

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700TDPLNPCR-LEDWD

PROJECT NUMBER

G105349749

REPORT NUMBER

105349749CHI-001

ISSUE DATE

2/15/2023

REVISED DATE

None

TEST DATES

2023-02-10 through 2023-02-14.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

105349749CHI-001

MODEL NUMBER(s)

700TDPLNPCR-LEDWD

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 600186-0. 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-01297671-0.

TEST STANDARDS

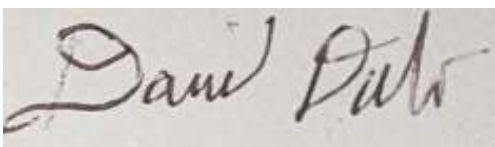
IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

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

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

IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

In Charge of Testing:



David Dalo
Engineer
Lighting Division

Reviewer:



Jeff Davis
N.A. Technical Lead
Lighting Division

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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH02092023022720	700TDPLNPCR-LEDWD	Palona Pendant Clear Warm Dim	Production	2/9/2023

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700TDPLNPCR-LEDWD	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700TDPLNPCR-LEDWD
Product Description:	Palona Pendant Clear Warm Dim
LED Model No.:	Ilsung SRL9-922
Driver Model No.:	NA
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	362.3	345.6
Input Power (W) @ 120 (Vac)	9.13	9.13
Lumen Efficacy (lm/W)	39.7	37.8
Input Power Factor (I) @ 120 (Vac)	0.987	0.989

Criteria	Results
Input ATHD (%) @ 120 (Vac)	12.73
Correlated Color Temperature (K)	2833
Color Rendering Index - Ra (I)	92.5
Color Rendering Index - R9 (I)	60.6
Duv (I)	-0.0070
Chromaticity Coordinate (x)	0.438
Chromaticity Coordinate (y)	0.387
Chromaticity Coordinate (u')	0.259
Chromaticity Coordinate (v')	0.515

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	700TDPLNPCR-LEDWD	NA

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

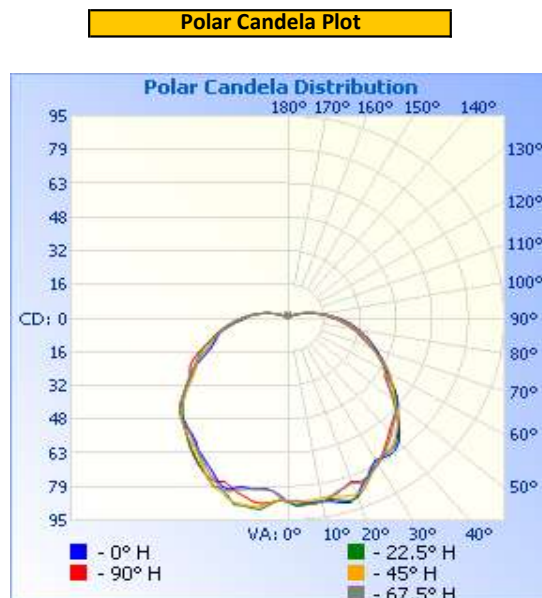
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.03	77.4	9.13	0.987

