

SUMMARY

Test Condition: 15V 60Hz for SL33

Setting : 1 (Max Light Output)

Criteria	Result
Total Lumen Output (lm)	214.152
Total Power(W)	6.0419
Lamp Luminaire Efficacy (lm/W)	35.44
Power Factor	0.7037
Field Angle (°)	41.7
Correlated Color Temperature (CCT)	2997
Color Rendering Index (CRI)	97
Color Rendering Index (R ₉)	86
Fidelity Index (R _f)	95
Gamut Index (R _g)	101
Chromaticity Coordinate (x)	0.4376
Chromaticity Coordinate (y)	0.4050
Chromaticity Coordinate (u')	0.2506
Chromaticity Coordinate (v')	0.5218
In-situ Case Temperature of LED/COB (°C)	57.9
Drive Current of LED/COB (mA)	125
Projection Life Time, Reported L70 (hours)	>42000

Test Condition: 15V 60Hz for SL33

Setting: 2 (Medium Light Output)

Criteria	Result
Total Lumen Output (lm)	163.01
Total Power(W)	4.1874
Lamp Luminaire Efficacy (lm/W)	38.93
Power Factor	0.6960
Correlated Color Temperature (CCT)	2990
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	88
Fidelity Index (R _f)	95
Gamut Index (R _g)	100
Chromaticity Coordinate (x)	0.4385
Chromaticity Coordinate (y)	0.4061
Chromaticity Coordinate (u')	0.2507
Chromaticity Coordinate (v')	0.5224

***** End of Page *****

SUMMARY

Test Condition: 15V 60Hz for SL33

Setting: 3 (Medium Light Output)

Criteria	Result
Total Lumen Output (lm)	125.438
Total Power(W)	3.0498
Lamp Luminaire Efficacy (lm/W)	41.13
Power Factor	0.6874
Correlated Color Temperature (CCT)	2996
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	88
Fidelity Index (R _f)	95
Gamut Index (R _g)	100
Chromaticity Coordinate (x)	0.4387
Chromaticity Coordinate (y)	0.4072
Chromaticity Coordinate (u')	0.2504
Chromaticity Coordinate (v')	0.5229

Test Condition: 15V 60Hz for SL33

Setting: 4 (Medium Light Output)

Criteria	Result
Total Lumen Output (lm)	85.4297
Total Power(W)	2.0066
Lamp Luminaire Efficacy (lm/W)	42.57
Power Factor	0.6651
Correlated Color Temperature (CCT)	3016
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	88
Fidelity Index (R _f)	94
Gamut Index (R _g)	100
Chromaticity Coordinate (x)	0.4375
Chromaticity Coordinate (y)	0.4073
Chromaticity Coordinate (u')	0.2496
Chromaticity Coordinate (v')	0.5227

***** End of Page *****

SUMMARY

Test Condition: 15V 60Hz for SL33

Setting: 5 (Medium Light Output)

Criteria	Result
Total Lumen Output (lm)	44.7464
Total Power(W)	1.0947
Lamp Luminaire Efficacy (lm/W)	40.87
Power Factor	0.6104
Correlated Color Temperature (CCT)	2956
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	92
Fidelity Index (R _f)	94
Gamut Index (R _g)	100
Chromaticity Coordinate (x)	0.4412
Chromaticity Coordinate (y)	0.4073
Chromaticity Coordinate (u')	0.2519
Chromaticity Coordinate (v')	0.5233

Test Condition: 15V 60Hz for SL33

Setting: 6 (Min Light Output)

Criteria	Result
Total Lumen Output (lm)	17.5781
Total Power(W)	0.5635
Lamp Luminaire Efficacy (lm/W)	31.20
Power Factor	0.5484
Correlated Color Temperature (CCT)	2935
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	94
Fidelity Index (R _f)	94
Gamut Index (R _g)	99
Chromaticity Coordinate (x)	0.4422
Chromaticity Coordinate (y)	0.4067
Chromaticity Coordinate (u')	0.2528
Chromaticity Coordinate (v')	0.5232

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EQUIPMENT LIST

Equipment Used	Model Number	Control Number
Fluke Temperature Meter	52	EC2357
Everfine- DC Power Supply	WY12010	EC4753-7
Everfine- AC power source for Integrating Sphere System	VPS1010 PWM	EC4760-12
Everfine - AC power source for Goniophotometer System	VPS1060 PWM	EC4753-8
Two meter integrating sphere unit	Everfine – 2M	EC4760
Everfine - Digital Power Meter	PF2010A	EC4760-10
YOKOGAWA - Digital Power Meter	WT210	EC4553
Everfine – Goniophotometer	Go-R5000	EC4753
Draught-proof enclosure	N/A	EC2201
Agilent - Data Acquisition Unit	34970A	EC2043
QINGZHI - Power Meter	8770A	EC2652
YOKOGAWA - Digital Power Meter	WT-210	EC4553

***** End of Page *****

TEST METHOD

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79

Light Distribution and Output Measurements

Light Distribution and total light output (luminous flux) were measured using a Go-R5000 Type-C Rotating Mirror Goniophotometer. Temperature 25°C and relative humidity of 60% was measured at a position in the testing laboratory.

The lamp rotates only around the fixed vertical axle in the prescribed burning position. The lamp and mirror permit the measurement of luminous intensity at the direction of any horizontal or vertical angle without tilting the lamp. The lamp was allowed to stabilize before measurements were made.

Chromaticity Measurements

Chromaticity was measured using a 2 meters integrating sphere spectral lamp measurement system. Temperature was measured at a position inside the sphere shielded from direct light. Relative humidity of 65% was measured at a position in the testing laboratory.

Spectral radiant flux measurements were made using spectroradiometer attached to the detector port of the integrating sphere. Each lamp was allowed to stabilise before measurements were made. The calibration of the integrating sphere spectroradiometer system is by the reference/standard lamps which are traceable to National Institute of Metrology P.R. CHINA. Lamp efficacy (lumens per watt) for each lamp model was then computed based on the luminous flux result. Electrical measurements including voltage, power and power factor were measured using YOKOGAWA - Digital Power Meter., model WT210.

Standard lamp used:

Model: Labsphere SCL-1400

Current: 2.679A

Temperature Measurement Test

The sample was operated at 25±5°C until constant temperatures were obtained. A temperature was considered constant if sample was operating for at least three hours and upon three successive readings-taken at 15 minutes intervals- were within one degree and were not rising.

Thermocouples were attached at locations described in the results by means of epoxy.

Driver current Measurement Test

During the temperature measurement test, measure the forward current for each LED package/array/module.

***** End of Page *****

RESULTS OF TESTS

Test Condition: 15V 60Hz for SL33

Setting : 1 (Max Light Output)

Total operation burning time: 70 min

Stabilization time: 60 min

Photometric Measurements at 25°C

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL33							
A240906-22-007	N/A	2997	97	0.4376	0.4050	0.2506	0.5218

Photometric and Electrical Measurements at 25°C

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Lamp Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL33							
A240906-22-007	N/A	15.0	0.5670	6.0419	0.7037	214.152	35.44

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL33		
0-30	205.478	95.95
0-40	211.264	98.65
0-60	213.622	99.75
0-90	214.090	99.97
0-180	214.152	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL33		
Beam (50%)	27.5	25.2
Beam Angle	26.4	

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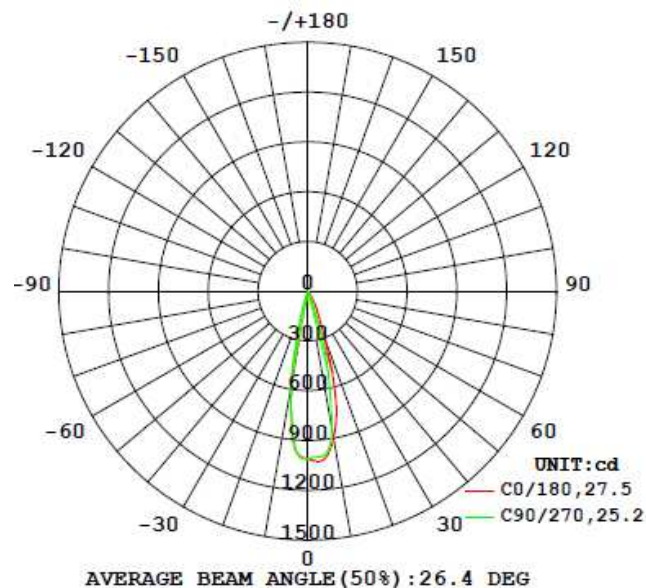
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL33

Setting : 1 (Max Light Output)

G \ C(°)	0	22.5	45	67.5	90
0	1009.79	1009.79	1009.79	1009.79	1009.79
5	1024.09	1016.66	1006.92	1009.74	998.86
10	899.87	889.61	872.26	888.27	835.01
15	642.41	617.92	540.35	521.62	452.60
20	301.01	291.21	260.90	240.79	123.44
25	143.73	141.71	105.62	62.93	25.77
30	73.67	65.83	37.42	22.52	12.36
35	29.86	26.43	15.50	10.48	6.69
40	13.53	11.75	7.75	5.96	4.06
45	5.68	5.41	4.39	3.46	2.57
50	3.12	3.05	2.46	2.22	1.54
55	1.60	1.67	1.56	1.48	0.90
60	1.04	1.10	1.08	0.97	0.51
65	0.72	0.76	0.71	0.62	0.29
70	0.47	0.48	0.47	0.40	0.16
75	0.30	0.31	0.31	0.26	0.09
80	0.19	0.20	0.21	0.17	0.05
85	0.13	0.14	0.15	0.12	0.02
90	0.10	0.10	0.11	0.08	0.01



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RESULTS OF TESTS (cont'd)

