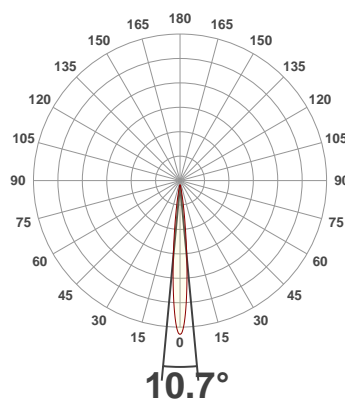
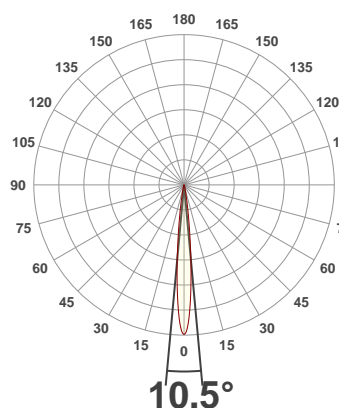




PRODUCT INFORMATION

| | |
|----------------------|-----------------|
| SERIAL NUMBER: | LL-20191008-829 |
| DATE OF MEASUREMENT: | 2019-10-08 |
| SIZE (dia. x h): | 440 mm x 92 mm |

ANGULAR DISTRIBUTION AT C0/180 | ANGULAR DISTRIBUTION AT C90/270 | LIGHT OUTPUT DATA

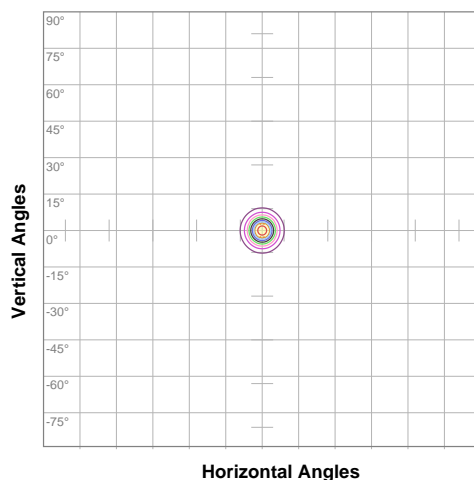


| | |
|------------------------------|-----------|
| TOTAL LUMEN OUTPUT: | 16182 lm |
| EFFICACY: | 82 lm/W |
| PEAK INTENSITY: | 345918 cd |
| COLOR RENDERING INDEX (CRI): | 83.3 |
| COLOR TEMPERATURE (CCT): | 3934K |
| FIDELITY INDEX (TM30Rf): | 84.5 |
| GAMUT INDEX (TM30Rg): | 96.4 |

BEAM OUTPUT DATA

| | |
|------------------------------|-------|
| BEAM ANGLE (FWHM) C0/180: | 10.5° |
| BEAM ANGLE (FWHM) C90/270: | 10.7° |
| FIELD ANGLE (10%) C0/180: | 20.2° |
| FIELD ANGLE (10%) C90/270: | 20.9° |
| NUMBER OF PLANES MEASURED: | 12 |

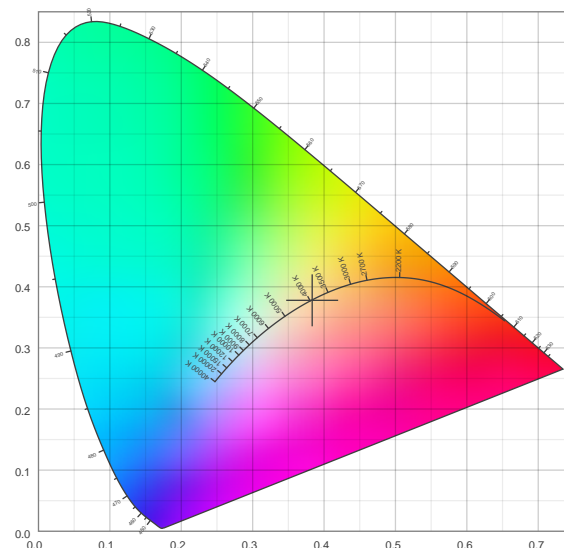
ISO CANDELA DIAGRAM | DATA



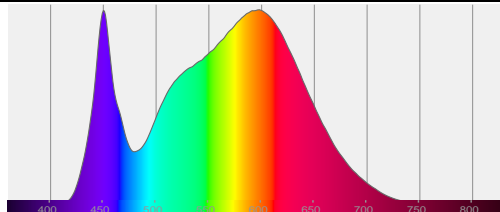
| | |
|-----|-----------|
| 10% | 34568 cd |
| 20% | 69136 cd |
| 30% | 103704 cd |
| 40% | 138272 cd |
| 50% | 172840 cd |
| 60% | 207408 cd |
| 70% | 241976 cd |
| 80% | 276544 cd |
| 90% | 311112 cd |

