ILLUMADYNE, INC.

TEST REPORT

SCOPE OF WORK
LED Performance Testing

MODEL NUMBER
4CB-HE-UNV-43-M-3500, 4CB-HE-UNV-43-N-3500

PROJECT NUMBER
G104618320

REPORT NUMBER
104618320CRT-001

ISSUE DATE
3/10/2021

REVISED DATE
None

TEST DATES
3/10/2021

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

PAGES
11

REPORT NUMBER 104618320CRT-001

MODEL NUMBER(s)
4CB-HE-UNV-43-M-3500, 4CB-HE-UNV-43-N-3500

REPORT RENDERED TO:
ILLUMADYNE, INC.
3840 HOPKINS STREET
PENSACOLA, FL 32534

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-01155563-0.

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:	Reviewer:
Melanie Brittain	Jeff Davis
Senior Associate Engineer	Technical Lead
Lighting Division	Lighting Division

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SAMPLE INFORMATION **REPORT NO. 104618320CRT-001**

ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2103081245-001	4CB-HE-UNV-43-M-3500	LED High Bays	Production	3/8/2021
2		4CB-HE-UNV-43-N-3500			

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Reflector
1	4CB-HE-UNV-43-M-3500	Medium
2	4CB-HE-UNV-43-N-3500	Narrow

SAMPLE PHOTOS - TESTED CONFIGURATIONS

4CB-HE-UNV-43-M-3500E

4CB-HE-UNV-43-N-3500E

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SUMMARY **REPORT NO. 104618320CRT-001**

PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	4CB-HE-UNV-43-M-3500, 4CB-HE-UNV-43-N-3500
Product Description:	LED High Bays
LED Model No.:	Seoul Semi Conductor S1W0-2835359003-00000000-0P003
Driver Model No.:	Sosen SS-100VP-56BH
Light Source:	LED

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.

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INTEGRATING SPHERE TESTING **REPORT NO. 104618320CRT-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	4CB-HE-UNV-43-M-3500	NA

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

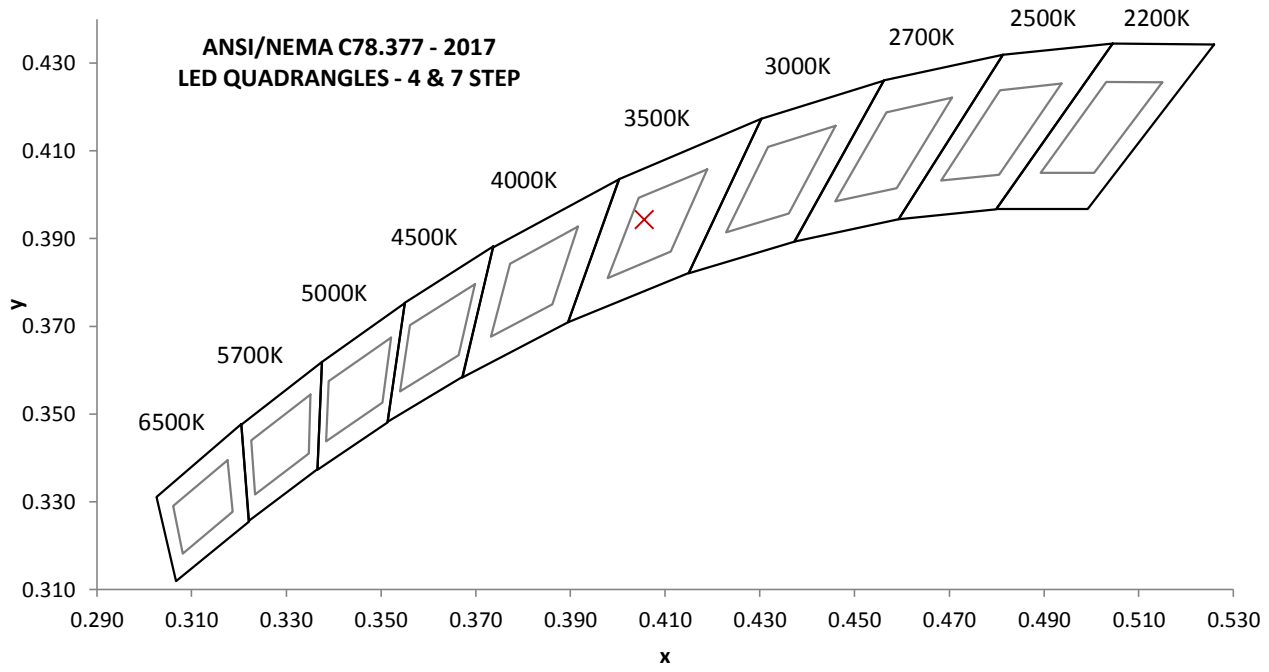
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.01	702.8	84.28	0.999	3.3
277.01	317.4	82.78	0.942	9.2

