

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCY2RS-L129274D-UNV-WW

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-007

## ISSUE DATE

8/19/2021

## REVISED DATE

None

## TEST DATES

8/17/21 though 8/19/21

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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## PAGES

12

**REPORT NUMBER**

104659241CRT-007

**MODEL NUMBER(s)**

ENCY2RS-L129274D-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

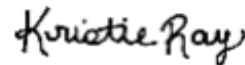
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



Gerald Gray  
Associate Engineer  
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Reviewer:



Kristie Ray  
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**SAMPLE INFORMATION**

**REPORT NO. 104659241CRT-007**

**ITEMS RECEIVED**

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2108101057-001-2	PTB15W-0300-42	Driver	Production	8/10/2021
2	CRT2108101057-001-4	BXRE-27-G1000-C-83	LED	Production	8/10/2021
3	CRT2108101057-001-10	40°	Optic	Production	8/10/2021

**TESTED SAMPLE CONFIGURATIONS**

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCY2RS-L129274D-UNV-WW	1,2,3

**SAMPLE PHOTOS - TESTED CONFIGURATIONS**



## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCY2RS-L129274D-UNV-WW
Product Description:	2 Inch Cylinder Downlight, 90 CRI, 2700K 40° optic
LED Model No.:	BXRE-27-G1000-C-83
Driver Model No.:	PTB15W-0300-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	916.9	945.0
Input Power (W) @ 120 (Vac)	11.03	11.05
Lumen Efficacy (lm/W)	83.1	85.5
Input Power Factor (I) @ 120 (Vac)	0.988	0.986

Criteria	Results
Input ATHD (%) @ 120 (Vac)	11.85
Correlated Color Temperature (K)	2716
Color Rendering Index - Ra (I)	91.9
Color Rendering Index - R9 (I)	70.7
Duv (I)	0.0008
Chromaticity Coordinate (x)	0.458
Chromaticity Coordinate (y)	0.409
Chromaticity Coordinate (u')	0.262
Chromaticity Coordinate (v')	0.526

## 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-007**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129274D-UNV-WW	NA

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

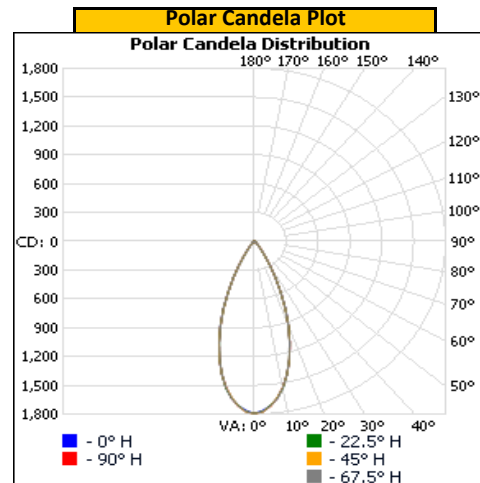
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.08	93.0	11.03	0.988

Light Output (lm)	Lumen Efficacy (lm/W)
916.9	83.1

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	1793	1793	1793	1793	1793
5	1717	1718	1722	1723	1725
10	1545	1550	1542	1546	1542
15	1272	1270	1273	1267	1271
20	940	935	936	926	934
25	588	589	586	587	591
30	298	303	303	307	312
35	128	128	131	132	135
40	62	63	64	63	64
45	36	36	36	36	37
50	21	21	21	21	22
55	13	13	13	13	14
60	10	10	10	10	10
65	7	7	7	7	8
70	5	5	5	5	5
75	2	2	2	2	2
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



