

PRELIMINARY



IES LM79-08 Test Report

Test results reported for:

Customer Reference P/N: SP38W-18-09D-930-03

Manufacturing P/N: SP38W-18-09D-930-03

Soraa PAR38W, E27/120V, 3000K, 95CRI, 18.5W, 9 degree

Relevant Standards

IES LM-79

ANSI C78.377

IES PR-16

Soraa Lamp Lab

1.0 Description of test sample

| | |
|---------------------------|----------------------------------|
| Customer reference ID | SP38W-18-09D-930-03 |
| Manufacturer reference ID | SP38W-18-09D-930-03 |
| Lamp description | Vivid 3000K 95CRI 18.5W 9 degree |
| Rated voltage | 120V |
| Rated power | 18.5W |
| Nominal CCT | 3000K |



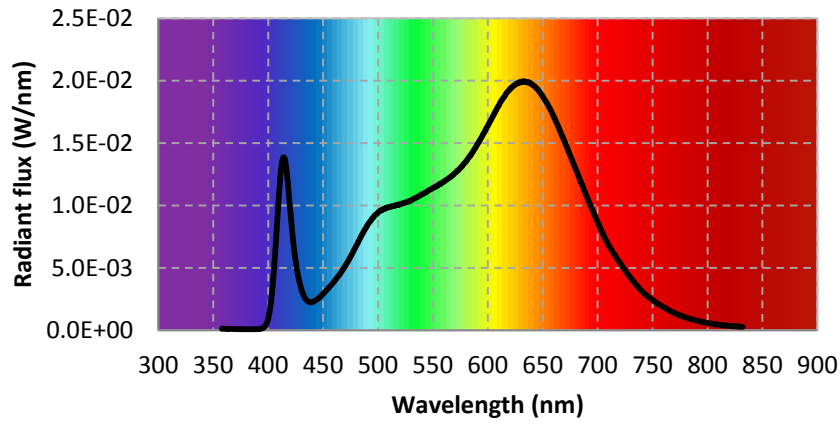
2.0 Results - Sphere Measurements

| Test conditions | |
|---------------------------|----------------------------|
| Orientation | Horizontal |
| Stabilization time (min) | 50-55 |
| Correction factor applied | Self absorption correction |
| Sphere geometry | 65" Sphere |
| | 95% coating reflectance |
| | 2pi geometry |
| Ambient temperature (°C) | 25±1 |

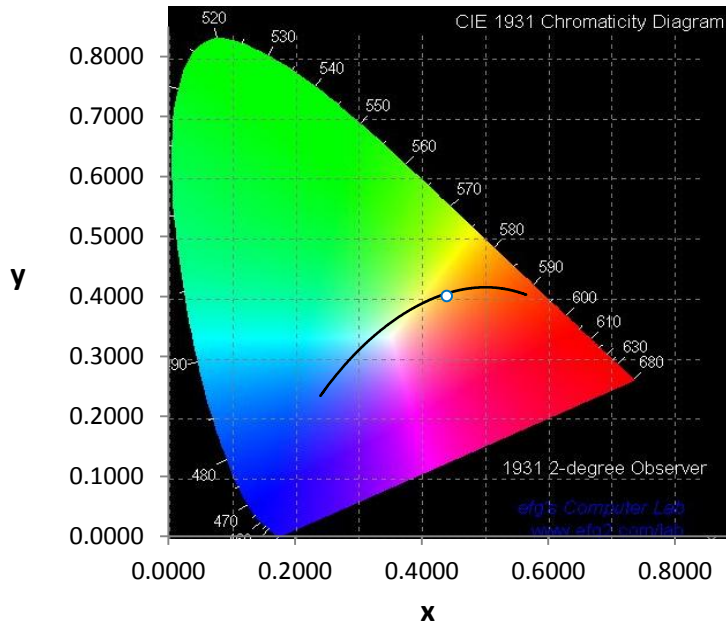
| Instrument | | | | |
|-----------------------|--------------------------------|--------------------|----------------|--|
| | Instrument | Manufacture | Model | |
| Photometric | Spectrometer | Instrument systems | CAS 140T | |
| | Integrating sphere | Labsphere | 65" | |
| | Standard lamp | Labsphere | CSFS-1400 lamp | |
| Electrical instrument | Power supply for standard lamp | Labsphere | LPS-150-0268 | |
| | Power supply for aux lamp | Labsphere | LPS-100-0833 | |
| | Power supply for test lamps | APT | Variplus 105 | |
| | Power meter for test lamps | Chroma | 66202 | |
| Thermometer | Digital multimeter | YOKOGAWA | TY720 | |

| Measurement results | | | | |
|--------------------------|---------------|--|-------------------|-------|
| | Photometric | | Electrical | |
| Total lumen (lm) | 965 | | Input voltage (V) | 230.0 |
| Luminous efficacy (lm/W) | 52 | | Current (A) | 0.083 |
| Chromaticity coordinates | $u' = 0.2511$ | | Power (W) | 18.4 |
| | $v' = 0.5231$ | | pf | 0.961 |
| | $x = 0.4399$ | | | |
| | $y = 0.4000$ | | | |
| CCT (K) | 2977 | | | |
| CRI | 96 | | | |
| R9 | 97 | | | |
| Duv | | | | |

