

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ESSF0606D482509W3018FW1

PROJECT NUMBER

G104349704

REPORT NUMBER

104349704CHI-075

ISSUE DATE

4/14/2021

REVISED DATE

None

TEST DATES

04/13/2021.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

© 2017 INTERTEK



REPORT NUMBER

104349704CHI-075

MODEL NUMBER(s)

ESSF0606D482509W3018FW1

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 600186-0. 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-01080748-3.

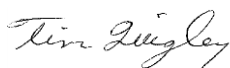
TEST STANDARDS

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

IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

In Charge of Testing:



Tim Quigley
Project Engineer
Lighting Division

Reviewer:



Jeff Davis
N.A. Technical Lead
Lighting Division

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

SAMPLE INFORMATION

REPORT NO. 104349704CHI-075

ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH04082021114642-003	ESSF0606D482509W301 8FW1	WARM DIM 350LM/FT 0606 FROSTED	Production	4/8/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ESSF0606D482509W3018FW1	1

SUMMARY

REPORT NO. 104349704CHI-075

PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ESSF0606D482509W3018FW1
Product Description:	WARM DIM 350LM/FT 0606 FROSTED
LED Model No.:	U series
Driver Model No.:	NA
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1027.8	1055.4
Input Power (W) @ 24 (Vdc)	14.79	14.79
Lumen Efficacy (lm/W)	69.5	71.4
Input Power Factor (I) @ 24 (Vdc)	--	--

Criteria	Results
Input ATHD (%) @ 24 (Vdc)	--
Correlated Color Temperature (K)	3035
Color Rendering Index - Ra	98.4
Color Rendering Index - R9	96.4
Duv	0.0005
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.402
Chromaticity Coordinate (u')	0.250
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

REPORT NO. 104349704CHI-075

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESSF0606D482509W3018FW1	NA

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

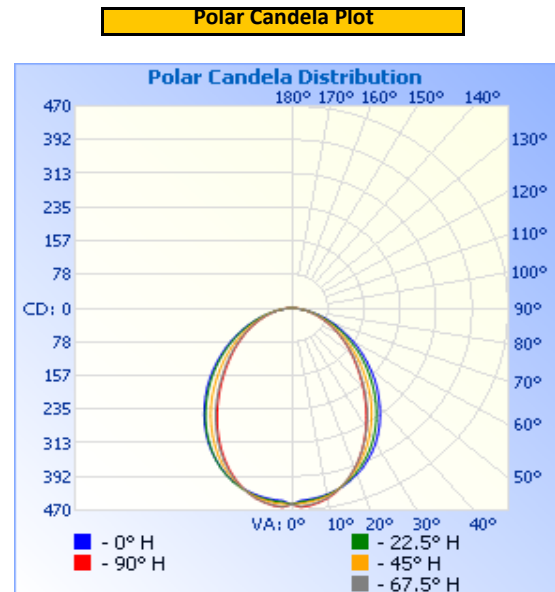
Base Orientation	Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	24.01	615.9	14.79	--