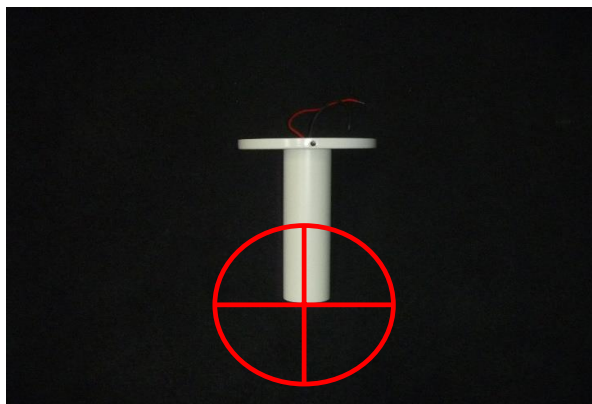
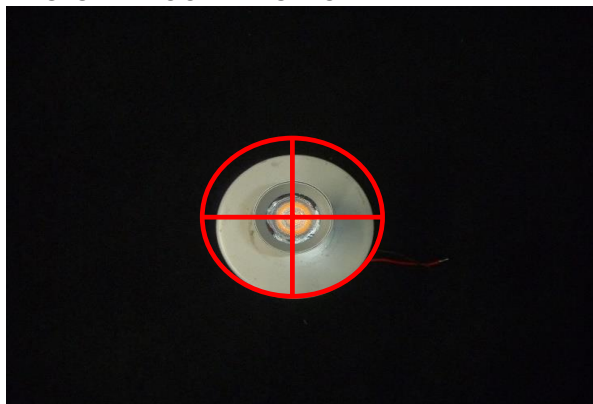
REPORT NO. 104659241CR1-007

