

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

KWLS20927CNB

PROJECT NUMBER

G106070014

REPORT NUMBER

106070014CRT-001a

ISSUE DATE

4/29/2025

REVISION DATE

None

TEST DATES

4/29/2025

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

106070014CRT-001a

MODEL NUMBER(s)

KWLS20927CNB

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 U.S. government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01505675-0.

TEST STANDARDS

ANSI/IES LM-79-19: Optical and Electrical Measurements of Solid State Lighting Products

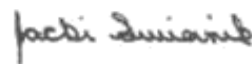
ANSI C78.377-2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Kristie Ray
Team Lead, Engineering
Lighting Division



Jacki Swiernik
Staff Engineer
Lighting Division

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SAMPLE INFORMATION

REPORT NO. 106070014CRT-001A

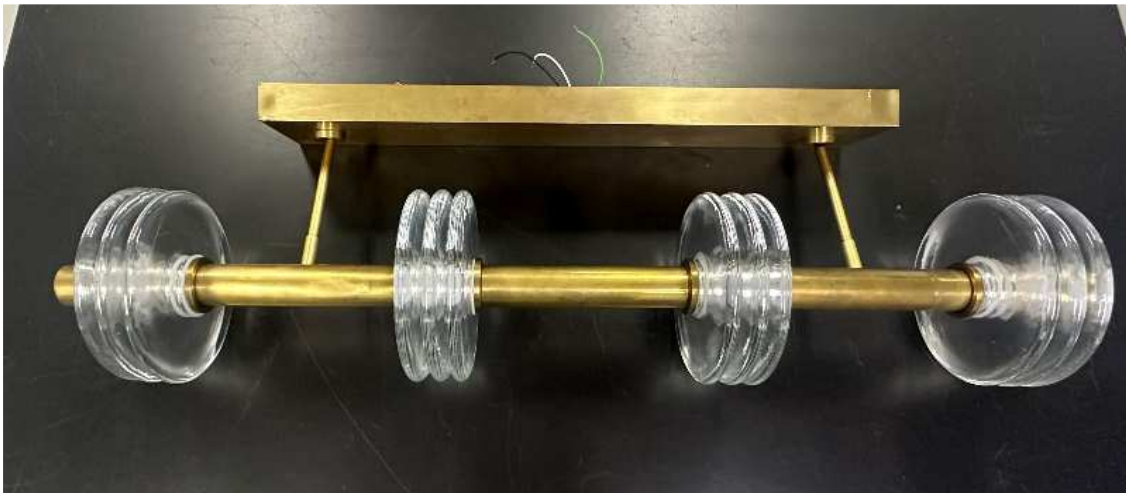
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received Date	Sampling Date
1	CRT2504161357-001	KWLS20927CNB	LAUREL LG LINEAR CHAN 207 CL	Production	4/16/2025	N/A
2	CRT2504211438-001	Glass	Glass	Production	4/21/2025	N/A

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	KWLS20927CNB	1

SAMPLE PHOTOS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Test Configuration 1	
Product Model No.:	KWLS20927CNB
Product Description:	LAUREL LG LINEAR CHAN 207 CL
LED Model No.:	Samsung 2835 3V (XY-CONCEPT_7_FTR_LED)
Driver Model No.:	MACRON MDR-608-24-60-LD (AA3319)

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1433.0	1476.2
Input Power (W) @ 120 (Vac)	34.22	34.14
Luminous Efficacy (lm/W)	41.9	43.2
Input Power Factor () @ 120 (Vac)	0.989	0.989

Criteria	Results
Input ATHD (%) @ 120 (Vac)	9.36
Correlated Color Temperature (K)	2547
Color Rendering Index - Ra ()	95.7
Color Rendering Index - R9 ()	72.9
Duv ()	-0.002
Chromaticity Coordinate (x)	0.469
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.270
Chromaticity Coordinate (v')	0.528

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with ANSI/IES LM-79-19

DUT SAMPLING METHOD

For testing plans, program requirements, or shipments requiring sampling of DUTs or components, the selections for each test were random. All samples are marked with control numbers regardless of being tested.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral power distribution for photometric and colorimetric data of the DUT. Electrical measurements of the unit were measured using a power analyzer. Each DUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at 25°C ± 1.2°C and 10-65% respectively at a position inside of the sphere within 1.5m and at equal height of the DUT. Stabilization procedures to LM-79-19 were followed. The DUT was mounted in a 4π configuration.