Light Output (lm)	Lumen Efficacy (lm/W)
362.3	39.7

INTENSITY SUMMARY - CANDELA

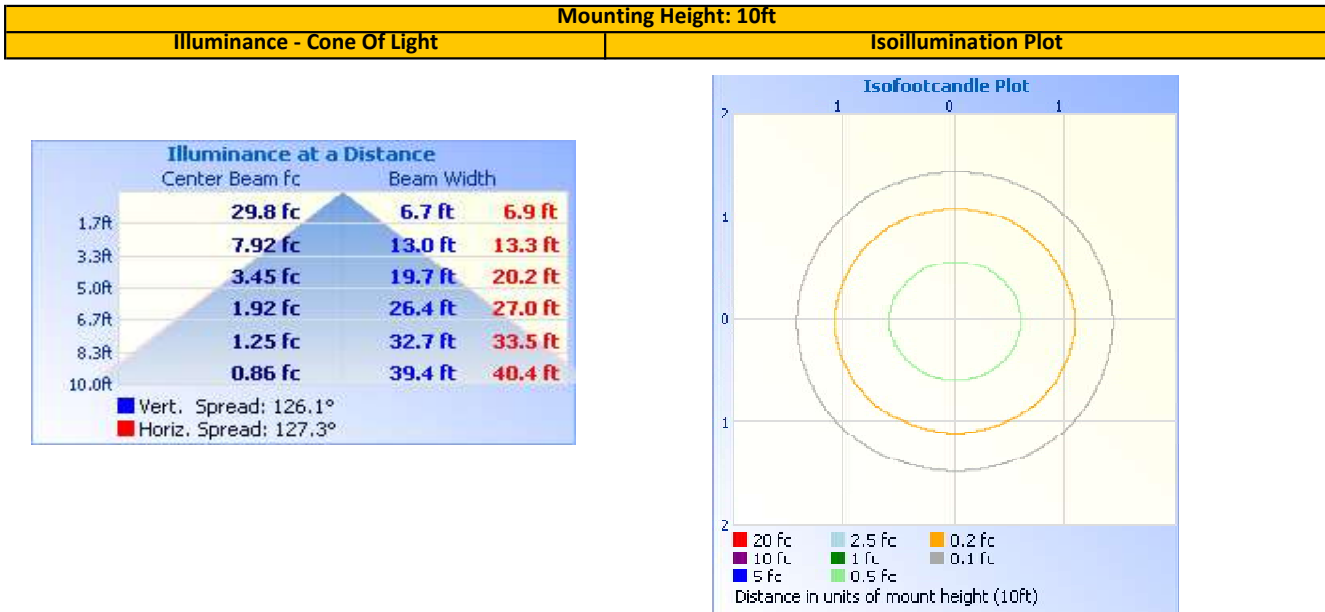
Angle	0	22.5	45	67.5	90
0	86	86	86	86	86
5	88	88	86	87	87
10	87	87	86	87	88
15	90	88	87	84	85
20	89	90	88	82	82
25	83	84	84	82	82
30	77	78	79	79	79
35	78	77	76	75	74
40	76	75	73	71	70
45	69	68	68	67	66
50	63	62	62	60	61
55	57	56	56	54	53
60	50	50	51	51	50
65	45	44	44	45	46
70	41	40	39	38	39
75	36	35	35	34	33
80	32	31	31	30	29
85	27	26	26	25	24
90	22	21	21	20	20
95	18	17	17	17	16
100	13	13	13	13	12
105	9	9	10	9	9
110	6	6	7	7	7
115	4	4	4	4	4
120	3	3	3	3	3
125	2	2	2	2	2
130	2	2	2	2	2
135	2	2	2	2	2
140	2	2	2	2	2
145	2	2	2	2	2
150	2	2	2	2	2
155	2	2	2	3	2
160	2	2	3	3	2
165	2	2	2	2	2
170	1	1	1	1	1
175	0	0	0	0	0
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
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Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	70.7	19.5%	90-100	18.0	5.0%
0-40	117.4	32.4%	100-110	9.9	2.7%
0-60	217.5	60.0%	110-120	4.4	1.2%
60-90	106.1	29.3%	120-130	1.9	0.5%
70-100	80.7	22.3%	130-140	1.5	0.4%
90-120	32.3	8.9%	140-150	1.3	0.4%
0-90	323.6	89.3%	150-160	1.0	0.3%
90-180	38.6	10.7%	160-170	0.5	0.1%
0-180	362.3	100.0%	170-180	0.1	0.0%

