

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCY2RS-L129306D-UNV-WW

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-003

## 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-003

**MODEL NUMBER(s)**

ENCY2RS-L129306D-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**

**REPORT NO. 104659241CRT-003**

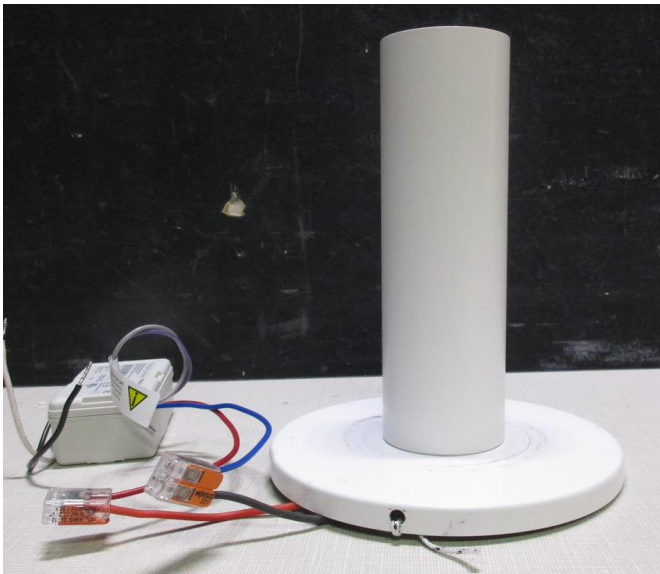
**ITEMS RECEIVED**

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	CRT2108101057-001-11	60°	Optic	Production	8/10/2021

**TESTED SAMPLE CONFIGURATIONS**

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCY2RS-L129306D-UNV-WW	1,2,3

**SAMPLE PHOTOS - TESTED CONFIGURATIONS**



## SUMMARY

REPORT NO. 104659241CRT-003

### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCY2RS-L129306D-UNV-WW
Product Description:	2 Inch Cylinder Downlight, 90 CRI, 3000K 60° 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)	977.9	1019.0
Input Power (W) @ 120 (Vac)	11.05	11.08
Lumen Efficacy (lm/W)	88.5	92.0
Input Power Factor (I) @ 120 (Vac)	0.988	0.986

Criteria	Results
Input ATHD (%) @ 120 (Vac)	11.86
Correlated Color Temperature (K)	3031
Color Rendering Index - Ra (I)	92.2
Color Rendering Index - R9 (I)	75.1
Duv (I)	0.0008
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.401
Chromaticity Coordinate (u')	0.250
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**

**REPORT NO. 104659241CRT-003**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129306D-UNV-WW	NA

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

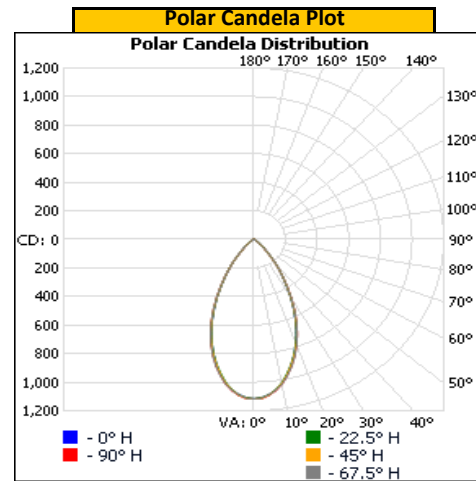
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.08	93.2	11.05	0.988

Light Output (lm)	Lumen Efficacy (lm/W)
977.9	88.5

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	1115	1115	1115	1115	1115
5	1090	1090	1093	1093	1096
10	1021	1019	1021	1028	1028
15	909	906	910	923	920
20	776	775	782	789	788
25	624	623	631	638	636
30	464	463	468	472	471
35	316	318	318	320	320
40	202	202	198	200	200
45	108	108	104	104	104
50	62	64	60	58	58
55	35	37	34	33	33
60	20	21	20	20	19
65	9	9	9	8	8
70	6	6	6	6	6
75	4	4	4	4	4
80	2	2	2	2	2
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



