

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

Performance Testing for Luminaires

MODEL NUMBER

E3SRF-LO9304A w/ E3SLB-LW

PROJECT NUMBER

G104622548

REPORT NUMBER

104622548CRT-005

ISSUE DATE

9/21/2021

REVISED DATE

None

TEST DATES

9/16/21 through 9/17/21

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104622548CRT-005

MODEL NUMBER(s)

E3SRF-LO9304A w/ E3SLB-LW

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-01154433-0.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting
ANSI NEMA ANSLG C78.377: 2017: Specifications of the Chromaticity of Solid State Lighting Products

In Charge of Testing:



Gerald Gray
Associate Engineer
Lighting Division

Reviewer:



Kristie Ray
Team Lead, Engineering
Lighting Division

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SAMPLE INFORMATION

REPORT NO. 104622548CRT-005

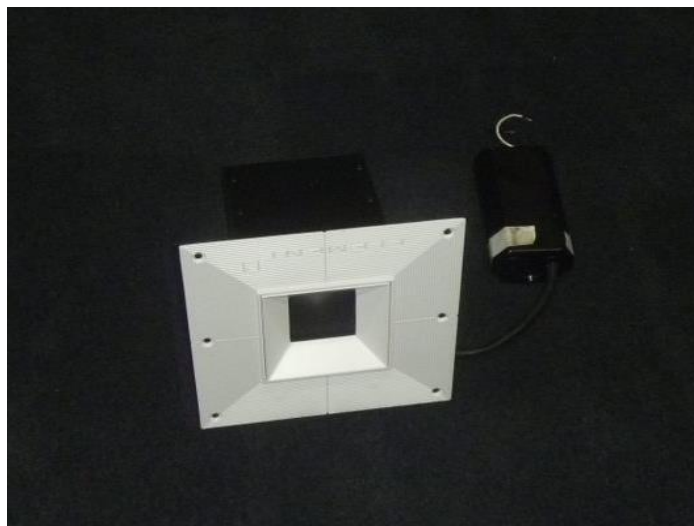
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2109100744-001-1	--	Housing w/PTB15W-0300-38-VCC	Production	9/10/2021
2	CRT2109100744-001-5	--	40° Lens	Production	9/10/2021
3	CRT2109100744-001-9	--	3000K LED	Production	9/10/2021
4	CRT2109100744-001-20	--	Trim with Lens	Production	9/10/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	E3SRF-LO9304A w/ E3SLB-LW	1,2,3,4

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	E3SRF-LO9304A w/ E3SLB-LW
Product Description:	E3 IC REMODEL-930-40DEG-LENS
LED Model No.:	Bridgelux® Gen 8 V10 Array Series
Driver Model No.:	PTB15W-0300-38-VCC
Light Source:	LED
CEC Product Type:	Inseparable

Criteria	Results
Light Output (lumens)	733.6
Input Power (W)	11.10
Lumen Efficacy (lm/W)	66.1
Input Power Factor ()	0.987
Correlated Color Temperature (K)	2983
Color Rendering Index - Ra ()	91.8
Color Rendering Index - R9 ()	72.5
Duv ()	-0.0013
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.401
Chromaticity Coordinate (u')	0.252
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. 104622548CRT-005

Test Configuration	Tested Model No.	Pass/Fail/NA
1	E3SRF-LO9304A w/ E3SLB-LW	NA

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

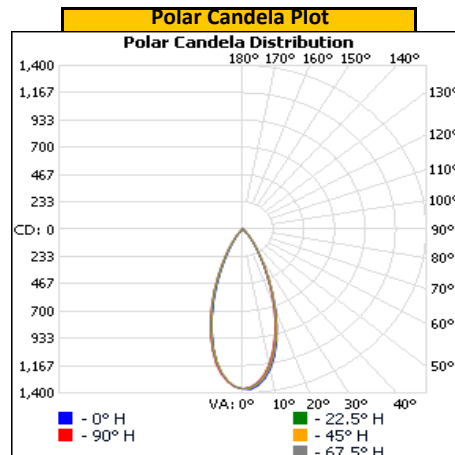
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.00	93.3	11.08	0.989