INTEGRATING SPHERE TESTING

REPORT NO. 105349749CHI-001

Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDPLNPCR-LEDWD	NA

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

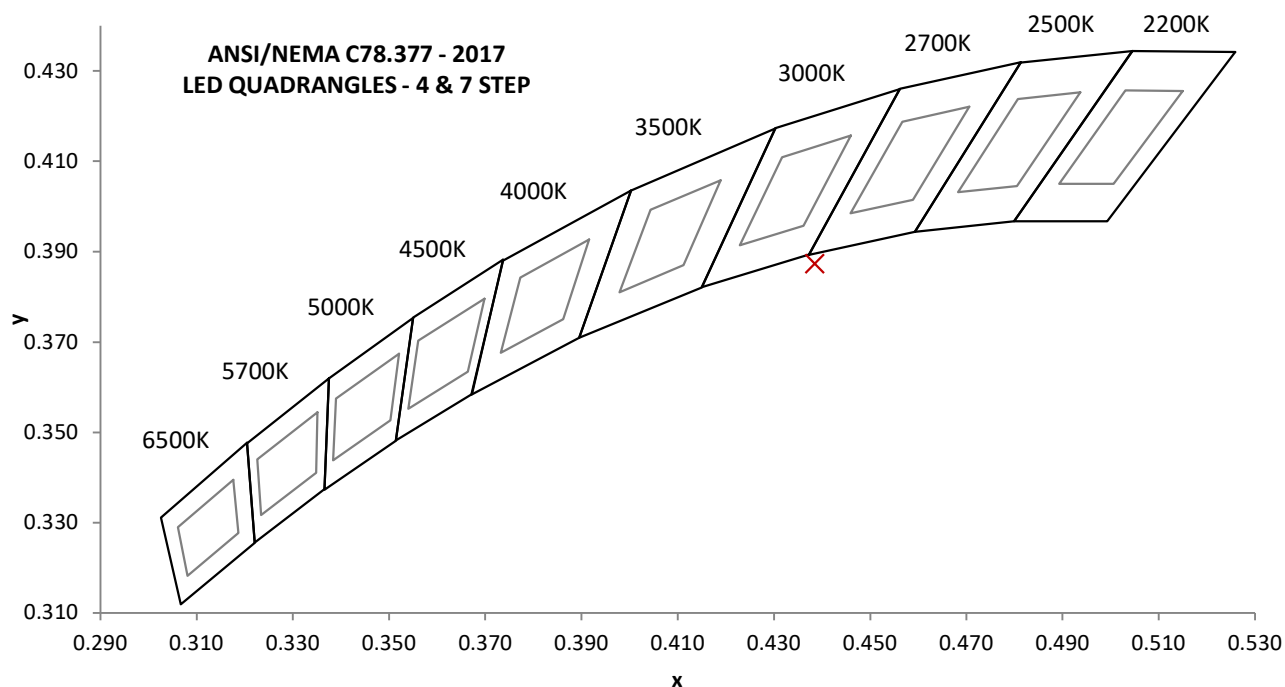
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.01	76.9	9.13	0.989	12.73

Measured at 120.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
345.6	37.8	2833	92.5	60.6

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0070	0.438	0.387	0.259	0.515

