

SUMMARY

Test Condition: 15V 60Hz for SL16

Setting: 1 (Max light output)

Criteria	Result
Total Lumen Output (lm)	320.022
Total Power(W)	7.4616
Lamp Luminaire Efficacy (lm/W)	42.89
Power Factor	0.7116
Field Angle (°)	77.9
Correlated Color Temperature (CCT)	3096
Color Rendering Index (CRI)	97
Color Rendering Index (R ₉)	86
Fidelity Index (R _f)	94
Gamut Index (R _g)	99
Chromaticity Coordinate (x)	0.4293
Chromaticity Coordinate (y)	0.3995
Chromaticity Coordinate (u')	0.2476
Chromaticity Coordinate (v')	0.5184
In-situ Case Temperature of LED/COB (°C)	79.7
Drive Current of LED/COB (mA)	691
Projection Life Time, Reported L70 (hours)	>42000

Test Condition: 15V 60Hz for SL16

Setting: 2 (Medium light output)

Criteria	Result
Total Lumen Output (lm)	277.004
Total Power(W)	5.5652
Lamp Luminaire Efficacy (lm/W)	49.77
Power Factor	0.6955
Correlated Color Temperature (CCT)	3081
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	88
Fidelity Index (R _f)	93
Gamut Index (R _g)	99
Chromaticity Coordinate (x)	0.4314
Chromaticity Coordinate (y)	0.4024
Chromaticity Coordinate (u')	0.2477
Chromaticity Coordinate (v')	0.5199
In-situ Case Temperature of LED/COB (°C)	60.9
Drive Current of LED/COB (mA)	551
Projection Life Time, Reported L70 (hours)	>42000

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

SUMMARY (CONT'D)

Test Condition: 15V 60Hz for SL16

Setting: 3 (Medium light output)

Criteria	Result
Total Lumen Output (lm)	91.7823
Total Power(W)	2.1131
Lamp Luminaire Efficacy (lm/W)	43.43
Power Factor	0.6704
Correlated Color Temperature (CCT)	3073
Color Rendering Index (CRI)	98
Color Rendering Index (R ₉)	93
Fidelity Index (R _f)	92
Gamut Index (R _g)	98
Chromaticity Coordinate (x)	0.4330
Chromaticity Coordinate (y)	0.4047
Chromaticity Coordinate (u')	0.2478
Chromaticity Coordinate (v')	0.5211
In-situ Case Temperature of LED/COB (°C)	38.9
Drive Current of LED/COB (mA)	226
Projection Life Time, Reported L70 (hours)	>42000

Test Condition: 15V 60Hz for SL16

Setting: 4 (Minimum light output)

Criteria	Result
Total Lumen Output (lm)	37.1129
Total Power(W)	0.7614
Lamp Luminaire Efficacy (lm/W)	48.74
Power Factor	0.5772
Correlated Color Temperature (CCT)	3059
Color Rendering Index (CRI)	96.8
Color Rendering Index (R ₉)	96
Fidelity Index (R _f)	91
Gamut Index (R _g)	97
Chromaticity Coordinate (x)	0.4334
Chromaticity Coordinate (y)	0.4038
Chromaticity Coordinate (u')	0.2484
Chromaticity Coordinate (v')	0.5208
In-situ Case Temperature of LED/COB (°C)	32.4
Drive Current of LED/COB (mA)	78.3
Projection Life Time, Reported L70 (hours)	>42000

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

RESULTS OF TESTS

Test Condition: 15V 60Hz for SL16

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')
SL16							
0230918-15-001	N/A	3097	97.3	0.4293	0.3996	0.2475	0.5184

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)
SL16							
0230918-15-001	N/A	15.0	0.6984	7.4616	0.7116	320.022	42.89

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL16		
0-30	218.7	68.3
0-40	266.5	83.3
0-60	308.3	96.3
0-90	320.0	100.0
0-180	320.0	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL16		
Beam (50%)	36.4	36.6
Beam Angle	36.5	

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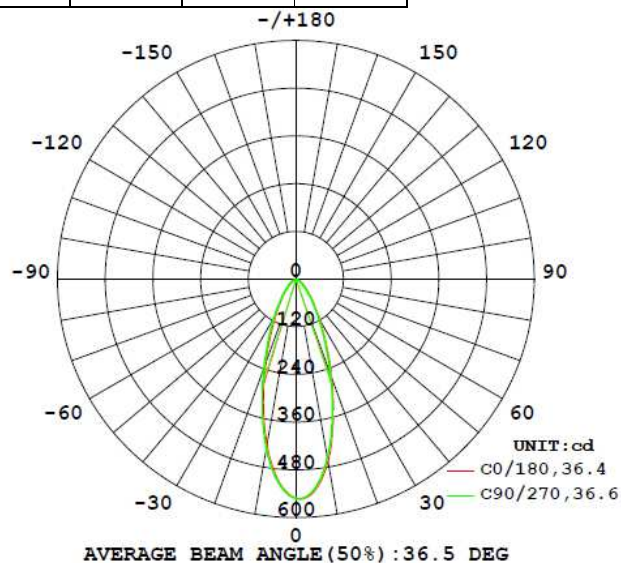
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL16

Setting: 1 (Max light output)

G \ C(°)	0	22.5	45	67.5	90
0	551.7	551.7	551.7	551.7	551.7
5	534.6	541.8	537.4	533.3	530.2
10	463.8	475.7	467.6	460.9	456.3
15	362.9	376.4	367.3	360.0	355.2
20	261.1	272.7	264.9	258.3	253.5
25	178.2	186.7	180.8	175.6	171.9
30	119.6	125.2	120.9	117.2	114.4
35	80.5	84.3	81.3	78.7	76.7
40	54.4	57.1	55.1	53.2	51.8
45	36.8	38.8	37.5	36.2	35.2
50	25.2	26.7	25.9	25.0	24.3
55	17.4	18.4	17.9	17.2	16.7
60	12.0	12.8	12.4	11.9	11.6
65	8.2	8.8	8.6	8.2	8.0
70	5.5	5.9	5.7	5.5	5.3
75	3.4	3.7	3.6	3.4	3.3
80	1.8	2.1	2.0	1.9	1.9
85	0.6	0.8	0.7	0.7	0.6
90	0.0	0.0	0.0	0.0	0.0



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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