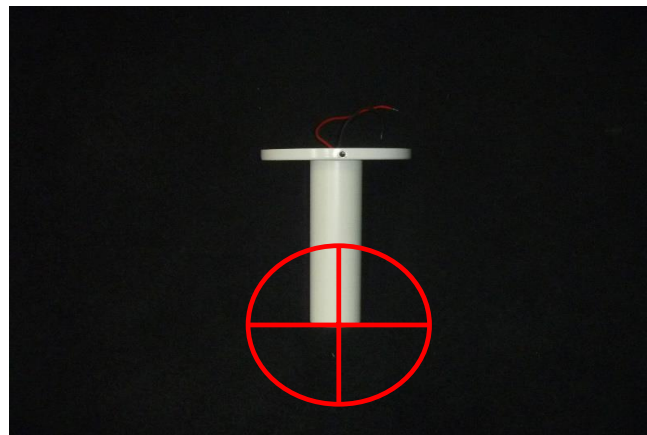
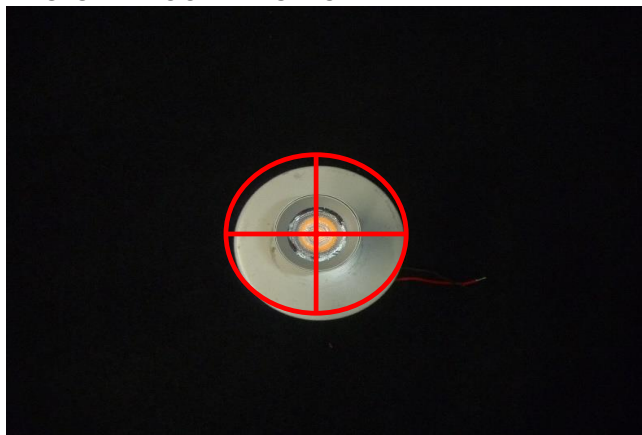
**REPORT NO. 104659241CR1-003**

