

GENERATION BRANDS, LLC TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ESSF0604P48275930FW1

PROJECT NUMBER

G104207161

REPORT NUMBER

104207161CRT-016

ISSUE DATE

10/2/2020

REVISED DATE

10/6/2020

TEST DATES

10/2/2020

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104207161CRT-016

MODEL NUMBER(s)

ESSF0604P48275930FW1

REPORT RENDERED TO:

GENERATION BRANDS, LLC
7400 LINDER AVE
SKOKIE, IL 60077

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01040731-2.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



Melanie Brittain
Senior Associate Engineer
Lighting Division

Reviewer:



Jeff Davis
Technical Lead
Lighting Division

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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2009221018-003A	ESSF0604P48275930FW 1	Surface 0.6" x 0.4"	Production	9/22/2020

SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ESSF0604P48275930FW1
Product Description:	Surface 0.6" x 0.4"
LED Model No.:	Valent X ~250 lm/ft
Driver Model No.:	N/A
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	957.1	916.1
Input Power (W) @ 24 (Vdc)	9.16	9.06
Lumen Efficacy (lm/W)	104.5	101.1
Input Power Factor (I) @ 24 (Vdc)	--	--

Criteria	Results
Input ATHD (%) @ 24 (Vdc)	---
Correlated Color Temperature (K)	3001
Color Rendering Index - Ra (I)	97.8
Color Rendering Index - R9 (I)	97.8
Duv (I)	0.0011
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.401
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.520

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

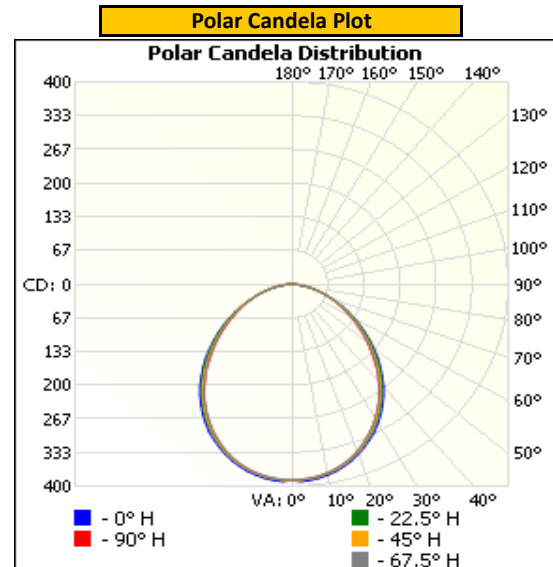
Base Orientation	Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	24.08	380.5	9.16	--