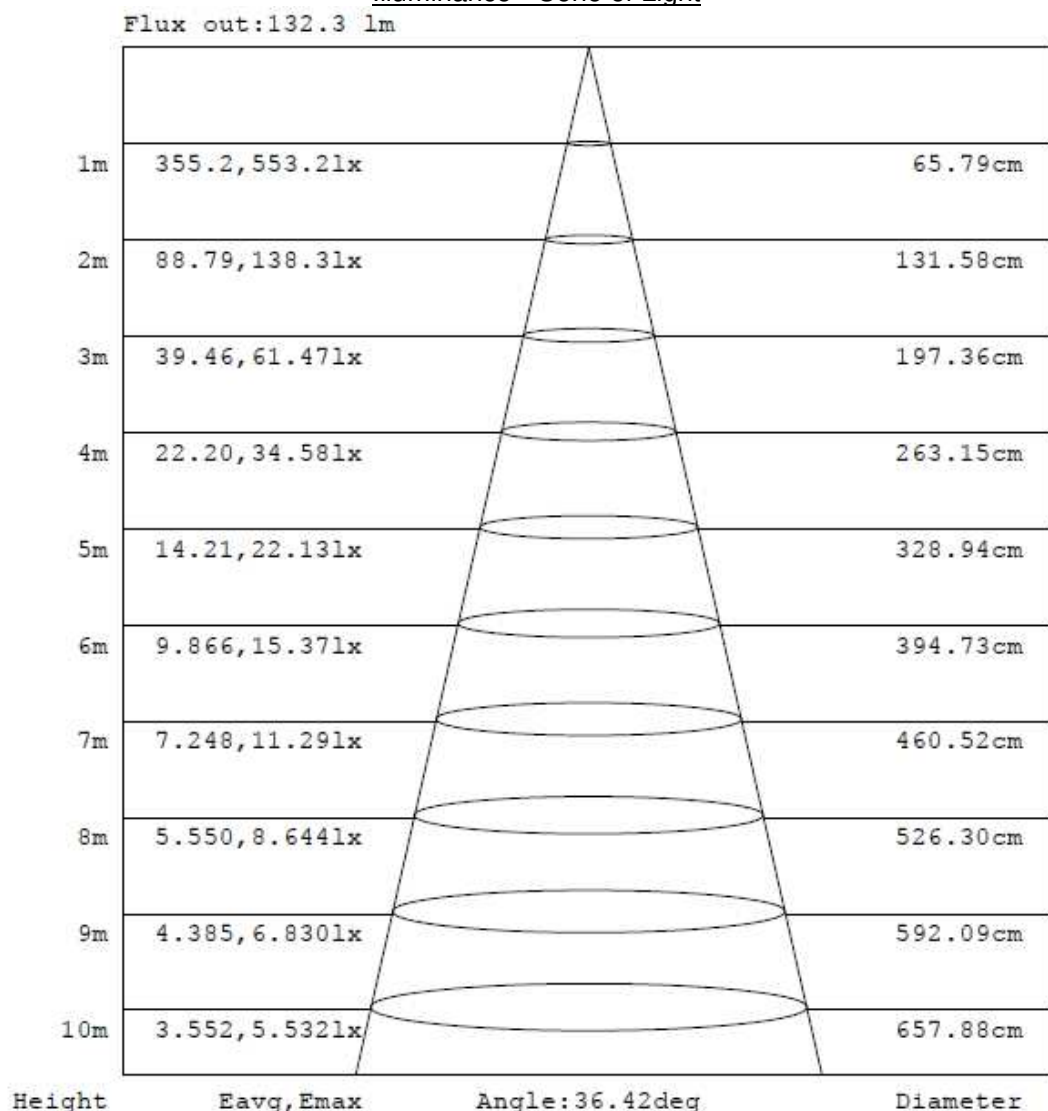
Setting: 1 (Max light output)

Illumination Plots

Model No.: SL16

Mount Height: 10 m

Illuminance - Cone of Light



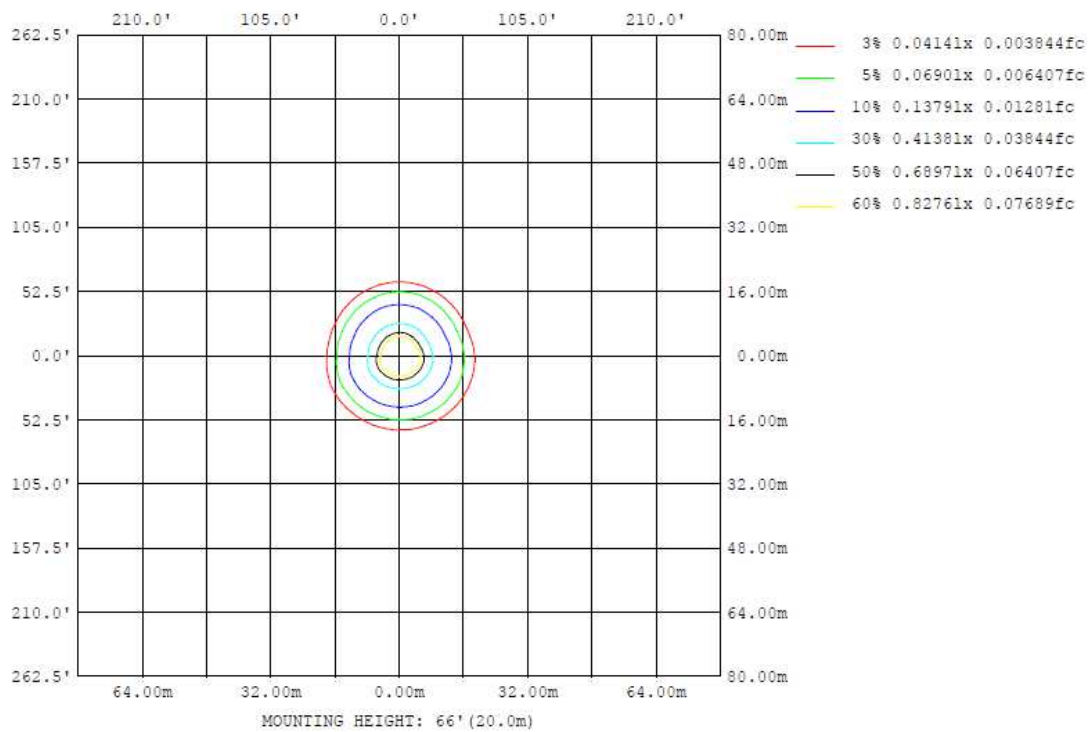
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16
Setting: 1 (Max light output)

Model No.: SL16
Mount Height: 20 m
Isoillumination Plot



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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16
Setting: 1 (Max light output)

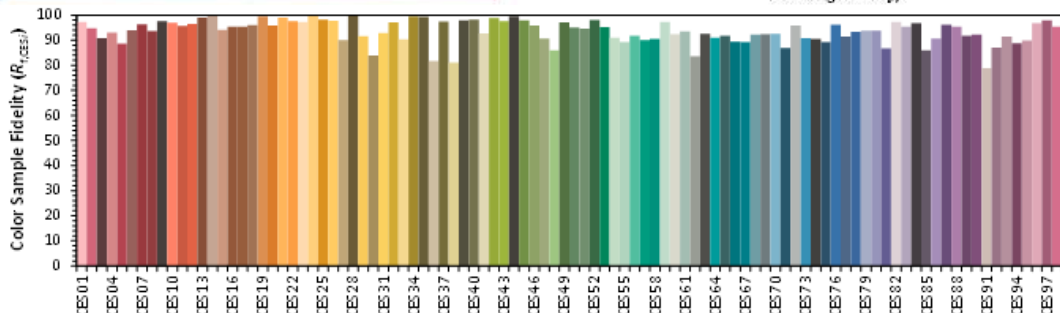
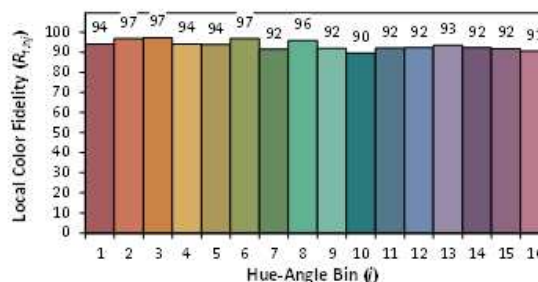
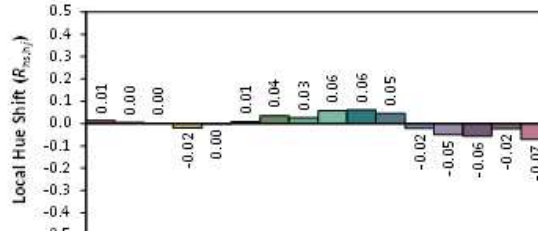
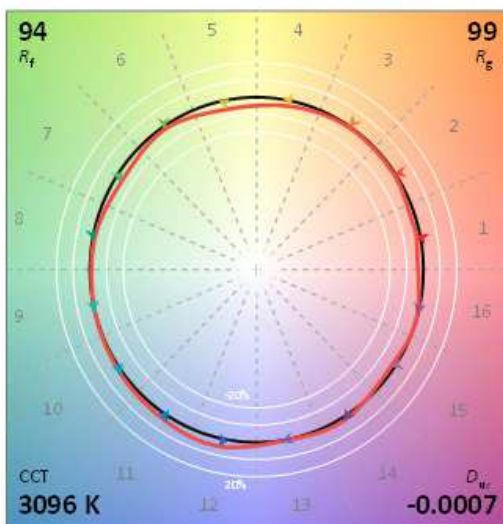
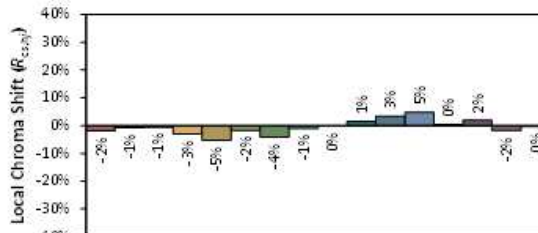
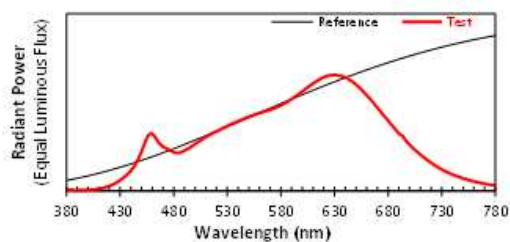
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 11/13/2023

