

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCY2RS-L129WD4D-UNV-WW

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-001

## ISSUE DATE

8/19/2021

## REVISED DATE

None

## TEST DATES

8/13/21 through 8/19/2021

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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## PAGES

12

**REPORT NUMBER**

104659241CRT-001

**MODEL NUMBER(s)**

ENCY2RS-L129WD4D-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:

Reviewer:



Gerald Gray  
Associate Engineer  
Lighting Division



Kristie Ray  
Team Lead, Engineering  
Lighting Division

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## SAMPLE INFORMATION

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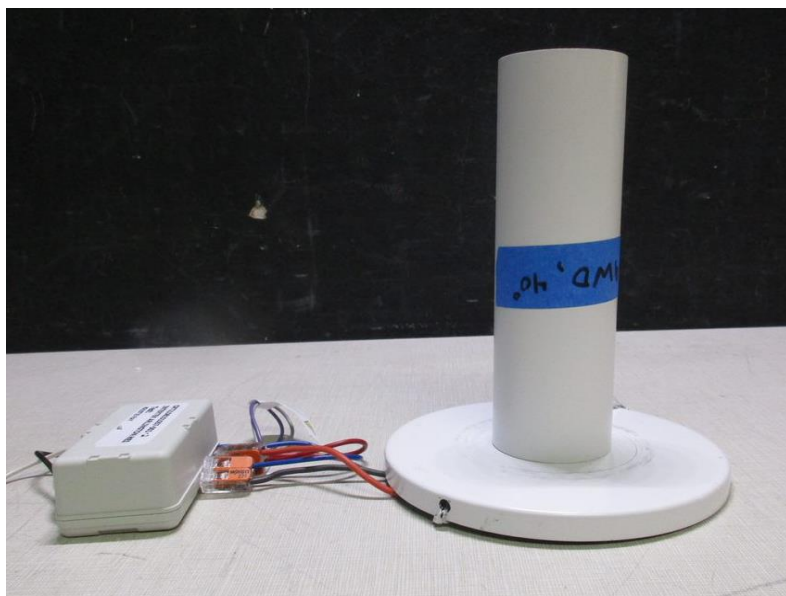
### ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2108101057-001-2	PTB15W-0300-42	Driver	Production	8/10/2021
2	CRT2108101057-001-3	BXRV-TR-2750G-10A0-A-23	LED	Production	8/10/2021
3	CRT2108101057-001-9	40°	Optic	Production	8/10/2021

### TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCY2RS-L129WD4D-UNV-WW	1,2,3

### SAMPLE PHOTOS - TESTED CONFIGURATIONS



## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCY2RS-L129WD4D-UNV-WW
Product Description:	2 Inch Cylinder Downlight, 90 CRI, Warm Dim 40 DEG OPTIC
LED Model No.:	BXRV-TR-2750G-10A0-A-23
Driver Model No.:	PTB15W-0300-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	835.9	849.7
Input Power (W) @ 120 (Vac)	12.03	12.07
Lumen Efficacy (lm/W)	69.5	70.4
Input Power Factor (I) @ 120 (Vac)	0.990	0.988

Criteria	Results
Input ATHD (%) @ 120 (Vac)	10.84
Correlated Color Temperature (K)	2995
Color Rendering Index - Ra (I)	93.8
Color Rendering Index - R9 (I)	76.0
Duv (I)	0.0020
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.399
Chromaticity Coordinate (u')	0.251
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**

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129WD4D-UNV-WW	NA

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

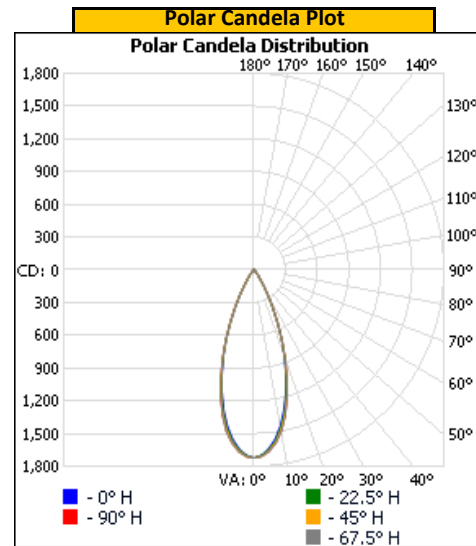
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.06	101.2	12.03	0.990