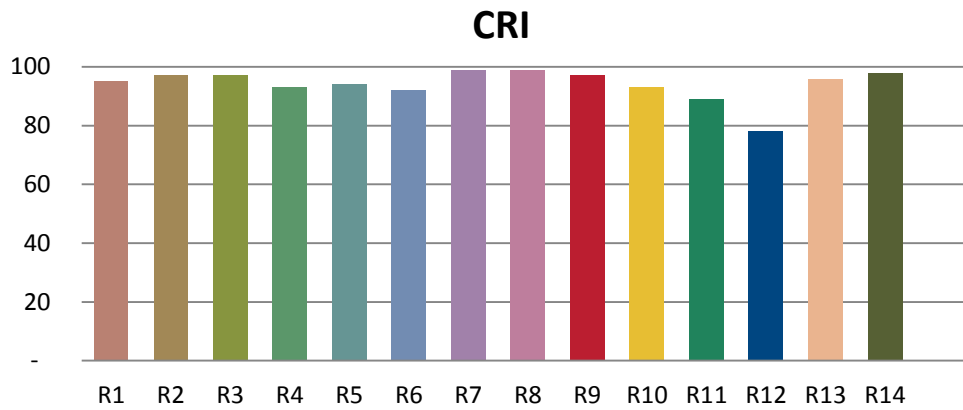
Spectral power distribution



Chromaticity on CIE1931



| CRI | |
|-----|----|
| R1 | 95 |
| R2 | 97 |
| R3 | 97 |
| R4 | 93 |
| R5 | 94 |
| R6 | 92 |
| R7 | 99 |
| R8 | 99 |
| R9 | 97 |
| R10 | 93 |
| R11 | 89 |
| R12 | 78 |
| R13 | 96 |
| R14 | 98 |
| | |
| Ra | 96 |



| Spectral Power Distribution | | | | | | | | | |
|-----------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) |
| 380 | 8.49E-05 | 421 | 8.75E-03 | 462 | 4.13E-03 | 503 | 9.61E-03 | 544 | 1.11E-02 |
| 381 | 8.34E-05 | 422 | 7.83E-03 | 463 | 4.25E-03 | 504 | 9.65E-03 | 545 | 1.11E-02 |
| 382 | 8.60E-05 | 423 | 6.98E-03 | 464 | 4.35E-03 | 505 | 9.72E-03 | 546 | 1.12E-02 |
| 383 | 8.23E-05 | 424 | 6.19E-03 | 465 | 4.48E-03 | 506 | 9.75E-03 | 547 | 1.12E-02 |
| 384 | 8.64E-05 | 425 | 5.57E-03 | 466 | 4.60E-03 | 507 | 9.76E-03 | 548 | 1.13E-02 |
| 385 | 8.63E-05 | 426 | 5.02E-03 | 467 | 4.74E-03 | 508 | 9.81E-03 | 549 | 1.13E-02 |
| 386 | 8.50E-05 | 427 | 4.51E-03 | 468 | 4.87E-03 | 509 | 9.85E-03 | 550 | 1.14E-02 |
| 387 | 8.63E-05 | 428 | 4.08E-03 | 469 | 4.99E-03 | 510 | 9.86E-03 | 551 | 1.15E-02 |
| 388 | 9.13E-05 | 429 | 3.69E-03 | 470 | 5.14E-03 | 511 | 9.90E-03 | 552 | 1.15E-02 |
| 389 | 9.06E-05 | 430 | 3.37E-03 | 471 | 5.29E-03 | 512 | 9.90E-03 | 553 | 1.15E-02 |
| 390 | 9.23E-05 | 431 | 3.09E-03 | 472 | 5.42E-03 | 513 | 9.94E-03 | 554 | 1.16E-02 |
| 391 | 9.81E-05 | 432 | 2.86E-03 | 473 | 5.59E-03 | 514 | 9.96E-03 | 555 | 1.16E-02 |
| 392 | 1.15E-04 | 433 | 2.67E-03 | 474 | 5.75E-03 | 515 | 9.97E-03 | 556 | 1.17E-02 |
| 393 | 1.14E-04 | 434 | 2.52E-03 | 475 | 5.91E-03 | 516 | 1.00E-02 | 557 | 1.17E-02 |
| 394 | 1.42E-04 | 435 | 2.41E-03 | 476 | 6.07E-03 | 517 | 1.00E-02 | 558 | 1.18E-02 |
| 395 | 1.75E-04 | 436 | 2.34E-03 | 477 | 6.23E-03 | 518 | 1.00E-02 | 559 | 1.19E-02 |
| 396 | 2.24E-04 | 437 | 2.28E-03 | 478 | 6.41E-03 | 519 | 1.01E-02 | 560 | 1.19E-02 |
| 397 | 3.17E-04 | 438 | 2.25E-03 | 479 | 6.57E-03 | 520 | 1.01E-02 | 561 | 1.20E-02 |
| 398 | 4.47E-04 | 439 | 2.24E-03 | 480 | 6.74E-03 | 521 | 1.01E-02 | 562 | 1.20E-02 |
| 399 | 6.49E-04 | 440 | 2.26E-03 | 481 | 6.91E-03 | 522 | 1.02E-02 | 563 | 1.21E-02 |
| 400 | 9.32E-04 | 441 | 2.30E-03 | 482 | 7.08E-03 | 523 | 1.02E-02 | 564 | 1.22E-02 |
| 401 | 1.36E-03 | 442 | 2.34E-03 | 483 | 7.25E-03 | 524 | 1.02E-02 | 565 | 1.22E-02 |
| 402 | 1.91E-03 | 443 | 2.39E-03 | 484 | 7.43E-03 | 525 | 1.03E-02 | 566 | 1.23E-02 |
| 403 | 2.60E-03 | 444 | 2.45E-03 | 485 | 7.60E-03 | 526 | 1.03E-02 | 567 | 1.24E-02 |
| 404 | 3.46E-03 | 445 | 2.51E-03 | 486 | 7.75E-03 | 527 | 1.03E-02 | 568 | 1.24E-02 |
| 405 | 4.56E-03 | 446 | 2.59E-03 | 487 | 7.92E-03 | 528 | 1.03E-02 | 569 | 1.25E-02 |
| 406 | 5.73E-03 | 447 | 2.67E-03 | 488 | 8.08E-03 | 529 | 1.04E-02 | 570 | 1.26E-02 |
| 407 | 7.03E-03 | 448 | 2.75E-03 | 489 | 8.21E-03 | 530 | 1.04E-02 | 571 | 1.27E-02 |
| 408 | 8.40E-03 | 449 | 2.84E-03 | 490 | 8.37E-03 | 531 | 1.05E-02 | 572 | 1.28E-02 |
| 409 | 9.77E-03 | 450 | 2.91E-03 | 491 | 8.51E-03 | 532 | 1.05E-02 | 573 | 1.28E-02 |
| 410 | 1.10E-02 | 451 | 3.02E-03 | 492 | 8.63E-03 | 533 | 1.06E-02 | 574 | 1.29E-02 |
| 411 | 1.22E-02 | 452 | 3.11E-03 | 493 | 8.74E-03 | 534 | 1.06E-02 | 575 | 1.30E-02 |
| 412 | 1.31E-02 | 453 | 3.21E-03 | 494 | 8.87E-03 | 535 | 1.06E-02 | 576 | 1.31E-02 |
| 413 | 1.36E-02 | 454 | 3.29E-03 | 495 | 8.98E-03 | 536 | 1.07E-02 | 577 | 1.32E-02 |
| 414 | 1.39E-02 | 455 | 3.40E-03 | 496 | 9.09E-03 | 537 | 1.07E-02 | 578 | 1.33E-02 |
| 415 | 1.37E-02 | 456 | 3.50E-03 | 497 | 9.20E-03 | 538 | 1.08E-02 | 579 | 1.34E-02 |
| 416 | 1.33E-02 | 457 | 3.59E-03 | 498 | 9.28E-03 | 539 | 1.08E-02 | 580 | 1.35E-02 |
| 417 | 1.26E-02 | 458 | 3.70E-03 | 499 | 9.33E-03 | 540 | 1.09E-02 | 581 | 1.36E-02 |
| 418 | 1.17E-02 | 459 | 3.80E-03 | 500 | 9.43E-03 | 541 | 1.09E-02 | 582 | 1.38E-02 |
| 419 | 1.07E-02 | 460 | 3.90E-03 | 501 | 9.51E-03 | 542 | 1.10E-02 | 583 | 1.39E-02 |
| 420 | 9.71E-03 | 461 | 4.02E-03 | 502 | 9.58E-03 | 543 | 1.10E-02 | 584 | 1.40E-02 |