Model: SL16



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

x 0.4293
y 0.3995
u' 0.2476
v' 0.5184

CIE 13.3-1995
(CRI)

R_a 97
R_s 86

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

RESULTS OF TESTS

Test Condition: 15V 60Hz for SL16

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')
SL16							
0230918-15-001	N/A	3081	97.7	0.4315	0.4025	0.2477	0.5199

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)
SL16							
0230918-15-001	N/A	15.0	0.5294	5.5652	0.6955	277.004	49.77

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL16		
0-30	187.5	67.7
0-40	229.0	82.7
0-60	266.4	96.2
0-90	277.0	100.0
0-180	277.0	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL16		
Beam (50%)	36.6	36.5
Beam Angle	36.6	

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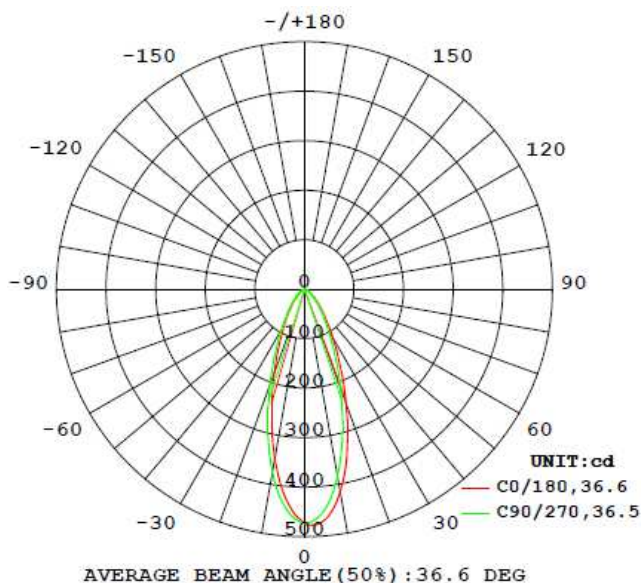
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL16

Setting: 2 (Medium light output)

G \ C(°)	0	22.5	45	67.5	90
0	472.1	472.1	472.1	472.1	472.1
5	467.8	465.4	460.8	455.2	449.3
10	415.7	411.2	403.2	393.6	383.9
15	333.8	328.8	319.4	308.2	297.1
20	245.8	240.9	232.2	222.2	212.5
25	170.3	166.4	159.6	152.2	144.9
30	115.4	112.5	107.8	102.5	97.4
35	78.2	76.3	73.0	69.3	65.8
40	53.4	52.1	49.8	47.2	44.7
45	36.5	35.7	34.1	32.3	30.5
50	25.2	24.8	23.6	22.3	21.1
55	17.5	17.1	16.3	15.4	14.6
60	12.1	11.8	11.3	10.7	10.2
65	8.3	8.1	7.7	7.4	7.0
70	5.5	5.4	5.1	4.9	4.6
75	3.4	3.4	3.2	3.0	2.8
80	1.9	1.9	1.8	1.6	1.5
85	0.7	0.6	0.6	0.5	0.4
90	0.0	0.0	0.0	0.0	0.0



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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

Setting: 2 (Medium light output)