Light Output (lm)	Lumen Efficacy (lm/W)
957.1	104.5

INTENSITY SUMMARY - CANDELA

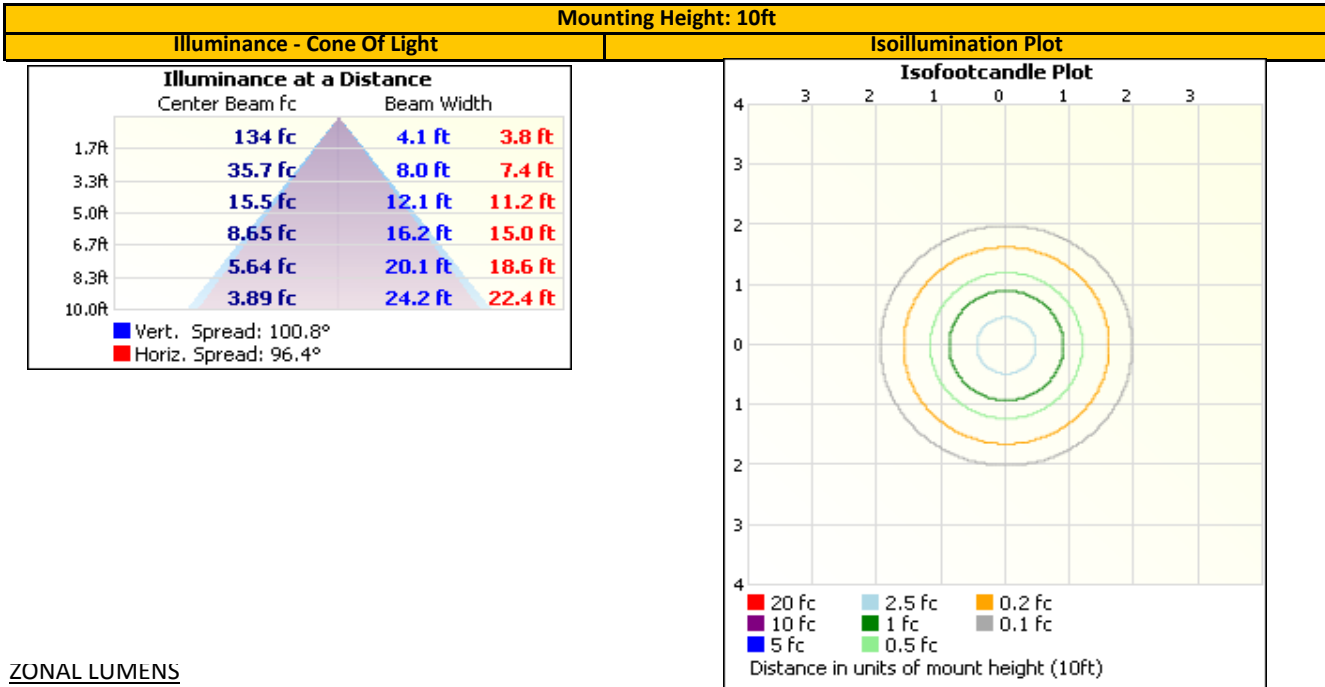
Angle	0	22.5	45	67.5	90
0	388	388	388	388	388
5	390	386	386	385	388
10	383	380	380	379	381
15	373	369	370	367	369
20	359	355	355	352	353
25	340	336	334	331	332
30	318	314	312	308	308
35	292	288	285	281	280
40	264	260	255	251	249
45	231	229	223	220	217
50	198	195	190	186	184
55	165	163	158	154	152
60	133	131	128	125	123
65	102	102	100	98	96
70	74	74	74	73	72
75	49	50	51	51	51
80	27	28	31	33	32
85	9	11	15	17	18
90	0	0	4	6	7
95	0	0	0	0	0
100	0	0	0	0	0
105	0	0	0	0	0
110	0	0	0	0	0
115	0	0	0	0	0
120	0	0	0	0	0
125	0	0	0	0	0
130	0	0	0	0	0
135	0	0	0	0	0
140	0	0	0	0	0
145	0	0	0	0	0
150	0	0	0	0	0
155	0	0	0	0	0
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary																																																																																																			
<table><tr><th>Zone</th><th>Lumens</th><th>Luminaire</th></tr><tr><td>0-30</td><td>294.7</td><td>30.8%</td></tr><tr><td>0-40</td><td>472.7</td><td>49.4%</td></tr><tr><td>0-60</td><td>786.9</td><td>82.2%</td></tr><tr><td>60-90</td><td>169.4</td><td>17.7%</td></tr><tr><td>70-100</td><td>71.3</td><td>7.5%</td></tr><tr><td>90-120</td><td>0.8</td><td>0.1%</td></tr><tr><td>0-90</td><td>956.4</td><td>99.9%</td></tr><tr><td>90-180</td><td>0.8</td><td>0.1%</td></tr><tr><td>0-180</td><td>957.1</td><td>100.0%</td></tr></table>			Zone	Lumens	Luminaire	0-30	294.7	30.8%	0-40	472.7	49.4%	0-60	786.9	82.2%	60-90	169.4	17.7%	70-100	71.3	7.5%	90-120	0.8	0.1%	0-90	956.4	99.9%	90-180	0.8	0.1%	0-180	957.1	100.0%	<table><tr><th>Zone</th><th>Lumens</th><th>Total</th><th>Zone</th><th>Lumens</th><th>Total</th></tr><tr><td>0-10</td><td>36.7</td><td>3.8%</td><td>90-100</td><td>0.8</td><td>0.1%</td></tr><tr><td>10-20</td><td>104.1</td><td>10.9%</td><td>100-110</td><td>0.0</td><td>0.0%</td></tr><tr><td>20-30</td><td>154.0</td><td>16.1%</td><td>110-120</td><td>0.0</td><td>0.0%</td></tr><tr><td>30-40</td><td>178.0</td><td>18.6%</td><td>120-130</td><td>0.0</td><td>0.0%</td></tr><tr><td>40-50</td><td>172.3</td><td>18.0%</td><td>130-140</td><td>0.0</td><td>0.0%</td></tr><tr><td>50-60</td><td>141.9</td><td>14.8%</td><td>140-150</td><td>0.0</td><td>0.0%</td></tr><tr><td>60-70</td><td>98.9</td><td>10.3%</td><td>150-160</td><td>0.0</td><td>0.0%</td></tr><tr><td>70-80</td><td>54.0</td><td>5.6%</td><td>160-170</td><td>0.0</td><td>0.0%</td></tr><tr><td>80-90</td><td>16.6</td><td>1.7%</td><td>170-180</td><td>0.0</td><td>0.0%</td></tr></table>							Zone	Lumens	Total	Zone	Lumens	Total	0-10	36.7	3.8%	90-100	0.8	0.1%	10-20	104.1	10.9%	100-110	0.0	0.0%	20-30	154.0	16.1%	110-120	0.0	0.0%	30-40	178.0	18.6%	120-130	0.0	0.0%	40-50	172.3	18.0%	130-140	0.0	0.0%	50-60	141.9	14.8%	140-150	0.0	0.0%	60-70	98.9	10.3%	150-160	0.0	0.0%	70-80	54.0	5.6%	160-170	0.0	0.0%	80-90	16.6	1.7%	170-180	0.0	0.0%
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INTEGRATING SPHERE TESTING

