

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ESLTD43509W3018

PROJECT NUMBER

G104349704

REPORT NUMBER

104349704CHI-072

ISSUE DATE

4/14/2021

REVISED DATE

None

TEST DATES

04/12/2021 through 04/13/2021.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104349704CHI-072

MODEL NUMBER(s)

ESLTD43509W3018

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
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Reviewer:



Jeff Davis
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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH04052021070257	ESLTD43509W3018	WARM DIM 350LM/FT LED TAPE	Production	4/5/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ESLTD43509W3018	1

SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ESLTD43509W3018
Product Description:	WARM DIM 350LM/FT LED TAPE
LED Model No.:	U series
Driver Model No.:	NA
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1462.1	1505.1
Input Power (W) @ 24 (Vdc)	14.89	14.85
Lumen Efficacy (lm/W)	98.2	101.4
Input Power Factor () @ 24 (Vdc)	--	--

Criteria	Results
Input ATHD (%) @ 24 (Vdc)	--
Correlated Color Temperature (K)	3002
Color Rendering Index - Ra ()	98.2
Color Rendering Index - R9 ()	97.0
Duv ()	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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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESLTD43509W3018	NA

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

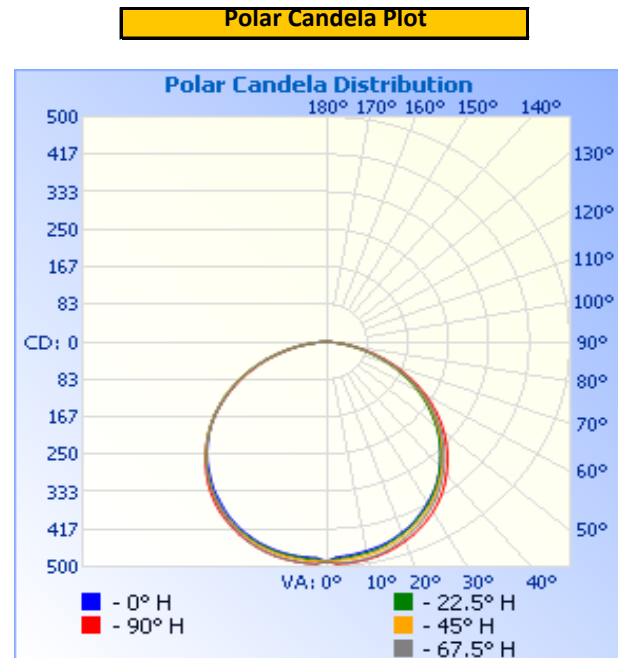
Base Orientation	Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor (I)
Up	24.01	620.3	14.89	--