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 DUT. Electrical measurements of the unit were measured using a power analyzer. Each DUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at 25°C ± 1.2°C and 10-65% respectively at a position within 1.5m and at equal height of the DUT. Stabilization procedures to LM-79-19 were followed. The test distance was ≥ 5x the longest luminous dimension of the DUT.

ANSI/IES Technical Memorandums (TM) reported are not NVLAP accredited

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 106070014CRT-001A

Test Configuration	Tested Model No.	Pass/Fail/NA
1	KWLS20927CNB	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.05	288.2	34.22	0.989

Light Output (lm)	Efficacy (lm/W)
1433.0	41.9

LUMINOUS INTENSITY SUMMARY (candela)

Vertical	Horizontal					Polar Candela Plot
Angle (°)	0	22.5	45	67.5	90	
0	140	140	140	140	140	Polar Candela Distribution 180° 170° 160° 150° 140° 133° 120° 110° 100° 90° 80° 70° 60° 50° 160 133 107 80 53 27 0.00 27 53 80 107 133 160 VA: 0° 10° 20° 30° 40° ■ - 0° H ■ - 22.5° H ■ - 90° H ■ - 45° H ■ - 67.5° H
5	142	143	144	141	140	
10	142	145	148	145	142	
15	142	149	150	147	145	
20	140	150	152	148	147	
25	138	149	147	145	144	
30	135	143	142	141	143	
35	130	140	136	139	142	
40	122	132	131	136	141	
45	114	121	129	134	140	
50	107	112	125	133	140	
55	104	107	121	131	139	
60	103	103	116	129	139	
65	100	101	111	128	139	
70	103	97	108	128	139	
75	113	95	107	128	139	
80	128	97	105	128	140	
85	93	98	104	128	139	
90	44	99	104	128	139	
95	90	98	106	128	139	
100	110	97	106	128	139	
105	71	96	108	128	139	
110	56	97	109	129	140	
115	50	98	112	130	140	
120	41	100	116	131	139	
125	35	102	119	132	139	
130	36	105	122	133	139	
135	35	102	125	134	140	
140	35	83	126	135	140	
145	36	58	115	136	140	
150	36	45	107	136	140	
155	47	50	91	125	134	
160	54	58	70	98	120	
165	65	66	70	64	89	
170	68	68	69	52	65	
175	68	68	68	66	36	
180	64	64	64	64	64	

Full luminous intensity matrix found in .IES file

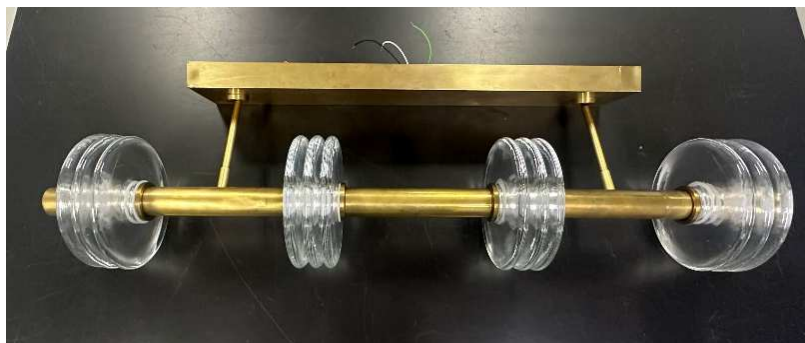
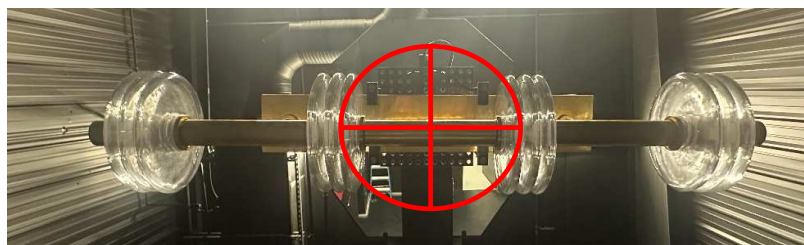
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ORIENTATION AND ALIGNMENT OF DUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
3.38	0.67	0.67
0°-180° H	90°-270° H	0°-180° V