Measured at 120.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
13756.8	163.2	3520	82.9	8.0

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0013	0.406	0.394	0.235	0.513



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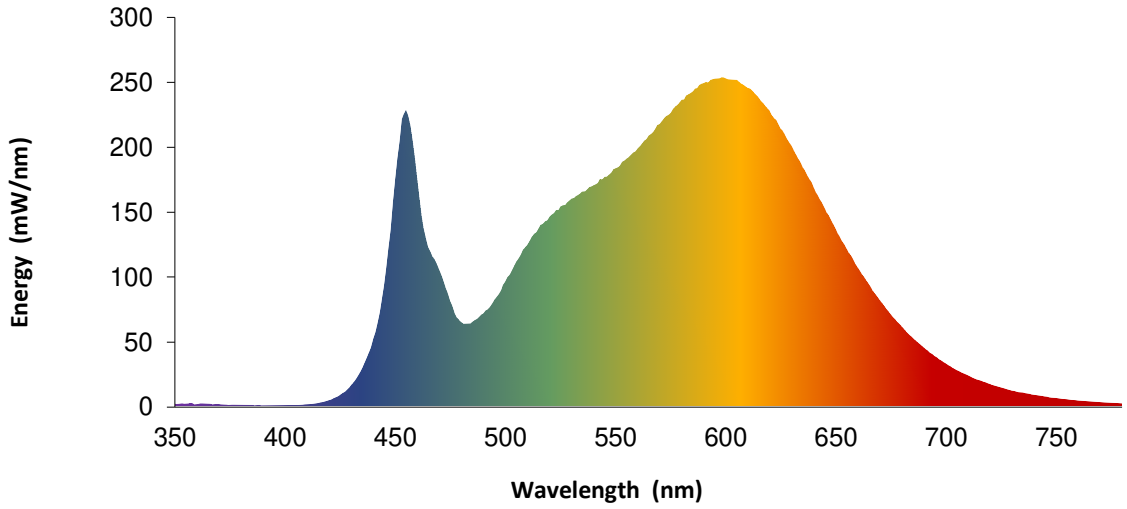
REPORT NO. 104618320CRT-001

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	2.7		460	177.0		570	218.0		680	62.2
355	2.5		465	123.3		575	226.6		685	53.5
360	2.2		470	106.0		580	236.6		690	45.9
365	2.5		475	82.0		585	243.3		695	39.2
370	2.4		480	65.4		590	249.4		700	33.6
375	1.8		485	65.6		595	252.9		705	28.6
380	1.8		490	72.2		600	253.3		710	24.5
385	1.6		495	82.6		605	252.0		715	20.9
390	1.5		500	96.7		610	245.9		720	17.9
395	1.4		505	112.2		615	238.6		725	15.2
400	1.4		510	125.1		620	228.1		730	12.9
405	1.5		515	137.6		625	214.6		735	11.0
410	2.2		520	146.7		630	201.0		740	9.4
415	3.1		525	154.5		635	184.8		745	8.0
420	5.3		530	160.6		640	169.5		750	6.9
425	9.4		535	166.3		645	153.7		755	5.9
430	16.9		540	170.9		650	137.9		760	5.1
435	30.0		545	177.3		655	122.1		765	4.3
440	52.2		550	183.9		660	107.9		770	3.7
445	93.3		555	191.2		665	95.0		775	3.2
450	175.4		560	199.1		670	82.6		780	2.8
455	229.0		565	209.2		675	71.9		---	---