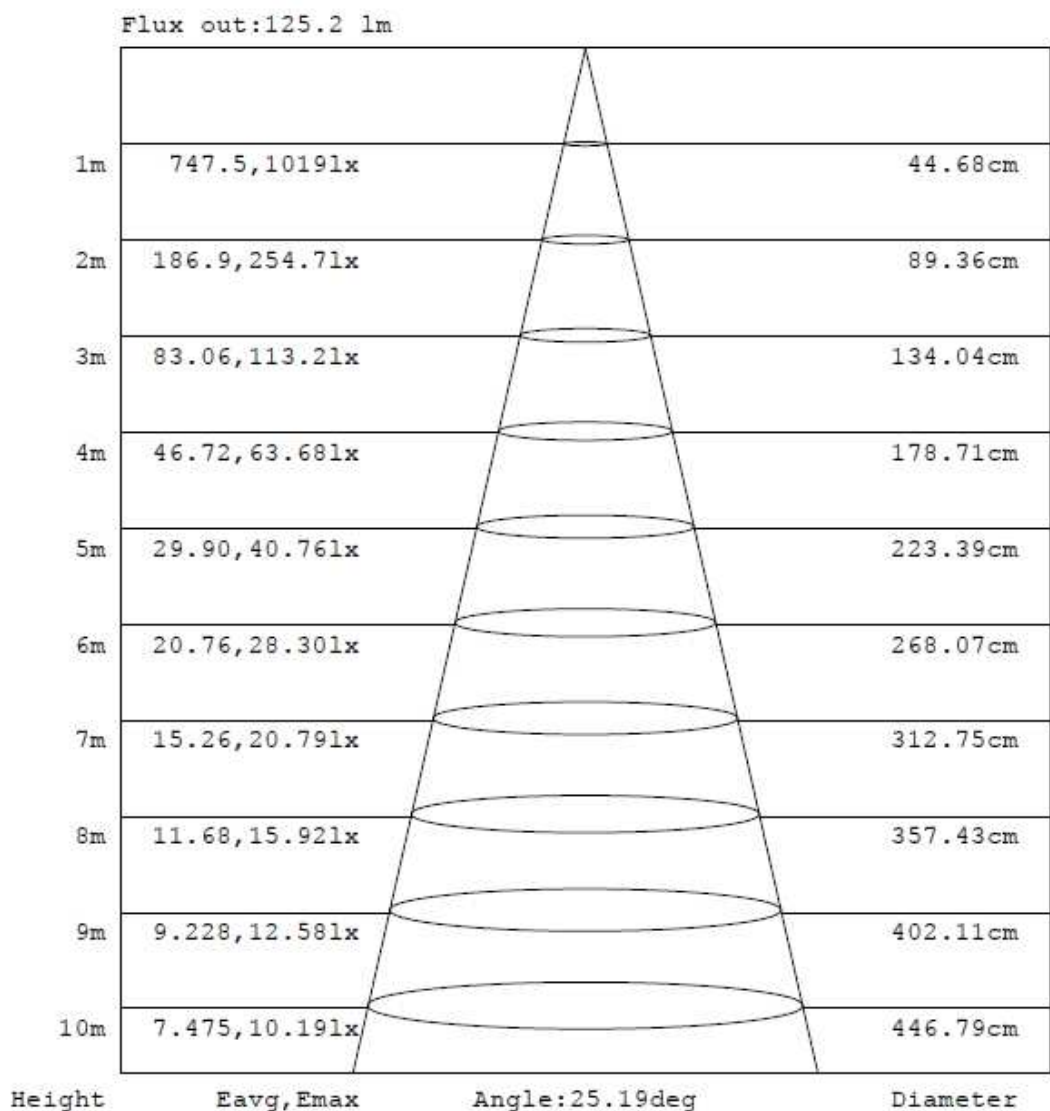
Test Condition: 15V 60Hz for SL33

Setting : 1 (Max Light Output)

Illumination Plots

Model No.: SL33
Mount Height: 10 m

Illuminance - Cone of Light



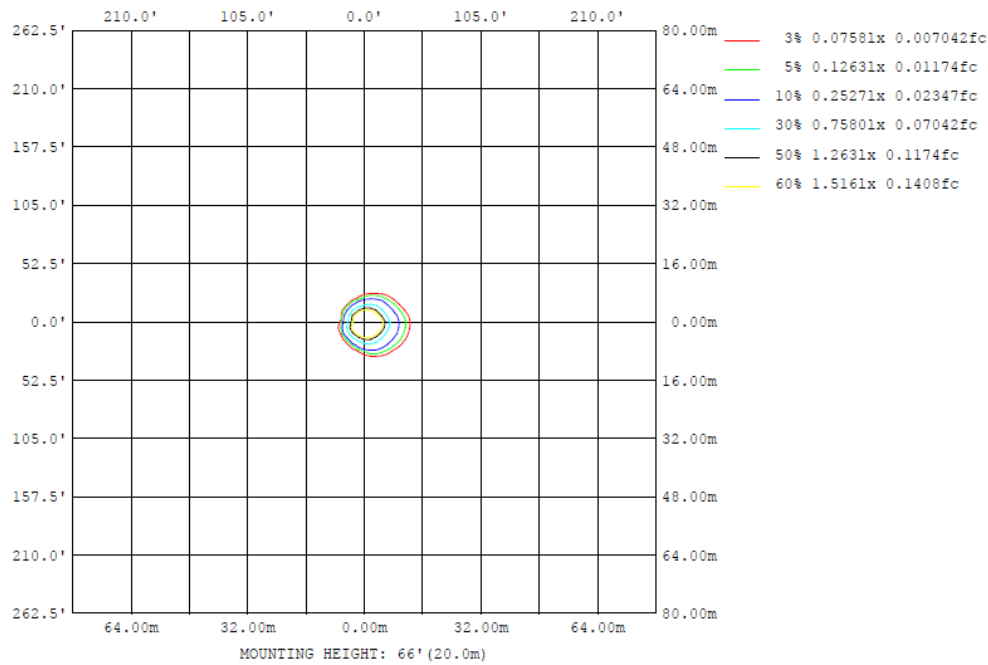
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 1 (Max Light Output)

Model No.: SL33
Mount Height: 20 m
Isoillumination Plot



***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 1 (Max Light Output)

ANSI/IES TM-30-18 Color Rendition Report

Source: LED

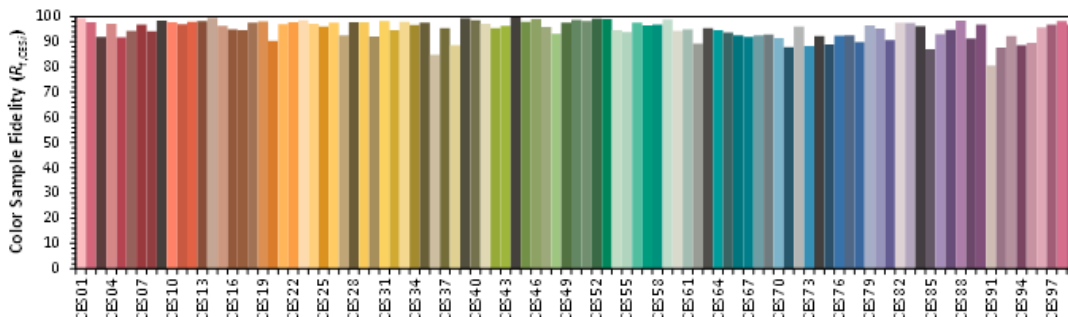
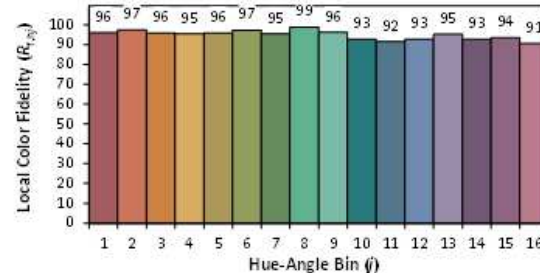
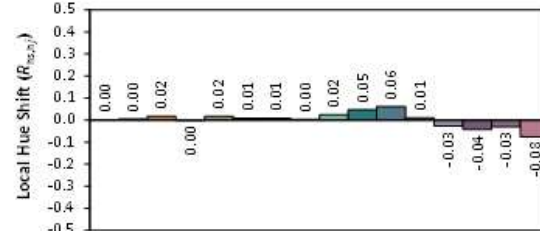
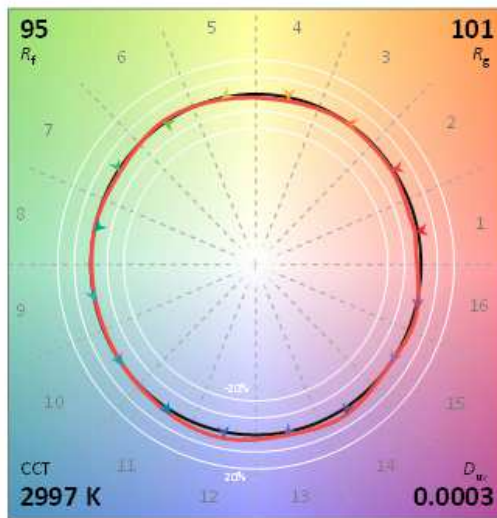
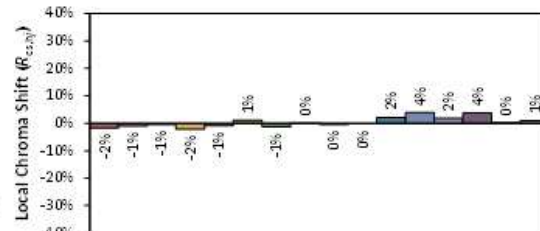
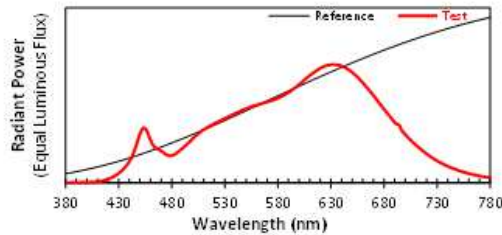
Manufacturer:

STERLING LIGHTING LLC

Date: 9/18/2024

Model:

SL33



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

x 0.4376

y 0.4050

u' 0.2506

v' 0.5218

CIE 13.3-1995
(CRI)

R_a 97

R_s 86

***** End of Page *****

RESULTS OF TESTS(cont'd)

Test Condition: 15V 60Hz for SL33

Setting : 2 (Medium Light Output)

Total operation burning time: 70 min

Stabilization time: 60 min

Photometric Measurements at 25°C

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL33							
A240906-22-007	N/A	2990	98	0.4385	0.4061	0.2507	0.5224

Photometric and Electrical Measurements at 25°C

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Lamp Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL33							
A240906-22-007	N/A	15.0	0.3997	4.1874	0.6960	163.01	38.93

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL33		
0-30	157.013	96.32
0-40	160.965	98.75
0-60	162.624	99.84
0-90	162.963	99.97
0-180	163.01	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL33		
Beam (50%)	26.9	26.0
Beam Angle	26.4	

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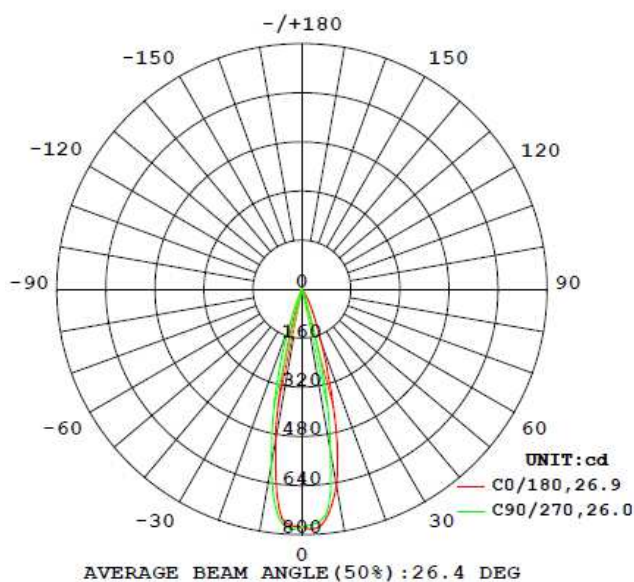
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL33

Setting : 2 (Medium Light Output)