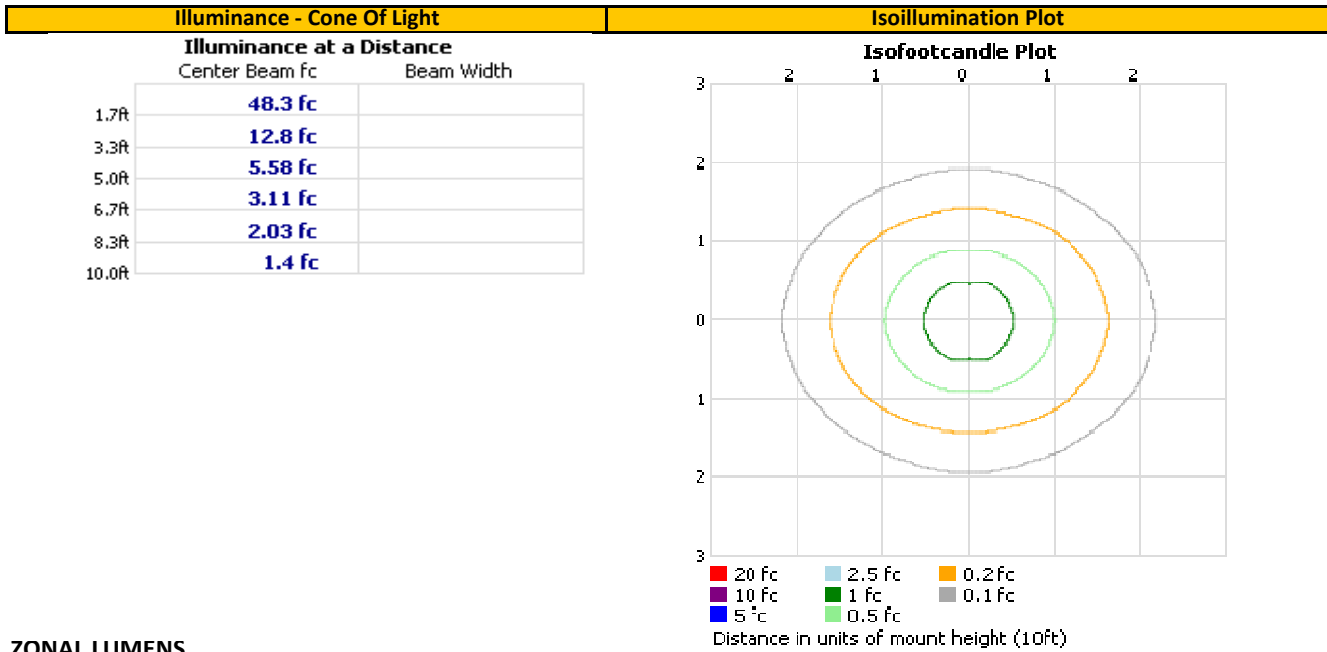
Test Distance (ft)
29.2

PHOTOMETRIC CENTER OF DUT



REPORT NO. 106070014CRT-001A

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone (°)	Lumens	Luminaire	Zone (°)	Lumens	Total
0-30	122.5	8.5%	90-100	121.2	8.5%
0-40	208.7	14.6%	100-110	116.8	8.2%
0-60	415.4	29.0%	110-120	107.8	7.5%
60-90	356.6	24.9%	120-130	98.9	6.9%
70-100	363.4	25.4%	130-140	86.1	6.0%
90-120	345.8	24.1%	140-150	63.1	4.4%
0-90	771.9	53.9%	150-160	40.9	2.9%
90-180	661.1	46.1%	160-170	20.1	1.4%
0-180	1,433.0	100.0%	170-180	6.1	0.4%

REPORT NO. 106070014CRT-001A

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				
4.3	5.3	5.2	6.3	7.5
7.0	7.9	7.9	8.9	10.1
8.5	9.3	9.4	10.3	11.5
10.2	11.0	11.1	12.0	13.2
10.9	11.7	11.9	12.7	13.9
11.5	12.2	12.4	13.2	14.5

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

5.4	6.3	6.4	7.3	8.5
8.2	9.0	9.1	10.0	11.2
9.7	10.4	10.7	11.4	12.7
11.5	12.1	12.5	13.1	14.4
12.3	12.9	13.3	13.9	15.2
13.0	13.5	13.9	14.5	15.8

8H	4H
	6H
	8H
	12H

10.5	11.1	11.5	12.1	13.4
12.4	12.9	13.4	13.9	15.2
13.3	13.8	14.3	14.8	16.1
14.1	14.5	15.1	15.5	16.9