**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

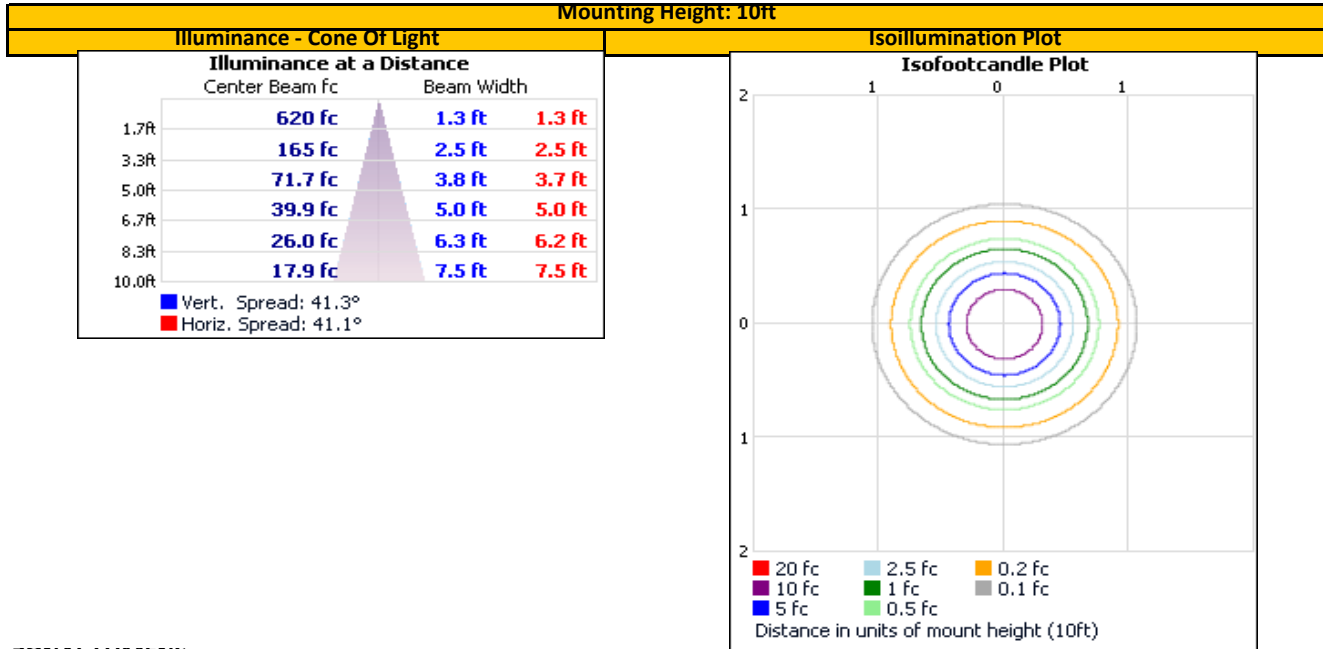
Test Distance (ft)
29.6

**PHOTOMETRIC CENTER OF EUT**



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## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	774.0	84.4%	0-10	158.4	17.3%
0-40	865.5	94.4%	10-20	346.9	37.8%
0-60	907.3	99.0%	20-30	268.6	29.3%
60-90	9.6	1.0%	30-40	91.5	10.0%
70-100	2.3	0.2%	40-50	29.2	3.2%
90-120	0.0	0.0%	50-60	12.6	1.4%
0-90	916.9	100.0%	60-70	7.3	0.8%
90-180	0.0	0.0%	70-80	2.3	0.2%
0-180	916.9	100.0%	80-90	0.0	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				
12.4	13.4	12.8	13.7	14.0
13.5	14.4	13.9	14.7	15.1
13.7	14.4	14.1	14.8	15.2
13.6	14.3	14.0	14.7	15.1
13.5	14.2	14.0	14.6	15.0
13.5	14.1	13.9	14.5	14.9

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

12.8	13.6	13.2	13.9	14.3
14.0	14.6	14.4	15.0	15.4
14.1	14.7	14.6	15.1	15.6
14.1	14.6	14.5	15.0	15.5
14.0	14.4	14.5	14.9	15.4
13.9	14.3	14.4	14.8	15.3

8H	4H
	6H
	8H
	12H

14.1	14.5	14.5	15.0	15.5
14.0	14.4	14.5	14.9	15.3
13.9	14.2	14.5	14.8	15.3
13.9	14.1	14.4	14.6	15.2

12H	4H
	6H
	8H

14.0	14.4	14.5	14.9	15.4
13.9	14.2	14.5	14.7	15.3
13.9	14.1	14.4	14.6	15.2

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

UGR Viewed Endwise				
12.5	13.5	12.9	13.8	14.1
13.6	14.4	14.0	14.7	15.1
13.7	14.5	14.1	14.8	15.2
13.6	14.3	14.0	14.7	15.1
13.6	14.2	14.0	14.6	15.0
13.5	14.2	14.0	14.5	15.0

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

12.9	13.6	13.3	14.0	14.4
14.0	14.6	14.4	15.1	15.5
14.2	14.7	14.6	15.2	15.6
14.1	14.6	14.6	15.0	15.5
14.0	14.5	14.5	14.9	15.4
14.0	14.4	14.5	14.8	15.3

8H	4H
	6H
	8H
	12H

14.1	14.6	14.6	15.0	15.5
14.0	14.4	14.5	14.9	15.4
14.0	14.3	14.5	14.8	15.3
13.9	14.2	14.4	14.7	15.3

