

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCY2RS-L129302D-UNV-WW

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-004

## ISSUE DATE

8/19/2021

## REVISED DATE

None

## TEST DATES

8/16/21 through 8/19/21

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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## PAGES

12

**REPORT NUMBER**

104659241CRT-004

**MODEL NUMBER(s)**

ENCY2RS-L129302D-UNV-WW

**REPORT RENDERED TO:**

VISUAL COMFORT AND COMPANY  
7400 LINDER AVE  
SKOKIE, IL 60077  
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 federal government.

**AUTHORIZATION**

The testing performed was authorized by signed quote number Qu-01166088-0.

**TEST STANDARDS**

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

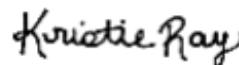
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



Gerald Gray  
Associate Engineer  
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Reviewer:



Kristie Ray  
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Title  
Lighting Division

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## SAMPLE INFORMATION

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### ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2108101057-001-2	PTB15W-0300-42	Driver	Production	8/10/2021
2	CRT2108101057-001-5	BXRE-30-G1000-C-83	LED	Production	8/10/2021
3	CRT2108101057-001-7	20°	Optic	Production	8/10/2021

### TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCY2RS-L129302D-UNV-WW	1,2,3

### SAMPLE PHOTOS - TESTED CONFIGURATIONS



## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCY2RS-L129302D-UNV-WW
Product Description:	2 Inch Cylinder Downlight, 90 CRI, 3000K 20° optic
LED Model No.:	BXRE-30-G1000-C-83
Driver Model No.:	PTB15W-0300-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	880.1	907.2
Input Power (W) @ 120 (Vac)	11.05	11.07
Lumen Efficacy (lm/W)	79.6	82.0
Input Power Factor (I) @ 120 (Vac)	0.988	0.986

Criteria	Results
Input ATHD (%) @ 120 (Vac)	11.82
Correlated Color Temperature (K)	3035
Color Rendering Index - Ra (I)	92.8
Color Rendering Index - R9 (I)	78.4
Duv (I)	0.0013
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.400
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.519

## 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. 104659241CRT-004**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129302D-UNV-WW	NA

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

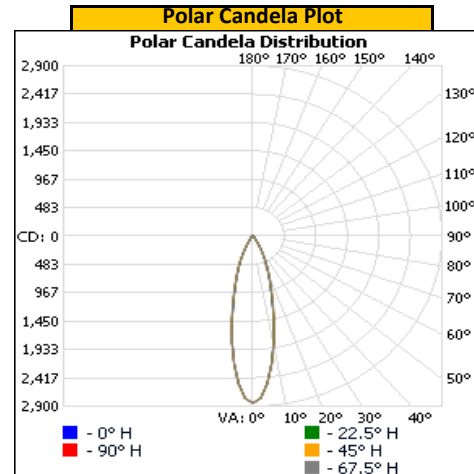
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.07	93.2	11.05	0.988

Light Output (lm)	Lumen Efficacy (lm/W)
880.1	79.6

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	2847	2847	2847	2847	2847
5	2519	2519	2528	2530	2522
10	1835	1840	1842	1844	1847
15	1157	1166	1194	1193	1170
20	716	721	739	741	735
25	425	425	438	445	442
30	205	204	216	219	216
35	89	90	93	94	94
40	55	56	57	57	56
45	40	41	41	41	42
50	30	29	30	30	30
55	20	20	20	20	20
60	16	16	17	17	17
65	13	13	13	13	13
70	9	8	8	8	8
75	5	4	5	4	4
80	1	1	1	1	1
85	0	0	0	0	0
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