G \ C(°)	0	22.5	45	67.5	90
0	775.86	775.86	775.86	775.86	775.86
5	767.20	761.97	758.00	756.69	753.53
10	646.54	626.29	595.01	556.58	536.07
15	399.46	349.48	317.83	255.45	221.34
20	183.97	159.31	99.56	47.68	28.88
25	87.49	52.90	25.88	13.38	8.43
30	34.84	19.60	10.31	6.84	4.57
35	14.42	8.24	5.77	3.99	2.99
40	6.42	4.79	3.28	2.49	1.56
45	3.57	2.63	2.07	1.43	0.64
50	1.90	1.59	1.36	0.78	0.19
55	1.14	1.10	0.86	0.40	0.06
60	0.79	0.74	0.53	0.20	0.02
65	0.53	0.48	0.33	0.09	0.01
70	0.34	0.32	0.21	0.04	0.01
75	0.22	0.21	0.13	0.01	0.00
80	0.15	0.14	0.08	0.00	0.00
85	0.11	0.10	0.05	0.00	0.00
90	0.08	0.07	0.03	0.00	0.00



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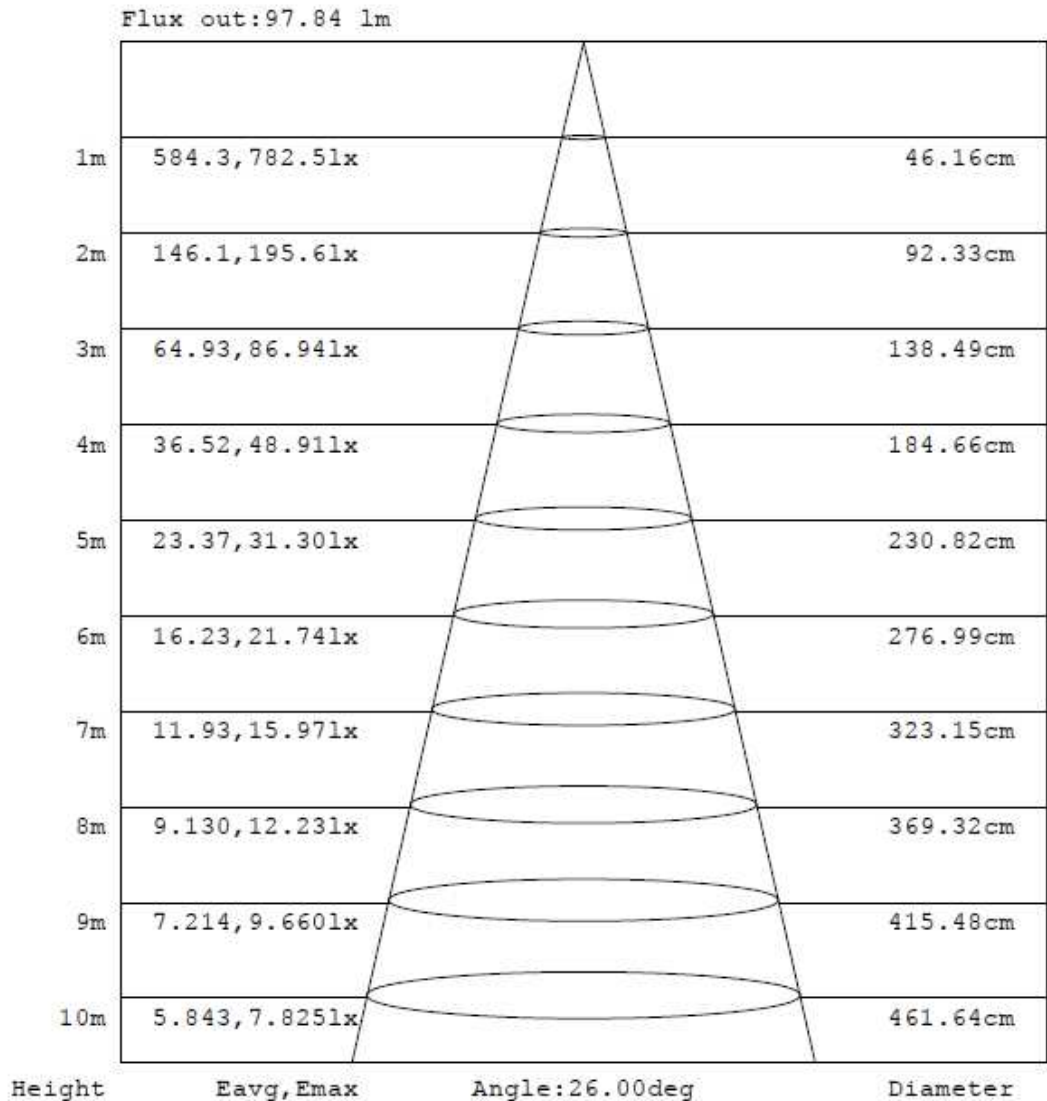
RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 2 (Medium Light Output)

Illumination Plots

Model No.: SL33
Mount Height: 10 m

Illuminance - Cone of Light



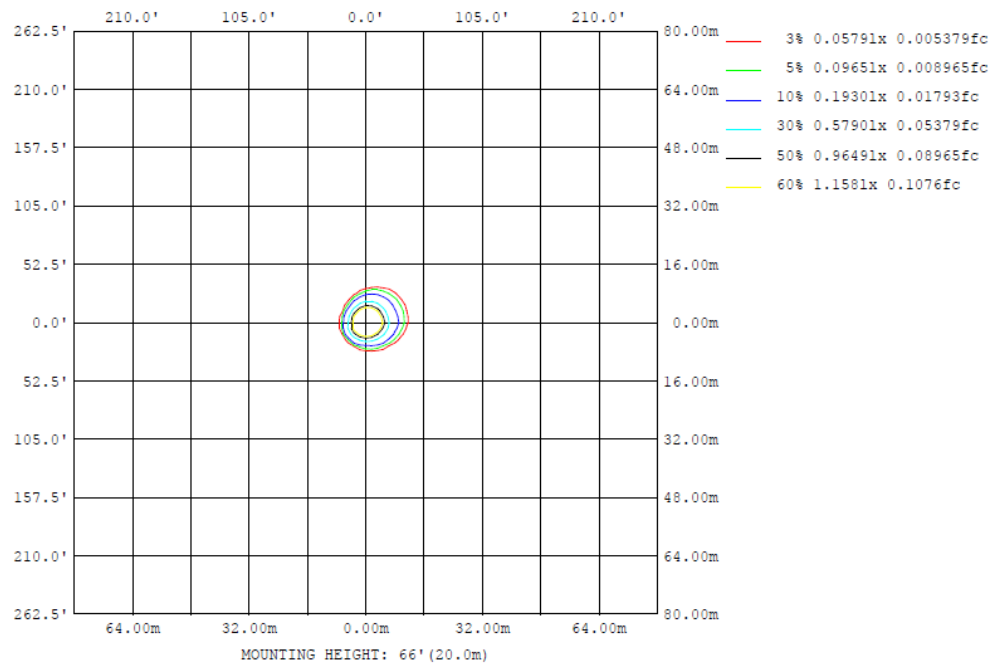
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 2 (Medium Light Output)

Model No.: SL33
Mount Height: 20 m
Isoillumination Plot



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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 2 (Medium Light Output)

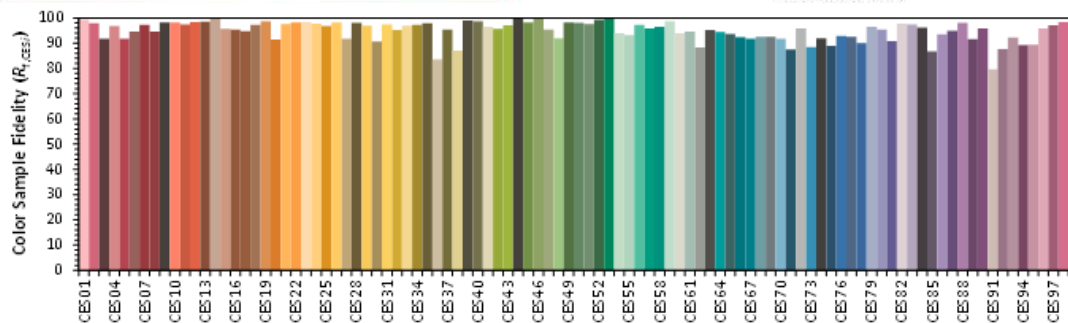
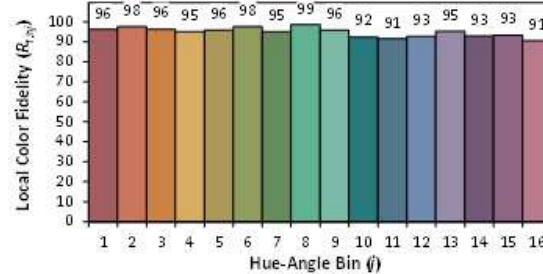
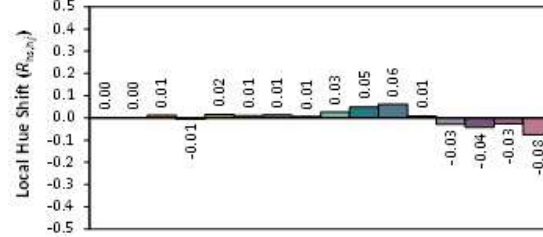
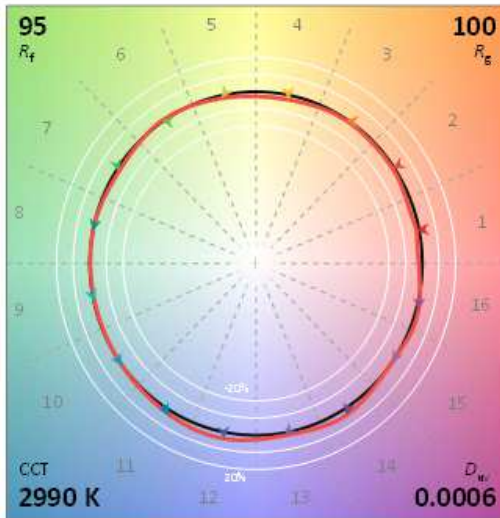
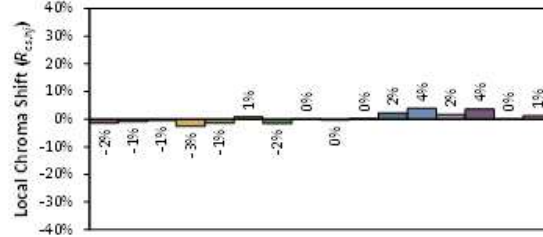
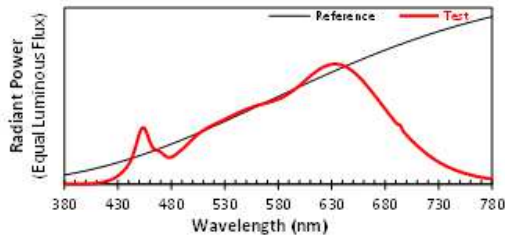
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 9/18/2024

Model: SL33



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

x 0.4385

y 0.4061

u' 0.2507

v' 0.5224

CIE 13.3-1995
(CRI)

R_a 98

R_g 88

***** End of Page *****

RESULTS OF TESTS(cont'd)

Test Condition: 15V 60Hz for SL33

Setting : 3 (Medium Light Output)

Total operation burning time: 70 min

Stabilization time: 60 min

Photometric Measurements at 25°C

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL33							
A240906-22-007	N/A	2996	98	0.4387	0.4072	0.2504	0.5229