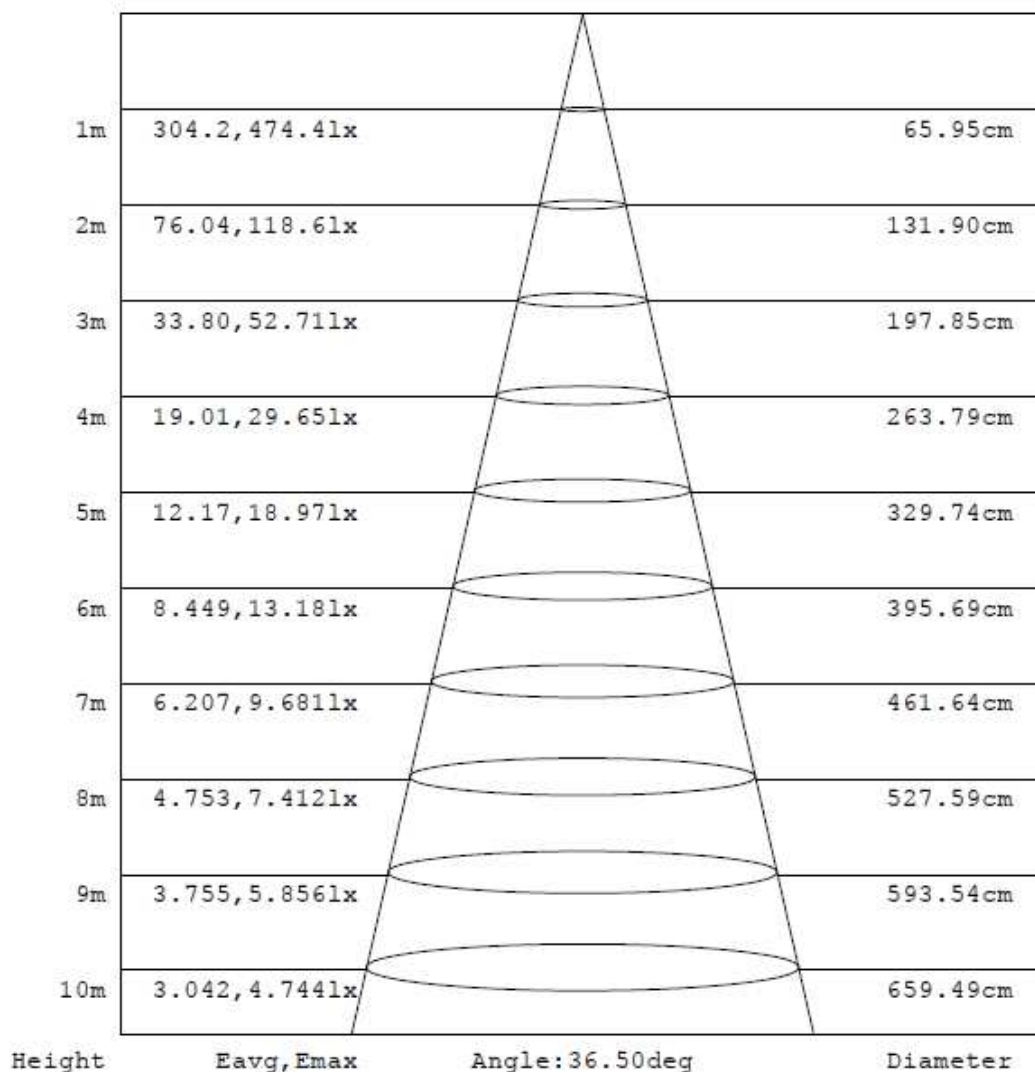
Illumination Plots

Model No.: SL16

Mount Height: 10 m

Illuminance - Cone of Light

Flux out: 113.3 lm



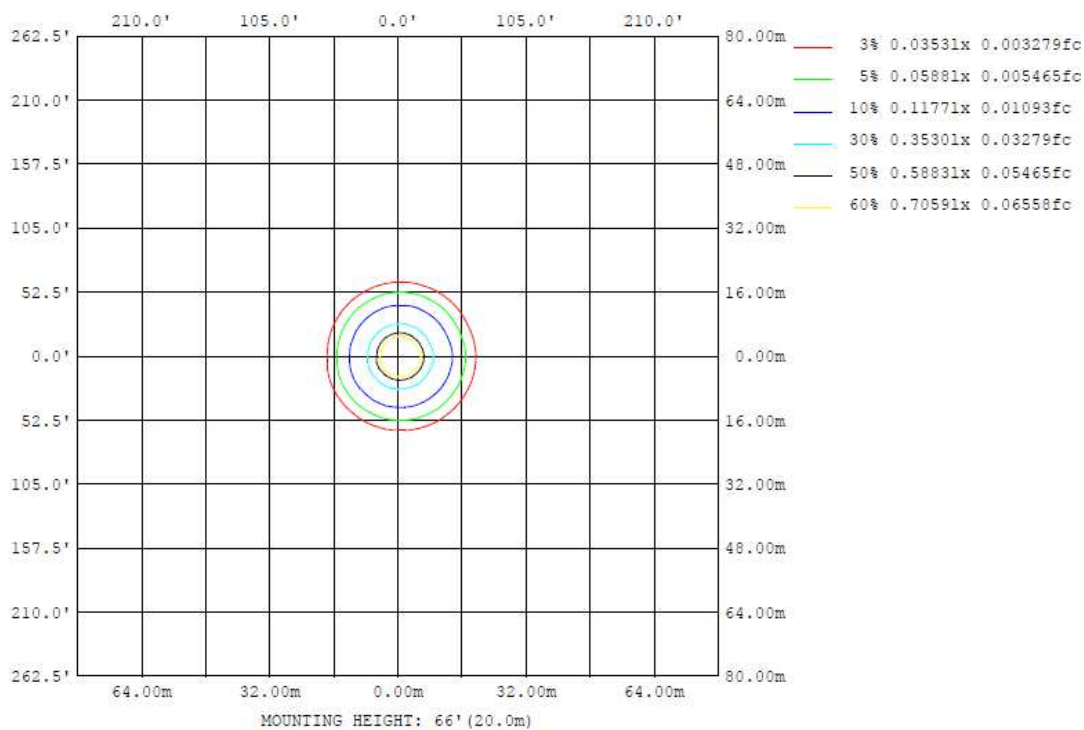
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16
Setting: 2 (Medium light output)

Model No.: SL16
Mount Height: 20 m
Isoillumination Plot



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

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

Setting: 2 (Medium light output)

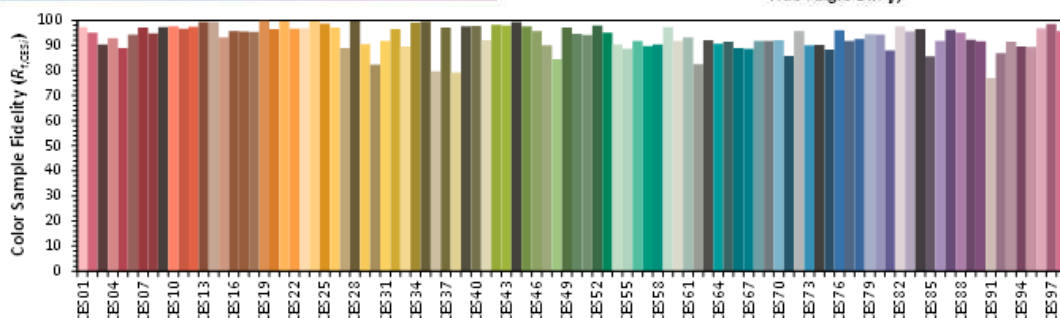
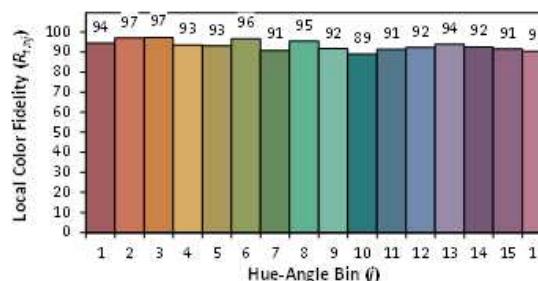
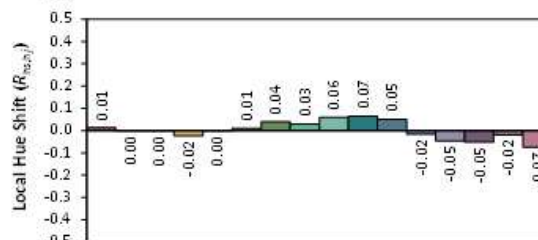
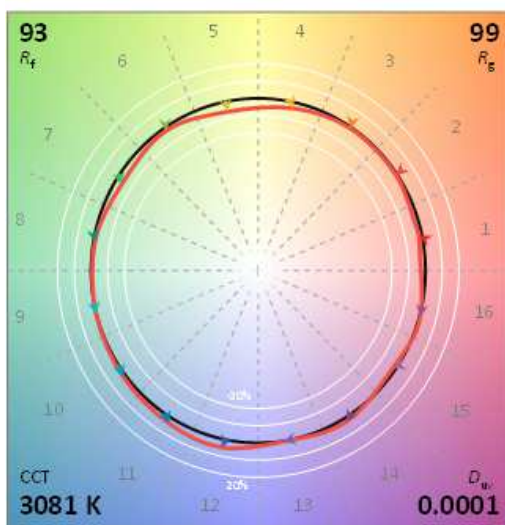
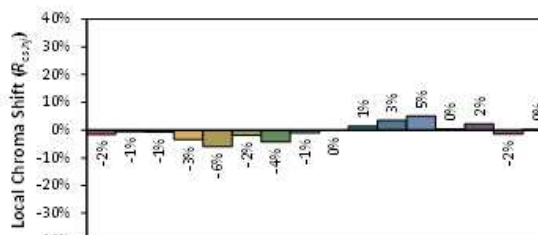
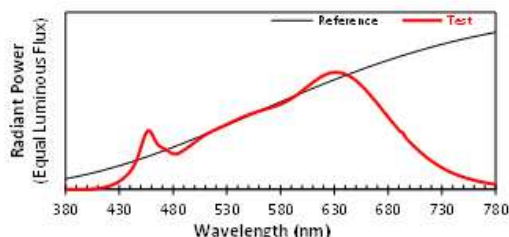
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 11/13/2023