| | |
|----------------------|---------|
| INPUT POWER: | 197.4 W |
| POWER FACTOR: | 1.0 |
| OPTICAL POWER: | 49.0 mW |
| PEAK WAVELENGTH: | 450 nm |
| DOMINANT WAVELENGTH: | 582 nm |

CIE 1931:



SPECTRA | CIE 1931 ZOOM



| | |
|------|---------|
| x: | 0.383 |
| y: | 0.378 |
| u: | 0.227 |
| v: | 0.335 |
| Δuv: | -0.0003 |

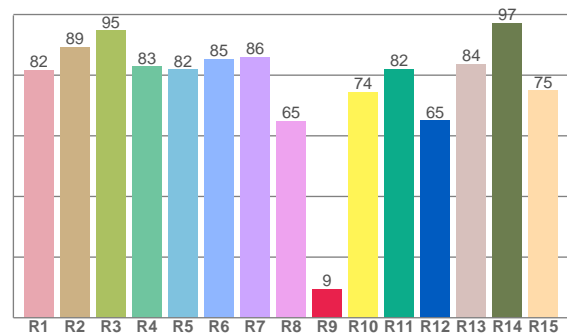
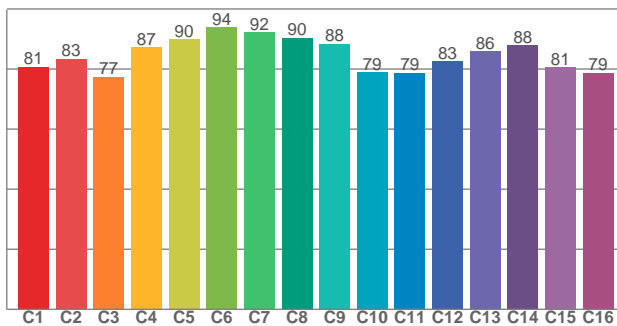
ZONAL LUMEN SUMMARY

| | | | | | | | | |
|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 0°-10° 12482 lm | 10°-20° 2758 lm | 20°-30° 605 lm | 30°-40° 251 lm | 40°-50° 67.0 lm | 50°-60° 17.0 lm | 60°-70° 1.59 lm | 70°-80° 0.321 lm | 80°-90° 0.038 lm |
| 90°-100° 0.014 lm | 100°-110° 0.014 lm | 110°-120° 0.010 lm | 120°-130° 0.009 lm | 130°-140° 0.006 lm | 140°-150° 0.004 lm | 150°-160° 0.003 lm | 160°-170° 0.002 lm | 170°-180° 0.001 lm |

COLOR DETAILS

TM30: 84.5

CRI: 83.3 (R1-R8)



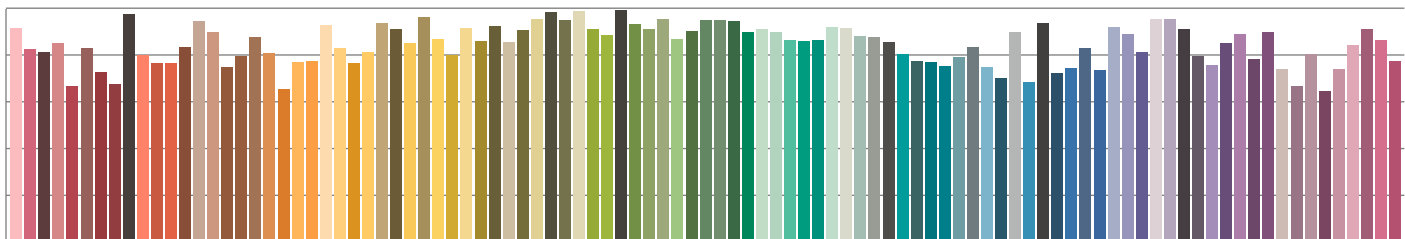
TM30 C values, 16 binned values out of total of 99 C values