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

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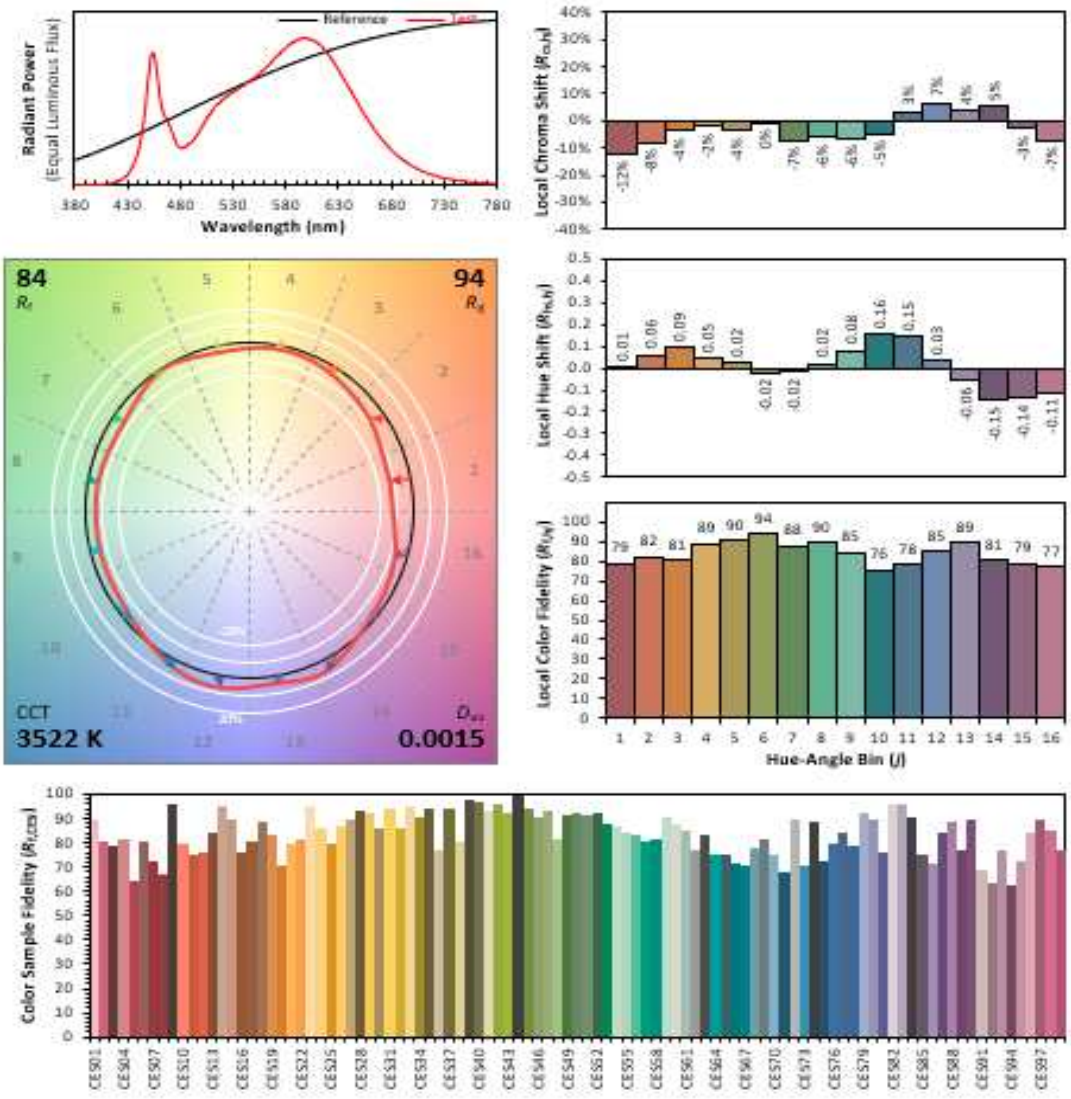
ANNEX A - TM-30 CALCULATIONS **REPORT NO. 104618320CRT-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	4CB-HE-UNV-43-M-3500	NA