| Spectral Power Distribution | | | | | | | | | |
|-----------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) | WL (nm) | SPD(W/nm) |
| 585 | 1.41E-02 | 626 | 1.98E-02 | 667 | 1.57E-02 | 708 | 7.14E-03 | 749 | 2.49E-03 |
| 586 | 1.43E-02 | 627 | 1.98E-02 | 668 | 1.55E-02 | 709 | 6.97E-03 | 750 | 2.42E-03 |
| 587 | 1.44E-02 | 628 | 1.98E-02 | 669 | 1.53E-02 | 710 | 6.81E-03 | 751 | 2.36E-03 |
| 588 | 1.45E-02 | 629 | 1.99E-02 | 670 | 1.51E-02 | 711 | 6.67E-03 | 752 | 2.30E-03 |
| 589 | 1.47E-02 | 630 | 1.99E-02 | 671 | 1.49E-02 | 712 | 6.53E-03 | 753 | 2.25E-03 |
| 590 | 1.48E-02 | 631 | 1.99E-02 | 672 | 1.47E-02 | 713 | 6.37E-03 | 754 | 2.17E-03 |
| 591 | 1.50E-02 | 632 | 1.99E-02 | 673 | 1.45E-02 | 714 | 6.23E-03 | 755 | 2.12E-03 |
| 592 | 1.51E-02 | 633 | 1.99E-02 | 674 | 1.42E-02 | 715 | 6.10E-03 | 756 | 2.07E-03 |
| 593 | 1.53E-02 | 634 | 1.99E-02 | 675 | 1.40E-02 | 716 | 5.97E-03 | 757 | 2.00E-03 |
| 594 | 1.54E-02 | 635 | 1.99E-02 | 676 | 1.38E-02 | 717 | 5.83E-03 | 758 | 1.96E-03 |
| 595 | 1.56E-02 | 636 | 1.99E-02 | 677 | 1.36E-02 | 718 | 5.70E-03 | 759 | 1.90E-03 |
| 596 | 1.57E-02 | 637 | 1.98E-02 | 678 | 1.34E-02 | 719 | 5.57E-03 | 760 | 1.86E-03 |
| 597 | 1.59E-02 | 638 | 1.98E-02 | 679 | 1.31E-02 | 720 | 5.44E-03 | 761 | 1.79E-03 |
| 598 | 1.61E-02 | 639 | 1.98E-02 | 680 | 1.29E-02 | 721 | 5.30E-03 | 762 | 1.75E-03 |
| 599 | 1.62E-02 | 640 | 1.97E-02 | 681 | 1.27E-02 | 722 | 5.18E-03 | 763 | 1.69E-03 |
| 600 | 1.64E-02 | 641 | 1.96E-02 | 682 | 1.25E-02 | 723 | 5.05E-03 | 764 | 1.66E-03 |
| 601 | 1.65E-02 | 642 | 1.96E-02 | 683 | 1.23E-02 | 724 | 4.91E-03 | 765 | 1.60E-03 |
| 602 | 1.67E-02 | 643 | 1.95E-02 | 684 | 1.20E-02 | 725 | 4.78E-03 | 766 | 1.56E-03 |
| 603 | 1.69E-02 | 644 | 1.94E-02 | 685 | 1.18E-02 | 726 | 4.67E-03 | 767 | 1.51E-03 |
| 604 | 1.71E-02 | 645 | 1.93E-02 | 686 | 1.16E-02 | 727 | 4.54E-03 | 768 | 1.47E-03 |
| 605 | 1.72E-02 | 646 | 1.92E-02 | 687 | 1.14E-02 | 728 | 4.43E-03 | 769 | 1.42E-03 |
| 606 | 1.74E-02 | 647 | 1.91E-02 | 688 | 1.12E-02 | 729 | 4.31E-03 | 770 | 1.38E-03 |
| 607 | 1.76E-02 | 648 | 1.90E-02 | 689 | 1.09E-02 | 730 | 4.20E-03 | 771 | 1.34E-03 |
| 608 | 1.77E-02 | 649 | 1.89E-02 | 690 | 1.08E-02 | 731 | 4.09E-03 | 772 | 1.31E-03 |
| 609 | 1.79E-02 | 650 | 1.87E-02 | 691 | 1.05E-02 | 732 | 3.98E-03 | 773 | 1.27E-03 |
| 610 | 1.80E-02 | 651 | 1.86E-02 | 692 | 1.03E-02 | 733 | 3.88E-03 | 774 | 1.24E-03 |
| 611 | 1.82E-02 | 652 | 1.85E-02 | 693 | 1.01E-02 | 734 | 3.76E-03 | 775 | 1.20E-03 |
| 612 | 1.84E-02 | 653 | 1.83E-02 | 694 | 9.89E-03 | 735 | 3.65E-03 | 776 | 1.16E-03 |
| 613 | 1.85E-02 | 654 | 1.82E-02 | 695 | 9.70E-03 | 736 | 3.55E-03 | 777 | 1.14E-03 |
| 614 | 1.86E-02 | 655 | 1.80E-02 | 696 | 9.49E-03 | 737 | 3.45E-03 | 778 | 1.10E-03 |
| 615 | 1.87E-02 | 656 | 1.78E-02 | 697 | 9.28E-03 | 738 | 3.34E-03 | 779 | 1.06E-03 |
| 616 | 1.89E-02 | 657 | 1.77E-02 | 698 | 9.07E-03 | 739 | 3.25E-03 | 780 | 1.03E-03 |
| 617 | 1.90E-02 | 658 | 1.75E-02 | 699 | 8.87E-03 | 740 | 3.16E-03 | | |
| 618 | 1.91E-02 | 659 | 1.73E-02 | 700 | 8.67E-03 | 741 | 3.08E-03 | | |
| 619 | 1.92E-02 | 660 | 1.71E-02 | 701 | 8.46E-03 | 742 | 2.99E-03 | | |
| 620 | 1.93E-02 | 661 | 1.69E-02 | 702 | 8.25E-03 | 743 | 2.91E-03 | | |
| 621 | 1.94E-02 | 662 | 1.67E-02 | 703 | 8.06E-03 | 744 | 2.83E-03 | | |
| 622 | 1.95E-02 | 663 | 1.65E-02 | 704 | 7.87E-03 | 745 | 2.75E-03 | | |
| 623 | 1.96E-02 | 664 | 1.63E-02 | 705 | 7.69E-03 | 746 | 2.69E-03 | | |
| 624 | 1.96E-02 | 665 | 1.61E-02 | 706 | 7.49E-03 | 747 | 2.62E-03 | | |
| 625 | 1.97E-02 | 666 | 1.59E-02 | 707 | 7.30E-03 | 748 | 2.55E-03 | | |