CRI R values, only R1-R8 are used to calculate final CRI value

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 80.7 | 83.4 | 77.4 | 87.2 | 90.0 | 93.8 | 92.2 | 90.3 | 88.4 | 78.9 | 78.8 | 82.6 | 85.9 | 87.9 | 80.6 | 78.7 |

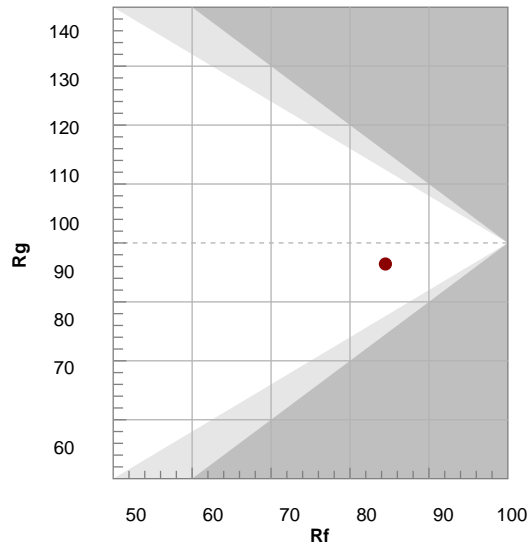
| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|
| 81.8 | 89.2 | 94.7 | 82.8 | 81.9 | 85.2 | 86.0 | 64.9 | 9.4 | 74.3 | 82.0 | 65.0 | 83.6 | 97.2 | 74.9 |

TM30 COLOR EVALUATION SAMPLE



TM30 DETAILS

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 81 | -12% | -1% |
| 2 | 83 | -7% | 6% |
| 3 | 77 | -4% | 12% |
| 4 | 87 | 1% | 8% |
| 5 | 90 | 2% | 5% |
| 6 | 94 | 3% | -2% |
| 7 | 92 | -3% | -4% |
| 8 | 90 | -5% | -2% |
| 9 | 88 | -7% | 4% |
| 10 | 79 | -7% | 11% |
| 11 | 79 | 2% | 14% |
| 12 | 83 | 5% | 7% |
| 13 | 86 | 7% | -6% |
| 14 | 88 | 9% | -7% |
| 15 | 81 | -1% | -14% |
| 16 | 79 | -6% | -12% |



FIDELITY INDEX

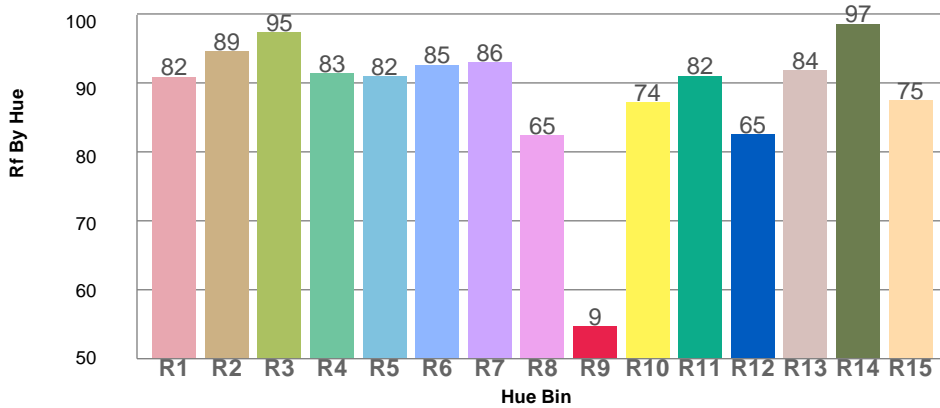
R_f 84.5

GAMUT INDEX

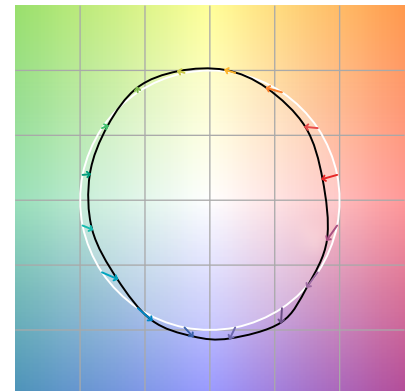
R_g 96.4

Approx. limits for sources on the Planckian locus.
Approx. limits for practical light sources.