12H	4H
	6H
	8H

14.0	14.4	14.5	14.9	15.4
14.0	14.3	14.5	14.8	15.3
13.9	14.2	14.4	14.7	15.3

Maximum UGR	
15.6	



**INTEGRATING SPHERE TESTING**

**REPORT NO. 104659241CRT-007**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129274D-UNV-WW	NA

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

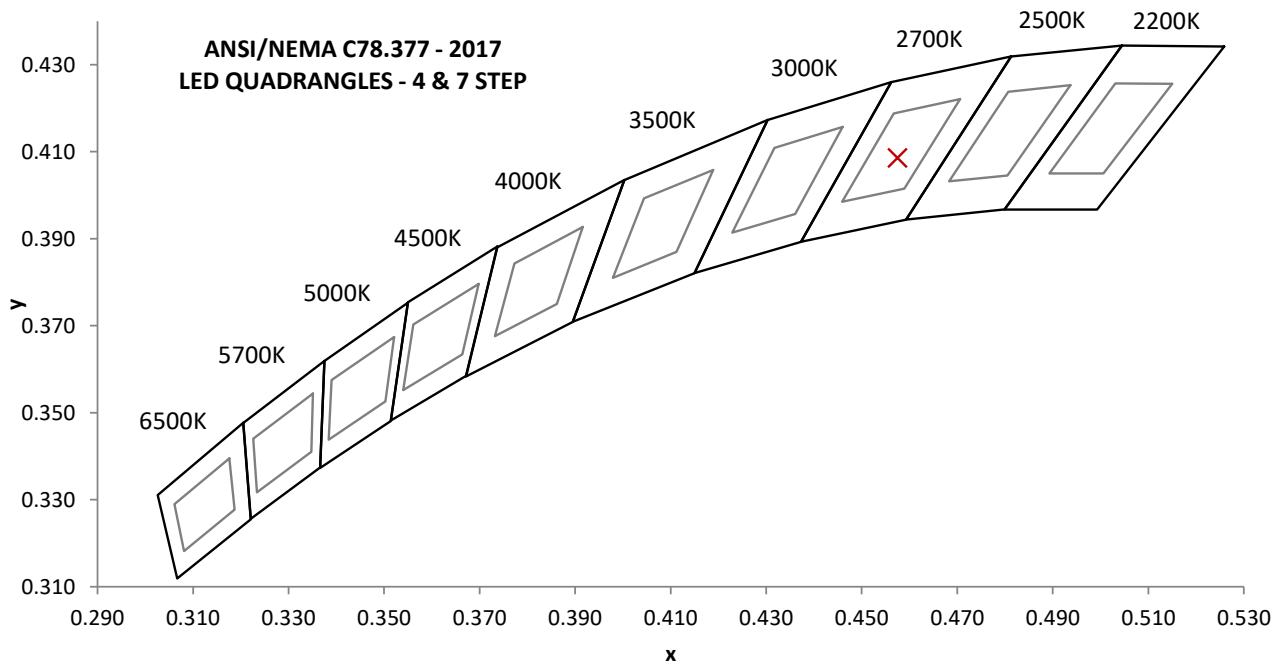
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.03	93.4	11.05	0.986	11.85

Measured at 120.03(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
945.0	85.5	2716	91.9	70.7

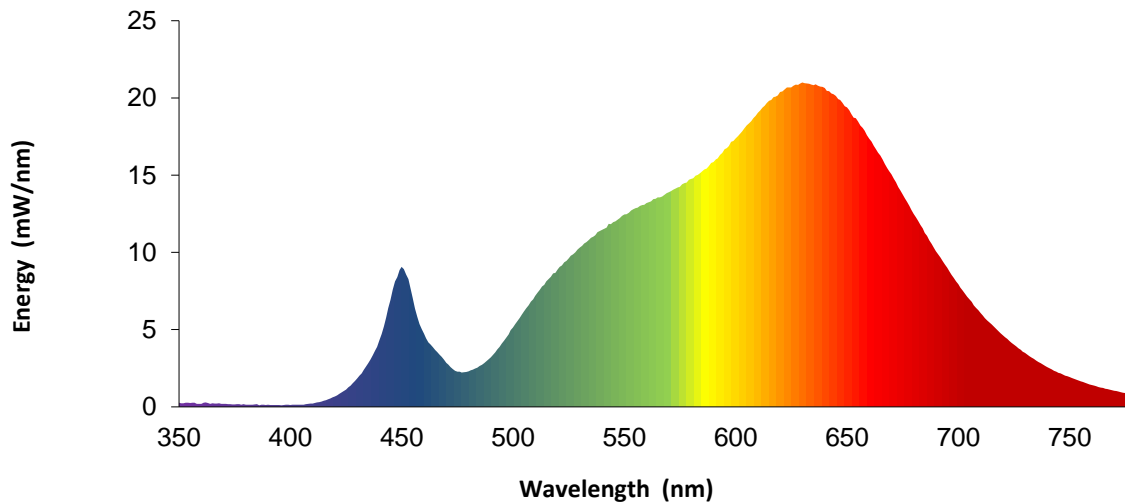
Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0008	0.458	0.409	0.262	0.526



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**SPECTRAL DISTRIBUTION OVER WAVELENGTHS**