Photometric and Electrical Measurements at 25°C

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Lamp Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL33							
A240906-22-007	N/A	15.0	0.2944	3.0498	0.6874	125.438	41.13

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL33		
0-30	120.812	96.31
0-40	123.858	98.74
0-60	125.137	99.76
0-90	125.400	99.97
0-180	125.438	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL33		
Beam (50%)	26.3	26.2
Beam Angle	26.3	

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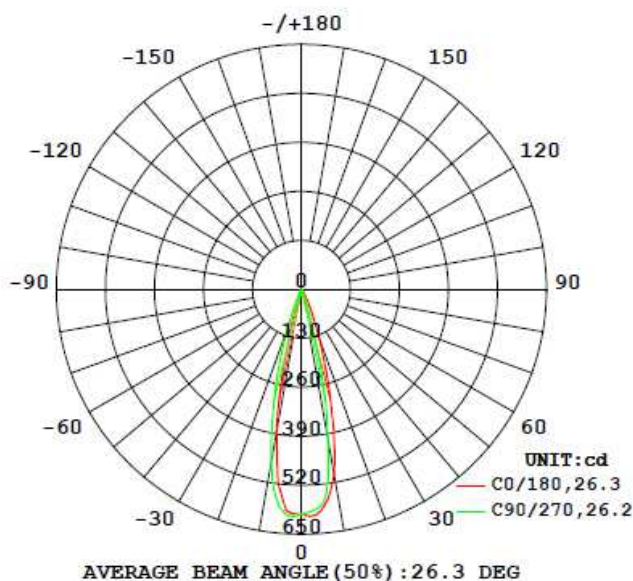
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL33

Setting : 3 (Medium Light Output)

G \ C(°)	0	22.5	45	67.5	90
0	597.53	597.53	597.53	597.53	597.53
5	590.32	586.24	583.88	581.27	577.77
10	496.85	471.97	438.65	411.49	402.64
15	290.89	258.43	218.76	170.61	150.15
20	139.46	102.56	50.01	26.18	20.96
25	56.33	27.32	12.65	8.01	5.12
30	21.40	10.35	6.52	4.11	2.87
35	8.52	5.36	3.55	2.66	1.79
40	4.33	3.02	2.17	1.52	0.81
45	2.44	1.79	1.37	0.77	0.28
50	1.35	1.17	0.83	0.33	0.07
55	0.88	0.78	0.49	0.12	0.02
60	0.61	0.51	0.28	0.03	0.01
65	0.40	0.33	0.16	0.01	0.00
70	0.26	0.21	0.09	0.01	0.00
75	0.17	0.14	0.05	0.00	0.00
80	0.12	0.09	0.03	0.00	0.00
85	0.08	0.06	0.01	0.00	0.00
90	0.06	0.04	0.01	0.00	0.00



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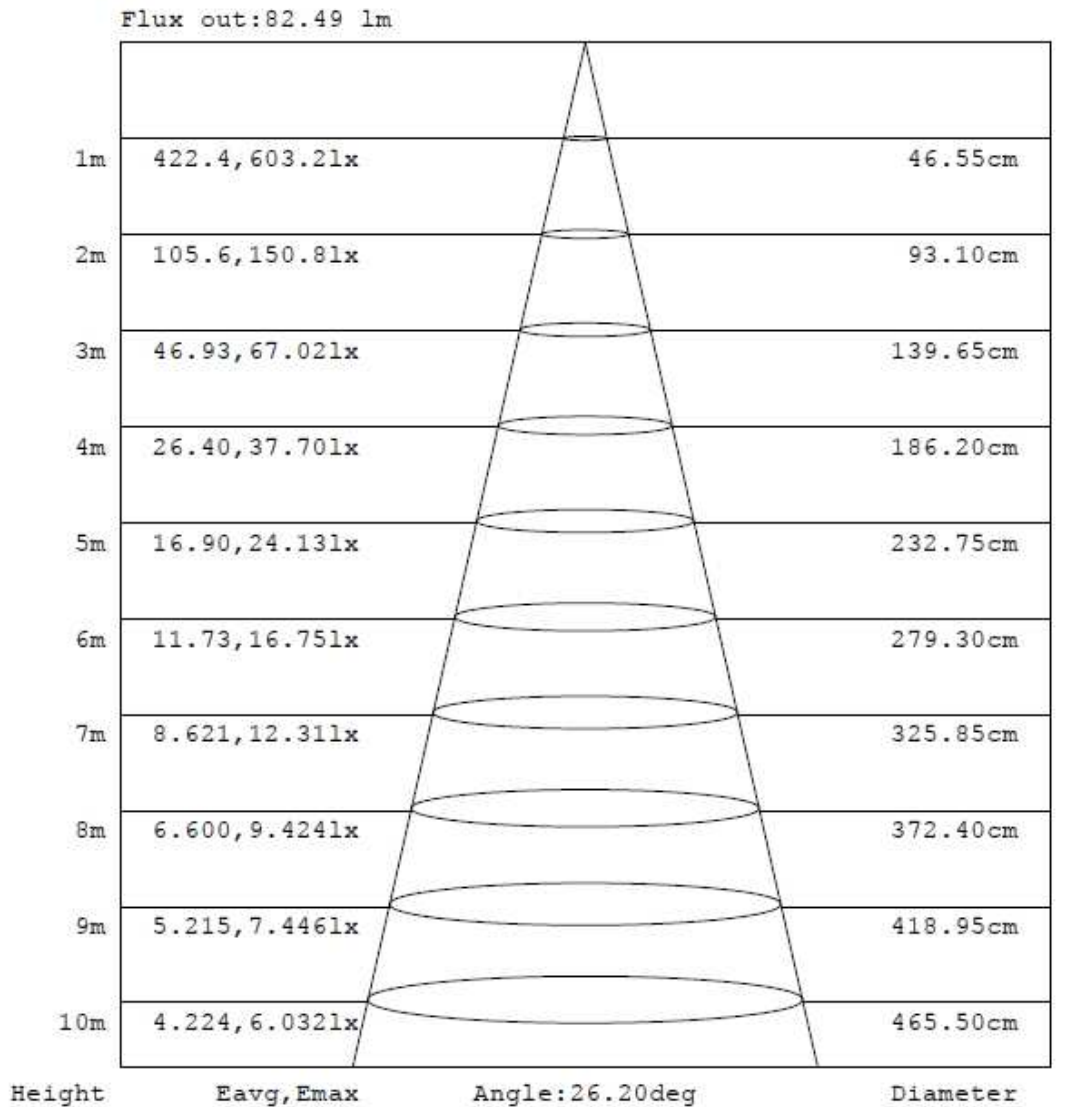
RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 3 (Medium Light Output)

Illumination Plots

Model No.: SL33
Mount Height: 10 m

Illuminance - Cone of Light



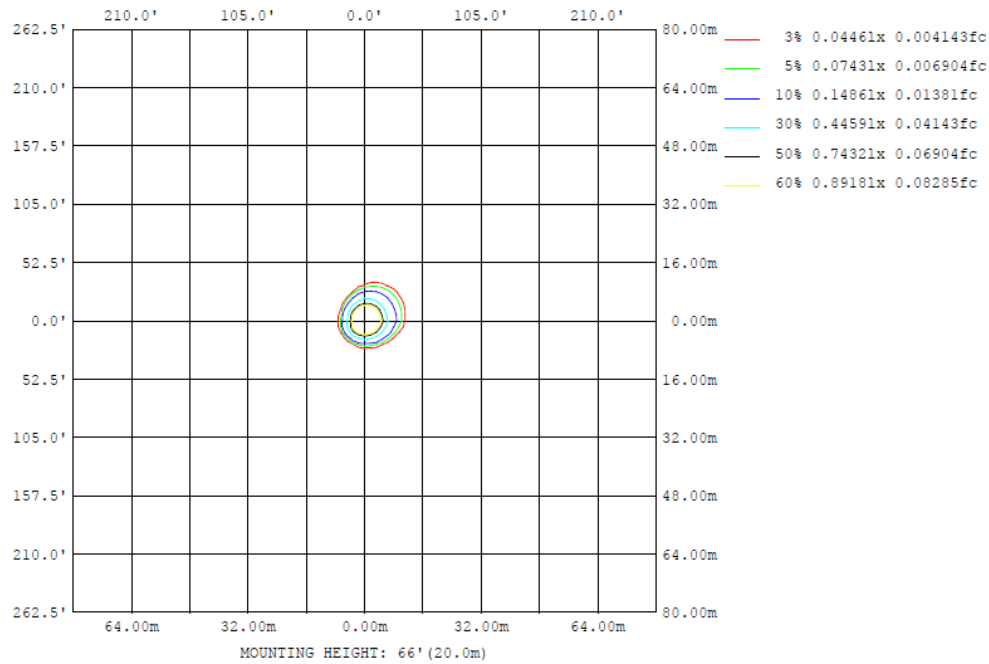
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 3 (Medium Light Output)

Model No.: SL33
Mount Height: 20 m
Isoillumination Plot



***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33

Setting : 3 (Medium Light Output)

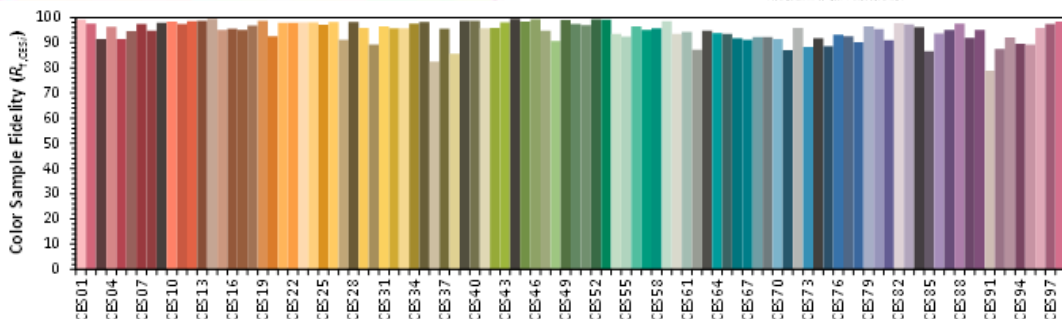
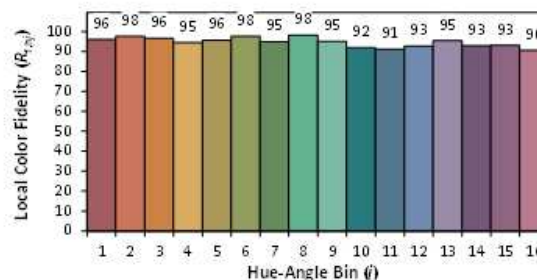
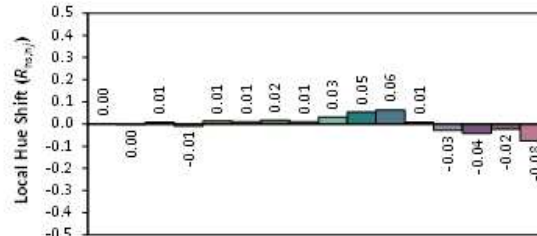
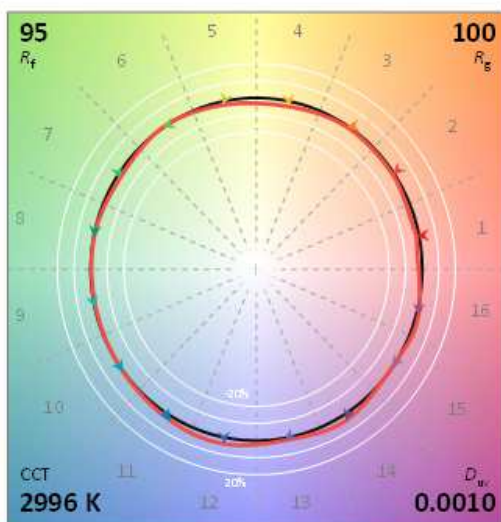
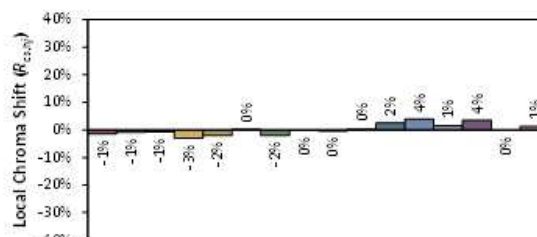
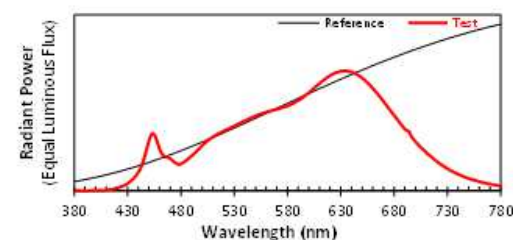
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 9/18/2024