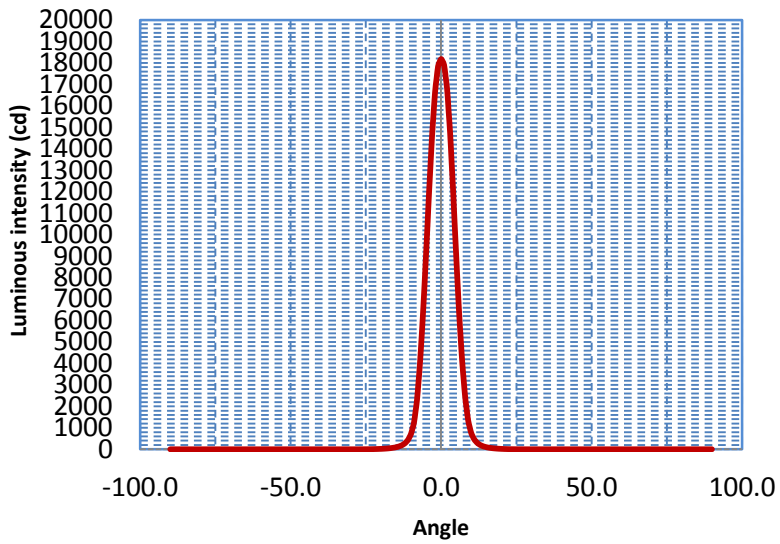
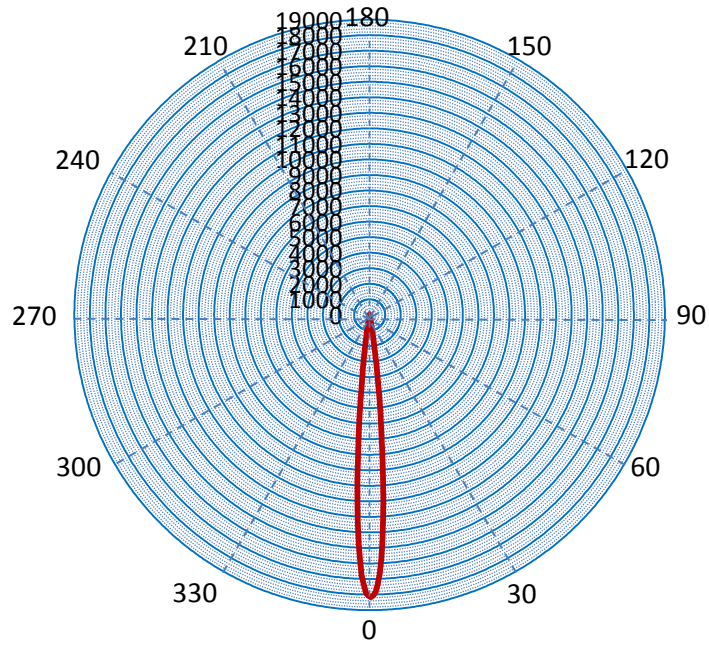
3.0 Results - Goniometric Measurements