Model: SL16



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

x 0.4314

y 0.4024

u' 0.2477

v' 0.5199

CIE 13.3-1995
(CRI)

R_a 98

R_g 88

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

RESULTS OF TESTS

Test Condition: 15V 60Hz for SL16

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')
SL16							
0230918-15-001	N/A	3073	97.36	0.4330	0.4048	0.2477	0.5211

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)
SL16							
0230918-15-001	N/A	15.0	0.2065	2.1131	0.6704	91.7823	43.43

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL16		
0-30	61.60	67.1
0-40	75.25	82.0
0-60	88.00	95.9
0-90	91.78	100.0
0-180	91.78	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL16		
Beam (50%)	34.4	35.0
Beam Angle	34.7	

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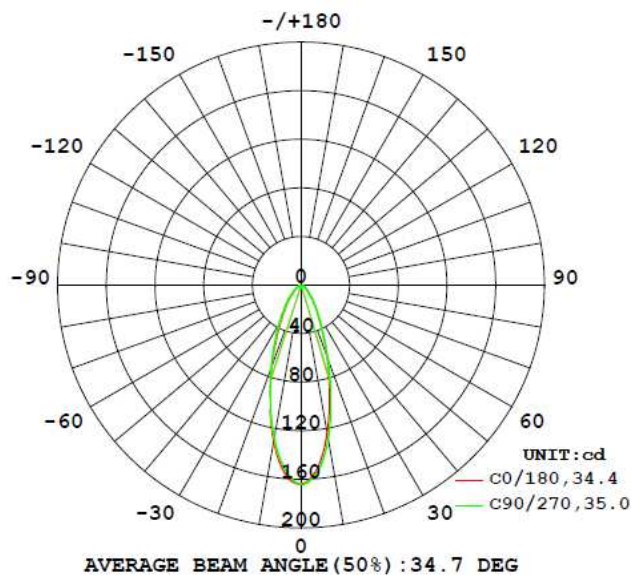
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL16

Setting: 3 (Medium light output)

G \ C(°)	0	22.5	45	67.5	90
0	163.8	163.8	163.8	163.8	163.8
5	151.9	151.8	152.1	153.2	154.6
10	124.1	123.5	124.0	126.0	128.4
15	91.2	90.2	90.6	92.6	95.2
20	62.4	61.1	61.1	62.6	64.6
25	41.5	40.1	39.8	40.6	41.9
30	27.8	26.8	26.5	26.9	27.4
35	19.1	18.2	17.9	18.1	18.5
40	13.1	12.6	12.4	12.5	12.8
45	9.1	8.7	8.6	8.7	8.9
50	6.4	6.1	6.1	6.1	6.3
55	4.5	4.3	4.3	4.4	4.5
60	3.1	3.0	3.0	3.1	3.2
65	2.3	2.2	2.2	2.3	2.3
70	1.5	1.5	1.5	1.5	1.6
75	0.9	0.9	0.9	1.0	1.0
80	0.5	0.5	0.5	0.5	0.5
85	0.1	0.1	0.1	0.1	0.2
90	0.0	0.0	0.0	0.0	0.0



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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

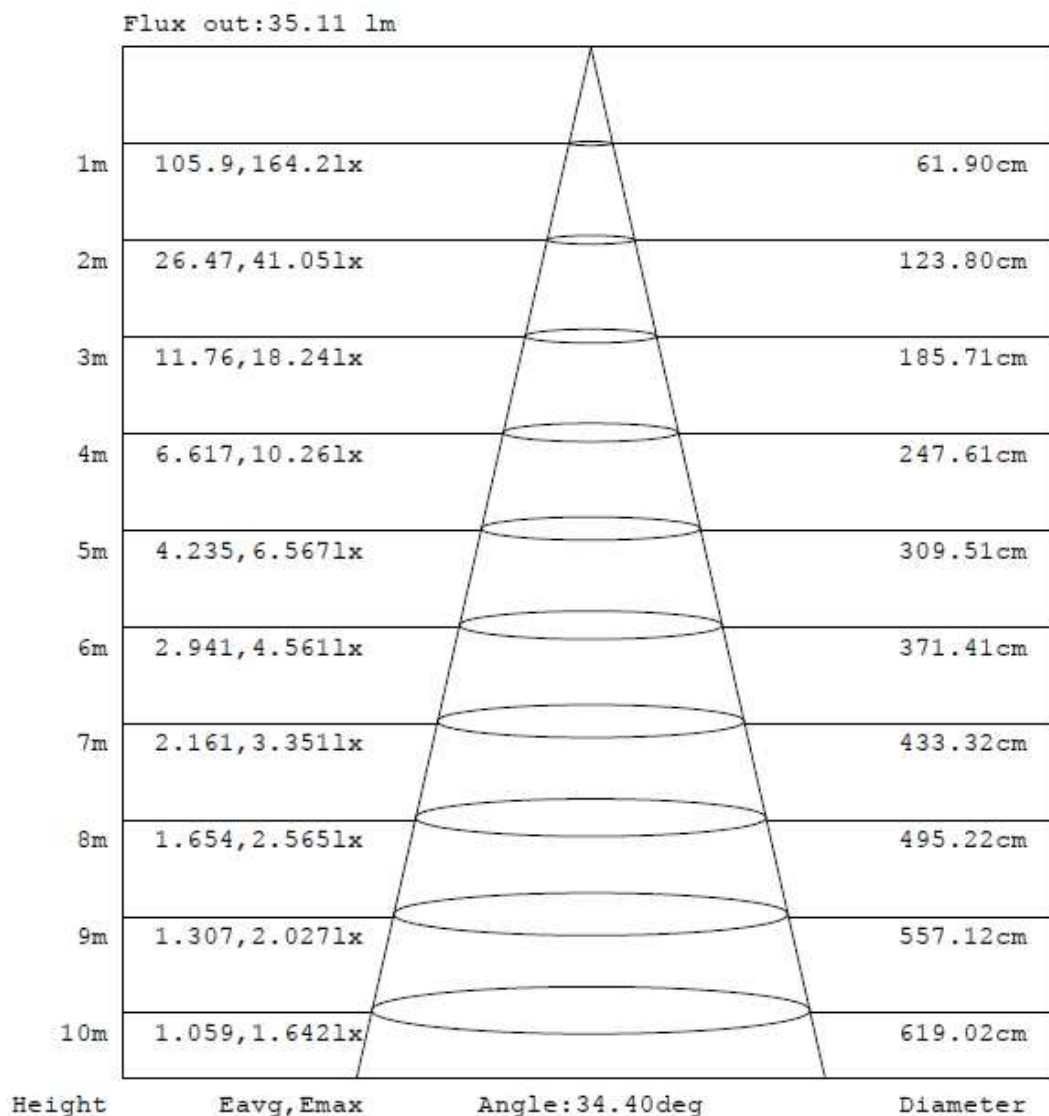
Setting: 3 (Medium light output)