Light Output (lm)	Lumen Efficacy (lm/W)
715.6	64.6

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	1364	1364	1364	1364	1364
5	1342	1327	1325	1316	1312
10	1213	1195	1192	1176	1169
15	998	983	979	961	945
20	730	720	725	706	690
25	468	464	479	462	446
30	266	267	284	272	261
35	139	142	156	150	143
40	68	72	81	79	75
45	31	35	42	40	36
50	11	14	20	17	14
55	3	4	9	6	4
60	0	1	2	1	1
65	0	0	0	0	0
70	0	0	0	0	0
75	0	0	0	0	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



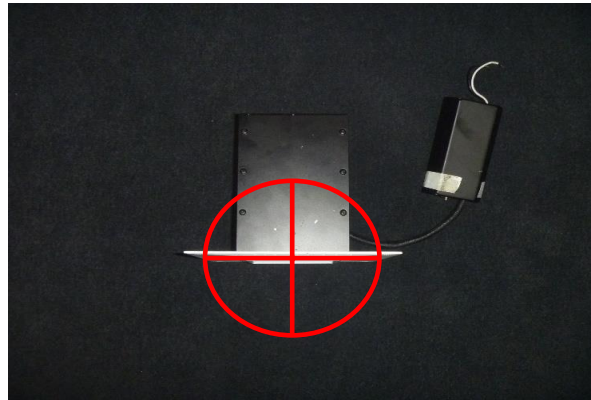
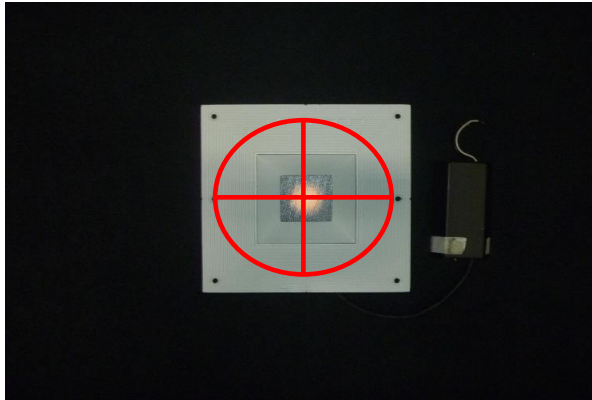
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.29	0.29	0.00
0°-180° H	90°-270° H	0°-180° V

