



UL Verification Services Inc.
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Integrating Sphere Test Report

Relevant Standards
IES LM-79-2008
ANSI C78.377-2011, ANSI C82.77-2002
CIE 13.3-1995, CIE 15-2004

Prepared For
Optolum
Karen Baker
1407 W. 10th Place, Suite 107
Tempe, AZ 85018
United States

Catalog Number
16 B2-CL---358USD-A072000

Order Number
10520546
Test Number
785431

Test Date
2014-10-16

Prepared By

A handwritten signature in black ink that reads "Dane Hernandez-Adams".

Dane Hernandez-Adams, Technician

Approved By

A handwritten signature in black ink that reads "Zachary Mooney".

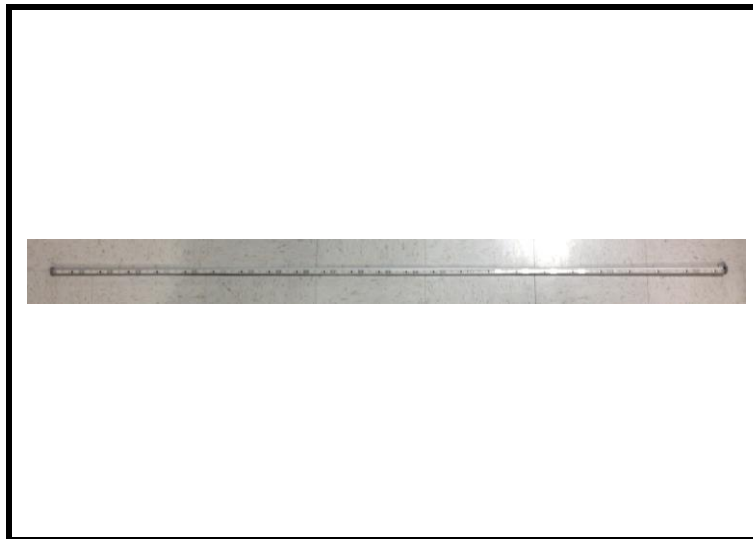
Zachary Mooney, Engineer Project Associate

The results contained in this report pertain only to the tested sample.
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Luminaire Description: Grey aluminum housing, clear plastic enclosure
Catalog Number: 16 B2-CL---358USD-A072000
Lamp: 72 white LEDs
Mounting: Surface
Ballast/Driver: One High Perfection Tech. LP1090-24-GG-290

Luminaire



Summary of Results

Radiant Flux: 10390 mW
Luminous Flux: 3245 Lumens
Luminaire Efficacy: 72.5 Lumens/Watt
CCT: 3426 K
CRI (Ra): 83.4
Chromaticity (x): 0.4071
Chromaticity (y): 0.3867
Chromaticity (u): 0.2385
Chromaticity (v): 0.3399
Duv: -0.0025

Test Conditions

Test Temperature: 24.9 °C
Voltage: 120.0 VAC
Current: 0.3798 A
Power: 44.75 W
Power Factor: 0.982
Frequency: 60 Hz
Current THD: 9.20 %

Testing was performed in a 3-meter integrating sphere using the 4 π geometry method.

Absorption correction was employed for this measurement.