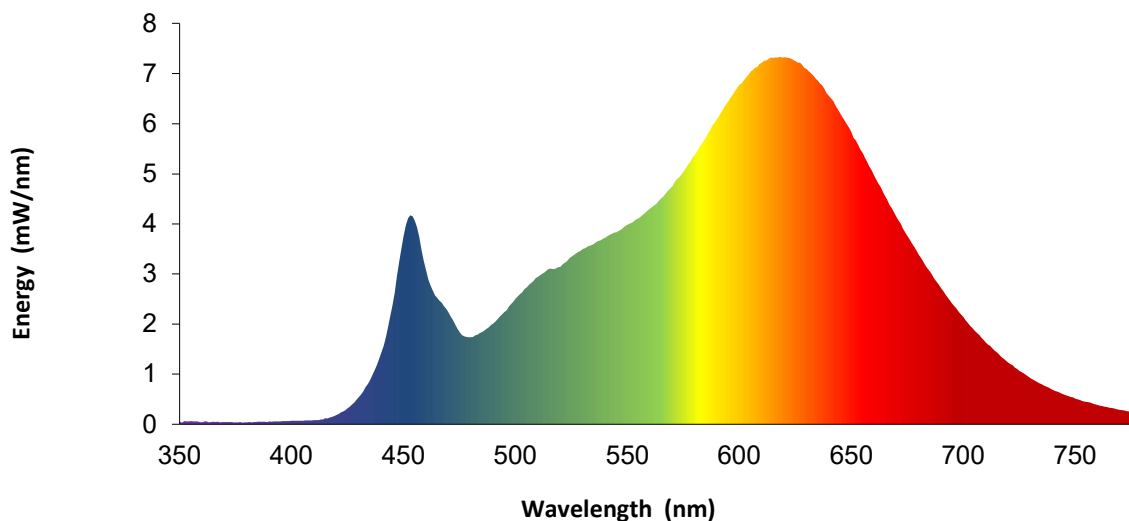


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	3.1		570	4.8		680	3.4
355	0.1		465	2.5		575	5.0		685	3.0
360	0.0		470	2.2		580	5.4		690	2.7
365	0.1		475	1.8		585	5.7		695	2.4
370	0.0		480	1.7		590	6.1		700	2.1
375	0.0		485	1.8		595	6.4		705	1.9
380	0.0		490	2.0		600	6.8		710	1.6
385	0.1		495	2.2		605	7.0		715	1.4
390	0.1		500	2.5		610	7.2		720	1.2
395	0.1		505	2.7		615	7.3		725	1.1
400	0.1		510	2.9		620	7.3		730	0.9
405	0.1		515	3.1		625	7.3		735	0.8
410	0.1		520	3.1		630	7.1		740	0.7
415	0.1		525	3.3		635	6.9		745	0.6
420	0.2		530	3.5		640	6.6		750	0.5
425	0.3		535	3.6		645	6.2		755	0.5
430	0.5		540	3.7		650	5.8		760	0.4
435	0.9		545	3.8		655	5.4		765	0.3
440	1.4		550	4.0		660	5.0		770	0.3
445	2.4		555	4.1		665	4.6		775	0.3
450	3.8		560	4.3		670	4.1		780	0.2
455	4.1		565	4.5		675	3.8		---	---

Without correction of sample absorption.



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

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Yokogawa Power Meter	WT310E	CHI0664	3/30/2022	3/30/2023
2	Omega Thermometer	DPI8-C24	146920	10/4/2022	10/4/2023
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	146958	10/6/2022	10/6/2023
5	Chroma Power Supply	61604	CHI0371	VBU	VBU
8	Newport Humidity Recorder	iServer	146379	5/11/2022	5/11/2023
9	Labsphere Spectroradiometer	CDS2600	CHI0539	VBU	VBU
10	3 Meter Sphere	SPR600	CHI0088	VBU	VBU
11	Elgar AC Power Supply	CW1251	146112	VBU	VBU
12	Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
13	Yokogawa Power Meter	WT1600	146767	4/5/2022	4/5/2023
26	Xitron Power Analyzer	XT-2640	CHI0611	7/6/2022	7/6/2023