12H	4H
	6H
	8H

10.8	11.3	11.8	12.3	13.6
12.7	13.2	13.7	14.2	15.5
13.7	14.1	14.7	15.1	16.4

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

UGR Viewed Endwise				
7.2	8.2	8.1	9.2	10.4
10.6	11.5	11.5	12.4	13.7
12.3	13.2	13.2	14.2	15.4
14.2	15.0	15.1	15.9	17.2
15.1	15.9	16.0	16.9	18.1
16.1	16.8	17.0	17.8	19.1

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

7.6	8.5	8.5	9.4	10.7
11.2	11.9	12.1	12.9	14.2
13.1	13.8	14.0	14.8	16.0
15.1	15.8	16.1	16.8	18.0
16.2	16.8	17.1	17.8	19.1
17.3	17.8	18.3	18.8	20.1

8H	4H
	6H
	8H
	12H

13.3	13.9	14.3	14.9	16.2
15.5	16.1	16.5	17.1	18.4
16.7	17.2	17.7	18.2	19.5
18.0	18.5	19.0	19.5	20.8

12H	4H
	6H
	8H

13.4	13.9	14.3	14.9	16.2
15.6	16.1	16.6	17.1	18.4
16.9	17.3	17.9	18.3	19.6

Maximum UGR	
20.8	

INTEGRATING SPHERE TESTING

REPORT NO. 106070014CRT-001A

Test Configuration	Tested Model No.	Pass/Fail/NA
1	KWLS20927CNB	NA

PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

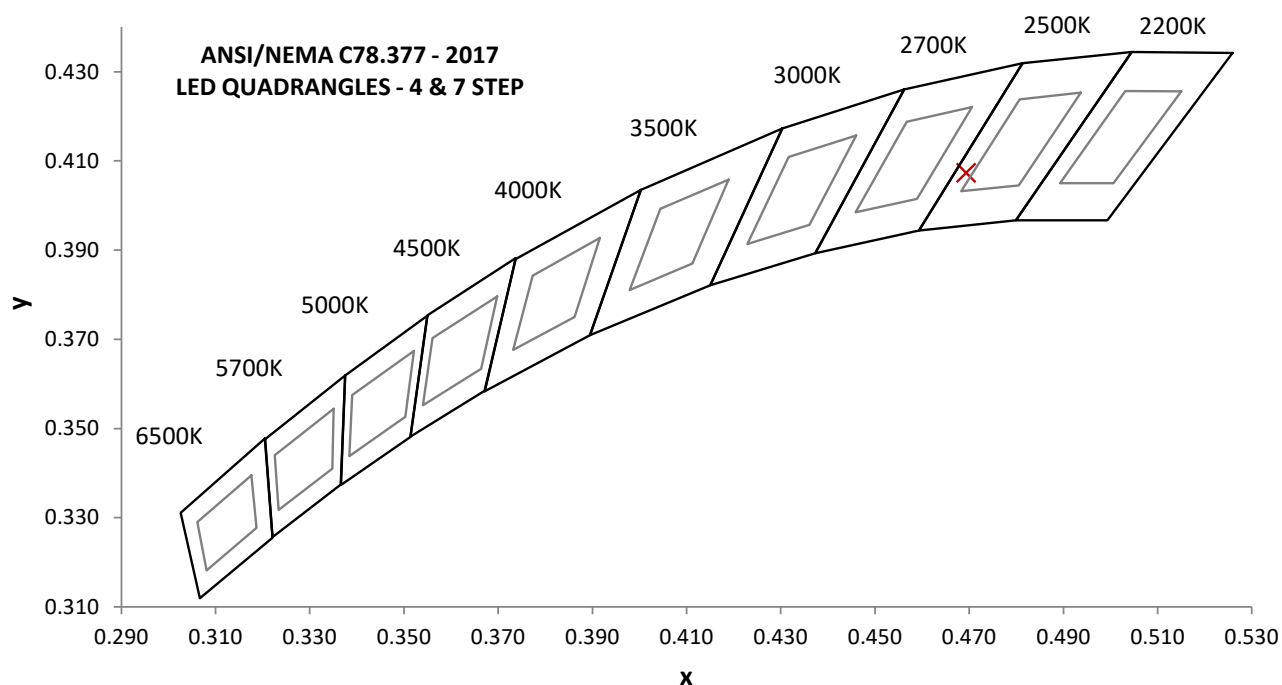
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.02	287.7	34.14	0.989	9.36

Measured at 120.02(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
1476.2	43.2	2547	95.7	72.9

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0019	0.469	0.407	0.270	0.528

