VANTAGE LIGHTING

TEST REPORT

SCOPE OF WORK
LED Performance Testing

MODEL NUMBER
SUR22L-Y115W-D1MV-35K

PROJECT NUMBER
G105471856

REPORT NUMBER
105471856CRT-010

ISSUE DATE
1/15/2024

REVISED DATE
1/19/2024

TEST DATES
1/12/2024 - 1/15/2024

DOCUMENT CONTROL NUMBER
RTTDS-R-AMER-Test-3407

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PAGES
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REPORT NUMBER
105471856CRT-010

MODEL NUMBER(s)
SUR22L-Y115W-D1MV-35K

REPORT RENDERED TO:
VANTAGE LIGHTING
181 NARRAGANSETT PARK DRIVE
EAST PROVIDENCE, RI 01916
USA

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 U.S. government.

AUTHORIZATION
The testing performed was authorized by signed quote number Qu-01343314-0.

TEST STANDARDS
ANSI/IES LM-79-19: Optical and Electrical Measurements of Solid State Lighting Products
IES LM-79-08: 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:	Reviewer:
Jacki Swiernik	Melanie Brittain
Staff Engineer	Senior Associate Engineer
Lighting Division	Lighting Division

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SAMPLE INFORMATION

REPORT NO. 105471856CRT-010

ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received Date	Sampling Date
1	CRT2401101319-001A	SUR22L-Y115W-D1MV-35K	2x2 recessed troffer with diffuse lens (option 3)	Prototype	1/10/2024	N/A

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	SUR22L-Y115W-D1MV-35K	1

SAMPLE PHOTOS

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SUMMARY **REPORT NO. 105471856CRT-010**

PRODUCT INFORMATION AND SUMMARY OF DATA

Test Configuration 1	
Product Model No.:	SUR22L-Y115W-D1MV-35K
Product Description:	2x2 recessed troffer with diffuse lens (option 3)
LED Board Model No.:	Signify FO Strip PR 22in 2200lm 835 LV6
Driver Model No.:	Signify XI075C200V054BST2

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	13031.0	13025.1
Input Power (W) @ 120 (Vac)	115.65	115.64
Luminous Efficacy (lm/W)	112.7	112.6
Input Power Factor () @ 120 (Vac)	0.998	0.997

Criteria	Results
Input ATHD (%) @ 120 (Vac)	6.45
Correlated Color Temperature (K)	3389
Color Rendering Index - Ra ()	83.6
Color Rendering Index - R9 ()	10.3
Duv ()	0.000
Chromaticity Coordinate (x)	0.412
Chromaticity Coordinate (y)	0.394
Chromaticity Coordinate (u')	0.238
Chromaticity Coordinate (v')	0.514

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with ANSI/IES LM-79-19

DUT SAMPLING METHOD

For testing plans, program requirements, or shipments requiring sampling of DUTs or components, the selections for each test were random. All samples are marked with control numbers regardless of being tested.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral power distribution for photometric and colorimetric data of the DUT. Electrical measurements of the unit were measured using a power analyzer. Each DUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at 25°C ± 1.2°C and 10-65% respectively at a position inside of the sphere within 1.5m and at equal height of the DUT. Stabilization procedures to LM-79-19 were followed. The DUT was mounted in a 4π configuration.

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 DUT. Electrical measurements of the unit were measured using a power analyzer. Each DUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at 25°C ± 1.2°C and 10-65% respectively at a position within 1.5m and at equal height of the DUT. Stabilization procedures to LM-79-19 were followed. The test distance was ≥ 5x the longest luminous dimension of the DUT.

ANSI/IES Technical Memorandums (TM) reported are not NVLAP accredited

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TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 105471856CRT-010

Test Configuration	Tested Model No.	Pass/Fail/NA
1	SUR22L-Y115W-D1MV-35K	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

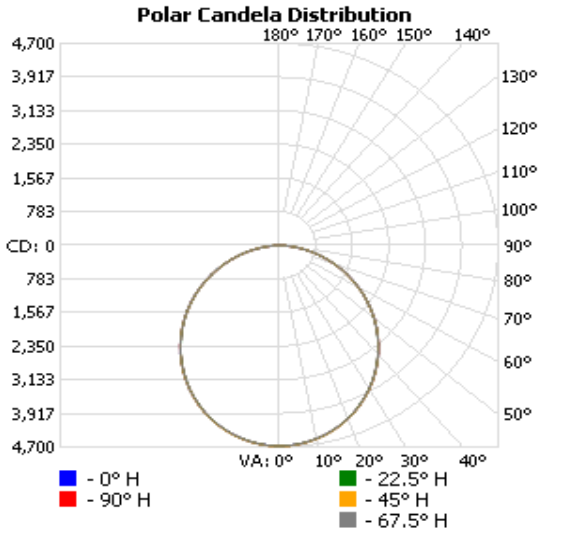
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.08	965.4	115.65	0.998