Model: SL33



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

x 0.4387

y 0.4072

u' 0.2504

v' 0.5229

CIE 13.3-1995
(CRI)

R_a 98

R_g 88

***** End of Page *****

RESULTS OF TESTS(cont'd)

Test Condition: 15V 60Hz for SL33

Setting : 4 (Medium Light Output)

Total operation burning time: 70 min

Stabilization time: 60 min

Photometric Measurements at 25°C

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL33							
A240906-22-007	N/A	3016	98	0.4375	0.4073	0.2496	0.5227

Photometric and Electrical Measurements at 25°C

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Lamp Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL33							
A240906-22-007	N/A	15.0	0.2010	2.0066	0.6651	85.4297	42.57

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL33		
0-30	82.195	96.21
0-40	84.326	98.71
0-60	85.213	99.75
0-90	85.398	99.96
0-180	85.430	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL33		
Beam (50%)	26.4	26.0
Beam Angle	26.2	

***** End of Page *****

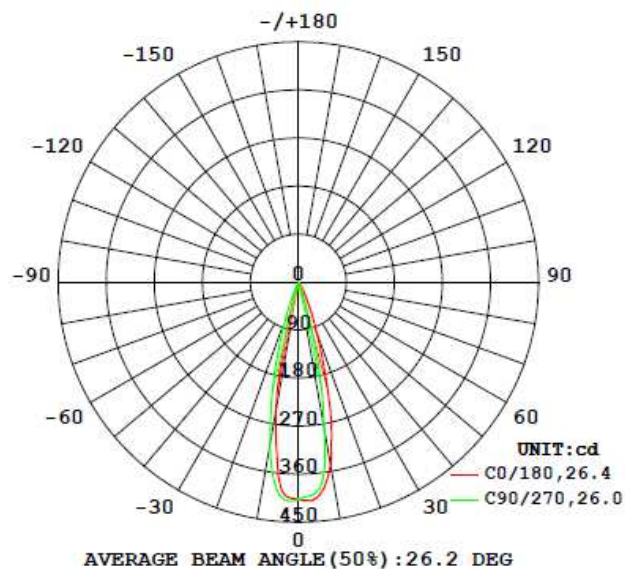
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL33

Setting : 4 (Medium Light Output)

G \ C(°)	0	22.5	45	67.5	90
0	406.95	406.95	406.95	406.95	406.95
5	405.33	402.52	400.40	397.45	394.07
10	347.60	336.92	313.54	291.82	279.30
15	215.29	187.67	164.22	124.37	107.77
20	102.64	81.32	42.64	23.27	16.50
25	44.50	24.55	10.25	6.00	3.68
30	16.55	8.22	4.88	3.01	2.03
35	6.72	4.01	2.66	1.90	1.30
40	3.15	2.28	1.58	1.13	0.61
45	1.80	1.30	1.01	0.59	0.21
50	0.97	0.84	0.63	0.28	0.06
55	0.62	0.57	0.37	0.11	0.02
60	0.43	0.37	0.22	0.04	0.01
65	0.29	0.24	0.13	0.01	0.00
70	0.19	0.16	0.08	0.01	0.00
75	0.12	0.10	0.04	0.00	0.00
80	0.08	0.07	0.02	0.00	0.00
85	0.06	0.05	0.01	0.00	0.00
90	0.04	0.03	0.01	0.00	0.00



***** End of Page *****

RESULTS OF TESTS (cont'd)

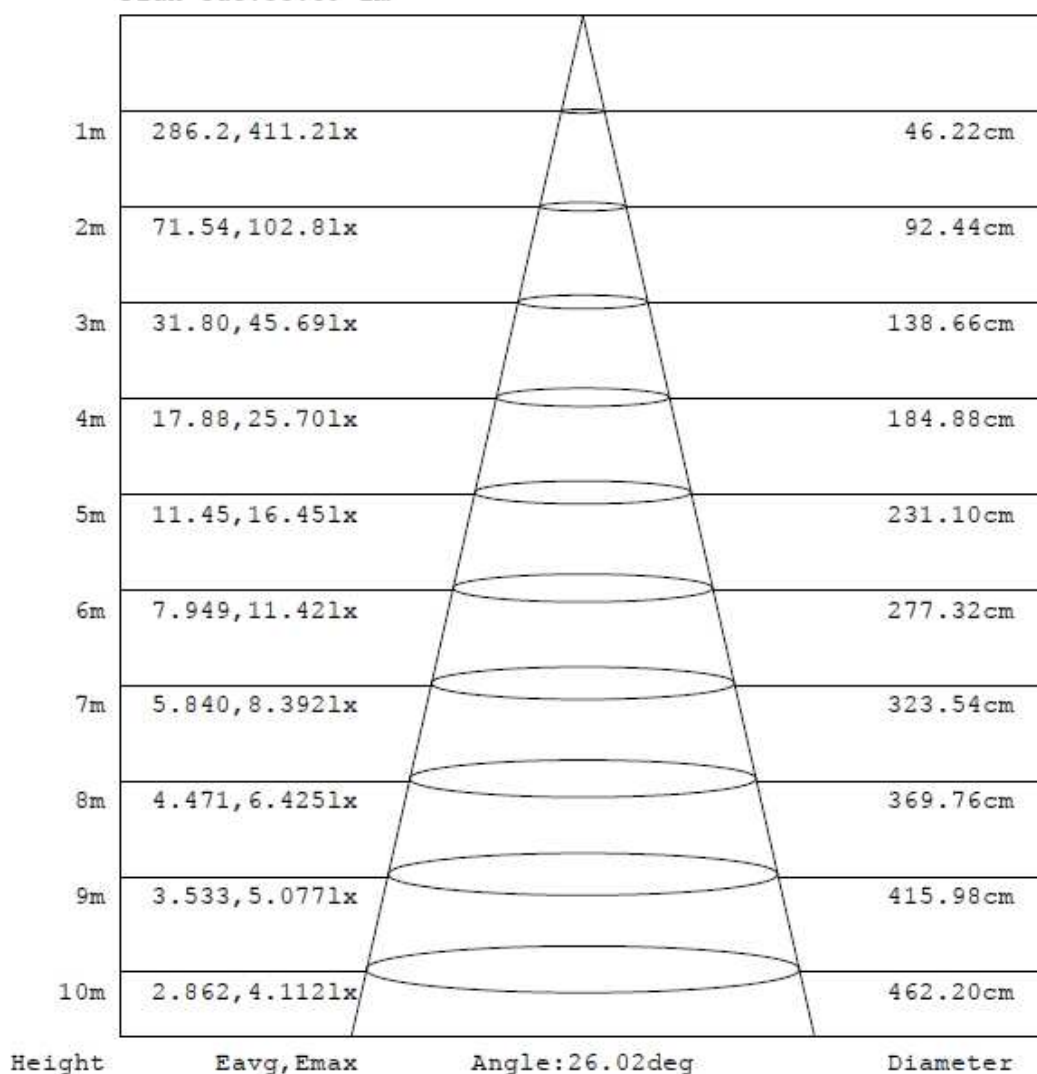
Test Condition: 15V 60Hz for SL33
Setting : 4 (Medium Light Output)

Illumination Plots

Model No.: SL33
 Mount Height: 10 m

Illuminance - Cone of Light

Flux out: 55.89 lm



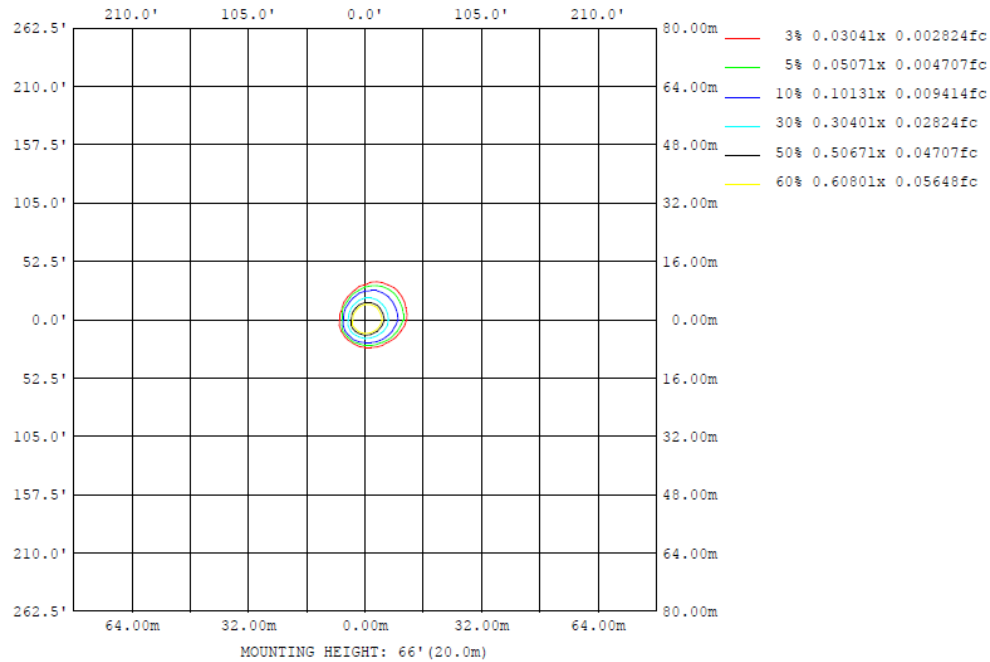
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 4 (Medium Light Output)