Illumination Plots

Model No.: SL16

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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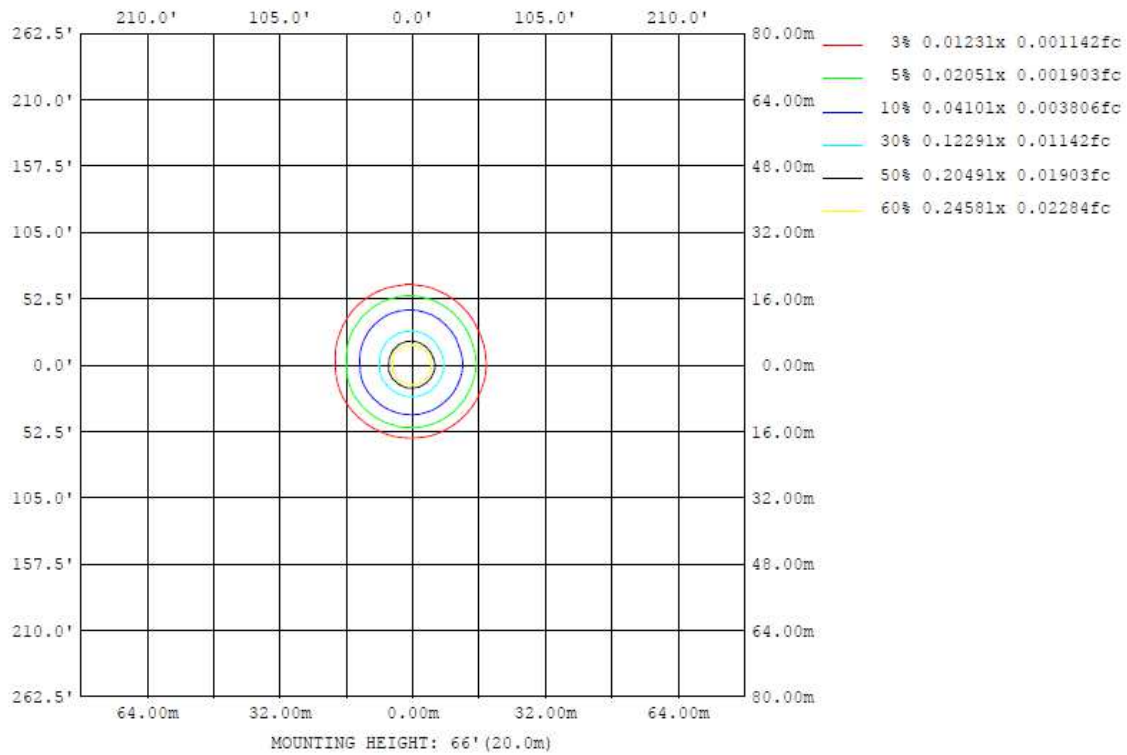
RESULTS OF TESTS (cont'd)

Intertek Testing Services Shanghai

7 floor, No.51, 1089 Qinzhou Road (North), Shanghai, China 200233
Tel: 86 21 61278200 Fax: 86 21 54262361 Website: www.intertek-etlsemko.com

Test Condition: 15V 60Hz for SL16
Setting: 3 (Medium light output)

Model No.: SL16
Mount Height: 20 m
Isoillumination Plot



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RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

Setting: 3 (Medium light output)

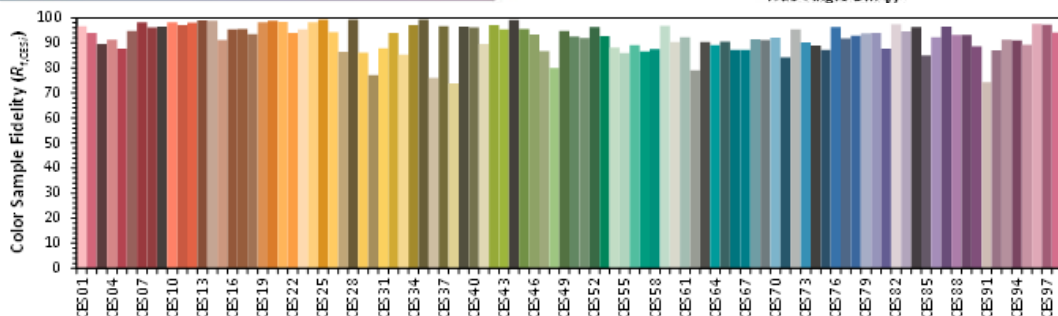
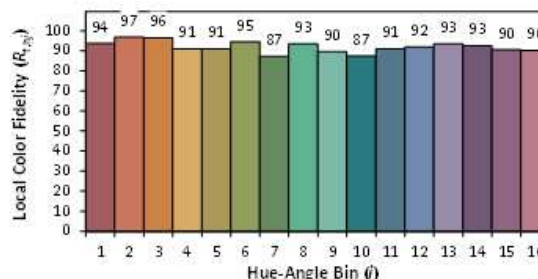
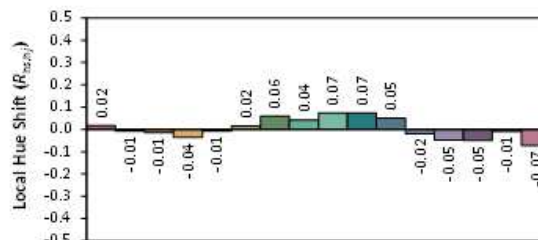
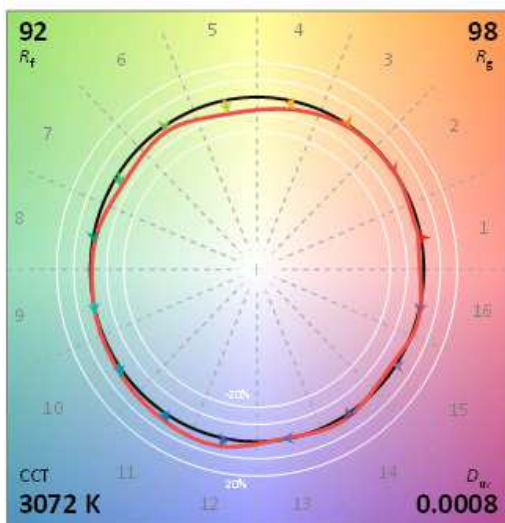
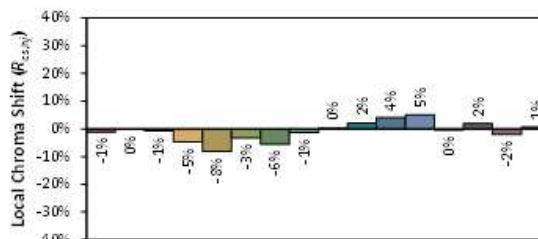
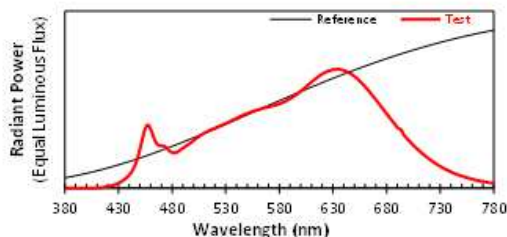
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 11/13/2023

Model: SL16



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

x 0.4330

y 0.4047

u' 0.2478

v' 0.5211

CIE 13.3-1995
(CRI)

R_a 98

R_g 93

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

RESULTS OF TESTS

Test Condition: 15V 60Hz for SL16

Setting: 4 (Minimum 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')
SL16							
0230918-15-001	N/A	3059	96.8	0.4334	0.4039	0.2484	0.5208

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)
SL16							
0230918-15-001	N/A	15.0	0.0881	0.7614	0.5772	37.1129	48.74

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
SL16		
0-30	24.61	66.3
0-40	30.25	81.5
0-60	35.59	95.9
0-90	37.11	100.0
0-180	37.11	100.0

Beam Angle

	Horizontal Spread (°)	Vertical Spread (°)
SL16		
Beam (50%)	34.7	35.5
Beam Angle	35.1	