Light Output (lm)	Efficacy (lm/W)
13031.0	112.7

LUMINOUS INTENSITY SUMMARY (candela)

Vertical	Horizontal				
Angle (°)	0	22.5	45	67.5	90
0	4675	4675	4675	4675	4675
5	4649	4645	4654	4648	4648
10	4573	4571	4580	4574	4574
15	4453	4453	4463	4454	4455
20	4296	4294	4302	4297	4296
25	4098	4089	4102	4095	4093
30	3858	3855	3864	3859	3858
35	3593	3588	3598	3591	3589
40	3304	3297	3306	3298	3300
45	2988	2984	2992	2987	2986
50	2662	2656	2661	2657	2657
55	2318	2317	2317	2316	2316
60	1970	1965	1961	1963	1963
65	1613	1605	1605	1609	1607
70	1254	1253	1250	1248	1248
75	906	903	901	902	895
80	571	567	566	562	557
85	254	249	248	241	237
90	0	0	0	0	0
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

Polar Candela Plot



Full luminous intensity matrix found in .IES file

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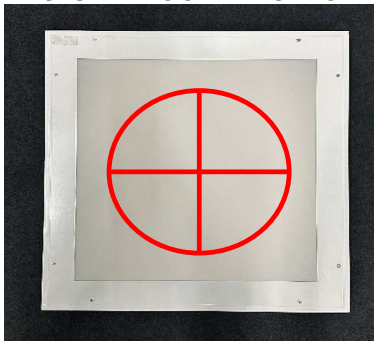
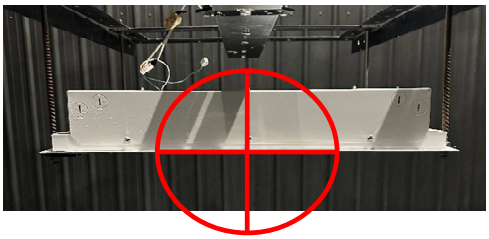
ORIENTATION AND ALIGNMENT OF DUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.56	1.56	0.00
0°-180° H	90°-270° H	0°-180° V

Test Distance (ft)
29.2

PHOTOMETRIC CENTER OF DUT





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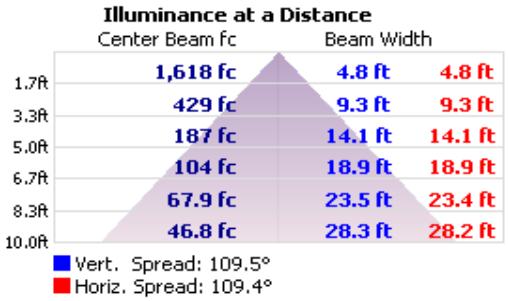
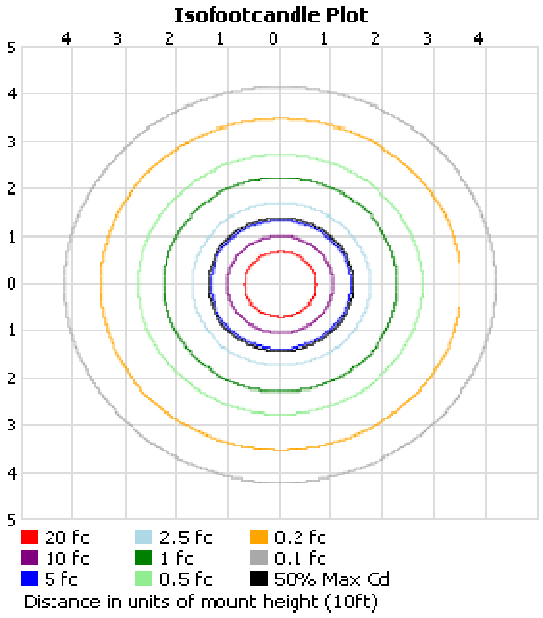
REPORT NO. 105471856CRT-010