**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

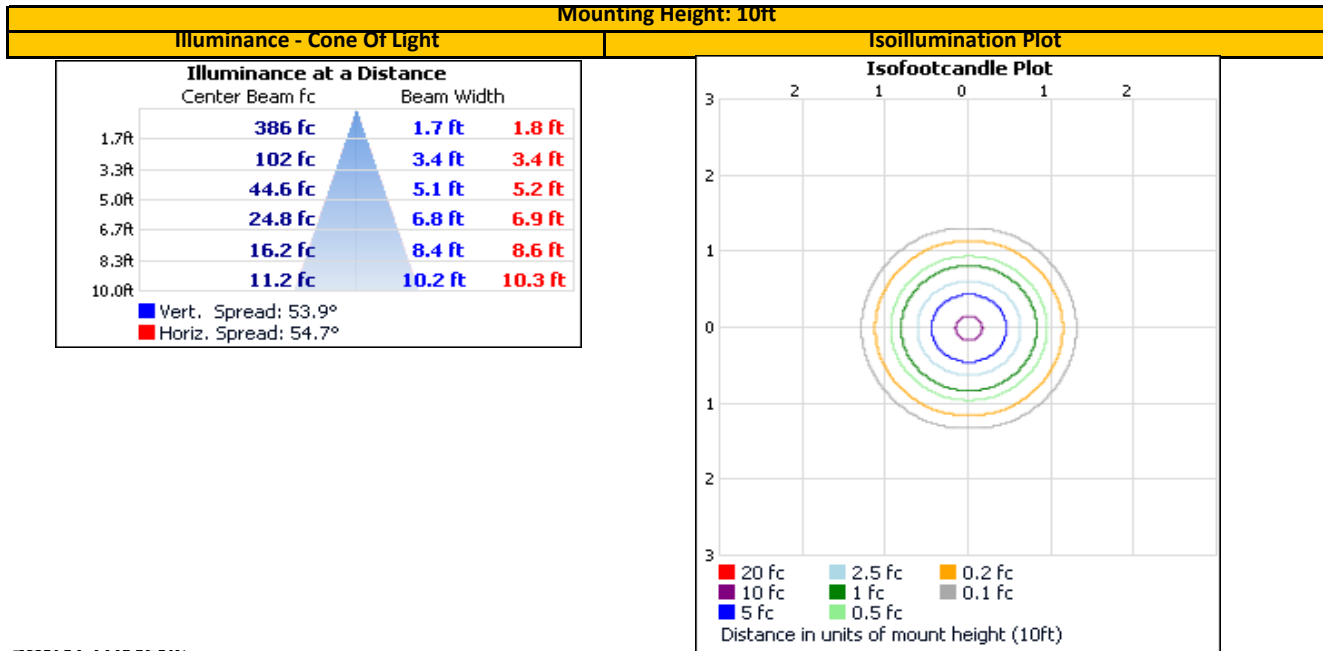
Test Distance (ft)
29.6

**PHOTOMETRIC CENTER OF EUT**



REPORT NO. 104659241CR1-003

## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary																																																																																																			
<table><tr><th>Zone</th><th>Lumens</th><th>Luminaire</th></tr><tr><td>0-30</td><td>642.1</td><td>65.7%</td></tr><tr><td>0-40</td><td>842.4</td><td>86.1%</td></tr><tr><td>0-60</td><td>962.3</td><td>98.4%</td></tr><tr><td>60-90</td><td>15.6</td><td>1.6%</td></tr><tr><td>70-100</td><td>4.8</td><td>0.5%</td></tr><tr><td>90-120</td><td>0.0</td><td>0.0%</td></tr><tr><td>0-90</td><td>977.9</td><td>100.0%</td></tr><tr><td>90-180</td><td>0.0</td><td>0.0%</td></tr><tr><td>0-180</td><td>977.9</td><td>100.0%</td></tr></table>			Zone	Lumens	Luminaire	0-30	642.1	65.7%	0-40	842.4	86.1%	0-60	962.3	98.4%	60-90	15.6	1.6%	70-100	4.8	0.5%	90-120	0.0	0.0%	0-90	977.9	100.0%	90-180	0.0	0.0%	0-180	977.9	100.0%	<table><tr><th>Zone</th><th>Lumens</th><th>Total</th><th>Zone</th><th>Lumens</th><th>Total</th></tr><tr><td>0-10</td><td>101.9</td><td>10.4%</td><td>90-100</td><td>0.0</td><td>0.0%</td></tr><tr><td>10-20</td><td>253.9</td><td>26.0%</td><td>100-110</td><td>0.0</td><td>0.0%</td></tr><tr><td>20-30</td><td>286.2</td><td>29.3%</td><td>110-120</td><td>0.0</td><td>0.0%</td></tr><tr><td>30-40</td><td>200.3</td><td>20.5%</td><td>120-130</td><td>0.0</td><td>0.0%</td></tr><tr><td>40-50</td><td>87.3</td><td>8.9%</td><td>130-140</td><td>0.0</td><td>0.0%</td></tr><tr><td>50-60</td><td>32.6</td><td>3.3%</td><td>140-150</td><td>0.0</td><td>0.0%</td></tr><tr><td>60-70</td><td>10.7</td><td>1.1%</td><td>150-160</td><td>0.0</td><td>0.0%</td></tr><tr><td>70-80</td><td>4.4</td><td>0.4%</td><td>160-170</td><td>0.0</td><td>0.0%</td></tr><tr><td>80-90</td><td>0.5</td><td>0.0%</td><td>170-180</td><td>0.0</td><td>0.0%</td></tr></table>							Zone	Lumens	Total	Zone	Lumens	Total	0-10	101.9	10.4%	90-100	0.0	0.0%	10-20	253.9	26.0%	100-110	0.0	0.0%	20-30	286.2	29.3%	110-120	0.0	0.0%	30-40	200.3	20.5%	120-130	0.0	0.0%	40-50	87.3	8.9%	130-140	0.0	0.0%	50-60	32.6	3.3%	140-150	0.0	0.0%	60-70	10.7	1.1%	150-160	0.0	0.0%	70-80	4.4	0.4%	160-170	0.0	0.0%	80-90	0.5	0.0%	170-180	0.0	0.0%
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**REPORT NO. 104659241CRT-003**