Light Output (lm)	Lumen Efficacy (lm/W)
1462.1	98.2

INTENSITY SUMMARY - CANDELA

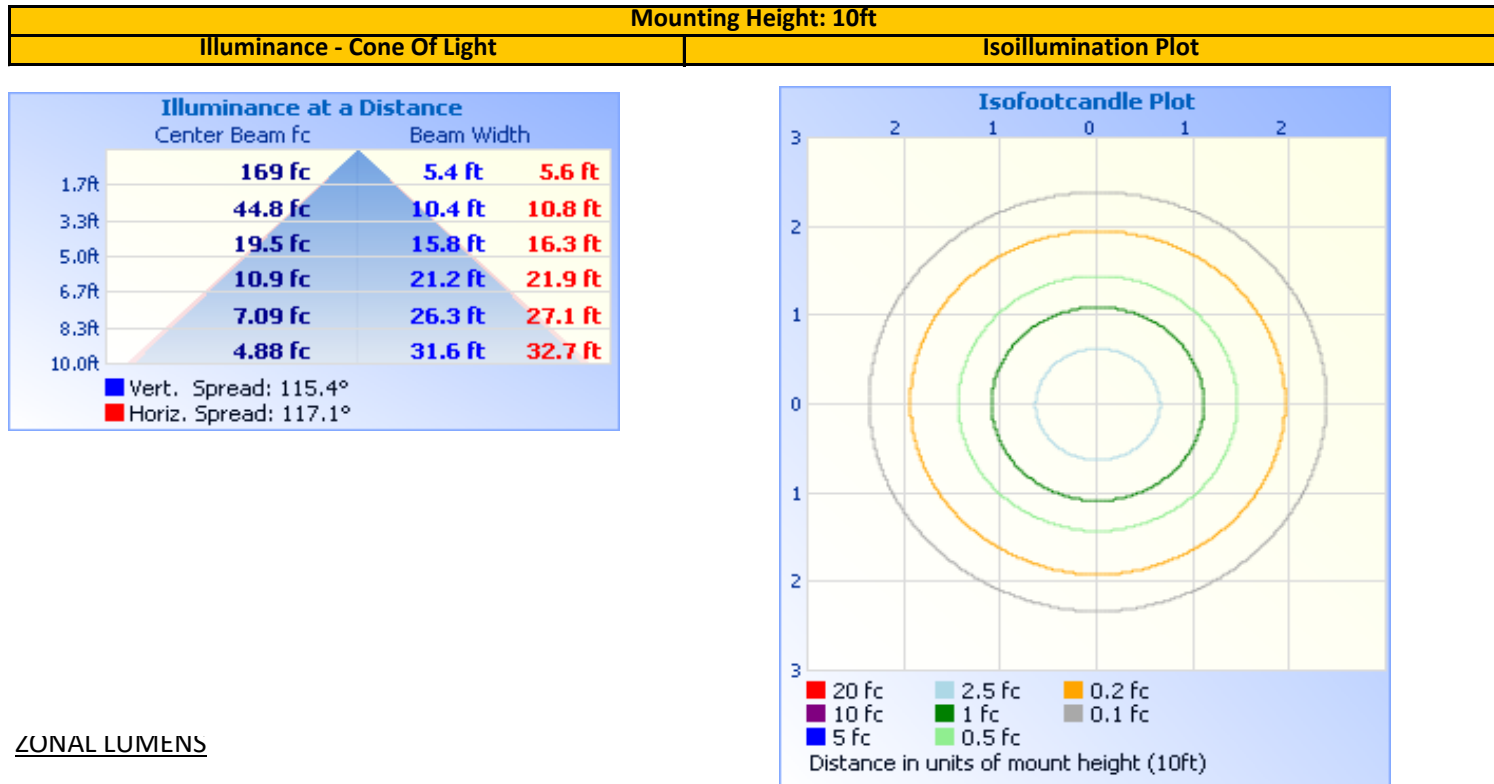
Angle	0	22.5	45	67.5	90
0	488	488	488	488	488
5	477	481	485	492	494
10	472	476	482	489	491
15	464	468	473	480	483
20	451	454	460	466	472
25	435	437	443	448	456
30	414	417	422	428	437
35	392	392	397	403	412
40	363	363	368	374	383
45	332	330	336	341	351
50	298	295	301	306	315
55	260	257	262	268	276
60	221	217	222	227	235
65	178	174	178	184	190
70	133	130	134	140	145
75	90	87	90	95	100
80	52	49	50	54	57
85	18	16	18	19	21
90	1	1	1	1	1
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					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	386.8	26.5%	0-10	46.4	3.2%
0-40	638.6	43.7%	10-20	134.3	9.2%
0-60	1,145.0	78.3%	20-30	206.1	14.1%
60-90	316.5	21.6%	30-40	251.8	17.2%
70-100	132.0	9.0%	40-50	264.5	18.1%
90-120	0.6	0.0%	50-60	242.0	16.5%
0-90	1,461.6	100.0%	60-70	185.1	12.7%
90-180	0.6	0.0%	70-80	104.4	7.1%
0-180	1,462.1	100.0%	80-90	27.0	1.8%
			90-100	0.6	0.0%
			100-110	0.0	0.0%
			110-120	0.0	0.0%
			120-130	0.0	0.0%
			130-140	0.0	0.0%
			140-150	0.0	0.0%
			150-160	0.0	0.0%
			160-170	0.0	0.0%
			170-180	0.0	0.0%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESLTD43509W3018	NA