Model No.: SL33
Mount Height: 20 m
Isoillumination Plot



***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 4 (Medium Light Output)

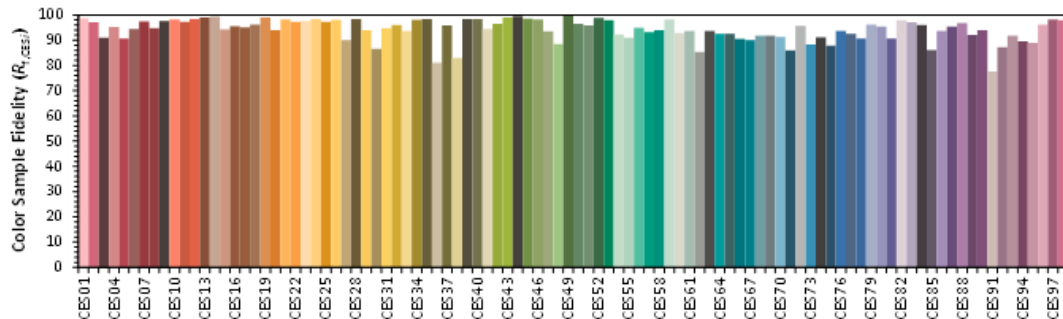
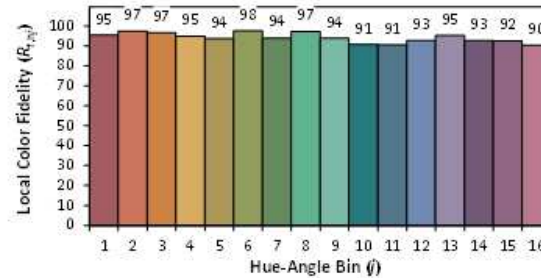
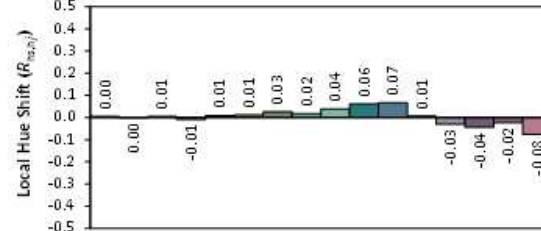
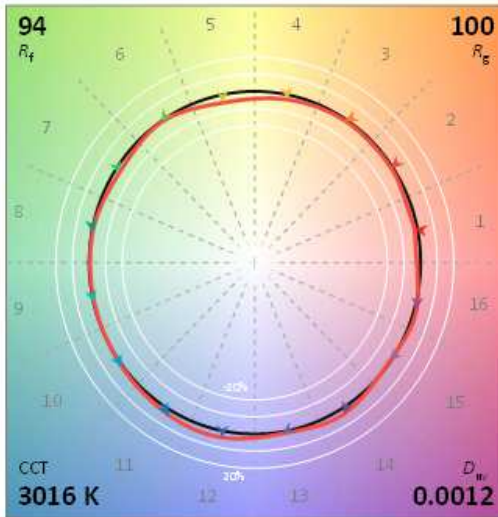
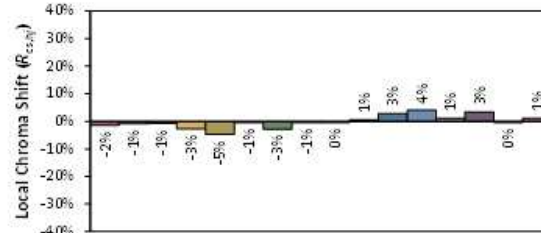
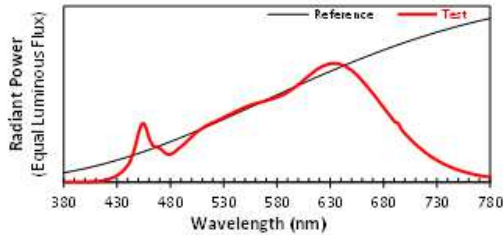
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 9/18/2024

Model: SL33



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

x 0.4375

y 0.4073

u' 0.2496

v' 0.5227

CIE 13.3-1995
(CRI)

R_a 98

R₉ 88

***** End of Page *****

RESULTS OF TESTS(cont'd)

Test Condition: 15V 60Hz for SL33

Setting : 5 (Medium Light Output)

Total operation burning time: 70 min

Stabilization time: 60 min

Photometric Measurements at 25°C

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL33							
A240906-22-007	N/A	2956	98	0.4412	0.4073	0.2519	0.5233

Photometric and Electrical Measurements at 25°C

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Lamp Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL33							
A240906-22-007	N/A	15.0	0.1193	1.0947	0.6104	44.7464	40.87

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL33		
0-30	43.038	96.18
0-40	44.154	98.68
0-60	44.621	99.72
0-90	44.722	99.95
0-180	44.746	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL33		
Beam (50%)	26.6	26.0
Beam Angle	26.3	

***** End of Page *****

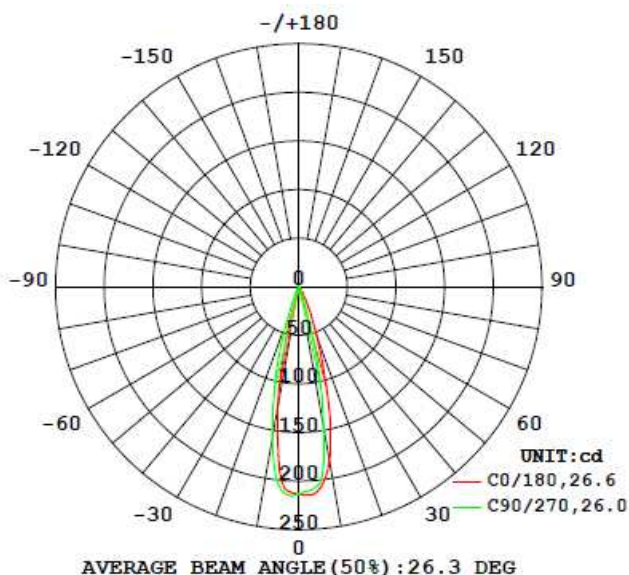
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL33

Setting : 5 (Medium Light Output)

G \ C(°)	0	22.5	45	67.5	90
0	212.92	212.92	212.92	212.92	212.92
5	212.07	210.62	209.74	208.22	206.44
10	181.82	176.90	166.27	154.92	147.59
15	114.38	99.52	88.69	68.39	58.60
20	54.01	44.98	25.34	11.98	7.40
25	24.85	13.56	5.98	3.40	2.15
30	9.39	4.72	2.74	1.67	1.13
35	3.80	2.19	1.47	1.04	0.73
40	1.70	1.26	0.86	0.63	0.36
45	0.98	0.70	0.56	0.35	0.13
50	0.53	0.45	0.35	0.17	0.04
55	0.33	0.31	0.22	0.08	0.01
60	0.23	0.20	0.13	0.03	0.01
65	0.15	0.13	0.08	0.01	0.00
70	0.10	0.09	0.05	0.00	0.00
75	0.07	0.06	0.03	0.00	0.00
80	0.04	0.04	0.02	0.00	0.00
85	0.03	0.03	0.01	0.00	0.00
90	0.02	0.02	0.01	0.00	0.00



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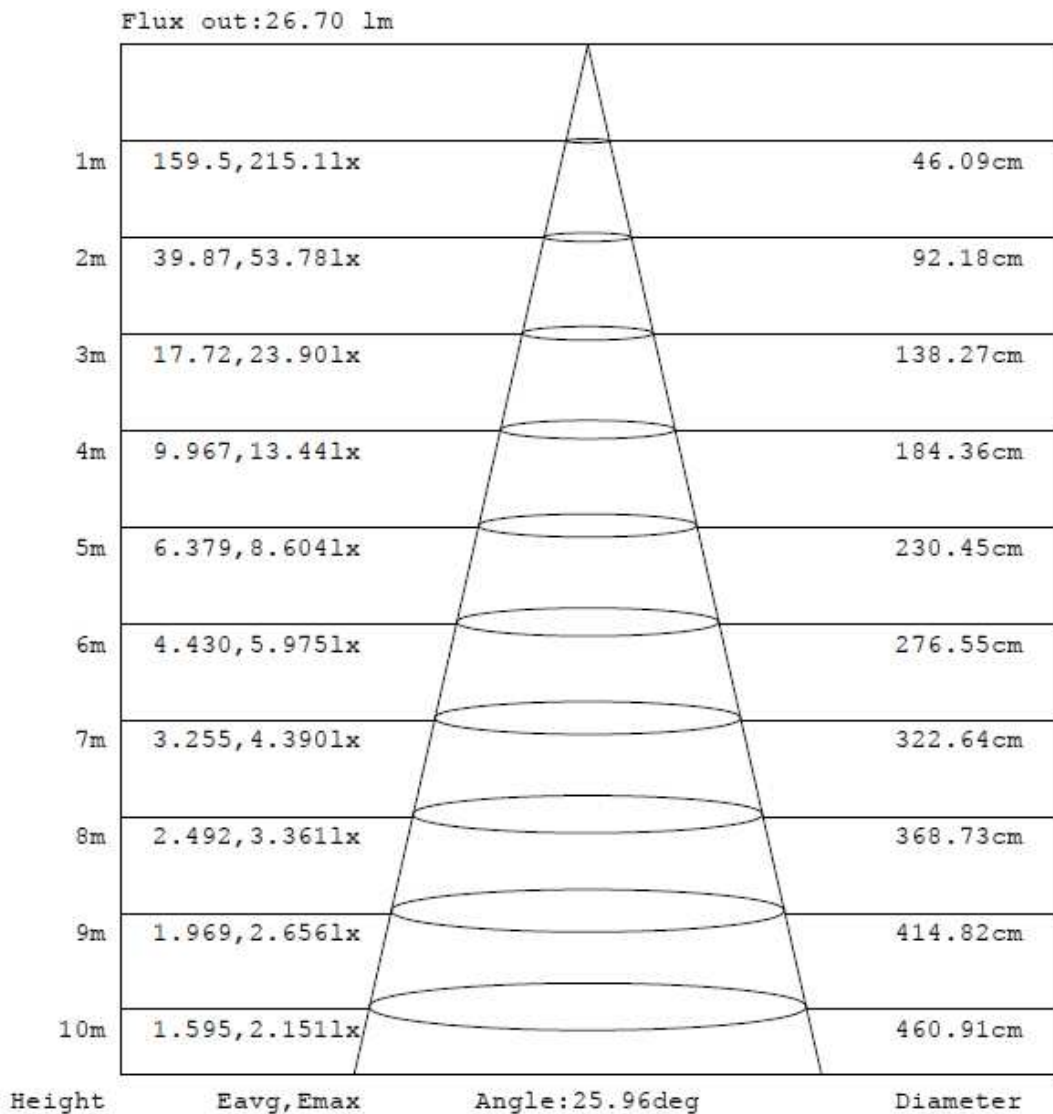
RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 5 (Medium Light Output)