**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				
18.3	19.4	18.7	19.7	20.0
18.6	19.5	19.0	19.8	20.2
18.6	19.5	19.1	19.9	20.3
18.7	19.5	19.1	19.8	20.2
18.6	19.4	19.1	19.8	20.2
18.6	19.3	19.0	19.7	20.1

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

18.2	19.1	18.7	19.5	19.9
18.6	19.3	19.0	19.7	20.1
18.8	19.4	19.2	19.8	20.2
18.8	19.4	19.3	19.8	20.3
18.8	19.3	19.3	19.7	20.2
18.7	19.2	19.2	19.6	20.1

8H	4H
	6H
	8H
	12H

18.7	19.2	19.2	19.7	20.1
18.8	19.2	19.3	19.7	20.2
18.8	19.1	19.3	19.6	20.1
18.7	19.0	19.2	19.5	20.1

12H	4H
	6H
	8H

18.6	19.1	19.1	19.6	20.1
18.8	19.1	19.3	19.6	20.1
18.7	19.0	19.3	19.5	20.1

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

UGR Viewed Endwise				
17.7	18.8	18.0	19.1	19.4
18.0	18.9	18.4	19.2	19.6
18.1	18.9	18.5	19.3	19.7
18.1	18.9	18.5	19.3	19.7
18.1	18.8	18.5	19.2	19.6
18.0	18.7	18.5	19.1	19.6

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

17.6	18.5	18.0	18.8	19.2
18.1	18.8	18.5	19.2	19.6
18.3	18.9	18.7	19.3	19.7
18.3	18.9	18.8	19.3	19.8
18.3	18.8	18.8	19.2	19.7
18.2	18.7	18.7	19.1	19.6

8H	4H
	6H
	8H
	12H

18.2	18.7	18.7	19.2	19.6
18.3	18.7	18.9	19.2	19.7
18.3	18.7	18.8	19.2	19.7
18.3	18.6	18.8	19.1	19.6