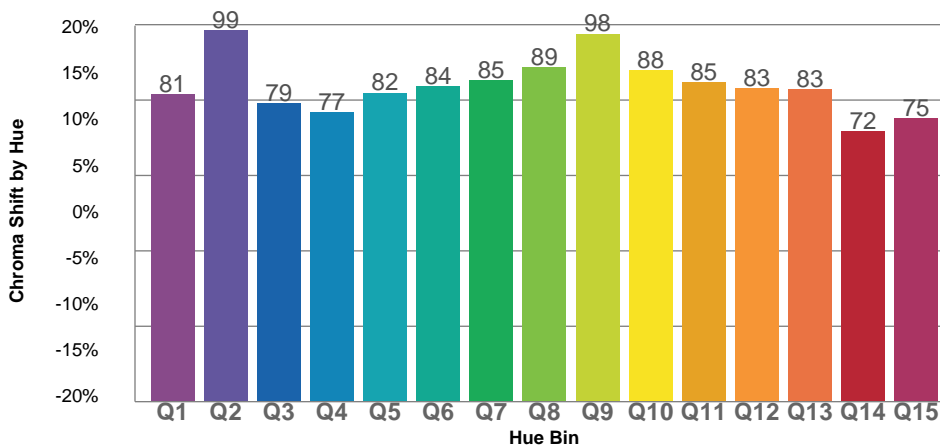
TM30 OVER 50



COLOR VECTOR GRAPHICS



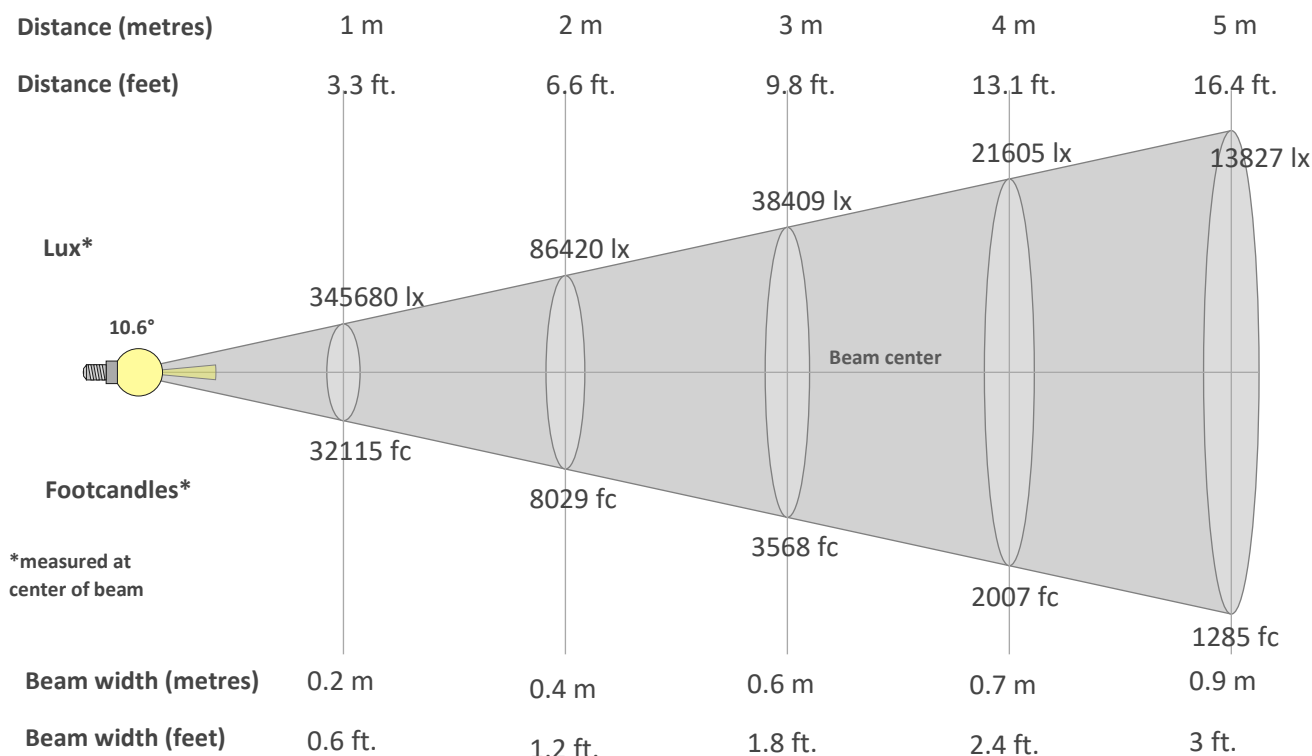
TM30 CHROMA SHIFT



COLOR DISTORTION GRAPHICS



BEAM DETAILS



Beam intensity from 1-20m

| 1m | 2m | 3m | 4m | 5m | 6m | 7m | 8m | 9m | 10m | 11m | 12m | 13m | 14m | 15m | 16m | 17m | 18m | 19m | 20m |
|-----------|----------|----------|----------|----------|---------|---------|---------|---------|---------|---------|--------|--------|---------|---------|---------|---------|--------|--------|--------|
| 3.3ft | 6.6ft | 9.8ft | 13.1ft | 16.4ft | 19.7ft | 23ft | 26.2ft | 29.5ft | 32.8ft | 36.1ft | 39.4ft | 42.7ft | 45.9ft | 49.2ft | 52.5ft | 55.8ft | 59.1ft | 62.3ft | 65.6ft |
| 345680lx | 86420lx | 38409lx | 21605lx | 13827lx | 9602lx | 7055lx | 5401lx | 4268lx | 3457lx | 2857lx | 2401lx | 2045lx | 1764lx | 1536lx | 1350lx | 1196lx | 1067lx | 958lx | 864lx |
| 32114.7fc | 8028.7fc | 3568.3fc | 2007.2fc | 1284.6fc | 892.1fc | 655.4fc | 501.8fc | 396.5fc | 321.1fc | 265.4fc | 223fc | 190fc | 163.9fc | 142.7fc | 125.4fc | 111.1fc | 99.1fc | 89fc | 80.3fc |

Intensity in 0° c-plane

| 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° | 10° | 11° | 12° | 13° | 14° | 15° | 16° | 17° | 18° | 19° |
|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 346K | 337K | 311K | 273K | 229K | 183K | 139K | 103K | 73K | 51K | 36K | 25K | 18K | 13K | 9K | 7K | 6K | 4K | 4K | 3K |