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

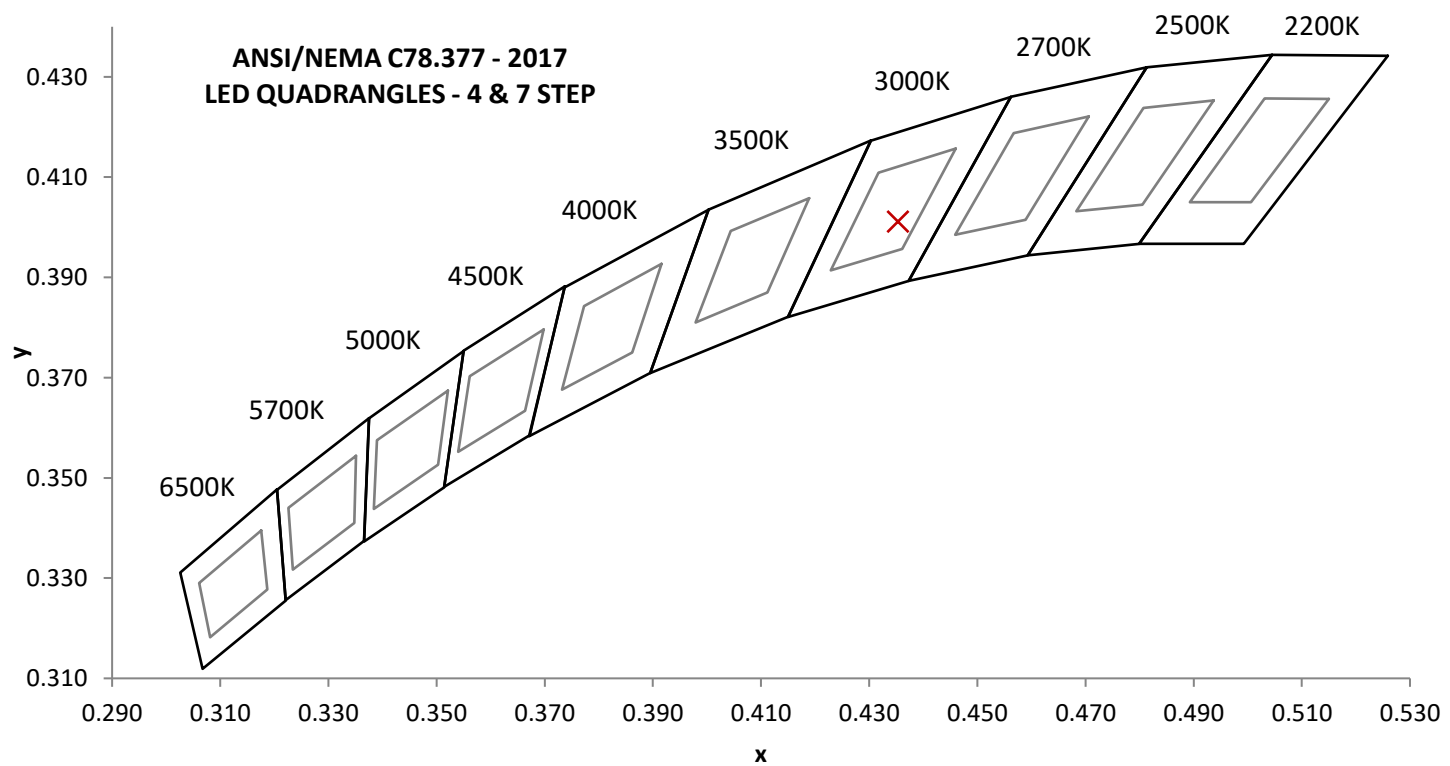
Base Orientation
Up

Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
23.99	618.7	14.85	--	--

Measured at 23.99(Vdc)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
1505.1	101.4	3002	98.2	97.0