Light Output (lm)	Lumen Efficacy (lm/W)
1027.8	69.5

INTENSITY SUMMARY - CANDELA

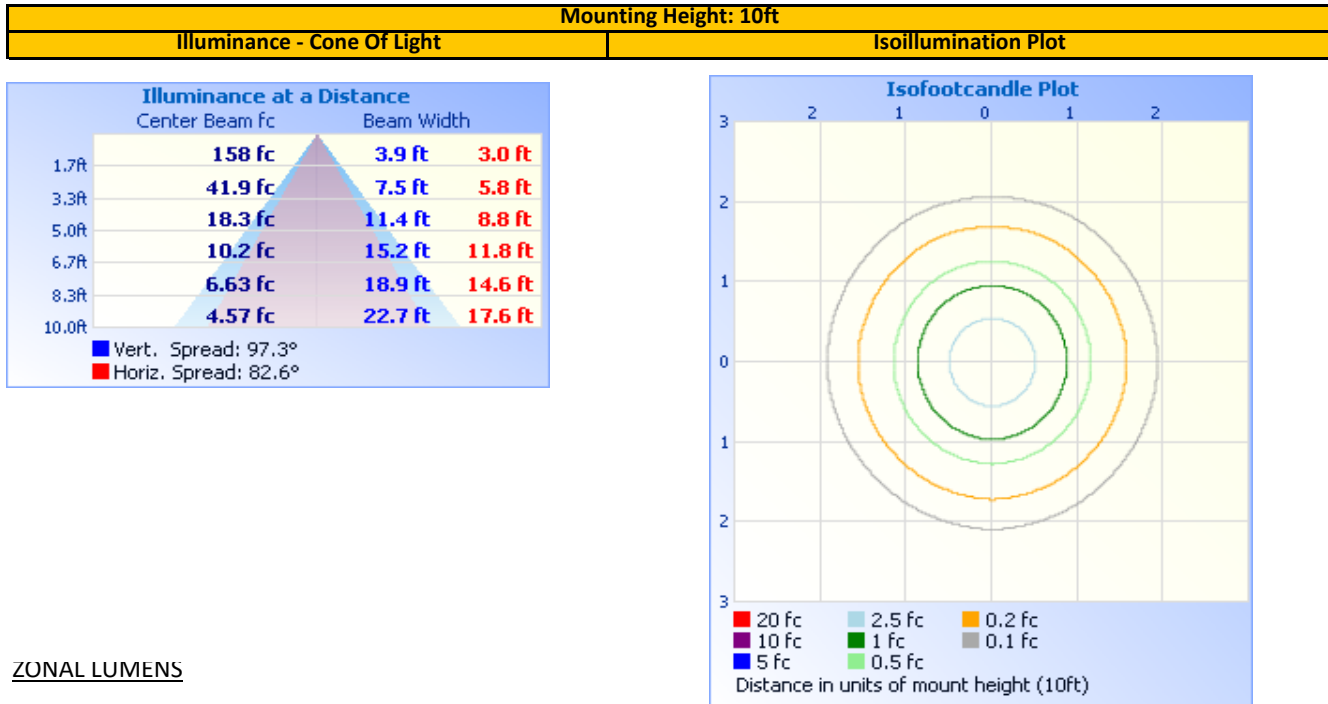
Angle	0	22.5	45	67.5	90
0	456	456	456	456	456
5	446	449	452	458	461
10	440	441	444	447	449
15	429	428	426	426	427
20	412	408	402	397	398
25	390	383	372	363	362
30	363	353	338	324	322
35	332	320	302	285	281
40	297	284	264	245	241
45	262	246	226	207	204
50	224	210	190	174	172
55	188	176	157	144	142
60	154	142	127	117	115
65	120	111	99	92	90
70	89	82	75	70	68
75	60	56	53	49	48
80	35	33	33	32	32
85	14	14	17	18	18
90	1	3	7	8	9
95	0	0	1	3	3
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



REPORT NO. 104349704CHI-075

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
---------------------	--	--	--	--	--

Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	335.7	32.7%	90-100	2.2	0.2%
0-40	526.0	51.2%	100-110	0.0	0.0%
0-60	847.7	82.5%	110-120	0.0	0.0%
60-90	177.9	17.3%	120-130	0.0	0.0%
70-100	78.3	7.6%	130-140	0.0	0.0%
90-120	2.2	0.2%	140-150	0.0	0.0%
0-90	1,025.6	99.8%	150-160	0.0	0.0%
90-180	2.2	0.2%	160-170	0.0	0.0%
0-180	1,027.8	100.0%	170-180	0.0	0.0%

Zone	Lumens	Total	Zone	Lumens	Total
0-10	43.0	4.2%			
10-20	120.4	11.7%			
20-30	172.3	16.8%			
30-40	190.3	18.5%			
40-50	177.2	17.2%			
50-60	144.5	14.1%			
60-70	101.8	9.9%			
70-80	56.9	5.5%			
80-90	19.2	1.9%			