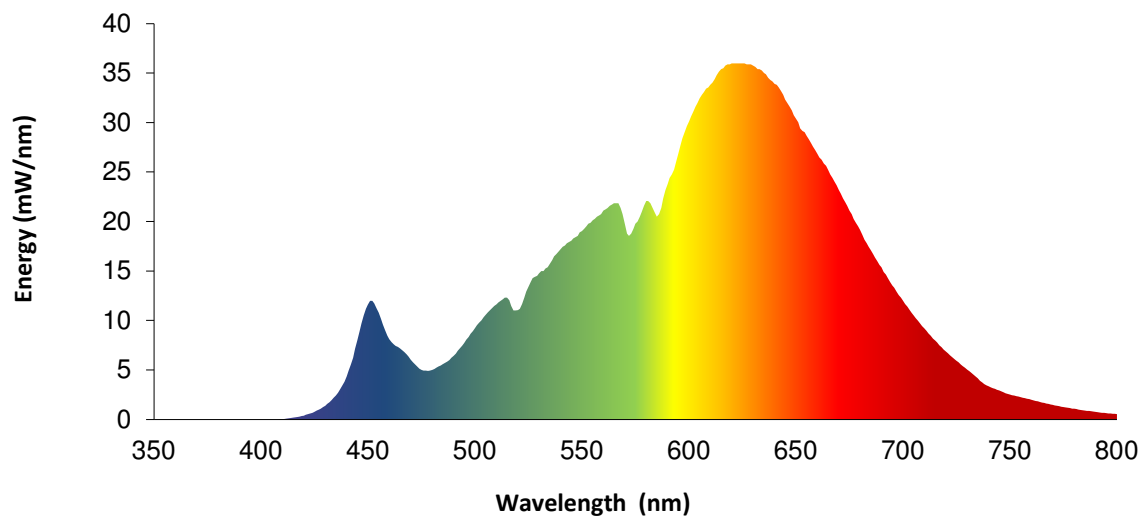


REPORT NO. 106070014CRT-001A

SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.0		460	8.1		570	19.8		680	19.2
355	0.0		465	7.2		575	19.8		685	17.1
360	0.0		470	6.0		580	22.1		690	15.4
365	0.0		475	5.0		585	20.5		695	13.5
370	0.0		480	5.0		590	23.8		700	12.0
375	0.0		485	5.6		595	26.8		705	10.5
380	0.0		490	6.4		600	30.1		710	9.2
385	0.0		495	7.7		605	32.5		715	8.0
390	0.0		500	9.2		610	33.8		720	6.9
395	0.0		505	10.6		615	35.4		725	5.9
400	0.0		510	11.6		620	36.0		730	5.1
405	0.0		515	12.3		625	36.0		735	4.1
410	0.0		520	11.0		630	35.7		740	3.3
415	0.2		525	13.4		635	35.0		745	2.9
420	0.4		530	14.8		640	33.9		750	2.5
425	0.8		535	15.7		645	32.3		755	2.2
430	1.4		540	17.2		650	30.4		760	2.0
435	2.4		545	18.1		655	28.7		765	1.7
440	4.4		550	19.0		660	26.8		770	1.5
445	8.0		555	20.1		665	25.3		775	1.3
450	11.6		560	21.1		670	23.2		780	1.1
455	10.8		565	21.8		675	21.1		---	---

Spectral radiant flux was measured by 1nm increments. 1nm data is on file.



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

SEE ANNEX A FOR IES TM-30 REPORT*

* = Not a NVLAP Accredited Test/Reporting Method

EQUIPMENT LIST

REPORT NO. 106070014CRT-001A

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	LSI Type C Goniophotometer System	6440	---	4/21/2025	7/20/2025
2	Elgar AC Power Supply	CW1251	---	VBV	VBV
3	Yokogawa Power Analyzer	WT210	E464	6/12/2024	6/12/2025
4	Testo Hygrothermometer	608-H1	L253	6/3/2024	6/3/2025
5	Omega Thermometer	DPI8-C24	M263	3/13/2025	3/13/2026
6	Tape Measure	Crescent	L288	12/9/2024	12/9/2027
7	Elgar AC Power Supply	CW1251	---	VBV	VBV
8	Sorenson DC Power Supply	XFR 150-8	---	VBV	VBV
9	Testo Hygrometer	608-H1	L253	6/3/2024	6/3/2025
10	Yokogawa Power Analyzer	WT310E	L247	6/10/2024	6/10/2025
11	Fluke Thermometer	53 II	N1324	7/15/2024	7/15/2025
12	Fisher Scientific Stopwatch	14-649-9	N1132	8/3/2024	8/3/2025
13	3M Integrating Sphere Spectrometer System	CDS2600	L231	4/11/2025	7/11/2025