Light Output (lm)	Lumen Efficacy (lm/W)
835.9	69.5

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	1722	1722	1722	1722	1722
5	1640	1649	1662	1669	1668
10	1448	1468	1486	1502	1496
15	1165	1183	1205	1209	1213
20	848	855	863	868	869
25	519	523	525	531	533
30	261	265	269	270	272
35	112	111	113	117	117
40	51	53	55	55	55
45	28	28	28	29	29
50	15	15	15	15	15
55	8	8	8	8	8
60	5	6	6	6	5
65	4	4	4	4	4
70	2	2	2	2	2
75	1	1	1	1	0
80	0	0	0	0	0
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



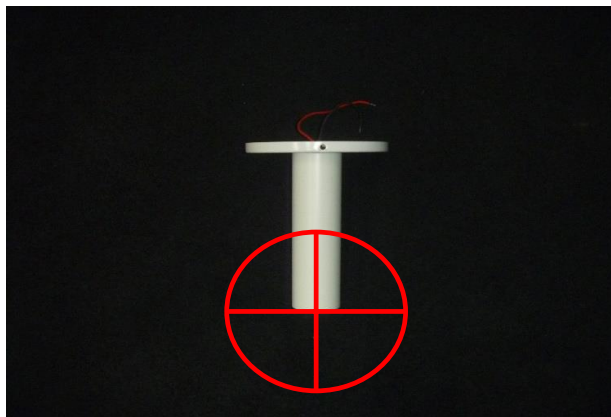
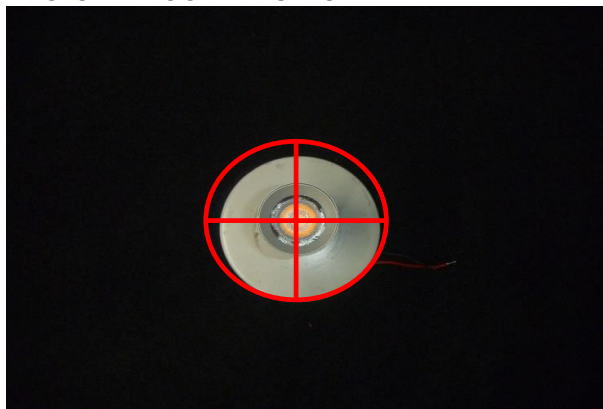
REPORT NO. 104659241CR1-001