Entire luminous intensity matrix found in .IES file



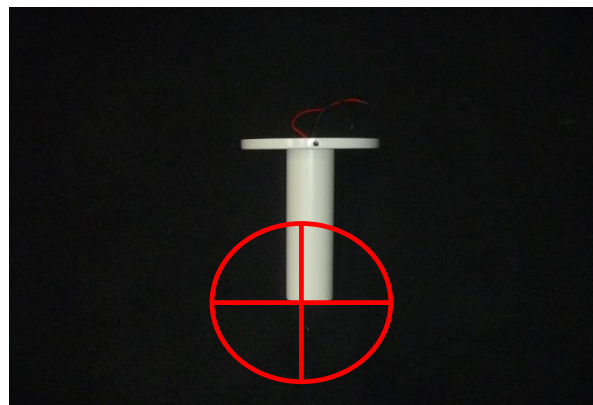
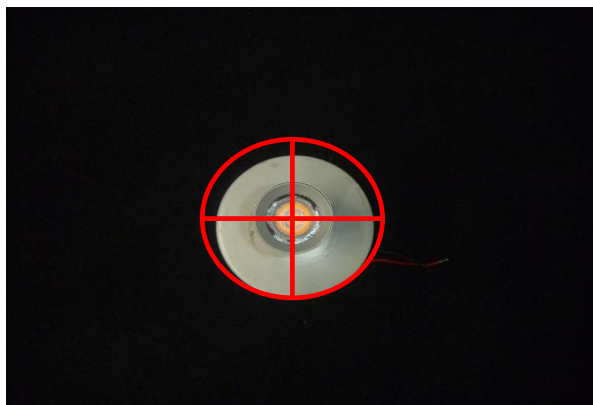
REPORT NO. 104659241CR1-004

**ORIENTATION AND ALIGNMENT OF EUT**

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.14	0.14	0.00
0°-180° H	90°-270° H	0°-180° V

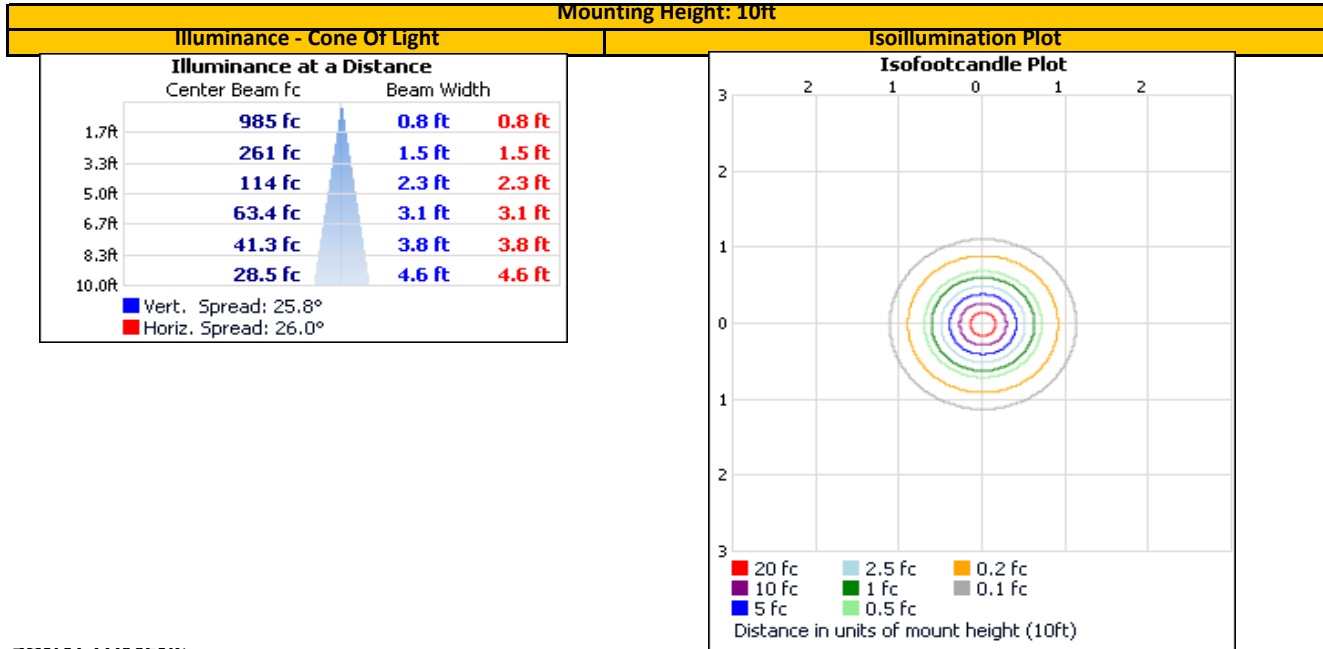
Test Distance (ft)
29.6

**PHOTOMETRIC CENTER OF EUT**



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## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	745.6	84.7%	0-10	217.4	24.7%
0-40	811.4	92.2%	10-20	328.4	37.3%
0-60	862.3	98.0%	20-30	199.7	22.7%
60-90	17.8	2.0%	30-40	65.8	7.5%
70-100	5.1	0.6%	40-50	32.0	3.6%
90-120	0.0	0.0%	50-60	18.9	2.2%
0-90	880.1	100.0%	60-70	12.7	1.4%
90-180	0.0	0.0%	70-80	4.9	0.6%
0-180	880.1	100.0%	80-90	0.2	0.0%
			90-100	0.0	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%