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PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

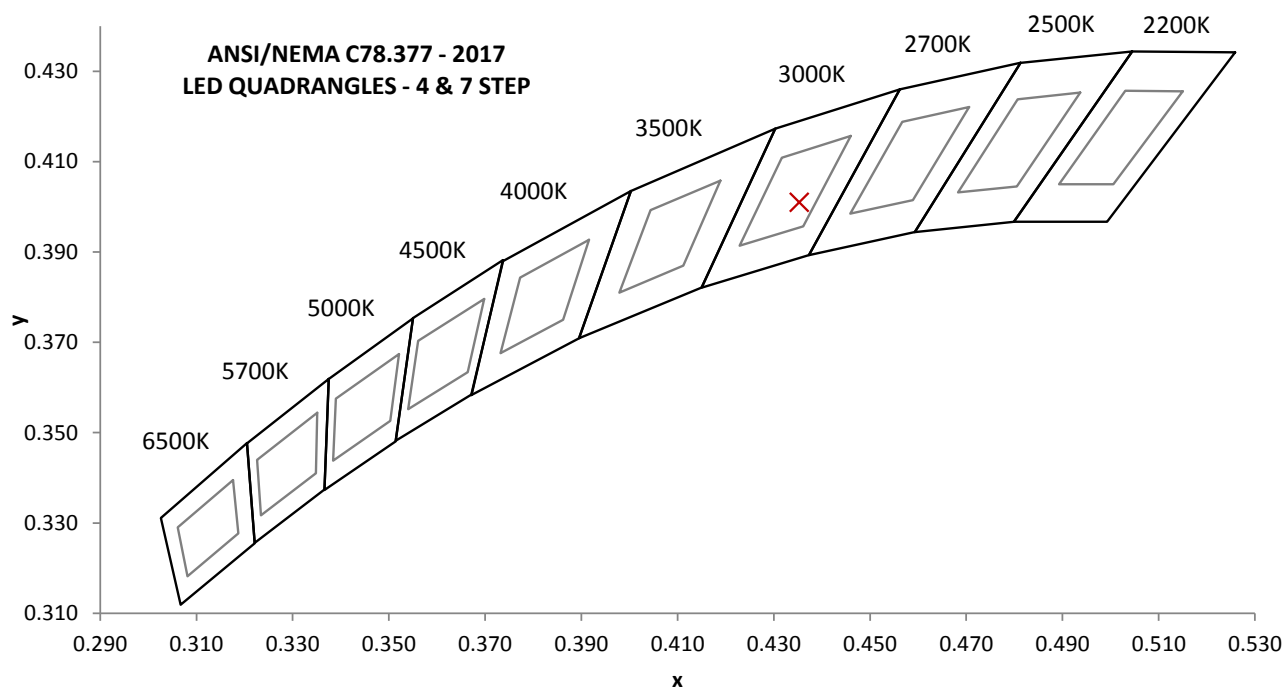
Base Orientation
Up

Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
24.00	377.3	9.06	--	---

Measured at 24(Vdc)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
916.1	101.1	3001	97.8	97.8