The AC power supplies used for testing have a crest factor capable of 0-3.5

REVISION HISTORY

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

ANNEX A - IES TM-30 CALCULATIONS

REPORT NO. 106070

Test Configuration	Tested Model No.	Pass/Fail/NA
1	KWLS20927CNB	NA

TM-30 REPORT

ANSI/IES TM-30-20 Color Rendition Report

Unique Identifier:

CRT2504161357-001

Manufacturer:

VISUAL COMFORT AND COMPAN'

Creation Date:

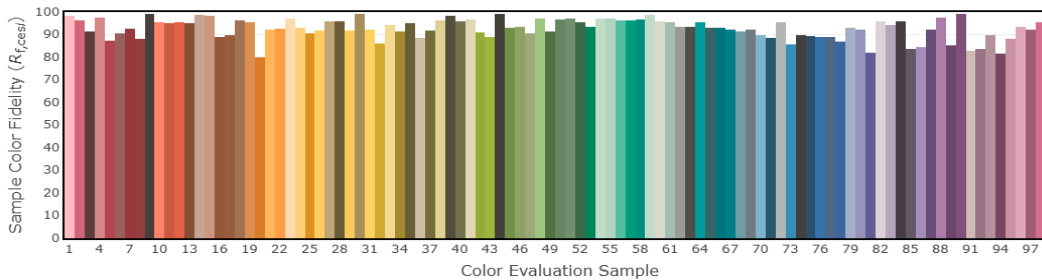
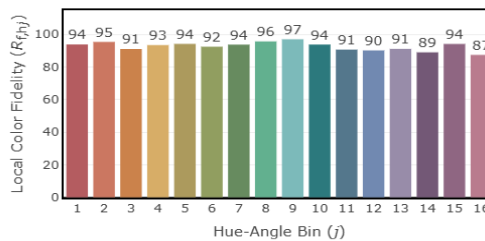
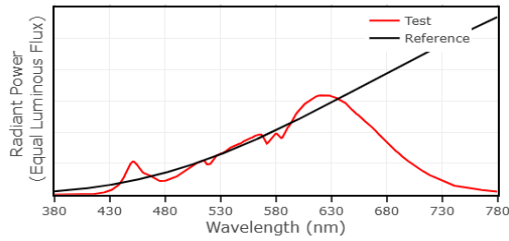
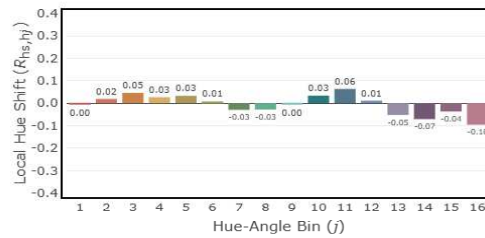
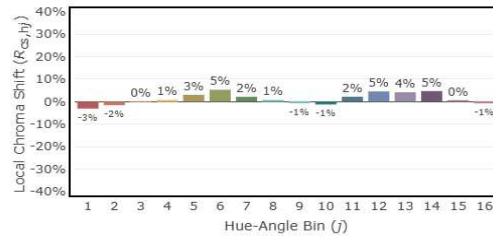
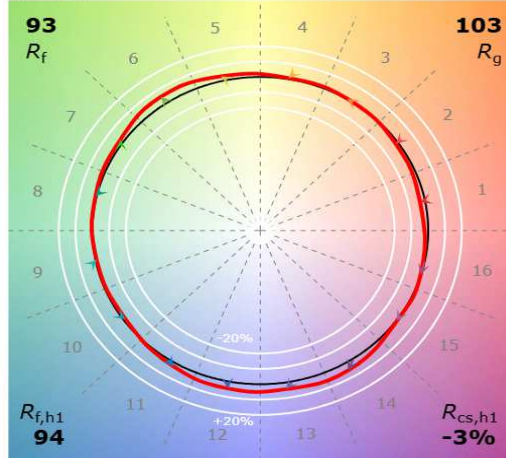
4/29/25

Catalog Number or Model:

KWLS20927CNB

CCT: **2547 K**
 D_{uv} : **-0.0019**

P2 V- F2



The content of this report was generated by the Illuminating Engineering Society's online spectral calculator (www.ies.org/spectralcalculator), in conformance with the ANSI/IES TM-30-20 standard published by the IES, 120 Wall Street, New York, New York 10005.