TM-30 REPORT



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INTEGRATING SPHERE TESTING **REPORT NO. 104618320CRT-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
2	4CB-HE-UNV-43-N-3500	NA

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

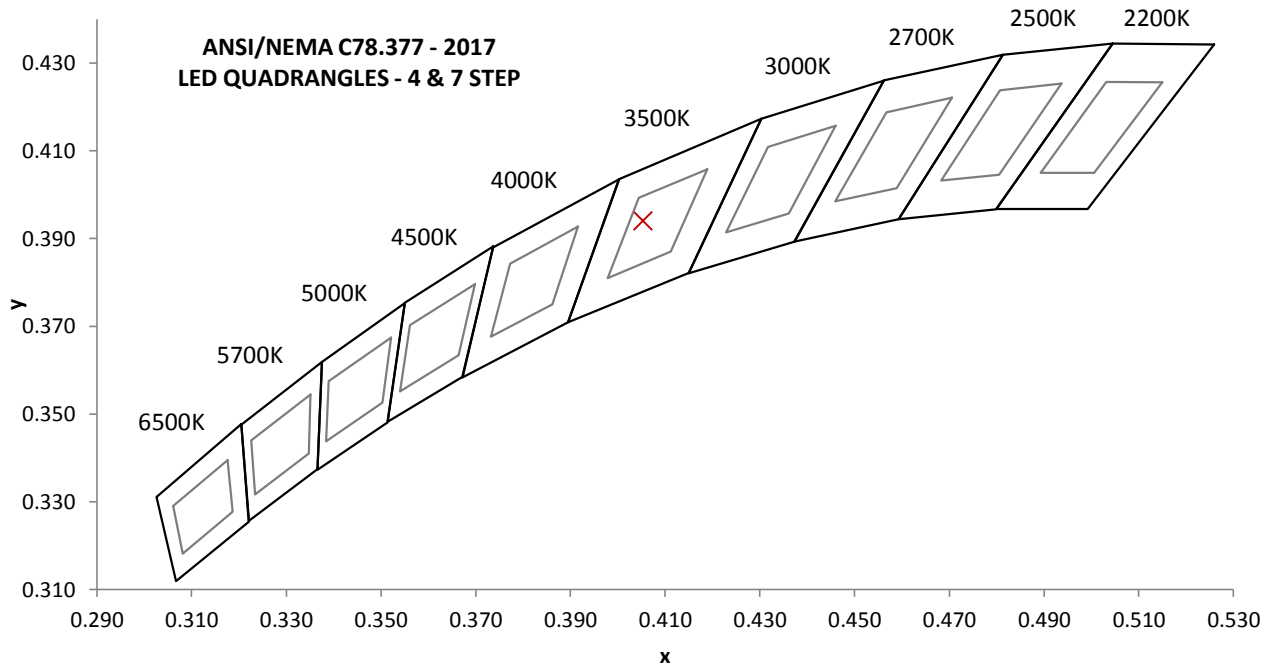
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.01	703.7	84.38	0.999	3.3
277.02	320.7	82.67	0.931	9.9

Measured at 120.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
13038.4	154.5	3525	82.9	7.9

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0013	0.405	0.394	0.234	0.513