Illumination Plots

Model No.: SL33
Mount Height: 10 m

Illuminance - Cone of Light



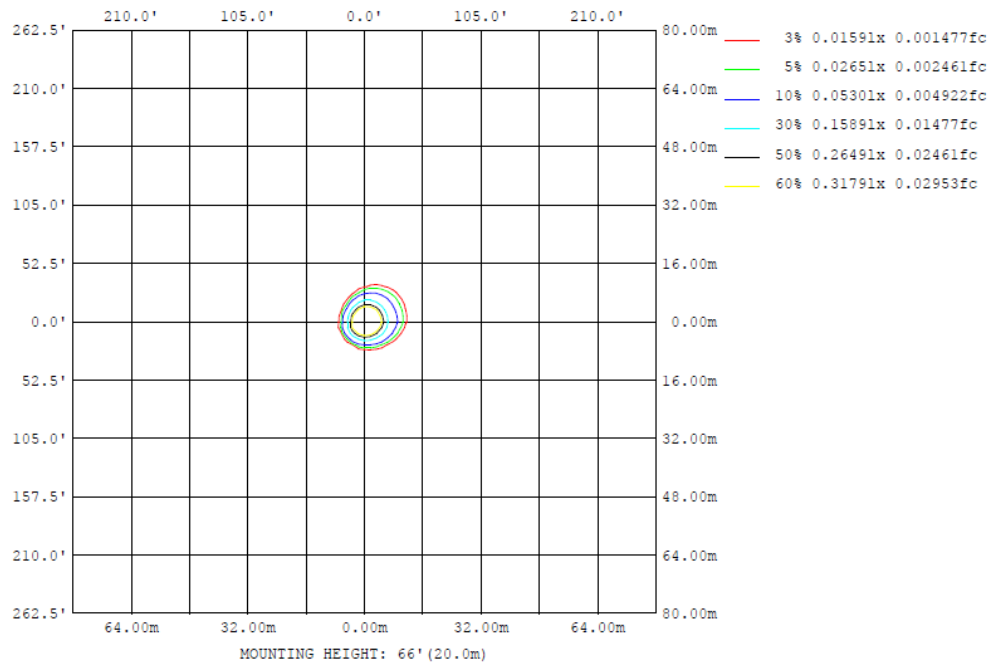
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 5 (Medium Light Output)

Model No.: SL33
Mount Height: 20 m
Isoillumination Plot



***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 5 (Medium Light Output)

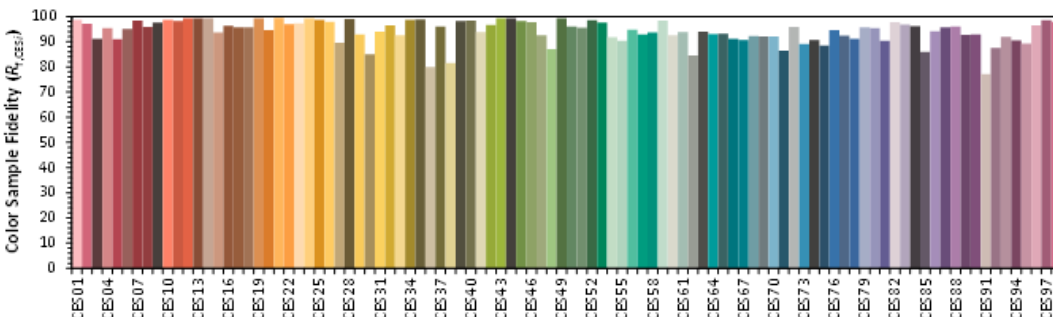
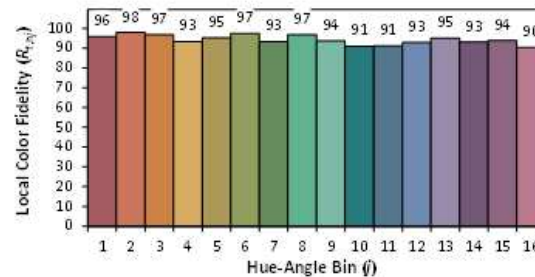
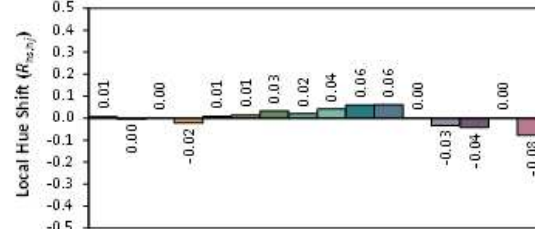
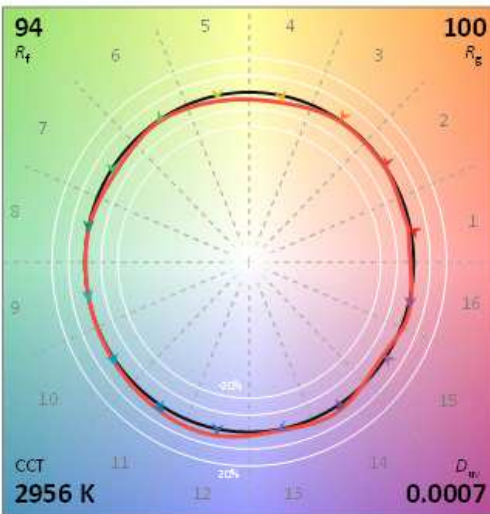
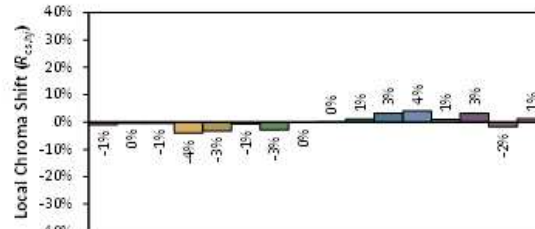
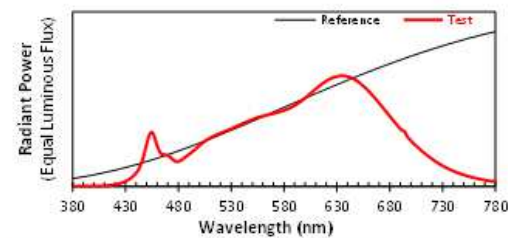
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 9/18/2024

Model: SL33



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

x 0.4412
 y 0.4073
 u' 0.2519
 v' 0.5233

CIE 13.3-1995
(CRI)

R_a 98
 R_g 92

***** End of Page *****

RESULTS OF TESTS(cont'd)

Test Condition: 15V 60Hz for SL33

Setting : 6 (Min Light Output)

Total operation burning time: 70 min

Stabilization time: 60 min

Photometric Measurements at 25°C

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL33							
A240906-22-007	N/A	2935	98	0.4422	0.4072	0.2528	0.5232

Photometric and Electrical Measurements at 25°C

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Lamp Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL33							
A240906-22-007	N/A	15.0	0.0683	0.5635	0.5485	17.5781	31.20

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL33		
0-30	16.933	96.33
0-40	17.339	98.64
0-60	17.517	99.65
0-90	17.559	99.89
0-180	17.578	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL33		
Beam (50%)	26.9	25.9
Beam Angle	26.4	

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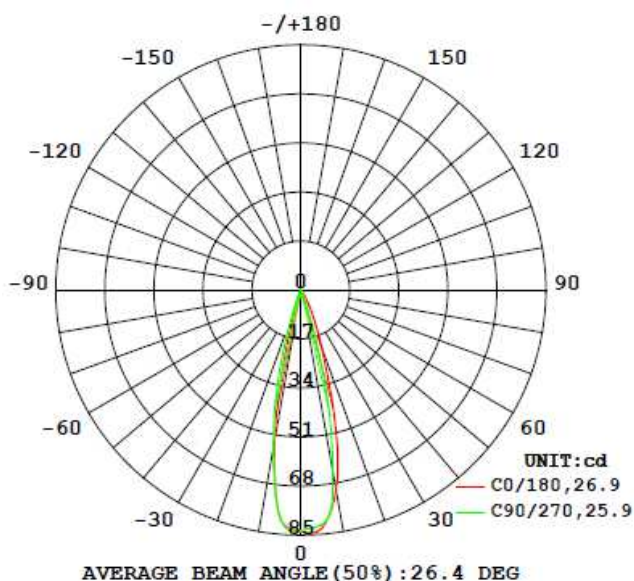
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL33

Setting : 6 (Min Light Output)

G \ C(°)	0	22.5	45	67.5	90
0	83.57	83.57	83.57	83.57	83.57
5	82.95	83.47	82.72	82.31	81.64
10	70.21	72.92	70.69	67.20	64.61
15	44.80	44.58	39.38	34.57	29.96
20	21.10	22.19	15.60	8.25	4.80
25	10.12	8.17	3.78	1.76	1.13
30	4.18	2.88	1.35	0.89	0.54
35	1.69	1.14	0.74	0.49	0.37
40	0.76	0.61	0.41	0.31	0.21
45	0.40	0.34	0.25	0.19	0.10
50	0.22	0.20	0.17	0.11	0.04
55	0.13	0.13	0.11	0.06	0.01
60	0.09	0.09	0.07	0.03	0.01
65	0.06	0.06	0.04	0.02	0.00
70	0.04	0.04	0.03	0.01	0.00
75	0.03	0.03	0.02	0.01	0.00
80	0.02	0.02	0.01	0.00	0.00
85	0.01	0.01	0.01	0.00	0.00
90	0.01	0.01	0.01	0.00	0.00



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RESULTS OF TESTS (cont'd)

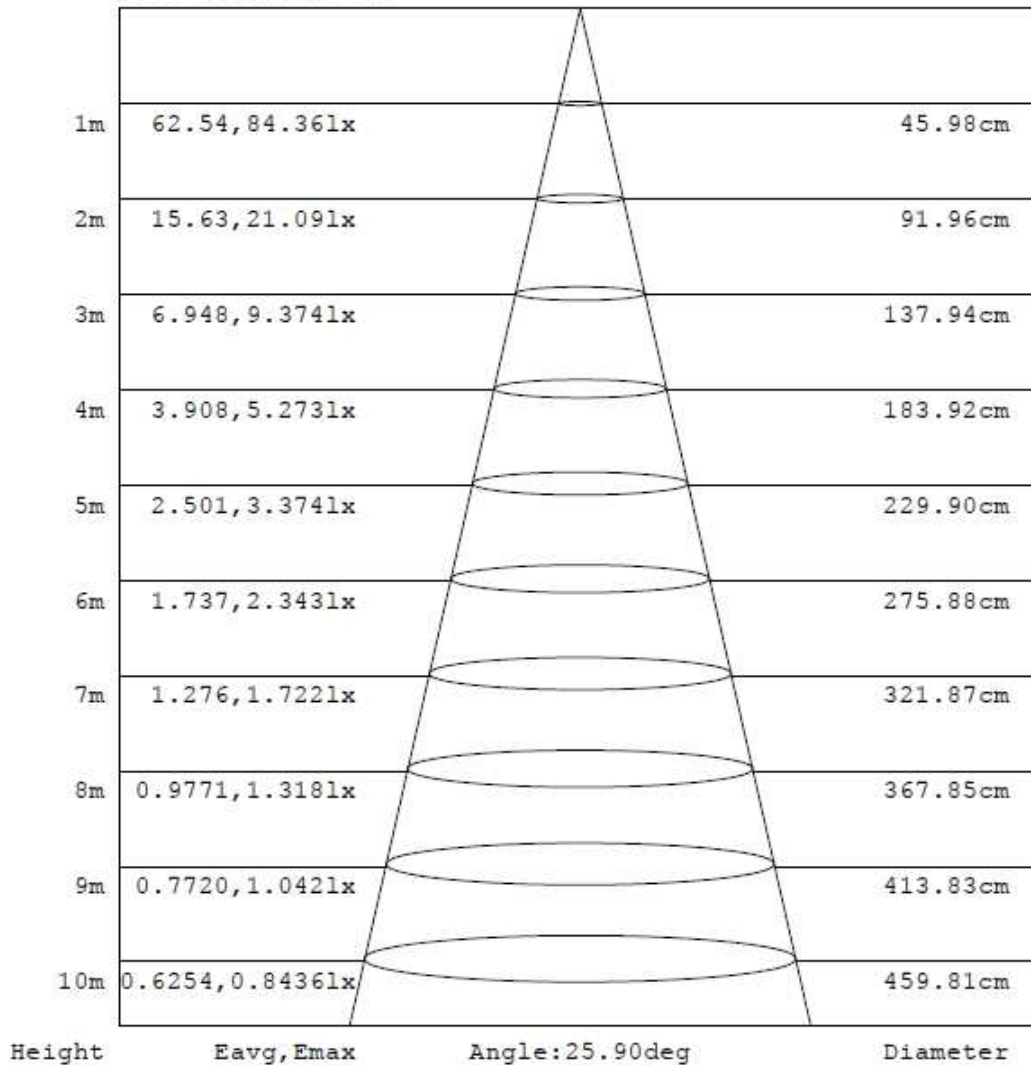
Test Condition: 15V 60Hz for SL33
Setting : 6 (Min Light Output)