| Test conditions | |
|--------------------------|------|
| Goniometer distance (m) | 1 |
| Temperature (°C) | 25±1 |
| Stabilization time (min) | 50 |

| Instrument | | | | |
|-----------------------|-----------------------------|-------------|--------------|--|
| | Instrument | Manufacture | Model | |
| Photometric | Photometer and color meter | Minolta | CL-200A | |
| Electrical instrument | Power supply for test lamps | APT | Variplus 105 | |
| | Power meter for test lamps | Chroma | 66202 | |
| Thermometer | Digital multimeter | YOKOGAWA | TY720 | |

| Measurement results | | | | |
|-------------------------------|------------|--|-------------------|---------|
| Photometric | | | Electrical | |
| Central beam candle power(cd) | 18180 | | Input voltage (V) | 230.0 |
| Beam Angle (°) | 10 | | Current (A) | 0.083 |
| Field Angle (°) | 19 | | Power (W) | 18.4000 |
| Chromaticity coordinates | u'= 0.2511 | | pf | 0.9610 |
| | v'= 0.5231 | | | |
| | x = 0.4399 | | | |
| | y = 0.4000 | | | |
| CCT (K) | 2977 | | | |

Luminous intensity distribution



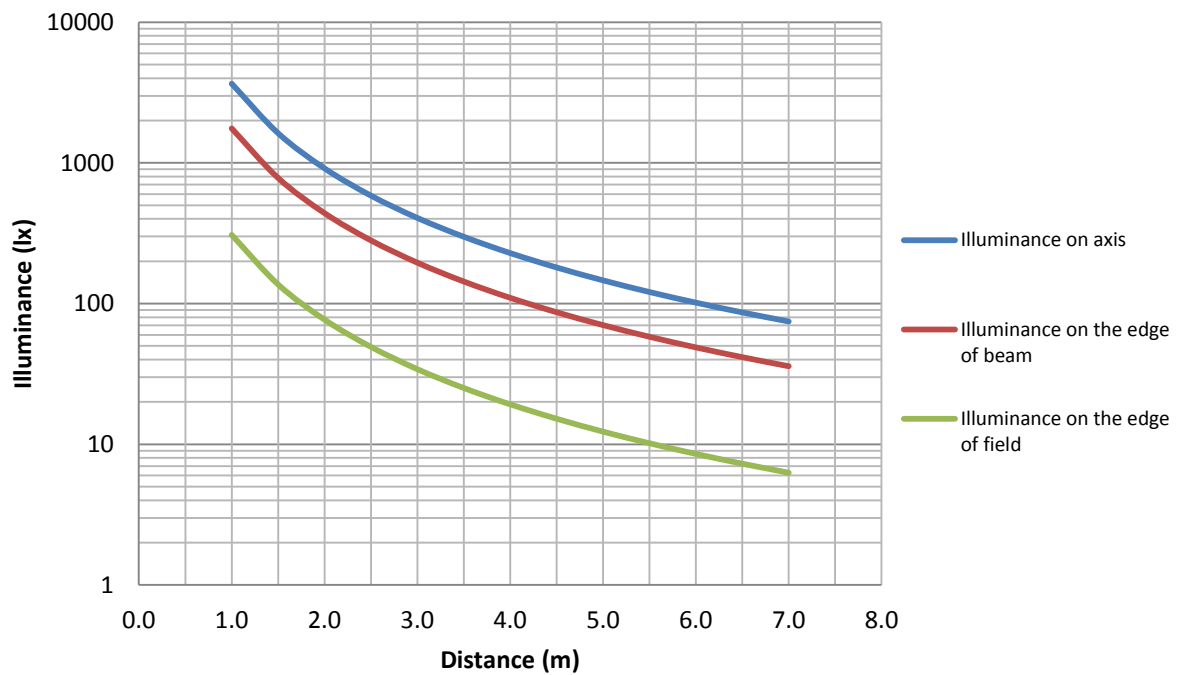
| Zonal Lumen Tabulation | | | | | |
|------------------------|--------|-------|-----------|--------|-------|
| Zones (°) | Lumens | %lamp | Zones (°) | Lumens | %lamp |
| 0-5 | 562.4 | 58.3% | 45-50 | 0.0 | 0.0% |
| 5-10 | 345.6 | 35.8% | 50-55 | 0.0 | 0.0% |
| 10-15 | 43.7 | 4.5% | 55-60 | 0.0 | 0.0% |
| 15-20 | 10.9 | 1.1% | 60-65 | 0.0 | 0.0% |
| 20-25 | 2.4 | 0.3% | 65-70 | 0.0 | 0.0% |
| 25-30 | 0.4 | 0.0% | 70-75 | 0.0 | 0.0% |
| 30-35 | 0.0 | 0.0% | 75-80 | 0.0 | 0.0% |
| 35-40 | 0.0 | 0.0% | 80-85 | 0.0 | 0.0% |
| 40-45 | 0.0 | 0.0% | 85-90 | 0.0 | 0.0% |
| Total lumen | | | | | 965 |