12H	4H
	6H
	8H

18.2	18.6	18.7	19.1	19.6
18.3	18.6	18.8	19.1	19.7
18.3	18.6	18.8	19.1	19.7

Maximum UGR	
20.3	



# **INTEGRATING SPHERE TESTING**

**REPORT NO. 104659241CRT-003**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129306D-UNV-WW	NA

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

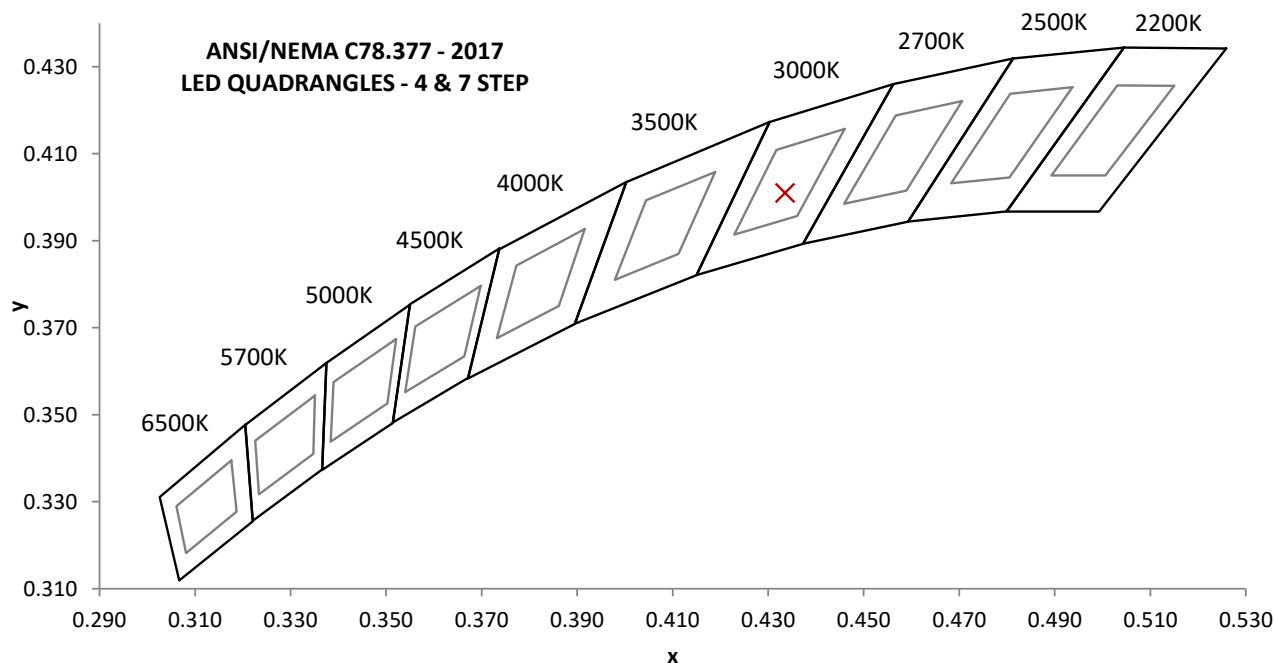
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
120.04	93.6	11.08	0.986	11.86

Measured at 120.04(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
1019.0	92.0	3031	92.2	75.1

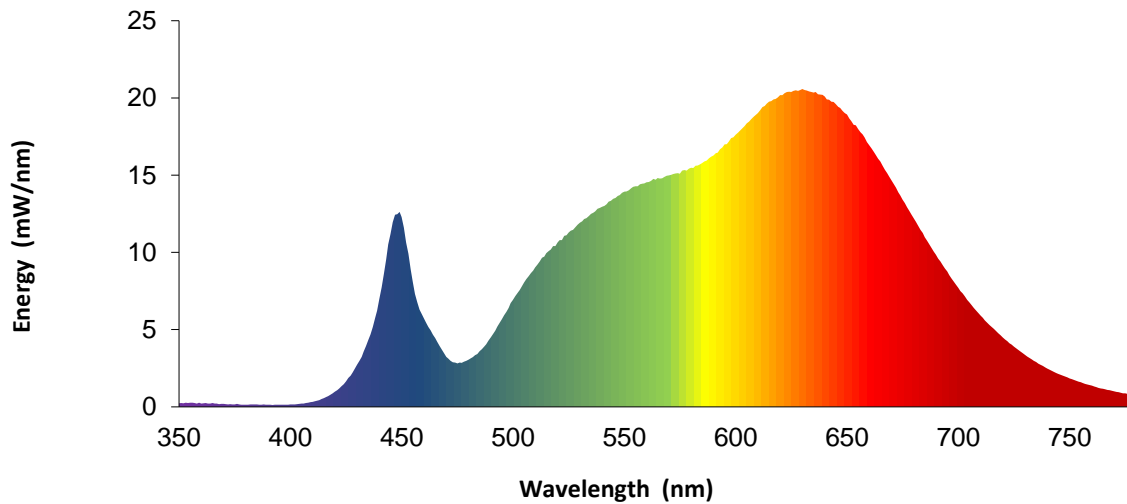
Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0008	0.434	0.401	0.250	0.520