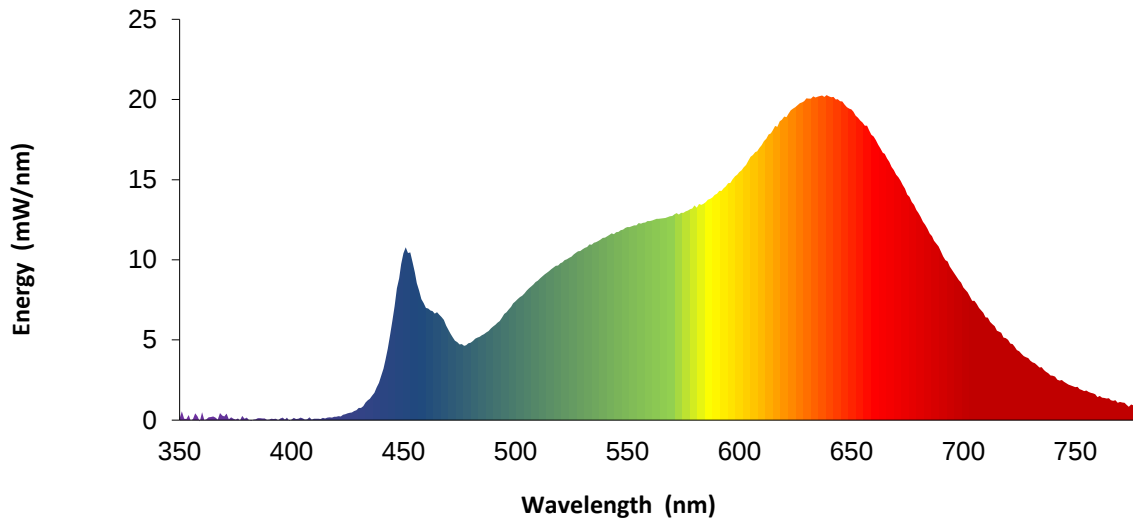
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0011	0.435	0.401	0.251	0.520



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	7.0		570	12.7		680	12.9
355	0.0		465	6.7		575	12.9		685	11.6
360	0.5		470	5.6		580	13.4		690	10.5
365	0.2		475	4.7		585	13.6		695	9.4
370	0.2		480	4.8		590	14.1		700	8.3
375	0.0		485	5.3		595	14.8		705	7.4
380	0.2		490	5.8		600	15.5		710	6.4
385	0.1		495	6.6		605	16.4		715	5.6
390	0.0		500	7.4		610	17.2		720	5.0
395	0.1		505	8.1		615	18.1		725	4.3
400	0.0		510	8.7		620	18.9		730	3.7
405	0.1		515	9.3		625	19.5		735	3.3
410	0.1		520	9.8		630	20.1		740	2.8
415	0.1		525	10.2		635	20.2		745	2.4
420	0.2		530	10.6		640	20.2		750	2.1
425	0.4		535	11.1		645	19.9		755	1.9
430	0.8		540	11.4		650	19.4		760	1.4
435	1.3		545	11.7		655	18.6		765	1.4
440	2.8		550	12.0		660	17.7		770	1.1
445	6.2		555	12.3		665	16.6		775	1.0
450	10.4		560	12.4		670	15.3		780	0.8
455	9.2		565	12.6		675	14.1		---	---



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	LSI High Speed Mirror Goniometer	6440	---	9/21/2020	10/21/2020
2	Elgar AC Power Supply	CW1251	---	VBV	VBV
3	Yokogawa Power Analyzer	WT210	E464	5/11/2020	5/11/2021
4	Traceable Hygrothermometer	4800	L203	2/17/2020	2/17/2021
5	M-D Building Products Digital Level	Smart Tool	307-L112	5/14/2020	5/14/2021
6	NIST Luminous Intensity Standard Source	NBS10322	N1427	2/11/2019	2/11/2021
7	NIST Luminous Intensity Standard Source	NBS10332	N1435	2/11/2019	2/11/2021
8	NIST Luminous Intensity Standard Source	NBS10265	N1437	2/11/2019	2/11/2021
9	NIST Luminous Flux Standard Source	NBS10428	N1424	1/3/2019	1/3/2021
10	Sorenson DC Power Supply	XG 150-10	---	VBV	VBV
11	Omega Thermometer	DPI8-C24	M263	2/27/2020	2/27/2021
12	2M Integrating Sphere Spectrometer System	CDS 600	W/N308	9/30/2020	10/30/2020
13	Yokogawa Power Analyzer	WT1600	E475	8/10/2020	8/10/2021
14	Digital Thermometer	Fluke 53 II	307-D587	1/23/2020	1/23/2021
15	Xantrex DC Power Supply	XTR 150-5.6	---	VBV	VBV
16	Elgar AC Power Supply	CW1251	---	VBV	VBV
17	Secondary Spectral Intensity Standard Source	BS5186	RF5186	11/21/2019	11/21/2020
18	Secondary Flux Standard Source	6836	---	2/11/2020	2/11/2021
19	Secondary Flux Standard Source	4116	---	2/11/2020	2/11/2021
20	Secondary Flux Standard Source	3616	---	2/11/2020	2/11/2021
21	Fisher Scientific Digital Stopwatch	130471471	307-N1404	3/19/2020	3/19/2021

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
1	10/6/2020	Melanie Brittain	Jeff Davis	Report revised to correct luminaire model number.
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