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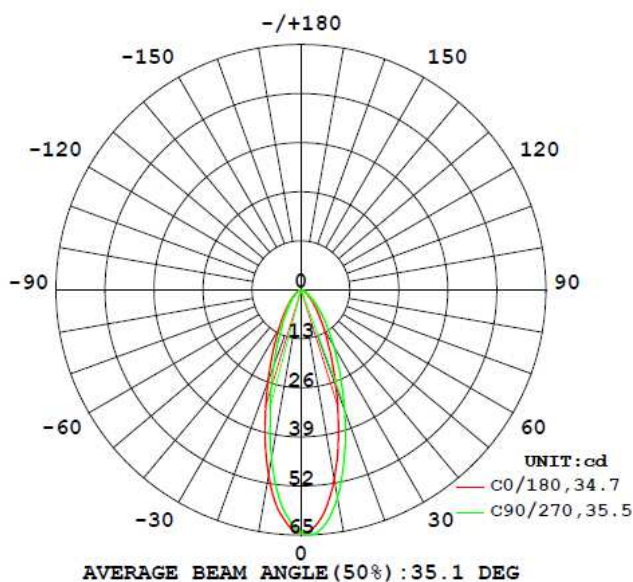
RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C – Candelas

Test Condition: 15V 60Hz for SL16

Setting: 4 (Minimum light output)

G \ C(°)	0	22.5	45	67.5	90
0	64.39	64.39	64.39	64.39	64.39
5	60.78	61.70	62.48	63.11	63.47
10	50.94	52.58	54.11	55.29	55.80
15	38.56	40.69	42.69	44.22	44.82
20	27.07	29.29	31.42	33.09	33.79
25	18.52	20.44	22.40	23.98	24.65
30	12.53	14.04	15.65	16.99	17.53
35	8.57	9.67	10.88	11.94	12.38
40	5.92	6.68	7.55	8.32	8.67
45	4.09	4.60	5.20	5.76	6.01
50	2.84	3.18	3.58	3.96	4.14
55	2.08	2.30	2.54	2.76	2.83
60	1.47	1.61	1.77	1.95	2.03
65	1.01	1.10	1.20	1.32	1.38
70	0.66	0.72	0.78	0.86	0.90
75	0.39	0.42	0.46	0.50	0.53
80	0.17	0.18	0.20	0.23	0.24
85	0.01	0.01	0.01	0.02	0.03
90	0.00	0.00	0.00	0.00	0.00



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

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

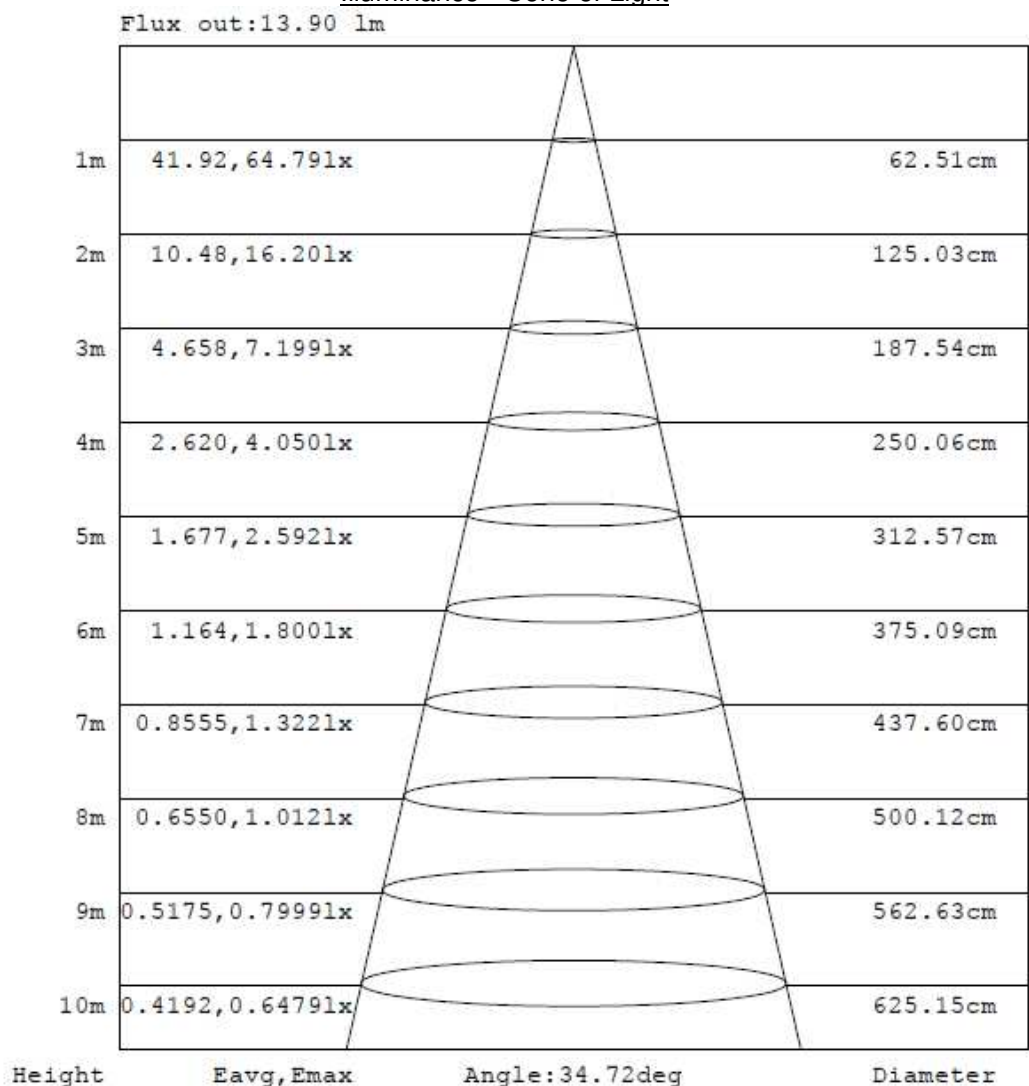
Setting: 4 (Minimum light output)

Illumination Plots

Model No.: SL16

Mount Height: 10 m

Illuminance - Cone of Light



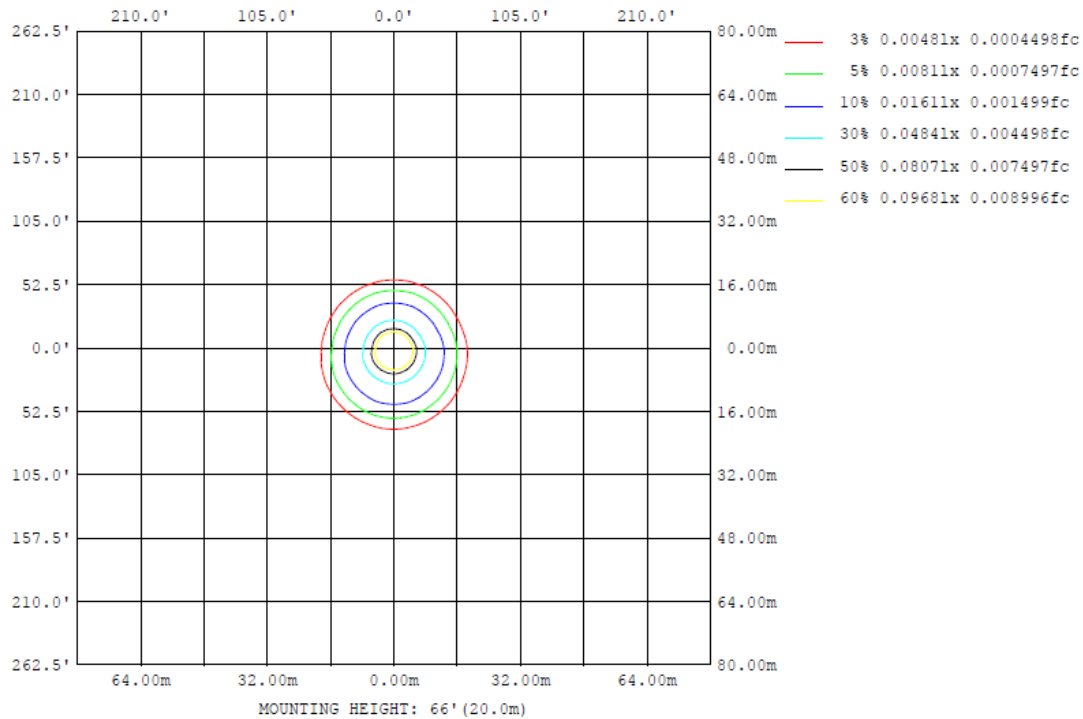
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16
Setting: 4 (Minimum light output)