| Accumulated Zonal Lumen Tabulation | | | | | |
|------------------------------------|--------|--------|-----------|--------|--------|
| Zones (°) | Lumens | %lamp | Zones (°) | Lumens | %lamp |
| 0-5 | 562.4 | 58.3% | 0-50 | 965.5 | 100.0% |
| 0-10 | 908.0 | 94.0% | 0-55 | 965.5 | 100.0% |
| 0-15 | 951.7 | 98.6% | 0-60 | 965.5 | 100.0% |
| 0-20 | 962.6 | 99.7% | 0-65 | 965.5 | 100.0% |
| 0-25 | 965.1 | 100.0% | 0-70 | 965.5 | 100.0% |
| 0-30 | 965.4 | 100.0% | 0-75 | 965.5 | 100.0% |
| 0-35 | 965.5 | 100.0% | 0-80 | 965.5 | 100.0% |
| 0-40 | 965.5 | 100.0% | 0-85 | 965.5 | 100.0% |
| 0-45 | 965.5 | 100.0% | 0-90 | 965.5 | 100.0% |

Center and edge illuminance, beam and field diameter

| Distance (m) | E on axis (lx) | Beam D(m) | E on the edge of beam (lx) | Field D(m) | E on the edge of field (lx) |
|--------------|----------------|-----------|----------------------------|------------|-----------------------------|
| 1.0 | 3657 | 0.33 | 1758 | 0.7 | 308 |
| 1.5 | 1626 | 0.49 | 781 | 1.0 | 137 |
| 2.0 | 914 | 0.65 | 440 | 1.4 | 77 |
| 2.5 | 585 | 0.81 | 281 | 1.7 | 49 |
| 3.0 | 406 | 0.98 | 195 | 2.1 | 34 |
| 3.5 | 299 | 1.14 | 144 | 2.4 | 25 |
| 4.0 | 229 | 1.30 | 110 | 2.8 | 19 |
| 4.5 | 181 | 1.47 | 87 | 3.1 | 15 |
| 5.0 | 146 | 1.63 | 70 | 3.5 | 12 |
| 5.5 | 121 | 1.79 | 58 | 3.8 | 10 |
| 6.0 | 102 | 1.95 | 49 | 4.2 | 9 |
| 6.5 | 87 | 2.12 | 42 | 4.5 | 7 |
| 7.0 | 75 | 2.28 | 36 | 4.9 | 6 |
| 7.5 | 65 | 2.44 | 31 | 5.2 | 5 |
| 8.0 | 57 | 2.61 | 27 | 5.6 | 5 |
| 8.5 | 51 | 2.77 | 24 | 5.9 | 4 |
| 9.0 | 45 | 2.93 | 22 | 6.3 | 4 |
| 9.5 | 41 | 3.09 | 19 | 6.6 | 3 |
| 10.0 | 37 | 3.26 | 18 | 7.0 | 3 |