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

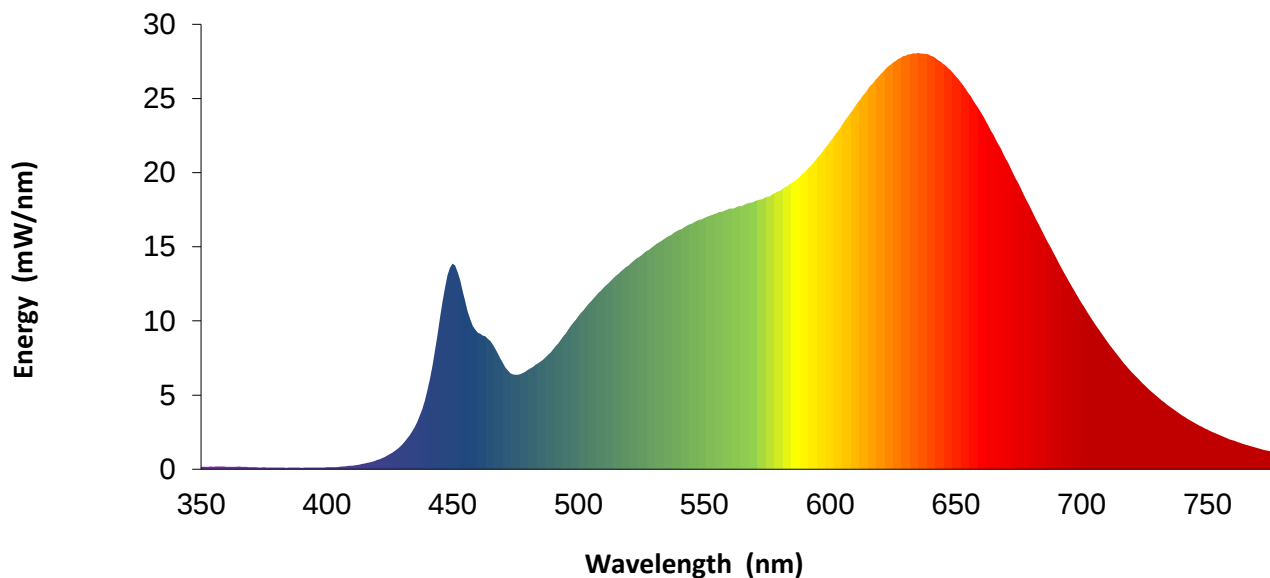


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	9.2		570	18.0		680	17.5
355	0.2		465	8.6		575	18.4		685	15.9
360	0.2		470	7.2		580	18.8		690	14.2
365	0.2		475	6.4		585	19.3		695	12.7
370	0.1		480	6.7		590	20.1		700	11.2
375	0.1		485	7.3		595	21.0		705	9.9
380	0.1		490	8.1		600	22.1		710	8.7
385	0.1		495	9.2		605	23.3		715	7.6
390	0.1		500	10.3		610	24.5		720	6.5
395	0.1		505	11.3		615	25.6		725	5.7
400	0.1		510	12.2		620	26.6		730	4.9
405	0.2		515	13.1		625	27.4		735	4.2
410	0.2		520	13.8		630	27.9		740	3.6
415	0.4		525	14.4		635	28.1		745	3.1
420	0.6		530	15.1		640	27.9		750	2.7
425	1.0		535	15.6		645	27.3		755	2.3
430	1.7		540	16.2		650	26.5		760	2.0
435	2.9		545	16.6		655	25.4		765	1.7
440	5.3		550	16.9		660	24.1		770	1.4
445	10.2		555	17.3		665	22.6		775	1.2
450	13.9		560	17.6		670	20.9		780	1.0
455	11.3		565	17.8		675	19.3		---	---

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

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#	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	146768	10/2/2020	10/2/2021
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	---	---	---
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESLTD43509W3018	NA