Model No.: SL16
Mount Height: 20 m
Isoillumination Plot



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

RESULTS OF TESTS (cont'd)

Test Condition: 15V 60Hz for SL16

Setting: 4 (Minimum light output)

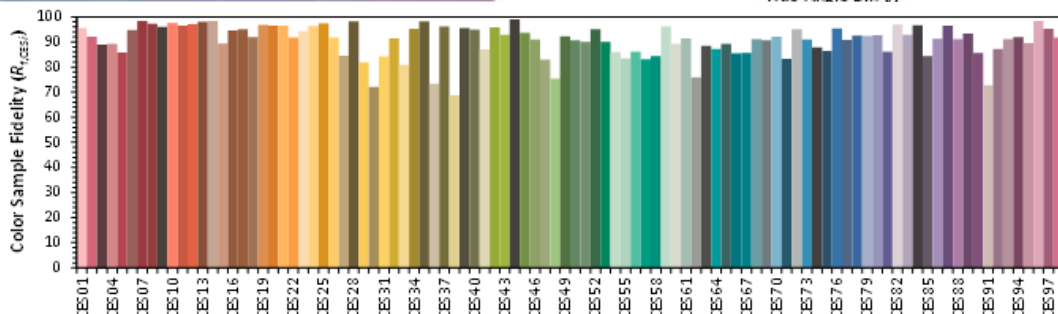
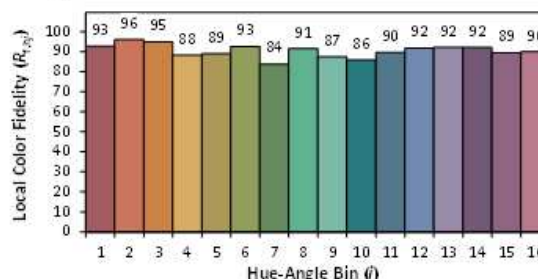
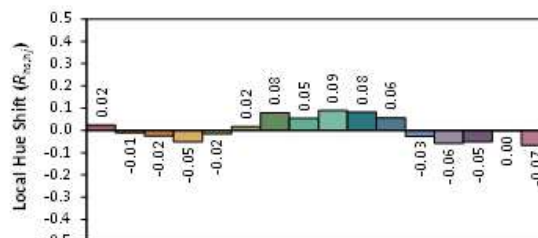
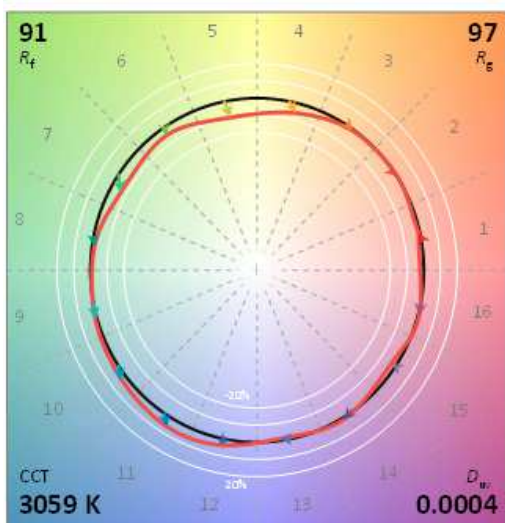
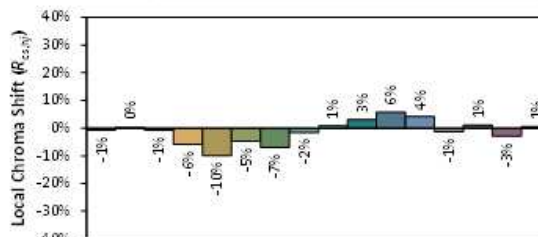
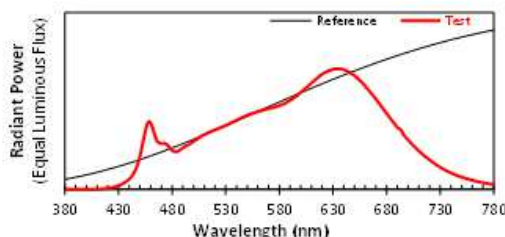
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: STERLING LIGHTING LLC

Date: 11/13/2023

Model: SL16



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

x 0.4334

y 0.4038

u' 0.2484

v' 0.5208

CIE 13.3-1995
(CRI)

R_a 97

R_g 96

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

RESULTS OF TESTS (cont'd)

IN SITU TEMPERATURE MEASUREMENT TEST

Test Results of LED chip temperature and current

Setting	In-situ TMP led: CXA1304		Drive Current of LED/COB	
	Measured TMP of LED/COB (°C)	Limit TMP of LED/COB temperature(°C)	Measured Current (mA)	Limit current (mA)
1(Max.)	79.7	85	691	692
2	60.9		551	
3	38.9		226	
4(Min.)	32.4		78.3	

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)

Setting: 1 (Max light output)

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					
Description of LED Light Source Tested (manufacturer, model, catalog number)		Manufacturer: Cree Model: CXA1304			
Test Condition 1 - 85°C Case Temp					
Sample size	25	Sample size	-	Sample size	-
Number of failures	0	Number of failures	-	Number of failures	-
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)	-
Test duration (hours)	7,056	Test duration (hours)	-	Test duration (hours)	-
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)	-
Tested case temperature (°C)	85	Tested case temperature (°C)	-	Tested case temperature (°C)	-
α	2.424E-06	α	-	α	-
B	0.985	B	-	B	-
Reported L70(7k) (hours)	>42000	Reported L70(7k) (hours)	-	Reported L70(7k) (hours)	-

Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
$T_{s,1}$ (°C)	85.00
$T_{s,1}$ (K)	358.15
α_1	2.424E-06
B_1	0.985
$T_{s,2}$ (°C)	-
$T_{s,2}$ (K)	-
α_2	-
B_2	-
E_{90}/k_0	-
A	-
B_0	0.985
$T_{s,1}$ (°C)	79.70
$T_{s,1}$ (K)	352.85
α_1	2.424E-06
Reported L70(7k) at 79.7°C (hours)	>42000

In-Situ Inputs

Drive current for each LED package/array/module (mA):	691
In-situ case temperature (T_c , °C):	79.7
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):	42,000
Lumen maintenance at time (t) (%):	89.01%
Reported L70 (hours):	>42000

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