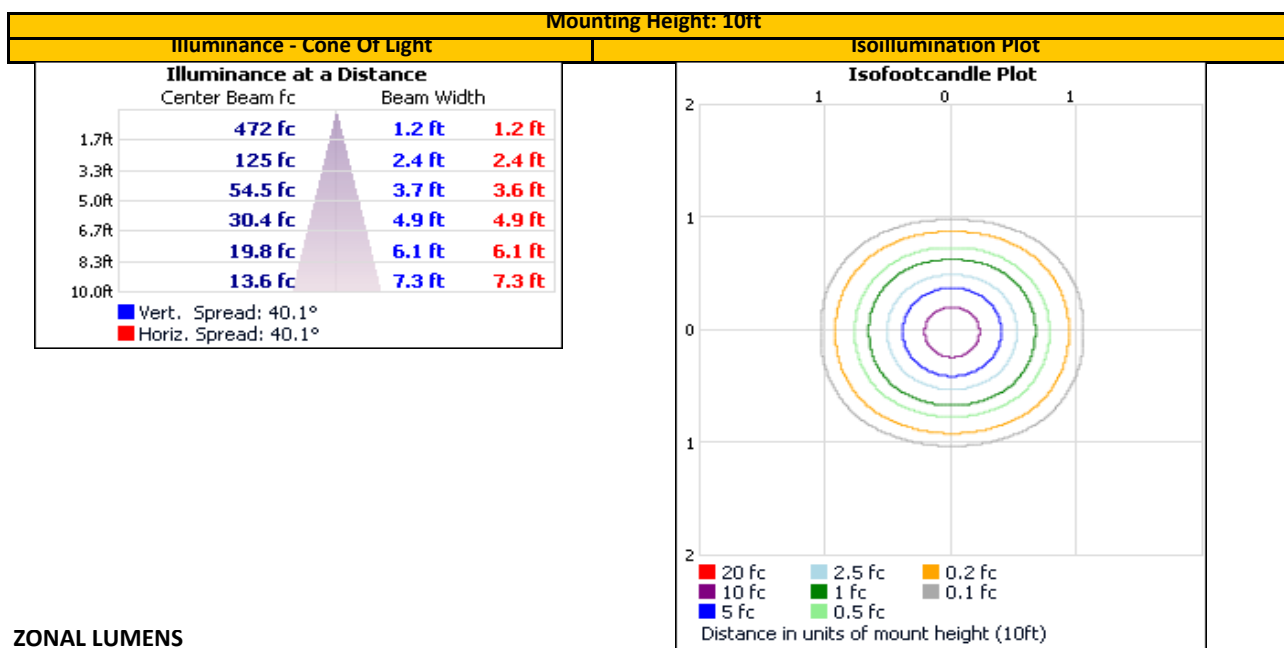
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary																																																																																																
<table><tr><th>Zone</th><th>Lumens</th><th>% Lum</th></tr><tr><td>0-30</td><td>587.6</td><td>82.1%</td></tr><tr><td>0-40</td><td>680.1</td><td>95.0%</td></tr><tr><td>0-60</td><td>715.4</td><td>100.0%</td></tr><tr><td>60-90</td><td>0.2</td><td>0.0%</td></tr><tr><td>70-100</td><td>0.0</td><td>0.0%</td></tr><tr><td>90-120</td><td>0.0</td><td>0.0%</td></tr><tr><td>0-90</td><td>715.6</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>715.6</td><td>100.0%</td></tr></table>			Zone	Lumens	% Lum	0-30	587.6	82.1%	0-40	680.1	95.0%	0-60	715.4	100.0%	60-90	0.2	0.0%	70-100	0.0	0.0%	90-120	0.0	0.0%	0-90	715.6	100.0%	90-180	0.0	0.0%	0-180	715.6	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>120.6</td><td>16.9%</td><td>90-100</td><td>0.0</td><td>0.0%</td></tr><tr><td>10-20</td><td>260.1</td><td>36.3%</td><td>100-110</td><td>0.0</td><td>0.0%</td></tr><tr><td>20-30</td><td>206.9</td><td>28.9%</td><td>110-120</td><td>0.0</td><td>0.0%</td></tr><tr><td>30-40</td><td>92.5</td><td>12.9%</td><td>120-130</td><td>0.0</td><td>0.0%</td></tr><tr><td>40-50</td><td>29.6</td><td>4.1%</td><td>130-140</td><td>0.0</td><td>0.0%</td></tr><tr><td>50-60</td><td>5.8</td><td>0.8%</td><td>140-150</td><td>0.0</td><td>0.0%</td></tr><tr><td>60-70</td><td>0.2</td><td>0.0%</td><td>150-160</td><td>0.0</td><td>0.0%</td></tr><tr><td>70-80</td><td>0.0</td><td>0.0%</td><td>160-170</td><td>0.0</td><td>0.0%</td></tr><tr><td>80-90</td><td>0.0</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	120.6	16.9%	90-100	0.0	0.0%	10-20	260.1	36.3%	100-110	0.0	0.0%	20-30	206.9	28.9%	110-120	0.0	0.0%	30-40	92.5	12.9%	120-130	0.0	0.0%	40-50	29.6	4.1%	130-140	0.0	0.0%	50-60	5.8	0.8%	140-150	0.0	0.0%	60-70	0.2	0.0%	150-160	0.0	0.0%	70-80	0.0	0.0%	160-170	0.0	0.0%	80-90	0.0	0.0%	170-180	0.0	0.0%
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INTEGRATING SPHERE TESTING