**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

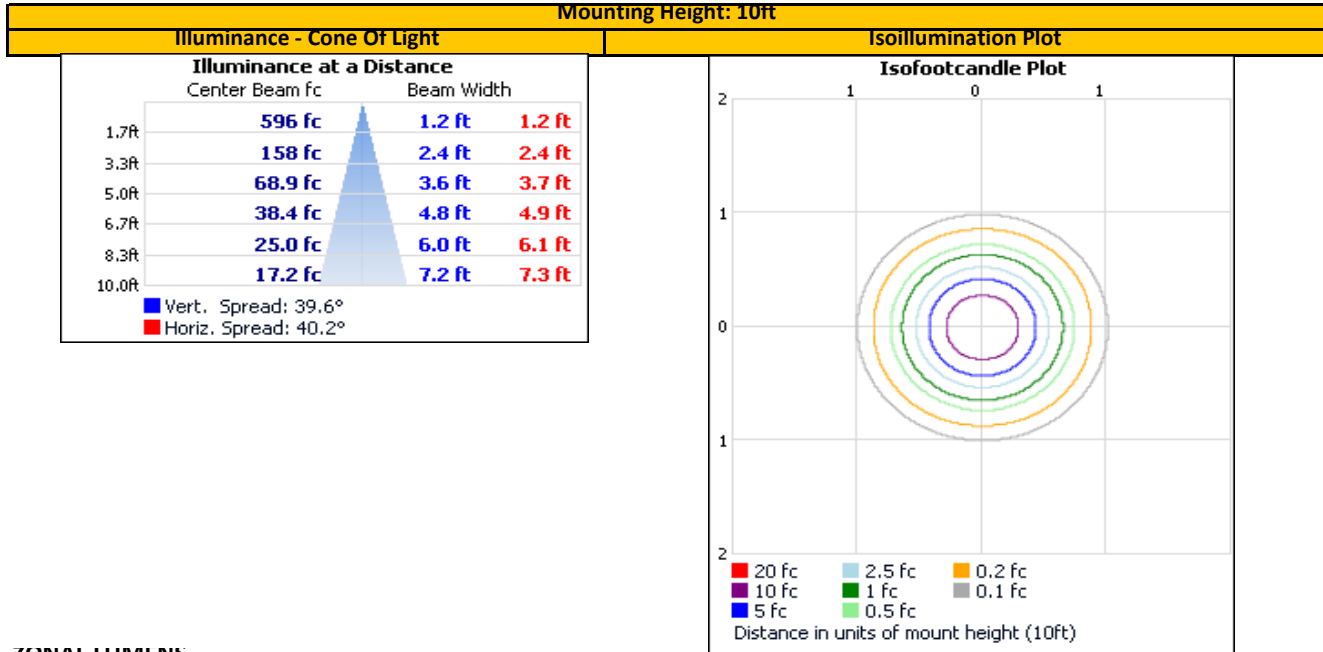
Test Distance (ft)
29.6

**PHOTOMETRIC CENTER OF EUT**



REPORT NO. 104659241CR1-001

## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	720.5	86.2%	90-100	0.0	0.0%
0-40	800.3	95.7%	100-110	0.0	0.0%
0-60	831.4	99.5%	110-120	0.0	0.0%
60-90	4.5	0.5%	120-130	0.0	0.0%
70-100	0.8	0.1%	130-140	0.0	0.0%
90-120	0.0	0.0%	140-150	0.0	0.0%
0-90	835.9	100.0%	150-160	0.0	0.0%
90-180	0.0	0.0%	160-170	0.0	0.0%
0-180	835.9	100.0%	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				
8.8	9.7	9.2	10.1	10.4
9.5	10.3	9.9	10.7	11.0
9.5	10.3	9.9	10.6	11.0
9.4	10.1	9.8	10.5	10.8
9.3	10.0	9.8	10.4	10.8
9.2	9.9	9.7	10.3	10.7

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

9.1	9.8	9.5	10.2	10.6
9.8	10.4	10.2	10.8	11.3
9.8	10.3	10.2	10.8	11.2
9.7	10.2	10.2	10.6	11.1
9.6	10.0	10.1	10.5	11.0
9.5	9.9	10.0	10.4	10.9

8H	4H
	6H
	8H
	12H

9.7	10.1	10.2	10.6	11.0
9.5	9.9	10.0	10.4	10.9
9.4	9.8	10.0	10.3	10.8
9.4	9.7	9.9	10.2	10.8

12H	4H
	6H
	8H

9.6	10.0	10.1	10.5	10.9
9.5	9.8	10.0	10.2	10.8
9.4	9.7	9.9	10.2	10.8

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

UGR Viewed Endwise				
8.8	9.8	9.2	10.1	10.4
9.6	10.4	9.9	10.7	11.1
9.6	10.3	10.0	10.7	11.1
9.4	10.1	9.9	10.5	10.9
9.4	10.0	9.8	10.4	10.8
9.3	9.9	9.7	10.3	10.7

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

9.1	9.9	9.5	10.2	10.6
9.9	10.5	10.3	10.9	11.3
9.8	10.4	10.3	10.8	11.3
9.7	10.2	10.2	10.7	11.1
9.7	10.1	10.1	10.6	11.0
9.6	10.0	10.1	10.5	10.9

8H	4H
	6H
	8H
	12H

9.7	10.2	10.2	10.6	11.1
9.6	9.9	10.1	10.4	10.9
9.5	9.8	10.0	10.3	10.8
9.5	9.7	10.0	10.2	10.8