**REPORT NO. 104659241CRT-003**

**SPECTRAL DISTRIBUTION OVER WAVELENGTHS**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.2	460	5.7	570	15.0	680	12.2
355	0.3	465	4.5	575	15.1	685	11.0
360	0.2	470	3.2	580	15.5	690	9.9
365	0.2	475	2.8	585	15.8	695	8.8
370	0.2	480	3.0	590	16.3	700	7.7
375	0.2	485	3.6	595	17.0	705	6.8
380	0.1	490	4.5	600	17.6	710	5.9
385	0.2	495	5.7	605	18.4	715	5.2
390	0.1	500	6.9	610	19.0	720	4.5
395	0.1	505	8.1	615	19.8	725	3.9
400	0.2	510	9.0	620	20.2	730	3.4
405	0.2	515	9.9	625	20.4	735	2.9
410	0.3	520	10.6	630	20.6	740	2.5
415	0.6	525	11.3	635	20.3	745	2.1
420	1.0	530	11.9	640	20.1	750	1.8
425	1.7	535	12.5	645	19.6	755	1.6
430	2.7	540	13.0	650	18.9	760	1.4
435	4.3	545	13.5	655	18.0	765	1.2
440	7.0	550	13.9	660	16.9	770	1.0
445	11.2	555	14.3	665	15.9	775	0.9
450	12.3	560	14.5	670	14.7	780	0.7
455	8.1	565	14.8	675	13.4	---	---



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-003**

#	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-003**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129306D-UNV-WW	NA

**TM-30 REPORT**

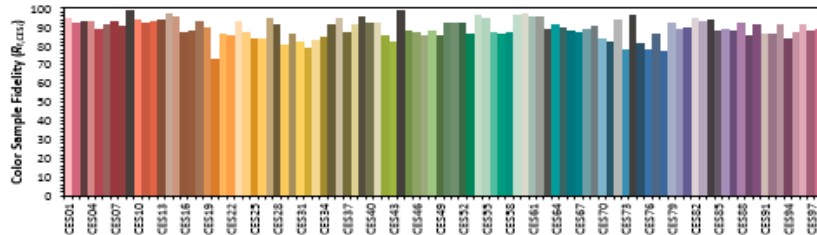
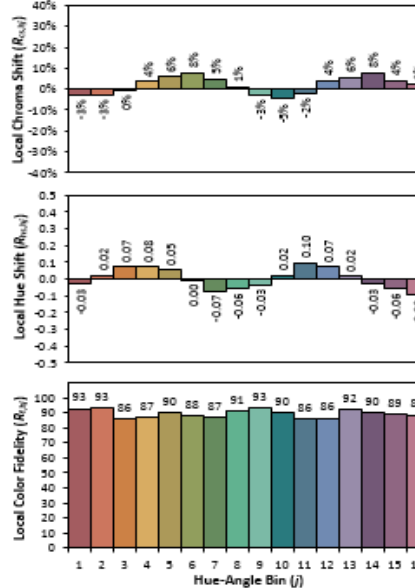
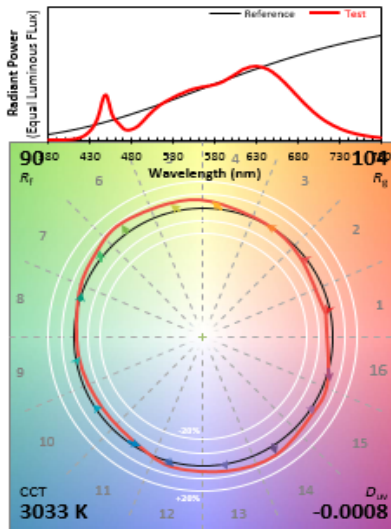
**ANSI/IES TM-30-18 Color Rendition Report**

Source: 104659241CRT-003

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 8/19/2021

Model: ENCY2RS-L129306D-UNV-WW



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

$x$  0.4335  
 $y$  0.4010  
 $u'$  0.2497  
 $v'$  0.5197

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