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**UNIFIED GLARE RATING (UGR) SUMMARY**

Reflectances					
Ceiling Cavity	70	70	50	50	30
Walls	50	30	50	30	30
Floor Cavity	20	20	20	20	20

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Crosswise				
15.6	16.6	16.0	16.9	17.3
17.1	17.9	17.5	18.3	18.6
17.4	18.2	17.8	18.5	18.9
17.4	18.1	17.8	18.5	18.9
17.4	18.0	17.8	18.4	18.8
17.3	18.0	17.7	18.3	18.8

4H	2H
	3H
	4H
	6H
	8H
	12H

16.2	17.0	16.6	17.3	17.7
17.7	18.3	18.1	18.7	19.1
18.0	18.6	18.5	19.0	19.5
18.1	18.6	18.6	19.0	19.5
18.0	18.5	18.5	18.9	19.4
18.0	18.4	18.5	18.9	19.3

8H	4H
	6H
	8H
	12H

18.1	18.5	18.5	19.0	19.4
18.1	18.5	18.7	19.0	19.5
18.1	18.4	18.6	18.9	19.4
18.0	18.3	18.5	18.8	19.4

12H	4H
	6H
	8H

18.0	18.4	18.5	18.9	19.4
18.1	18.4	18.6	18.9	19.4
18.0	18.3	18.5	18.8	19.4

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Endwise				
15.8	16.8	16.1	17.1	17.4
17.2	18.0	17.5	18.4	18.7
17.4	18.2	17.8	18.6	19.0
17.5	18.2	17.9	18.6	19.0
17.4	18.1	17.8	18.5	18.9
17.4	18.0	17.8	18.4	18.8

4H	2H
	3H
	4H
	6H
	8H
	12H

16.3	17.1	16.7	17.4	17.8
17.8	18.4	18.2	18.8	19.2
18.1	18.7	18.5	19.1	19.5
18.1	18.6	18.6	19.1	19.6
18.1	18.5	18.6	19.0	19.5
18.0	18.4	18.5	18.9	19.4

8H	4H
	6H
	8H
	12H

18.1	18.6	18.6	19.0	19.5
18.2	18.5	18.7	19.0	19.5
18.1	18.4	18.7	19.0	19.5
18.1	18.3	18.6	18.8	19.4

12H	4H
	6H
	8H

18.1	18.4	18.5	18.9	19.4
18.1	18.4	18.7	18.9	19.5
18.1	18.3	18.6	18.8	19.4

Maximum UGR	
19.6	



**INTEGRATING SPHERE TESTING**

**REPORT NO. 104659241CRT-004**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129302D-UNV-WW	NA

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

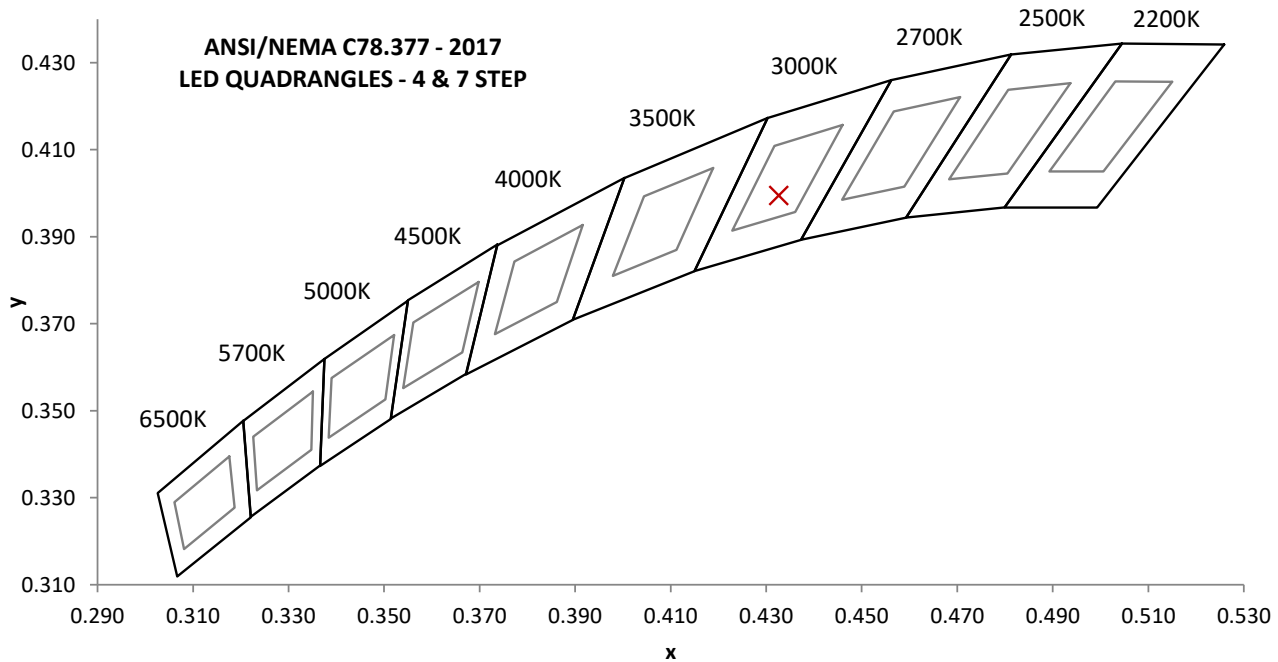
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
120.04	93.5	11.07	0.986	11.82