REPORT NO. 104622548CRT-005

Test Configuration	Tested Model No.	Pass/Fail/NA
1	E3SRF-LO9304A w/ E3SLB-LW	NA

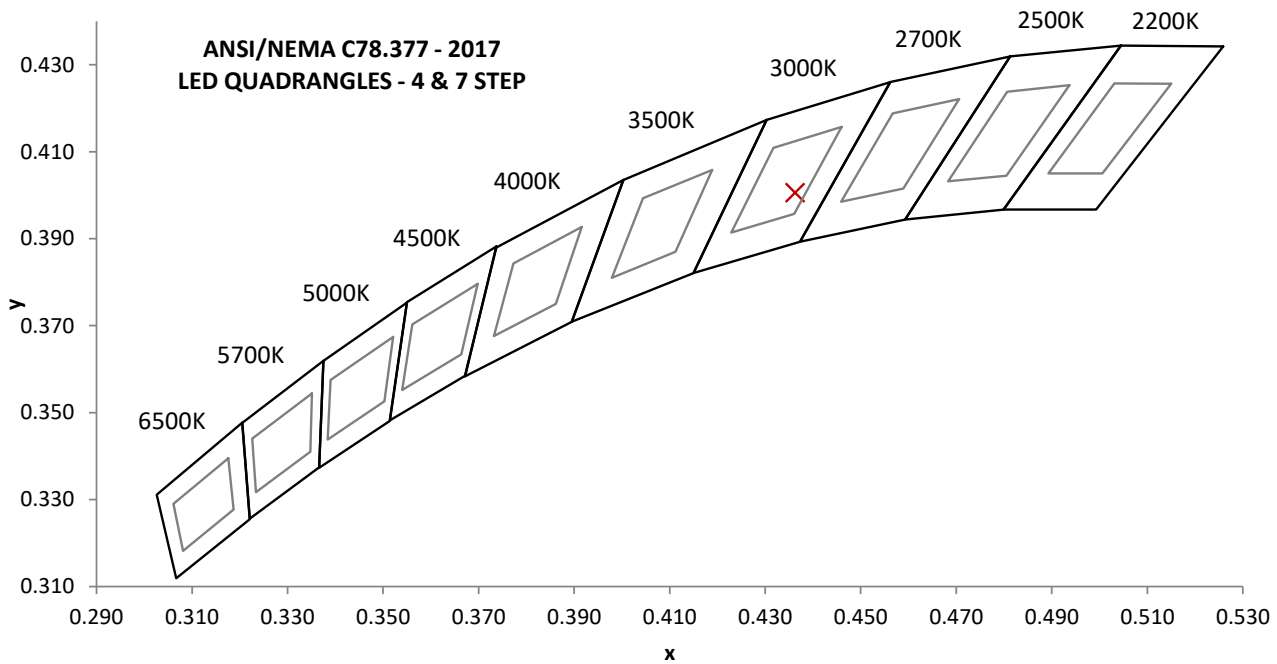
PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

Base Orientation
Select One

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.01	93.7	11.10	0.987	10.90
277.01	44.6	11.18	0.905	14.85

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
733.6	66.1	2983	91.8	72.5

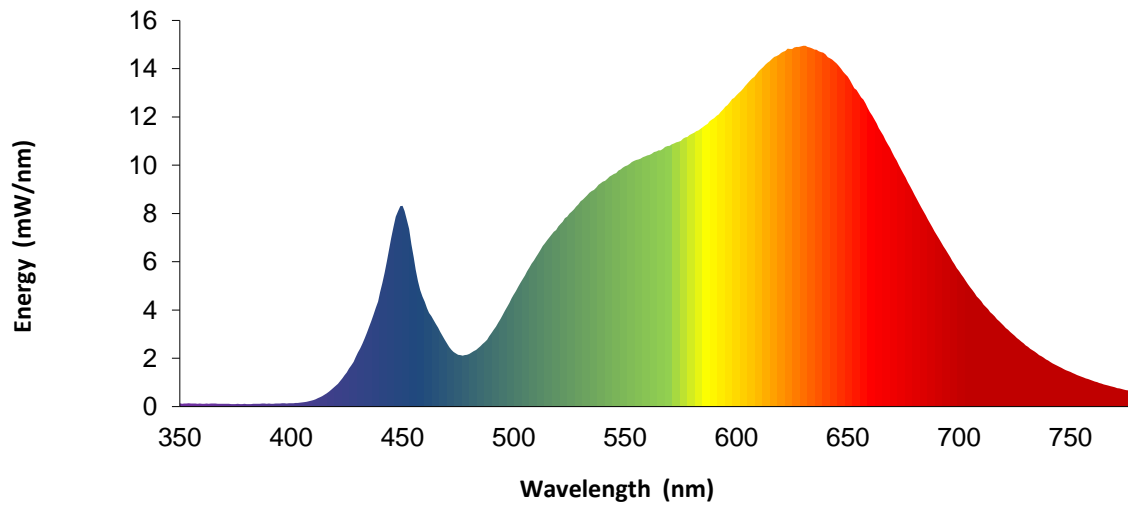
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0013	0.436	0.401	0.252	0.520