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REPORT NO. 104618320CRT-001

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	2.3		460	168.7		570	206.3		680	58.9
355	2.3		465	116.9		575	214.9		685	50.7
360	2.4		470	100.8		580	224.7		690	43.5
365	2.3		475	78.1		585	230.6		695	37.2
370	2.0		480	61.9		590	236.6		700	31.8
375	1.6		485	62.5		595	239.7		705	27.1
380	1.4		490	68.4		600	240.4		710	23.2
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400	1.2		510	118.8		620	215.7		730	12.2
405	1.4		515	130.5		625	203.0		735	10.3
410	2.0		520	139.4		630	190.4		740	8.9
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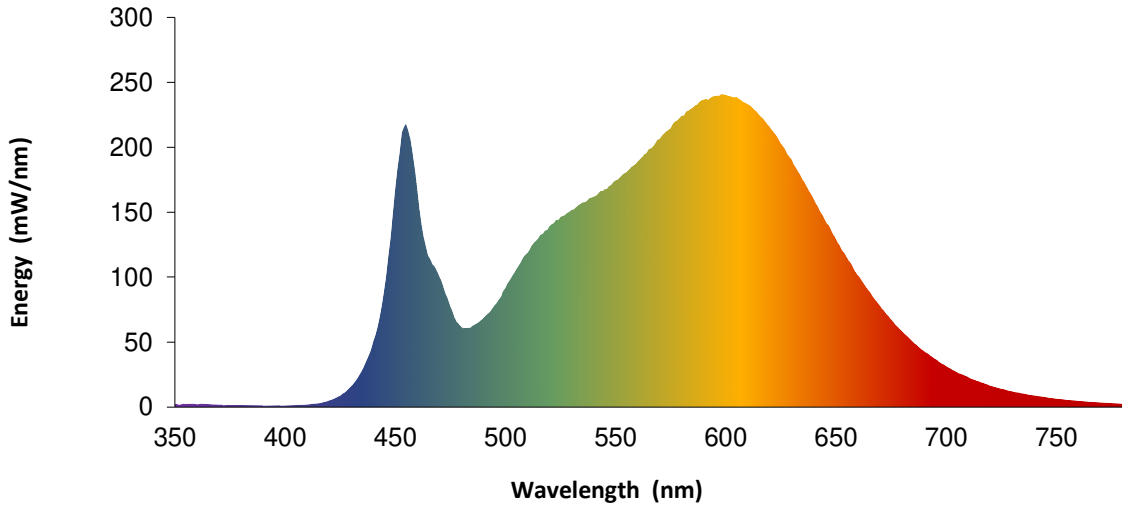
430	16.1		540	162.0		650	130.5		760	4.8
435	28.5		545	167.8		655	115.6		765	4.1
440	49.9		550	174.6		660	102.1		770	3.6
445	88.9		555	181.1		665	89.9		775	3.1
450	167.5		560	188.9		670	78.5		780	2.6
455	218.4		565	198.4		675	68.0		---	---