12H	4H
	6H
	8H

9.6	10.0	10.1	10.5	11.0
9.5	9.8	10.0	10.3	10.8
9.5	9.7	10.0	10.2	10.8

Maximum UGR	
	11.3



**INTEGRATING SPHERE TESTING**

**REPORT NO. 104659241CRT-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129WD4D-UNV-WW	NA

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

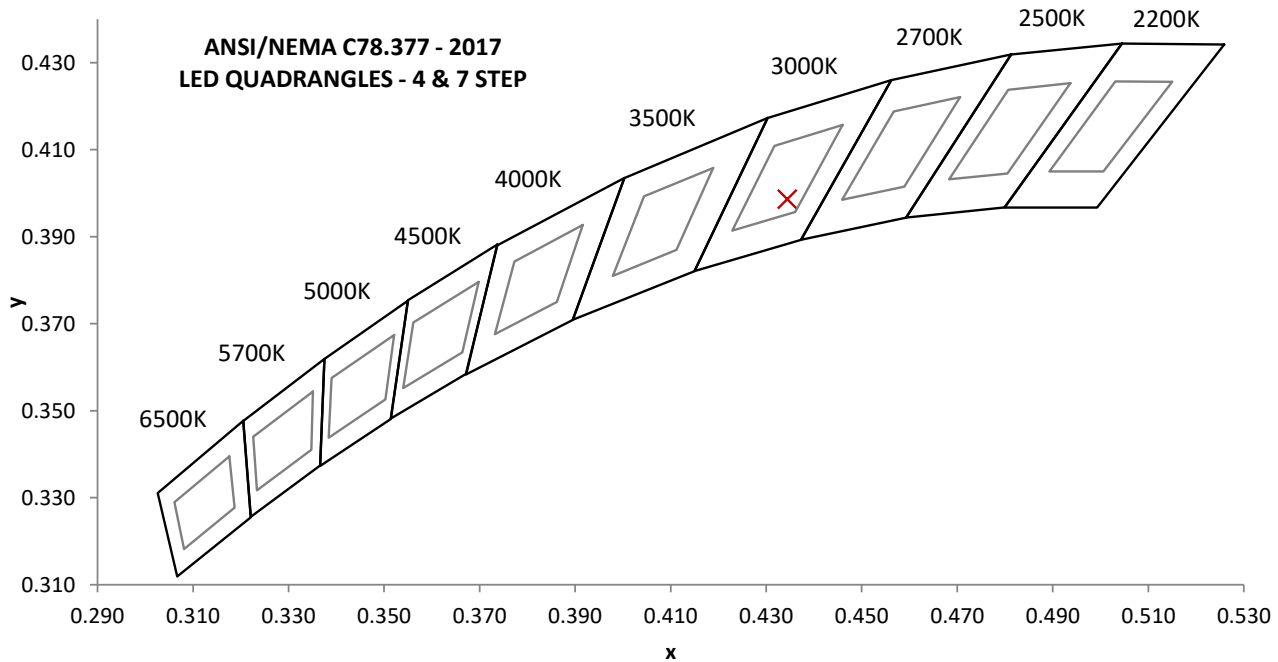
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
120.04	101.8	12.07	0.988	10.84

Measured at 120.04(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
849.7	70.4	2995	93.8	76.0

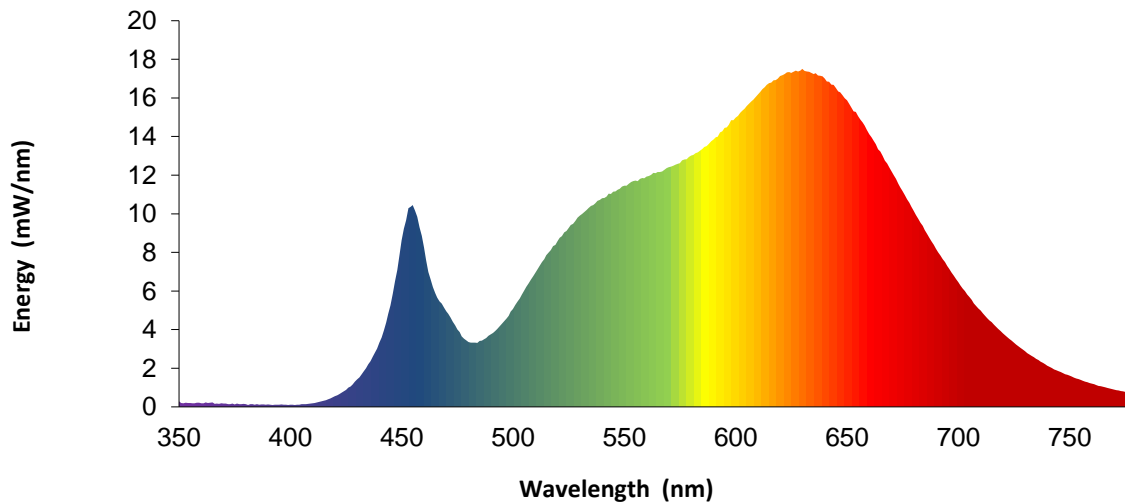
Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0020	0.434	0.399	0.251	0.519