Beam illuminance vs. distance



Luminous Intensity Distribution

| Angle (°C) | CP (cd) | Angle (°C) | CP (cd) | Angle (°C) | CP (cd) | Angle (°C) | CP (cd) | Angle (°C) | CP (cd) |
|------------|---------|------------|---------|------------|---------|------------|---------|------------|---------|
| -90.0 | 0.0 | -69.5 | 0.0 | -49.0 | 0.0 | -28.5 | 0.6 | -8.0 | 2314.2 |
| -89.5 | 0.0 | -69.0 | 0.0 | -48.5 | 0.0 | -28.0 | 0.8 | -7.5 | 3146.4 |
| -89.0 | 0.0 | -68.5 | 0.0 | -48.0 | 0.0 | -27.5 | 1.0 | -7.0 | 4051.7 |
| -88.5 | 0.0 | -68.0 | 0.0 | -47.5 | 0.0 | -27.0 | 1.3 | -6.5 | 5166.8 |
| -88.0 | 0.0 | -67.5 | 0.0 | -47.0 | 0.0 | -26.5 | 1.6 | -6.0 | 6359.6 |
| -87.5 | 0.0 | -67.0 | 0.0 | -46.5 | 0.0 | -26.0 | 2.0 | -5.5 | 7687.0 |
| -87.0 | 0.0 | -66.5 | 0.0 | -46.0 | 0.0 | -25.5 | 2.5 | -5.0 | 9082.2 |
| -86.5 | 0.0 | -66.0 | 0.0 | -45.5 | 0.0 | -25.0 | 3.1 | -4.5 | 10505.2 |
| -86.0 | 0.0 | -65.5 | 0.0 | -45.0 | 0.0 | -24.5 | 3.8 | -4.0 | 11972.9 |
| -85.5 | 0.0 | -65.0 | 0.0 | -44.5 | 0.0 | -24.0 | 4.6 | -3.5 | 13286.7 |
| -85.0 | 0.0 | -64.5 | 0.0 | -44.0 | 0.0 | -23.5 | 5.6 | -3.0 | 14610.7 |
| -84.5 | 0.0 | -64.0 | 0.0 | -43.5 | 0.0 | -23.0 | 6.8 | -2.5 | 15642.4 |
| -84.0 | 0.0 | -63.5 | 0.0 | -43.0 | 0.0 | -22.5 | 8.3 | -2.0 | 16649.7 |
| -83.5 | 0.0 | -63.0 | 0.0 | -42.5 | 0.0 | -22.0 | 9.9 | -1.5 | 17272.8 |
| -83.0 | 0.0 | -62.5 | 0.0 | -42.0 | 0.0 | -21.5 | 11.9 | -1.0 | 17845.0 |
| -82.5 | 0.0 | -62.0 | 0.0 | -41.5 | 0.0 | -21.0 | 14.1 | -0.5 | 18044.3 |
| -82.0 | 0.0 | -61.5 | 0.0 | -41.0 | 0.0 | -20.5 | 16.7 | 0.0 | 18180.0 |
| -81.5 | 0.0 | -61.0 | 0.0 | -40.5 | 0.0 | -20.0 | 19.7 | 0.5 | 18070.1 |
| -81.0 | 0.0 | -60.5 | 0.0 | -40.0 | 0.0 | -19.5 | 23.2 | 1.0 | 17896.3 |
| -80.5 | 0.0 | -60.0 | 0.0 | -39.5 | 0.0 | -19.0 | 27.1 | 1.5 | 17361.8 |
| -80.0 | 0.0 | -59.5 | 0.0 | -39.0 | 0.0 | -18.5 | 31.6 | 2.0 | 16775.1 |
| -79.5 | 0.0 | -59.0 | 0.0 | -38.5 | 0.0 | -18.0 | 36.8 | 2.5 | 15759.7 |
| -79.0 | 0.0 | -58.5 | 0.0 | -38.0 | 0.0 | -17.5 | 43.1 | 3.0 | 14719.7 |
| -78.5 | 0.0 | -58.0 | 0.0 | -37.5 | 0.0 | -17.0 | 50.2 | 3.5 | 13363.5 |
| -78.0 | 0.0 | -57.5 | 0.0 | -37.0 | 0.0 | -16.5 | 58.8 | 4.0 | 12018.9 |
| -77.5 | 0.0 | -57.0 | 0.0 | -36.5 | 0.0 | -16.0 | 68.6 | 4.5 | 10519.2 |
| -77.0 | 0.0 | -56.5 | 0.0 | -36.0 | 0.0 | -15.5 | 80.6 | 5.0 | 9066.0 |
| -76.5 | 0.0 | -56.0 | 0.0 | -35.5 | 0.0 | -15.0 | 94.2 | 5.5 | 7664.6 |
| -76.0 | 0.0 | -55.5 | 0.0 | -35.0 | 0.0 | -14.5 | 112.0 | 6.0 | 6331.7 |
| -75.5 | 0.0 | -55.0 | 0.0 | -34.5 | 0.0 | -14.0 | 132.1 | 6.5 | 5184.9 |
| -75.0 | 0.0 | -54.5 | 0.0 | -34.0 | 0.0 | -13.5 | 159.2 | 7.0 | 4111.7 |
| -74.5 | 0.0 | -54.0 | 0.0 | -33.5 | 0.1 | -13.0 | 189.8 | 7.5 | 3236.1 |
| -74.0 | 0.0 | -53.5 | 0.0 | -33.0 | 0.1 | -12.5 | 233.1 | 8.0 | 2430.0 |
| -73.5 | 0.0 | -53.0 | 0.0 | -32.5 | 0.1 | -12.0 | 281.9 | 8.5 | 1858.6 |
| -73.0 | 0.0 | -52.5 | 0.0 | -32.0 | 0.1 | -11.5 | 355.2 | 9.0 | 1340.0 |
| -72.5 | 0.0 | -52.0 | 0.0 | -31.5 | 0.2 | -11.0 | 437.6 | 9.5 | 1035.3 |
| -72.0 | 0.0 | -51.5 | 0.0 | -31.0 | 0.2 | -10.5 | 568.7 | 10.0 | 761.5 |
| -71.5 | 0.0 | -51.0 | 0.0 | -30.5 | 0.2 | -10.0 | 715.4 | 10.5 | 604.7 |
| -71.0 | 0.0 | -50.5 | 0.0 | -30.0 | 0.3 | -9.5 | 970.4 | 11.0 | 464.7 |
| -70.5 | 0.0 | -50.0 | 0.0 | -29.5 | 0.4 | -9.0 | 1254.0 | 11.5 | 377.0 |
| -70.0 | 0.0 | -49.5 | 0.0 | -29.0 | 0.5 | -8.5 | 1758.2 | 12.0 | 299.0 |