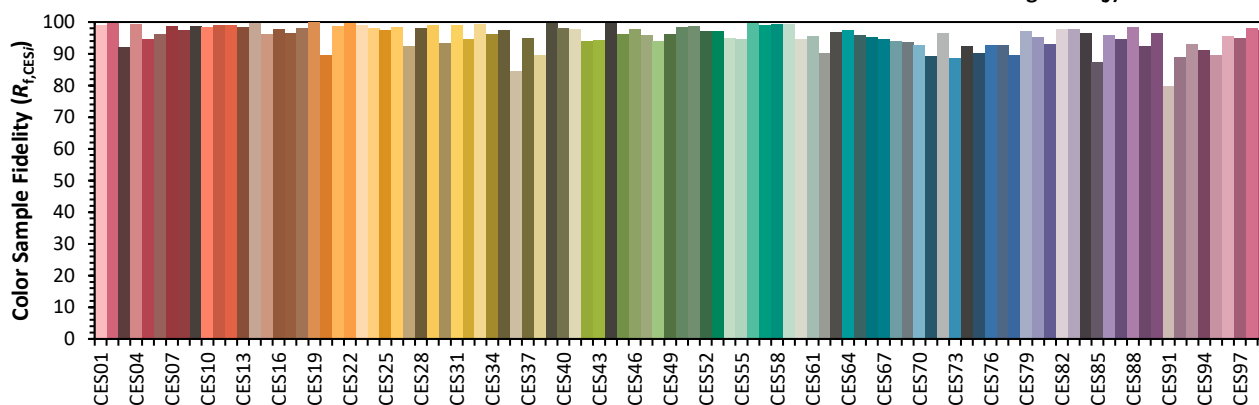
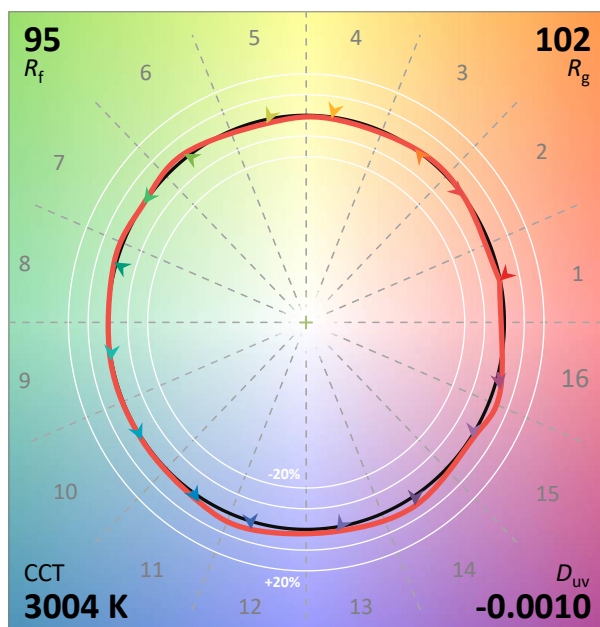
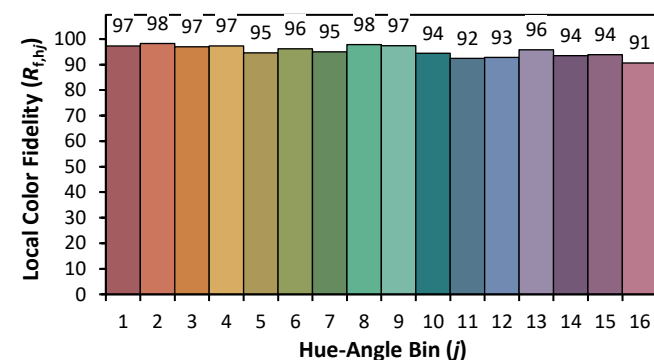
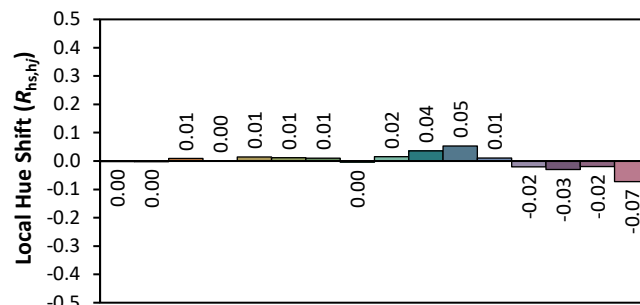
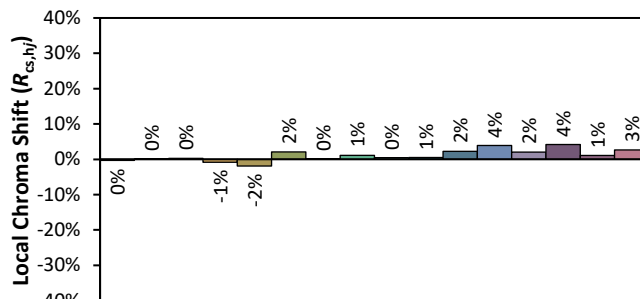
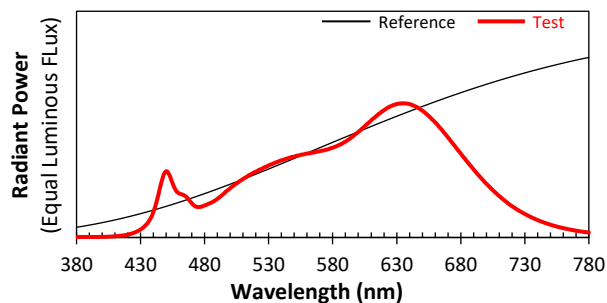
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 4/12/2021

Model: ESLTD43509W3018



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

 x 0.4353 y 0.4011 u' 0.2508 v' 0.5200