INTEGRATING SPHERE TESTING

REPORT NO. 104349704CHI-075

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESSF0606D482509W3018FW1	NA

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

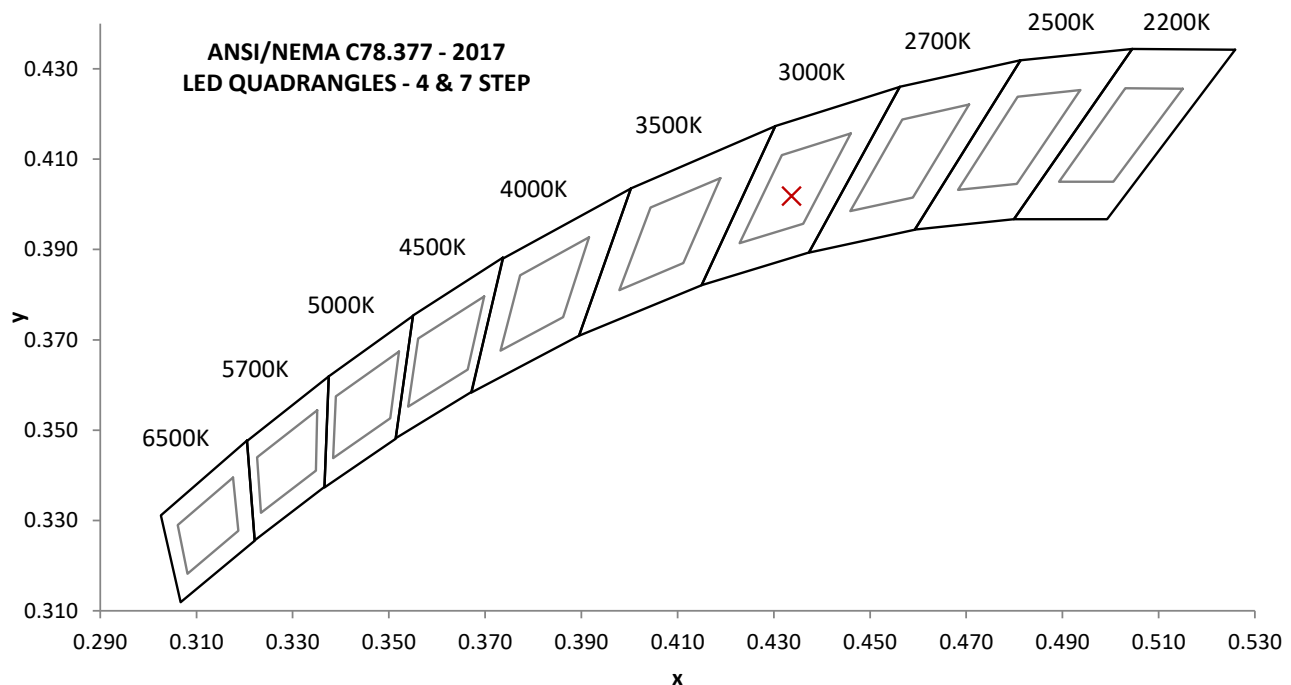
Base Orientation
Up

Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
24.02	615.7	14.79	--	--

Measured at 24.02(Vdc)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
1055.4	71.4	3035	98.4	96.4

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0005	0.434	0.402	0.250	0.520