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDPLNPCR-LEDWD	NA

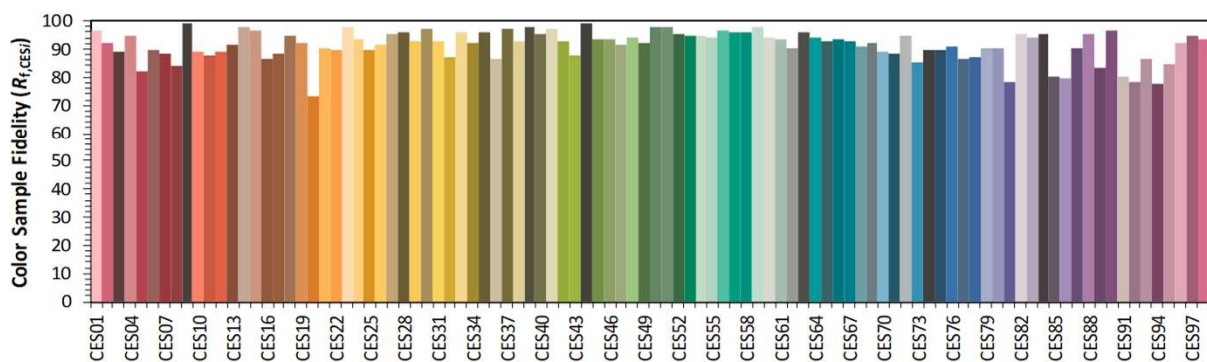
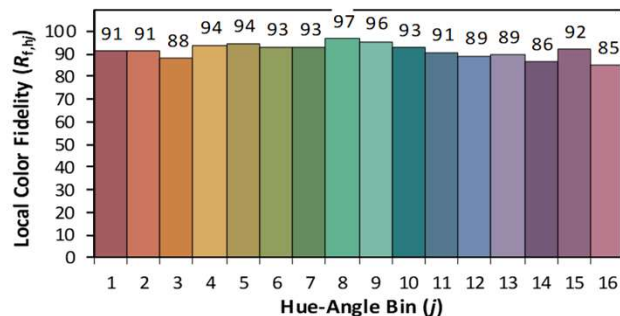
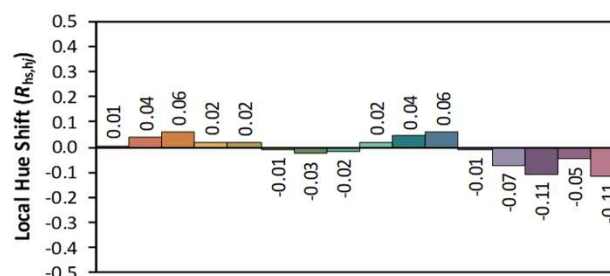
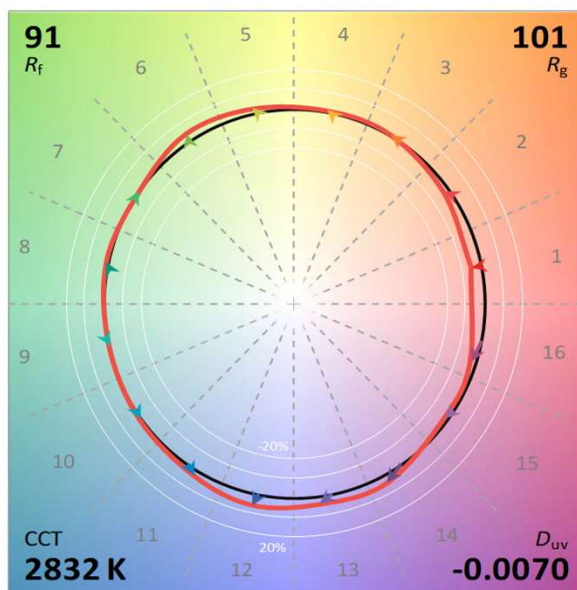
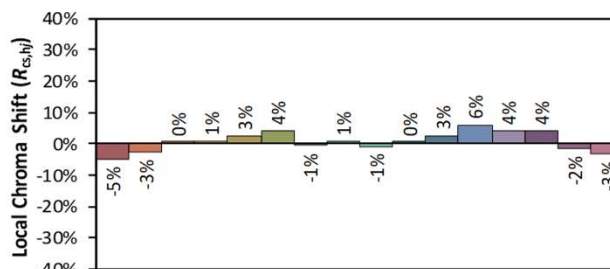
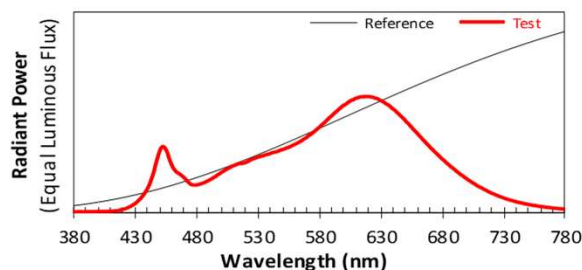
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 2/10/2023

Model: 700TDPLNPCR-LEDWD



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

x 0.4385

y 0.3873

u' 0.2591

v' 0.5148

CIE 13.3-1995
(CRI)

R_a 93R_g 61