	932	938	939	939
12	934	936	932	926	932	930	937	938	940	938	937	930	932	926	932	936	934
13	931	931	928	921	926	925	932	935	937	935	932	925	926	921	928	931	931
14	925	926	924	915	919	919	928	932	934	932	928	919	919	915	924	926	925
15	920	922	919	909	914	914	922	927	928	927	922	914	914	909	919	922	920
16	917	917	912	903	907	907	918	921	926	921	918	907	907	903	912	917	917
17	911	913	907	896	899	901	911	917	920	917	911	901	899	896	907	913	911
18	906	905	901	889	893	894	907	911	918	911	907	894	893	889	901	905	906
19	901	899	894	883	885	886	898	905	910	905	898	886	885	883	894	899	901
20	895	895	887	874	876	879	893	900	904	900	893	879	876	874	887	895	895
25	860	860	847	830	831	835	855	866	874	866	855	835	831	830	847	860	860
30	826	821	802	780	776	786	809	828	839	828	809	786	776	780	802	821	826
35	786	779	753	722	716	728	757	787	799	787	757	728	716	722	753	779	786
40	744	732	699	663	650	665	705	739	754	739	705	665	650	663	699	732	744
45	693	684	644	598	580	598	648	688	706	688	648	598	580	598	644	684	693
50	641	628	584	532	507	533	590	632	652	632	590	533	507	532	584	628	641
55	577	565	524	466	435	462	526	569	586	569	526	462	435	466	524	565	577
60	499	494	459	400	360	397	459	494	508	494	459	397	360	400	459	494	499
65	422	417	390	335	286	332	387	416	427	416	387	332	286	335	390	417	422
70	312	320	311	268	214	264	309	321	318	321	309	264	214	268	311	320	312
75	204	215	224	199	145	195	222	213	208	213	222	195	145	199	224	215	204
80	112	120	130	127	81	123	128	118	115	118	128	123	81	127	130	120	112
85	39	43	48	51	30	50	46	42	41	42	46	50	30	51	48	43	39
90	1	1	2	3	3	2	2	1	1	1	2	2	3	3	2	1	1
95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
130	1	2	2	1	1	2	2	2	2	2	2	2	1	1	2	2	1
135	2	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	2
140	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
145	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
150	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
155	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
160	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
165	2	2	3	3	3	3	3	2	2	2	3	3	3	3	3	2	2
170	3	3	2	3	3	3	3	3	2	3	3	3	3	3	2	3	3
175	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
180	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3



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