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	4.3		570	10.8		680	8.8
355	0.1		465	3.4		575	11.0		685	7.9
360	0.1		470	2.6		580	11.3		690	7.1
365	0.1		475	2.1		585	11.6		695	6.3
370	0.1		480	2.2		590	12.0		700	5.6
375	0.1		485	2.5		595	12.4		705	4.9
380	0.1		490	3.0		600	12.9		710	4.4
385	0.1		495	3.8		605	13.4		715	3.8
390	0.1		500	4.6		610	13.9		720	3.4
395	0.1		505	5.4		615	14.3		725	2.9
400	0.1		510	6.2		620	14.7		730	2.5
405	0.2		515	6.9		625	14.8		735	2.2
410	0.3		520	7.5		630	15.0		740	1.9
415	0.5		525	8.0		635	14.8		745	1.6
420	0.9		530	8.5		640	14.6		750	1.4
425	1.4		535	8.9		645	14.2		755	1.2
430	2.2		540	9.3		650	13.7		760	1.1
435	3.3		545	9.6		655	13.0		765	0.9
440	4.7		550	10.0		660	12.2		770	0.8
445	7.0		555	10.2		665	11.4		775	0.7
450	8.3		560	10.4		670	10.5		780	0.6
455	6.2		565	10.6		675	9.7		---	---



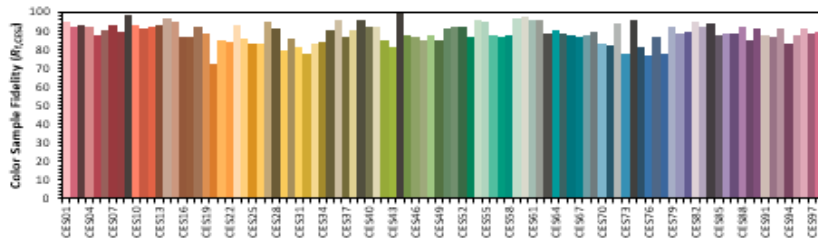
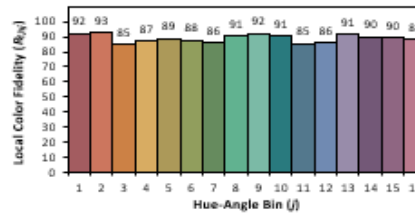
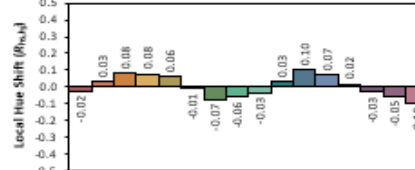
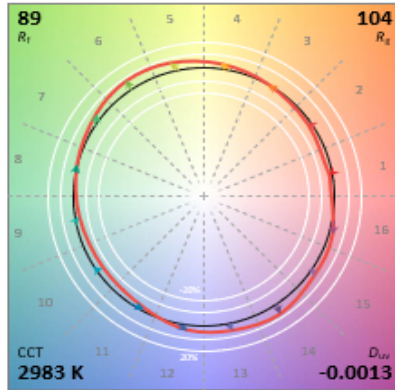
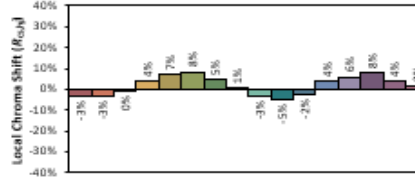
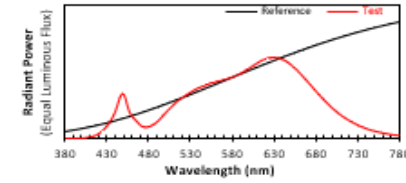
Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

REPORT NO. 104622548CRT-005

ANSI/IES TM-30-18 Color Rendition Report

Source: LED
Date: 9/21/2021

Manufacturer: VISUAL COMFORT AND COMPANY
Model: E3SRF-LQ9304A w/ E3SLB-LW



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

R_e 0.4362
 R_s 0.4005
 R'_a 0.2517
 R'_s 0.5199

CIE 13.3-1995
(CRI)

R_a 92
 R_s 73

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

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Elgar AC Power Supply	CW1251	---	VBV	VBV
2	Sorenson DC Power Supply	XFR 150-8	---	VBV	VBV
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 2600	---	9/3/2021	12/3/2021
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	---	VBV	VBV
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	---	VBV	VBV
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
16	Tape Measure	Powerlock	N1342	3/11/2019	3/11/2022

REVISION HISTORY

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