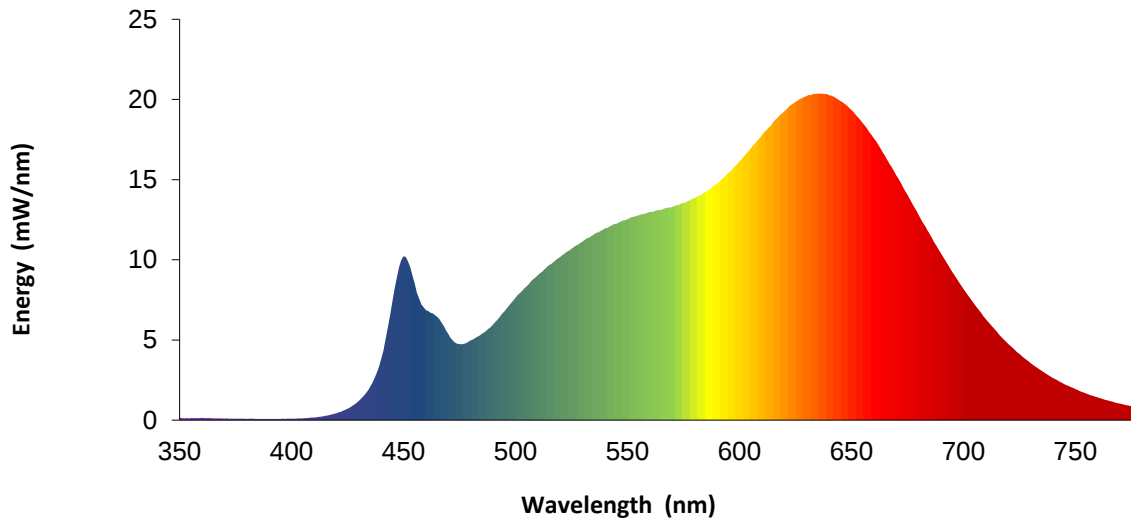


REPORT NO. 104349704CHI-075

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	6.9		570	13.3		680	12.8
355	0.1		465	6.5		575	13.6		685	11.6
360	0.1		470	5.4		580	13.8		690	10.4
365	0.1		475	4.7		585	14.3		695	9.3
370	0.1		480	5.0		590	14.7		700	8.2
375	0.1		485	5.4		595	15.4		705	7.2
380	0.1		490	6.0		600	16.1		710	6.3
385	0.1		495	6.8		605	16.9		715	5.5
390	0.1		500	7.6		610	17.8		720	4.8
395	0.1		505	8.4		615	18.6		725	4.1
400	0.1		510	9.0		620	19.3		730	3.6
405	0.1		515	9.7		625	19.8		735	3.1
410	0.2		520	10.2		630	20.2		740	2.6
415	0.3		525	10.7		635	20.4		745	2.3
420	0.4		530	11.1		640	20.3		750	1.9
425	0.7		535	11.6		645	19.9		755	1.7
430	1.2		540	12.0		650	19.3		760	1.4
435	2.1		545	12.2		655	18.5		765	1.2
440	3.8		550	12.5		660	17.6		770	1.0
445	7.4		555	12.8		665	16.5		775	0.9
450	10.2		560	13.0		670	15.3		780	0.7
455	8.5		565	13.1		675	14.1		---	---

Without correction of sample absorption.



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

EQUIPMENT LIST

REPORT NO. 104349704CHI-075

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Yokogawa Power Meter	WT210	146919	7/1/2020	7/1/2021
2	Omega Thermometer	DPI8-C24	146920	10/1/2020	10/1/2021
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	146957	1/29/2021	1/29/2022
6	Sorenson DC Power Supply	XHR 150-7	146922	VBU	VBU
8	Newport Humidity Recorder	iServer	146961	9/3/2020	9/3/2021
21	Labsphere 2M Sphere & Spectroradiometer	CDS1100	146137	VBU	VBU
23	Sorenson DC Power Supply	XFR150-8	146847	VBU	VBU
24	Yokogawa Power Meter	WT1600	146767	4/6/2020	4/6/2021
25	Omega Thermometer	MDSi8	146873	7/1/2020	7/1/2021
26					
27					
28					
29					
30					

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
---	None	---	---	---
---	---	---	---	---
---	---	---	---	---