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	4.7		570	13.9		680	12.5
355	0.3		465	3.7		575	14.2		685	11.3
360	0.2		470	2.9		580	14.8		690	10.1
365	0.2		475	2.3		585	15.3		695	9.0
370	0.2		480	2.3		590	15.9		700	7.9
375	0.2		485	2.6		595	16.7		705	7.0
380	0.1		490	3.2		600	17.4		710	6.1
385	0.2		495	4.1		605	18.2		715	5.3
390	0.1		500	5.1		610	19.0		720	4.6
395	0.1		505	6.2		615	19.8		725	4.0
400	0.1		510	7.2		620	20.4		730	3.5
405	0.1		515	8.1		625	20.7		735	3.0
410	0.2		520	8.9		630	21.0		740	2.6
415	0.4		525	9.6		635	20.8		745	2.2
420	0.7		530	10.3		640	20.6		750	1.9
425	1.1		535	10.9		645	20.1		755	1.7
430	1.8		540	11.5		650	19.4		760	1.4
435	2.8		545	12.0		655	18.5		765	1.2
440	4.3		550	12.5		660	17.4		770	1.0
445	6.9		555	12.9		665	16.3		775	0.9
450	9.1		560	13.2		670	15.1		780	0.8
455	7.1		565	13.6		675	13.8		---	---



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-007**

#	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	---	---	---
---	---	---	---	---
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**ANNEX A - TM-30 CALCULATIONS**

**REPORT NO. 104659241CRT-007**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCY2RS-L129274D-UNV-WW	NA

**TM-30 REPORT**

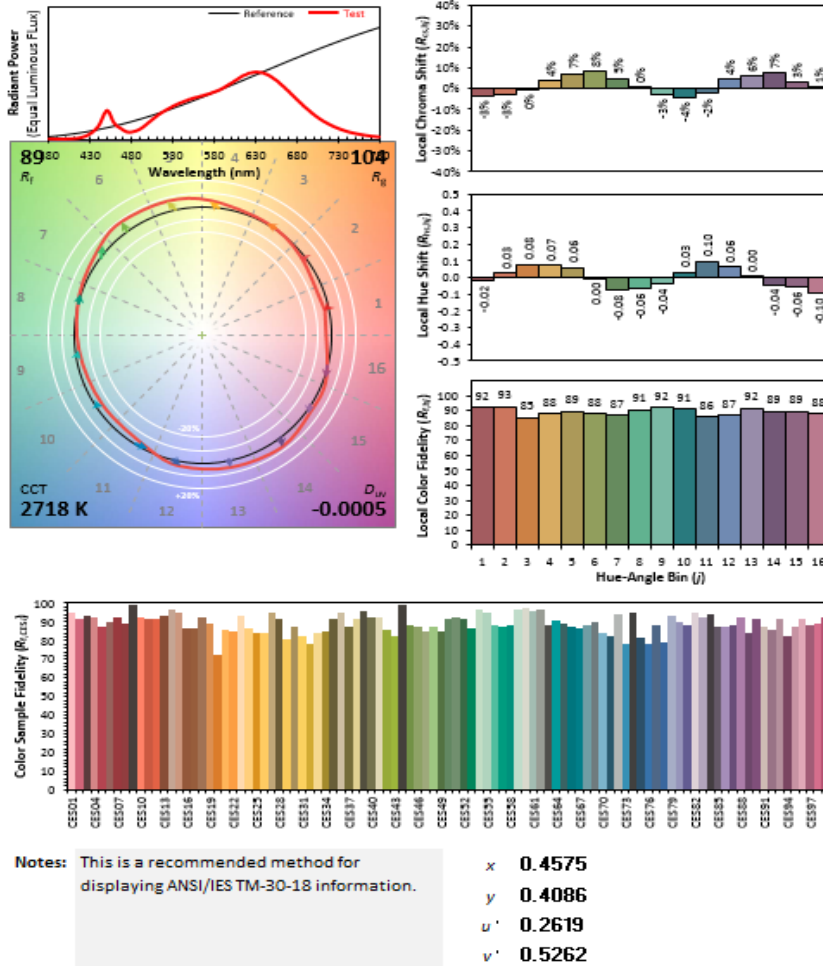
**ANSI/IES TM-30-18 Color Rendition Report**

Source: 104659241CRT-007

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 8/19/2021

Model: ENCY2RS-L129274D-UNV-WW



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