Measured at 120.04(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
907.2	82.0	3035	92.8	78.4

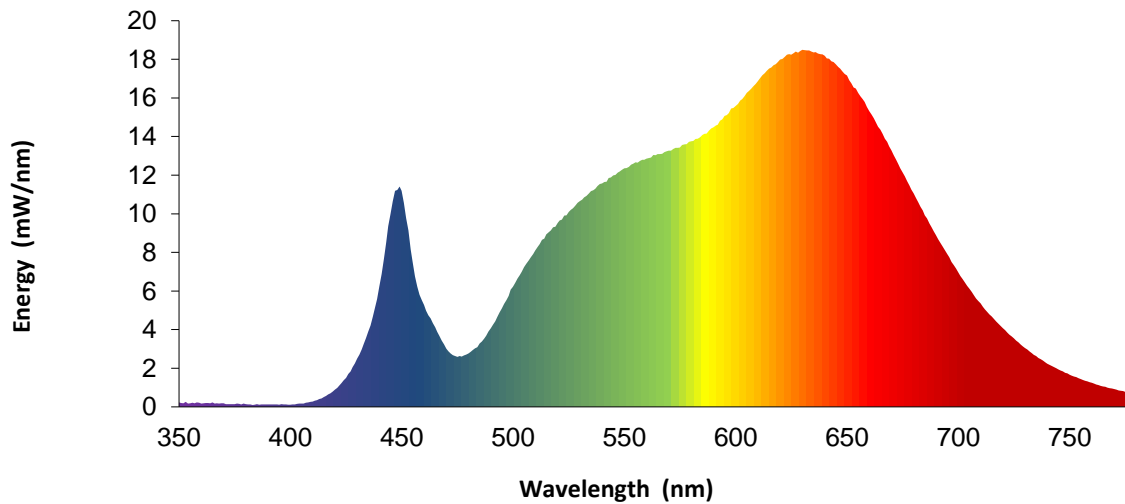
Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0013	0.433	0.400	0.250	0.519



**REPORT NO. 104659241CRT-004**

**SPECTRAL DISTRIBUTION OVER WAVELENGTHS**

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	5.3		570	13.3		680	11.1
355	0.2		465	4.1		575	13.4		685	9.9
360	0.2		470	3.0		580	13.8		690	8.9
365	0.2		475	2.6		585	14.1		695	7.9
370	0.2		480	2.8		590	14.5		700	7.0
375	0.1		485	3.3		595	15.1		705	6.1
380	0.1		490	4.1		600	15.6		710	5.4
385	0.1		495	5.1		605	16.3		715	4.7
390	0.1		500	6.2		610	16.9		720	4.1
395	0.1		505	7.2		615	17.5		725	3.5
400	0.1		510	8.1		620	18.0		730	3.1
405	0.2		515	8.9		625	18.2		735	2.6
410	0.3		520	9.5		630	18.5		740	2.2
415	0.5		525	10.1		635	18.4		745	1.9
420	0.9		530	10.7		640	18.2		750	1.7
425	1.5		535	11.2		645	17.7		755	1.4
430	2.5		540	11.6		650	17.2		760	1.2
435	3.9		545	12.0		655	16.3		765	1.1
440	6.2		550	12.4		660	15.3		770	0.9
445	10.0		555	12.7		665	14.4		775	0.8
450	11.2		560	12.9		670	13.3		780	0.7
455	7.5		565	13.1		675	12.2		---	---