ILLUMINANCE SUMMARY

Illuminance - Cone Of Light	Isoillumination Plot





ZONAL LUMENS

Zonal Lumen Summary

Zone (°)	Lumens	Luminaire
0-30	3,584.1	27.5%
0-40	5,830.1	44.7%
0-60	10,204.9	78.3%
60-90	2,826.1	21.7%
70-100	1,235.6	9.5%
90-120	0.0	0.0%
0-90	13,031.0	100.0%
90-180	0.0	0.0%
0-180	13,031.0	100.0%

Zone (°)	Lumens	Total	Zone (°)	Lumens	Total
0-10	441.3	3.4%	90-100	0.0	0.0%
10-20	1256.7	9.6%	100-110	0.0	0.0%
20-30	1886.1	14.5%	110-120	0.0	0.0%
30-40	2246.1	17.2%	120-130	0.0	0.0%
40-50	2304.2	17.7%	130-140	0.0	0.0%
50-60	2070.5	15.9%	140-150	0.0	0.0%
60-70	1590.4	12.2%	150-160	0.0	0.0%
70-80	952.8	7.3%	160-170	0.0	0.0%
80-90	282.9	2.2%	170-180	0.0	0.0%

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INTEGRATING SPHERE TESTING **REPORT NO. 105471856CRT-010**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	SUR22L-Y115W-D1MV-35K	NA

PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

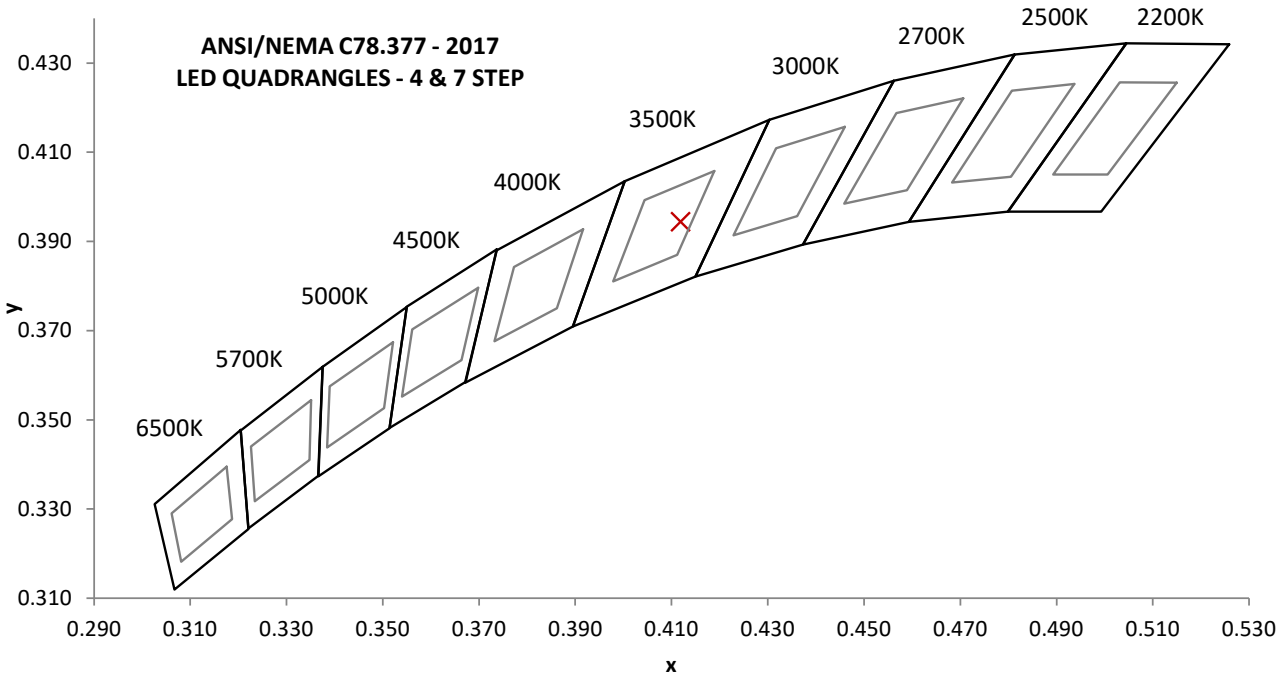
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.05	965.7	115.64	0.997	6.45

Measured at 120.05(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
13025.1	112.6	3389	83.6	10.3

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0002	0.412	0.394	0.238	0.514