Illumination Plots

Model No.: SL33
Mount Height: 10 m

Illuminance - Cone of Light

Flux out:10.47 lm



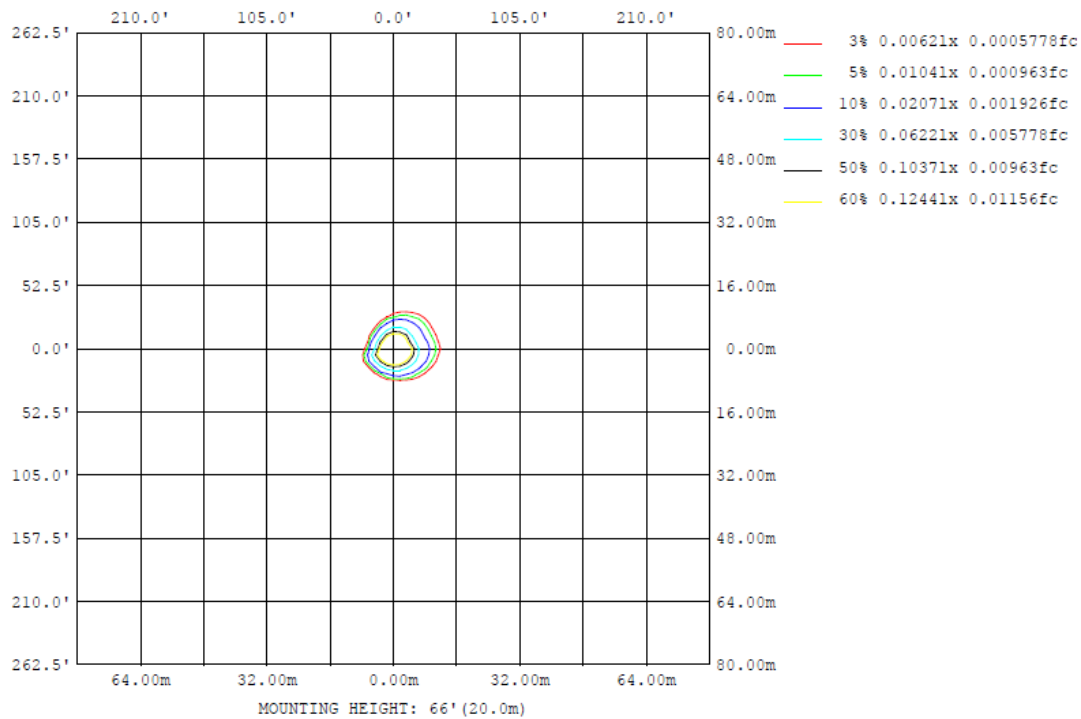
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 6 (Min Light Output)

Model No.: SL33
Mount Height: 20 m
Isoillumination Plot



***** End of Page *****

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL33
Setting : 6 (Min Light Output)

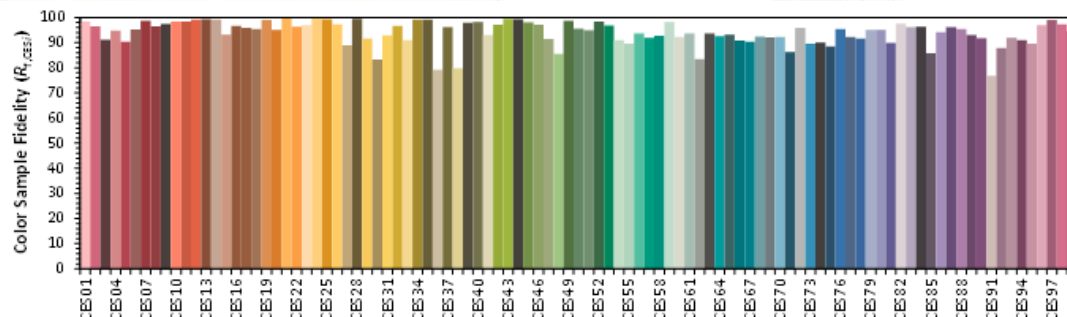
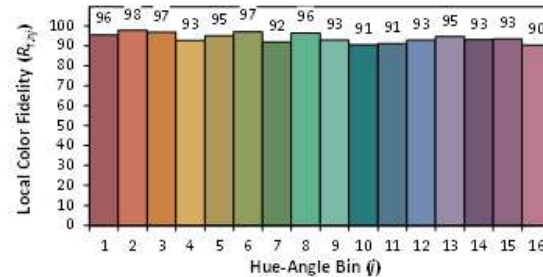
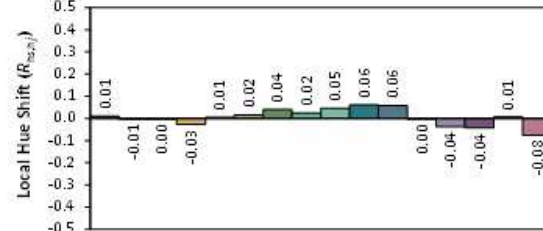
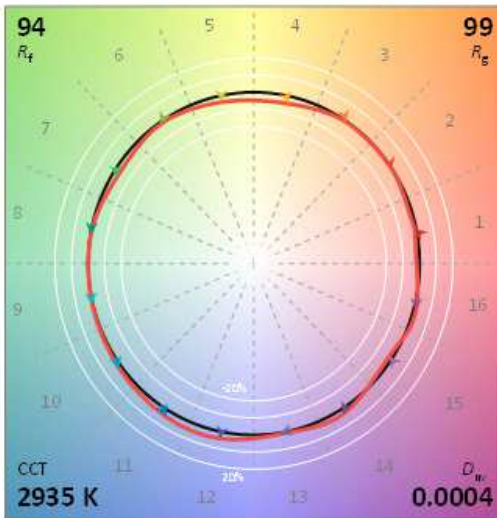
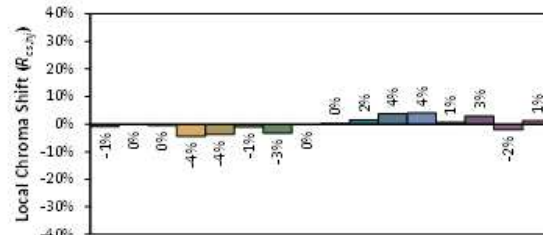
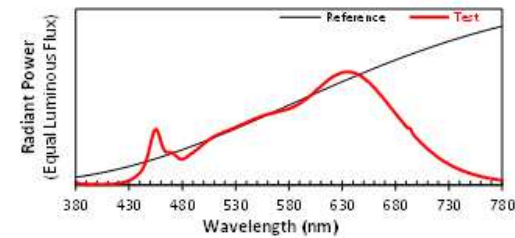
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 9/18/2024

Model: SL33



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

x 0.4422

y 0.4067

u' 0.2528

v' 0.5232

CIE 13.3-1995
(CRI)

R_a 98

R_s 94

***** End of Page *****

RESULTS OF TESTS (cont'd)

IN SITU TEMPERATURE MEASUREMENT TEST

Test Results of LED chip temperature and current

TMP led: CXA1304	
In-situ case temperature of LED source (°C)	Limit single led chip temperature(°C)
57.9	85
Measured Drive current for each LED package/array/module (mA)	Limit single led chip current (mA)
125	692

Note: In-situ case temperature was corrected to ambient temperature at 25°C in above table.

***** End of Page *****

RESULTS OF TESTS (cont'd)

IN SITU TEMPERATURE MEASUREMENT TEST

Lumen Maintenance Life Projection (Cont'd) - led chip point 1

The Calculation is based on the Illumination Engineering Society's TM-21-11: Projecting Long Term Lumen Maintenance of LED Light Sources.

Table 1: Report at each LM-80 Test Condition						Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
Description of LED Light Source Tested (manufacturer, model, catalog number)		Manufacturer: Cree LED Model: CXA1304 Report No: CLD-AP144 Rev5 Issued: Jun. 11, 2015				$T_{s,1}$ (°C)	85.00
Test Condition 1 - 85°C Case Temp						$T_{s,1}$ (K)	358.15
Sample size	25	Sample size	-	Sample size	-	α_1	2.424E-06
Number of failures	0	Number of failures	-	Number of failures	-	B_1	0.985
DUT drive current used in the test (mA)	692	DUT drive current used in the test (mA)	-	DUT drive current used in the test (mA)	-	$T_{s,2}$ (°C)	-
Test duration (hours)	7,056	Test duration (hours)	-	Test duration (hours)	-	$T_{s,2}$ (K)	-
Test duration used for projection (hour to hour)	2,016 - 7,056	Test duration used for projection (hour to hour)	-	Test duration used for projection (hour to hour)	-	α_2	-
Tested case temperature (°C)	85	Tested case temperature (°C)	-	Tested case temperature (°C)	-	B_2	-
α	2.424E-06	α	-	α	-	E_{90}/k_0	-
B	0.985	B	-	B	-	A	-
Reported L70(7k) (hours)	>42000	Reported L70(7k) (hours)	-	Reported L70(7k) (hours)	-	B_{90}	0.985
						$T_{s,1}$ (°C)	57.90
						$T_{s,1}$ (K)	331.05
						α_1	2.424E-06
						Reported L70(7k) at 57.9°C (hours)	>42000

In-Situ Inputs

Drive current for each LED package/array/module (mA):	125
<i>In-situ</i> case temperature (T_c , °C):	57.9
Percentage of initial lumens to project to (e.g. for L ₇₀ , enter 70):	70

Results

Time (t) at which to estimate lumen maintenance (hours):	50,000
Lumen maintenance at time (t) (%):	87.30%
Reported L70 (hours):	>42000

***** End of Page *****