Luminous Intensity Distribution

| Angle (°C) | CP (cd) | Angle (°C) | CP (cd) | Angle (°C) | CP (cd) | Angle (°C) | CP (cd) | | |
|------------|---------|------------|---------|------------|---------|------------|---------|--|--|
| 12.5 | 246.9 | 33.0 | 0.1 | 53.5 | 0.0 | 74.0 | 0.0 | | |
| 13.0 | 200.7 | 33.5 | 0.1 | 54.0 | 0.0 | 74.5 | 0.0 | | |
| 13.5 | 168.1 | 34.0 | 0.0 | 54.5 | 0.0 | 75.0 | 0.0 | | |
| 14.0 | 139.3 | 34.5 | 0.0 | 55.0 | 0.0 | 75.5 | 0.0 | | |
| 14.5 | 117.9 | 35.0 | 0.0 | 55.5 | 0.0 | 76.0 | 0.0 | | |
| 15.0 | 99.0 | 35.5 | 0.0 | 56.0 | 0.0 | 76.5 | 0.0 | | |
| 15.5 | 84.5 | 36.0 | 0.0 | 56.5 | 0.0 | 77.0 | 0.0 | | |
| 16.0 | 71.7 | 36.5 | 0.0 | 57.0 | 0.0 | 77.5 | 0.0 | | |
| 16.5 | 61.2 | 37.0 | 0.0 | 57.5 | 0.0 | 78.0 | 0.0 | | |
| 17.0 | 52.0 | 37.5 | 0.0 | 58.0 | 0.0 | 78.5 | 0.0 | | |
| 17.5 | 44.4 | 38.0 | 0.0 | 58.5 | 0.0 | 79.0 | 0.0 | | |
| 18.0 | 37.7 | 38.5 | 0.0 | 59.0 | 0.0 | 79.5 | 0.0 | | |
| 18.5 | 32.1 | 39.0 | 0.0 | 59.5 | 0.0 | 80.0 | 0.0 | | |
| 19.0 | 27.2 | 39.5 | 0.0 | 60.0 | 0.0 | 80.5 | 0.0 | | |
| 19.5 | 23.0 | 40.0 | 0.0 | 60.5 | 0.0 | 81.0 | 0.0 | | |
| 20.0 | 19.4 | 40.5 | 0.0 | 61.0 | 0.0 | 81.5 | 0.0 | | |
| 20.5 | 16.3 | 41.0 | 0.0 | 61.5 | 0.0 | 82.0 | 0.0 | | |
| 21.0 | 13.6 | 41.5 | 0.0 | 62.0 | 0.0 | 82.5 | 0.0 | | |
| 21.5 | 11.3 | 42.0 | 0.0 | 62.5 | 0.0 | 83.0 | 0.0 | | |
| 22.0 | 9.4 | 42.5 | 0.0 | 63.0 | 0.0 | 83.5 | 0.0 | | |
| 22.5 | 7.8 | 43.0 | 0.0 | 63.5 | 0.0 | 84.0 | 0.0 | | |
| 23.0 | 6.4 | 43.5 | 0.0 | 64.0 | 0.0 | 84.5 | 0.0 | | |
| 23.5 | 5.3 | 44.0 | 0.0 | 64.5 | 0.0 | 85.0 | 0.0 | | |
| 24.0 | 4.3 | 44.5 | 0.0 | 65.0 | 0.0 | 85.5 | 0.0 | | |
| 24.5 | 3.5 | 45.0 | 0.0 | 65.5 | 0.0 | 86.0 | 0.0 | | |
| 25.0 | 2.9 | 45.5 | 0.0 | 66.0 | 0.0 | 86.5 | 0.0 | | |
| 25.5 | 2.3 | 46.0 | 0.0 | 66.5 | 0.0 | 87.0 | 0.0 | | |
| 26.0 | 1.9 | 46.5 | 0.0 | 67.0 | 0.0 | 87.5 | 0.0 | | |
| 26.5 | 1.5 | 47.0 | 0.0 | 67.5 | 0.0 | 88.0 | 0.0 | | |
| 27.0 | 1.2 | 47.5 | 0.0 | 68.0 | 0.0 | 88.5 | 0.0 | | |
| 27.5 | 1.0 | 48.0 | 0.0 | 68.5 | 0.0 | 89.0 | 0.0 | | |
| 28.0 | 0.8 | 48.5 | 0.0 | 69.0 | 0.0 | 89.5 | 0.0 | | |
| 28.5 | 0.6 | 49.0 | 0.0 | 69.5 | 0.0 | 90.0 | 0.0 | | |
| 29.0 | 0.5 | 49.5 | 0.0 | 70.0 | 0.0 | | | | |
| 29.5 | 0.4 | 50.0 | 0.0 | 70.5 | 0.0 | | | | |
| 30.0 | 0.3 | 50.5 | 0.0 | 71.0 | 0.0 | | | | |
| 30.5 | 0.2 | 51.0 | 0.0 | 71.5 | 0.0 | | | | |
| 31.0 | 0.2 | 51.5 | 0.0 | 72.0 | 0.0 | | | | |
| 31.5 | 0.2 | 52.0 | 0.0 | 72.5 | 0.0 | | | | |
| 32.0 | 0.1 | 52.5 | 0.0 | 73.0 | 0.0 | | | | |
| 32.5 | 0.1 | 53.0 | 0.0 | 73.5 | 0.0 | | | | |