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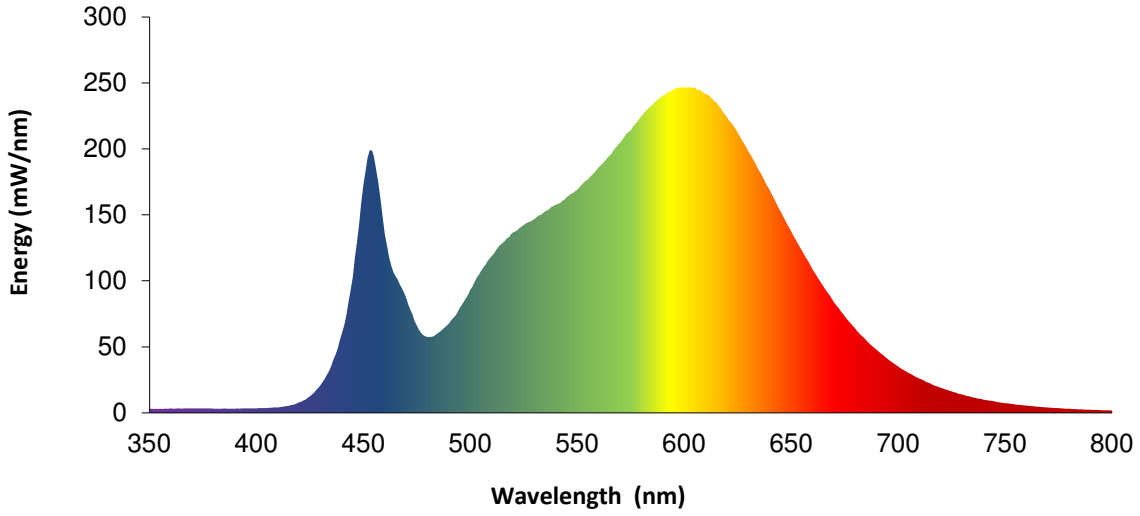
SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	3.1		460	135.1		570	204.7		680	63.5
355	3.1		465	103.7		575	214.1		685	55.0
360	3.3		470	87.0		580	224.9		690	47.6
365	3.2		475	66.2		585	233.3		695	40.8
370	3.4		480	57.4		590	240.4		700	35.0
375	3.3		485	60.6		595	244.6		705	30.1
380	3.1		490	67.6		600	246.3		710	25.8
385	3.2		495	79.5		605	246.2		715	22.1
390	3.2		500	93.3		610	241.5		720	18.8
395	3.4		505	107.5		615	235.0		725	16.1
400	3.4		510	118.7		620	223.6		730	13.8
405	3.7		515	128.8		625	212.1		735	11.7
410	4.1		520	136.7		630	198.0		740	10.0
415	5.3		525	142.2		635	183.2		745	8.6
420	7.8		530	146.9		640	168.4		750	7.3
425	12.7		535	152.7		645	152.4		755	6.3
430	21.1		540	157.7		650	137.5		760	5.5
435	35.9		545	163.4		655	122.7		765	4.7
440	60.3		550	169.1		660	108.4		770	4.0
445	103.0		555	176.9		665	95.9		775	3.5
450	172.9		560	185.9		670	83.7		780	3.0
455	194.0		565	194.9		675	73.2		---	---

Spectral radiant flux was measured by 1nm increments. 1nm data is on file.



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

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EQUIPMENT LIST

REPORT NO. 105471856CRT-010

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	LSI Type C Goniophotometer System	6440	---	11/1/2023	2/1/2024
2	Elgar AC Power Supply	CW1251	---	VBU	VBU
3	Yokogawa Power Analyzer	WT210	E464	6/21/2023	6/21/2024
4	Traceable Hygrothermometer	4800	L206	3/7/2023	3/7/2024
5	Omega Thermometer	DPi8-C24	M263	3/9/2023	3/9/2024
6	Tape Measure	Crescent	---	9/21/2021	9/21/2024
7	Elgar AC Power Supply	CW1251	---	VBU	VBU
8	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
9	Traceable Thermometer	4800	L204	3/7/2023	3/7/2024
10	Yokogawa Power Analyzer	WT1600	E462	7/31/2023	7/31/2024
11	Fluke Thermometer	53 II	N1324	6/28/2023	6/28/2024
12	Fisher Scientific Stopwatch	14-649-9	N1315	3/2/2023	3/2/2024
13	Current Monitor	411	A197	8/26/2021	8/26/2024
14	3M Integrating Sphere Spectrometer System	CDS 2600	L231	1/10/2024	4/10/2024