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

**SEE ANNEX A FOR TM-30 REPORT**

**EQUIPMENT LIST**

**REPORT NO. 104659241CRT-004**

#	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	E474	6/15/2021	6/15/2022
5	Fluke Thermometer	53 II	D587	2/5/2021	2/5/2022
6	3M Integrating Sphere Spectrometer System	CDS 1100	O235	7/26/2021	10/26/2021
7	Fisher Scientific Stopwatch	14-649-9	N1132	3/26/2021	3/26/2022
8	LSI High Speed Mirror Goniophotometer	6440	---	8/16/2021	11/16/2021
9	Elgar AC Power Supply	CW1251	---	VBU	VBU
10	Yokogawa Power Analyzer	WT210	E464	5/11/2021	5/11/2022
11	Traceable Hygrothermometer	4800	L204	2/21/2021	2/21/2022
12	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
13	Omega Thermometer	DPI8-C24	M263	3/23/2021	3/23/2022
14	Bosch Distance Laser	Pro GLM 20	L211	3/3/2021	3/3/2022
15	M-D Building Products Digital Level	Smart Tool	L112	5/26/2021	5/26/2022

**REVISION HISTORY**

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
---	---	---	---	---
---	---	---	---	---

**ANNEX A - TM-30 CALCULATIONS**

**REPORT NO. 104659241CRT-004**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129302D-UNV-WW	NA

**TM-30 REPORT**

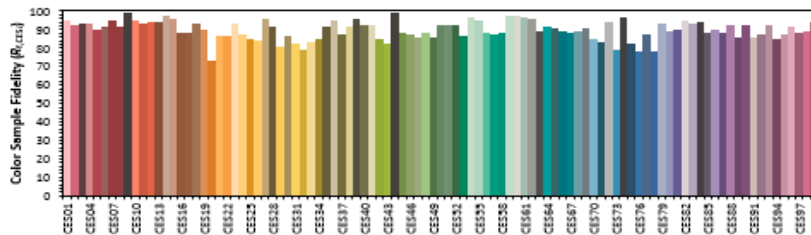
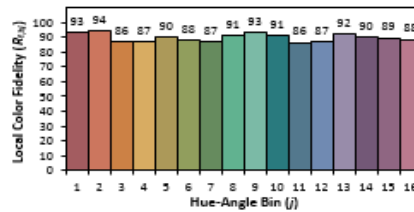
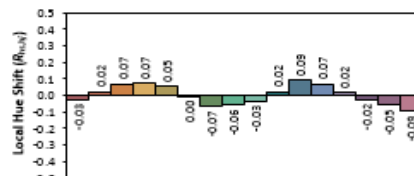
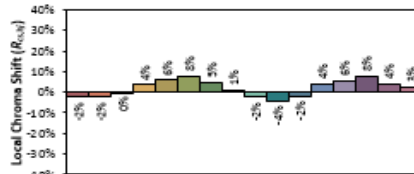
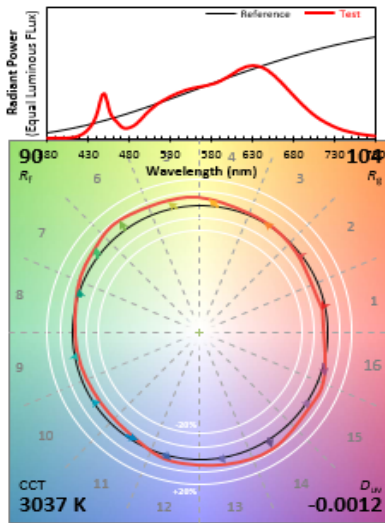
**ANSI/IES TM-30-18 Color Rendition Report**

Source: 104659241CRT-004

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 8/19/2021

Model: ENCY2RS-L129302D-UNV-WW



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

x 0.4326  
y 0.3995  
u' 0.2497  
v' 0.5189

Colors are for visual orientation purposes only. Created with the IES TM-30-18 Calculator Version 2.00.