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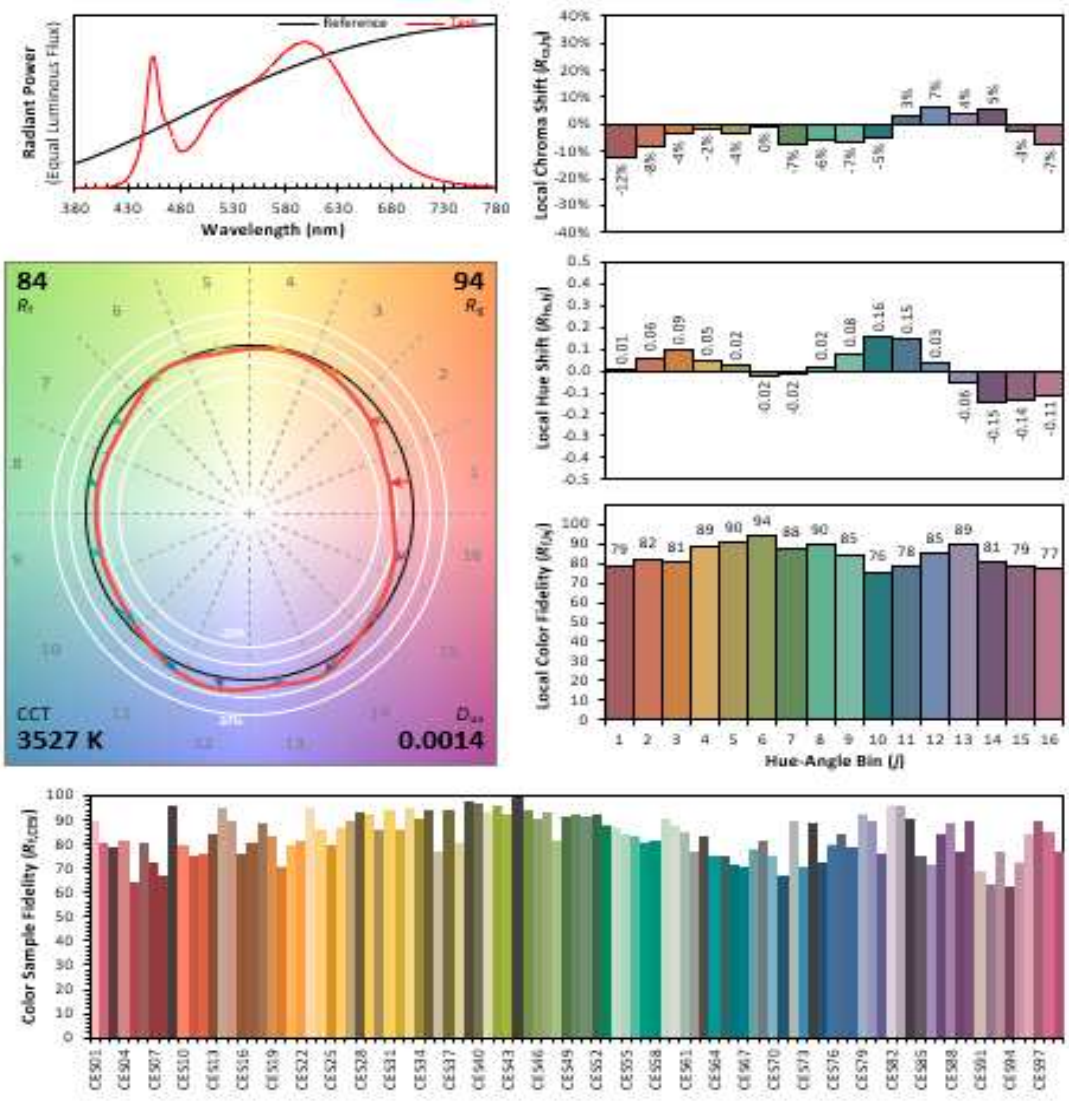
ANNEX A - TM-30 CALCULATIONS **REPORT NO. 104618320CRT-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
2	4CB-HE-UNV-43-N-3500	NA

TM-30 REPORT



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EQUIPMENT LIST

REPORT NO. 104618320CRT-001

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Elgar AC Power Supply	CW1251	---	VBU	VBU
2	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
3	Traceable Hygrothermometer	4800	L206	2/12/2021	2/12/2022
4	Yokogawa Power Analyzer	WT1600	E473	6/22/2020	6/22/2021
5	Fluke Thermometer	53 II	N1324	3/19/2020	3/19/2021
6	3M Integrating Sphere Spectrometer System	CDS 1100	O235	2/23/2021	5/23/2021
7	Fisher Scientific Stopwatch	14-649-9	N1132	3/18/2020	3/18/2021
8	Fluke Multimeter	87V	D590	6/15/2020	6/15/2021

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
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