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESSF0606D482509W3018FW1	NA

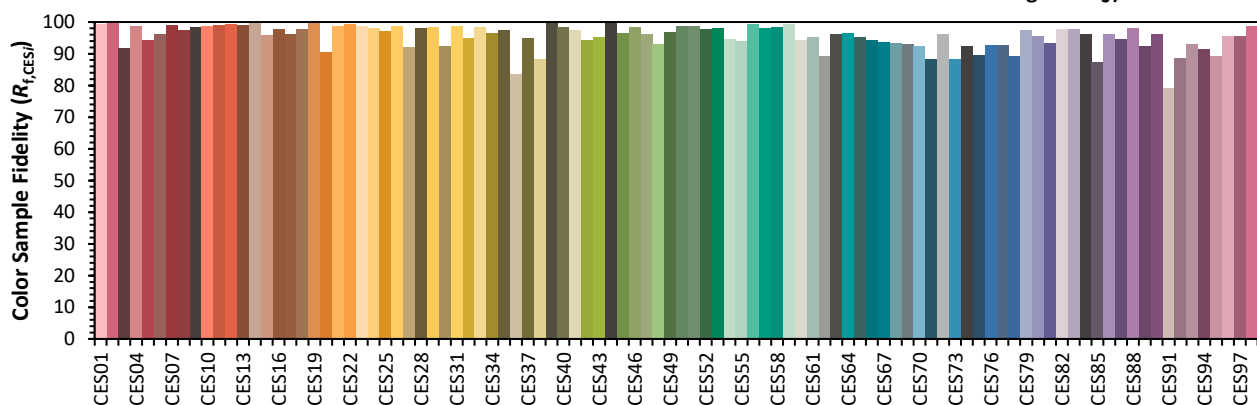
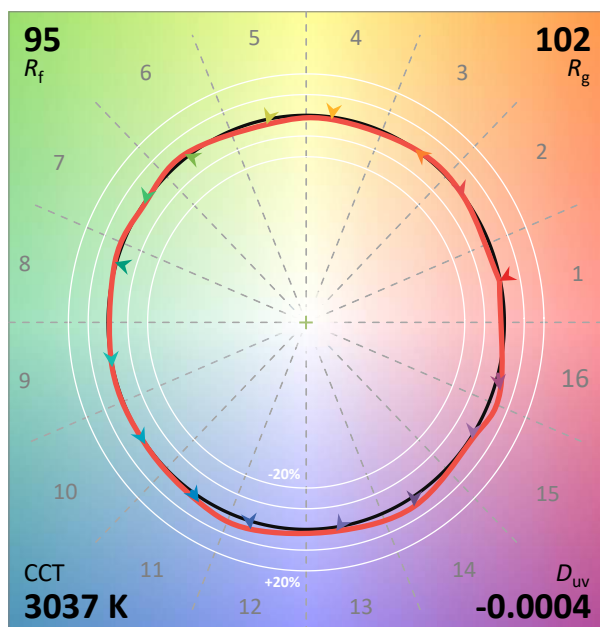
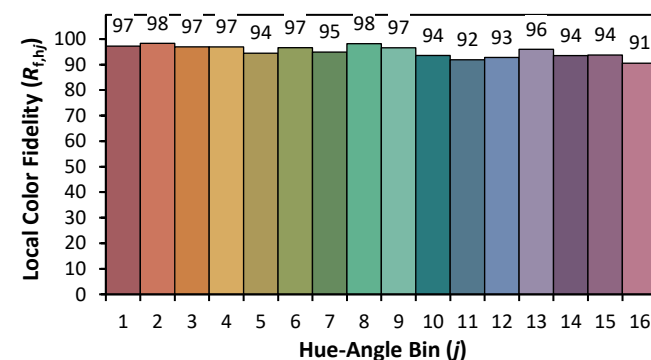
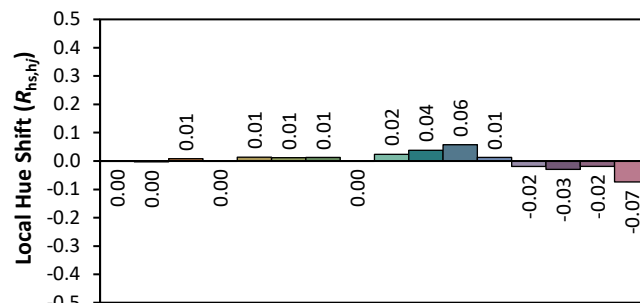
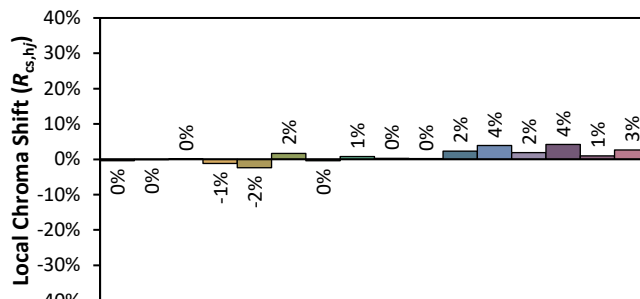
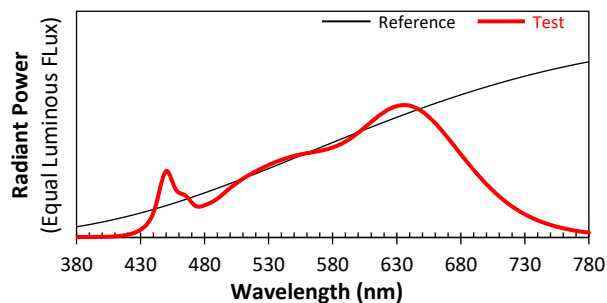
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 4/13/2021

Model: ESSF0606D482509W3018FW1



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

 x 0.4337 y 0.4018 u' 0.2495 v' 0.5200