| 100% | 97% | 90% | 79% | 66% | 53% | 40% | 30% | 21% | 15% | 10% | 7% | 5% | 4% | 3% | 2% | 2% | 1% | 1% | 1% |

Intensity in 90° c-plane

| 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° | 10° | 11° | 12° | 13° | 14° | 15° | 16° | 17° | 18° | 19° |
|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 346K | 337K | 312K | 276K | 232K | 187K | 145K | 108K | 79K | 56K | 40K | 29K | 21K | 15K | 11K | 9K | 7K | 6K | 4K | 4K |
| 100% | 98% | 90% | 80% | 67% | 54% | 42% | 31% | 23% | 16% | 12% | 8% | 6% | 4% | 3% | 2% | 2% | 2% | 1% | 1% |

Intensity in 180° c-plane

| 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° | 10° | 11° | 12° | 13° | 14° | 15° | 16° | 17° | 18° | 19° |
|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 346K | 337K | 311K | 273K | 229K | 183K | 139K | 103K | 73K | 51K | 36K | 25K | 18K | 13K | 9K | 7K | 6K | 4K | 4K | 3K |
| 100% | 97% | 90% | 79% | 66% | 53% | 40% | 30% | 21% | 15% | 10% | 7% | 5% | 4% | 3% | 2% | 2% | 1% | 1% | 1% |

Intensity in 270° c-plane

| 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° | 10° | 11° | 12° | 13° | 14° | 15° | 16° | 17° | 18° | 19° |
|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 346K | 337K | 312K | 276K | 232K | 187K | 145K | 108K | 79K | 56K | 40K | 29K | 21K | 15K | 11K | 9K | 7K | 6K | 4K | 4K |
| 100% | 98% | 90% | 80% | 67% | 54% | 42% | 31% | 23% | 16% | 12% | 8% | 6% | 4% | 3% | 2% | 2% | 2% | 1% | 1% |