The AC power supplies used for testing have a crest factor capable of 0-3.5

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
1	1/19/2024	Jacki Swiernik	Melanie Brittain	Added TM-30 graphics by client request
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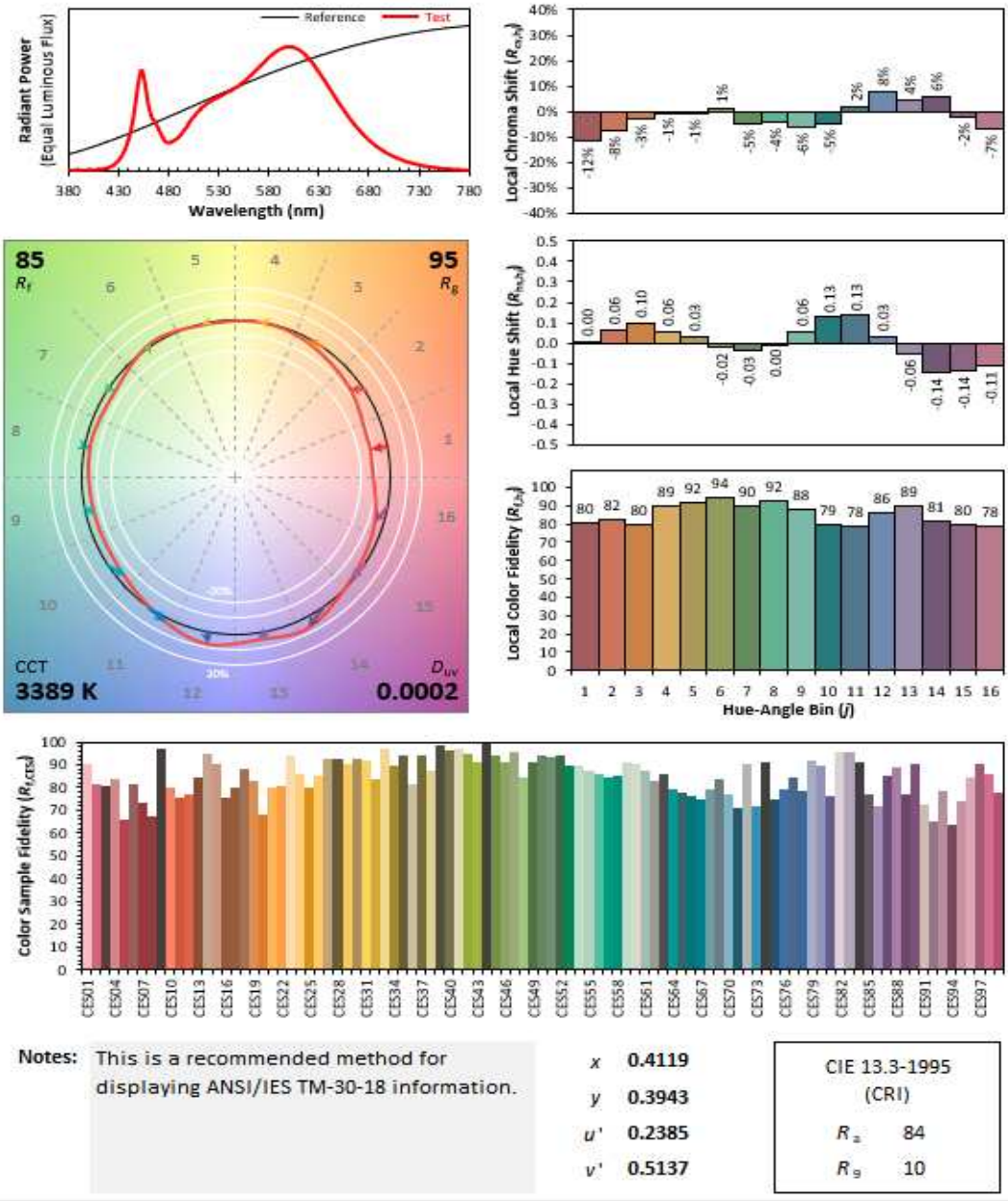
ANNEX A - IES TM-30 CALCULATIONS

REPORT NO. 105471856CRT-010

Test Configuration	Tested Model No.	Pass/Fail/NA
1	SUR22L-Y115W-D1MV-35K	NA

TM-30 REPORT



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

x	0.4119
y	0.3943
u'	0.2385
v'	0.5137

CIE 13.3-1995 (CRI)

R_a	84
R_9	10