**REPORT NO. 104659241CRT-001**

**SPECTRAL DISTRIBUTION OVER WAVELENGTHS**

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	8.2		570	12.4		680	10.2
355	0.2		465	5.9		575	12.6		685	9.1
360	0.2		470	5.0		580	13.0		690	8.2
365	0.2		475	4.0		585	13.4		695	7.3
370	0.2		480	3.4		590	13.8		700	6.5
375	0.1		485	3.4		595	14.5		705	5.7
380	0.1		490	3.7		600	15.0		710	5.0
385	0.1		495	4.3		605	15.6		715	4.4
390	0.1		500	5.1		610	16.2		720	3.8
395	0.1		505	6.0		615	16.8		725	3.3
400	0.1		510	6.9		620	17.1		730	2.9
405	0.1		515	7.9		625	17.3		735	2.5
410	0.2		520	8.6		630	17.5		740	2.1
415	0.3		525	9.3		635	17.2		745	1.9
420	0.6		530	9.9		640	17.0		750	1.6
425	0.9		535	10.4		645	16.5		755	1.4
430	1.4		540	10.8		650	15.9		760	1.2
435	2.2		545	11.1		655	15.0		765	1.0
440	3.3		550	11.5		660	14.1		770	0.9
445	5.3		555	11.7		665	13.2		775	0.8
450	8.6		560	11.9		670	12.2		780	0.7
455	10.5		565	12.2		675	11.2		---	---



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-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	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-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129WD4D-UNV-WW	NA

**TM-30 REPORT**

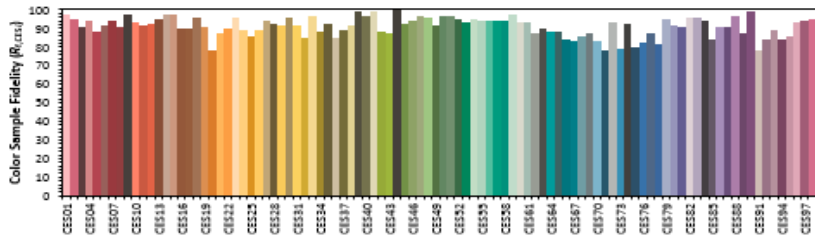
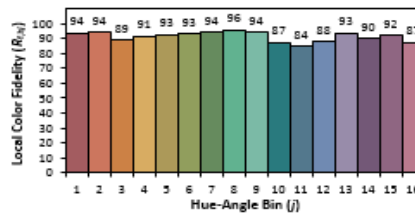
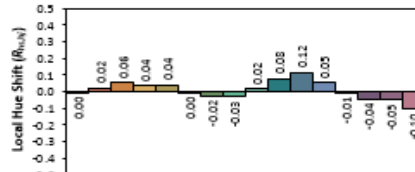
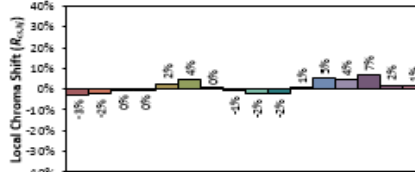
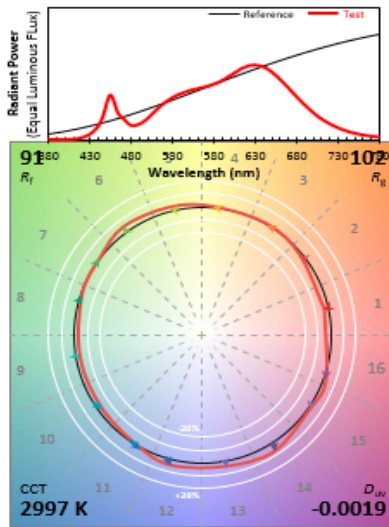
**ANSI/IES TM-30-18 Color Rendition Report**

Source: 104659241CRT-001

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 8/19/2021

Model: ENCY2RS-L129WD4D-UNV-WW



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

x 0.4344  
y 0.3986  
u' 0.2513  
v' 0.5188

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