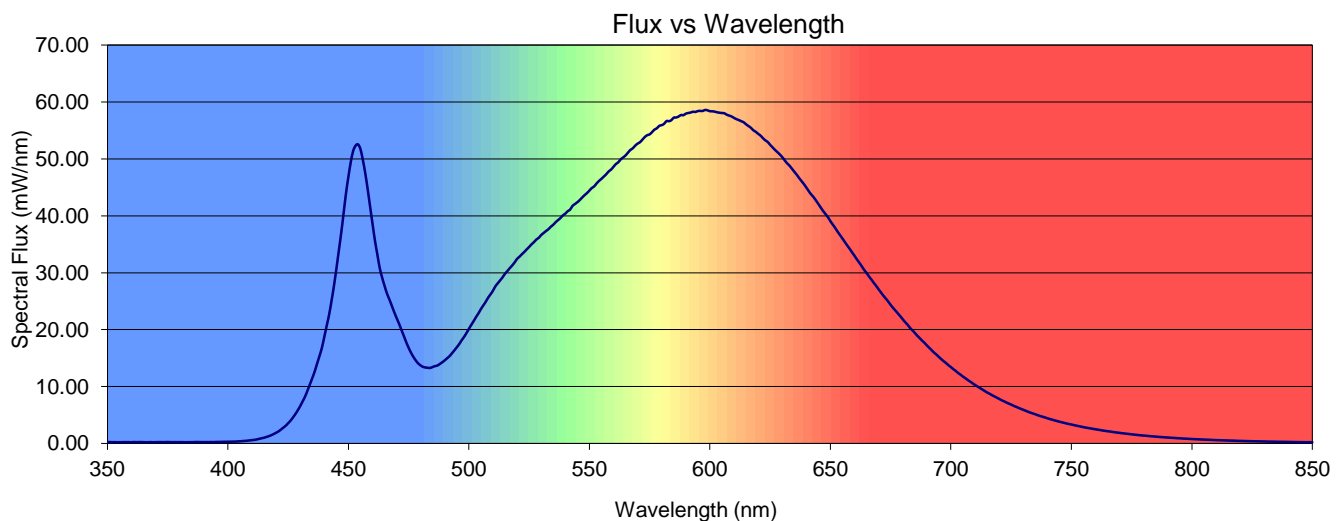
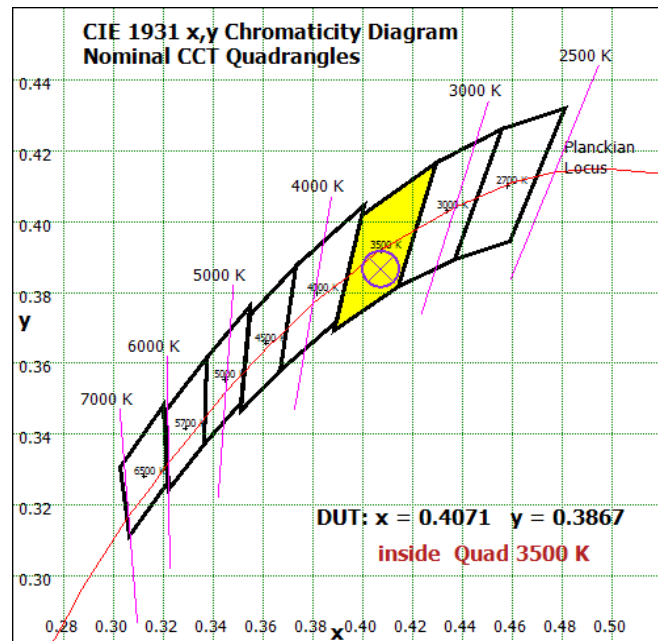
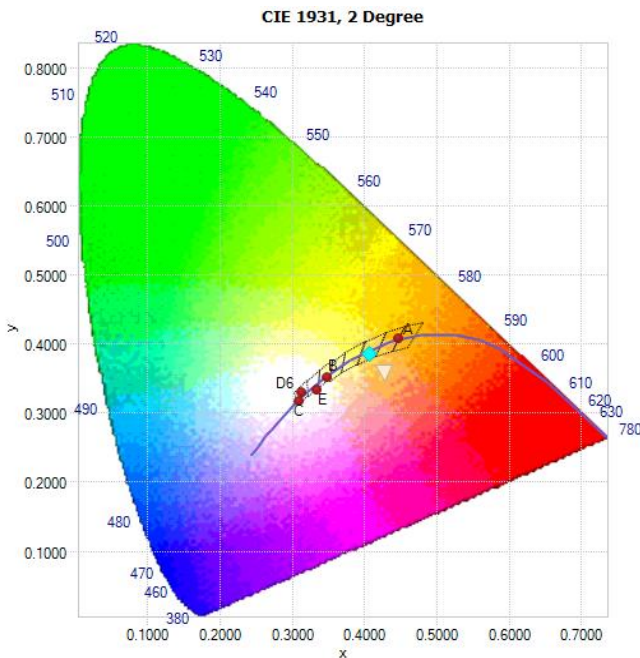


Chromaticity Coordinates

| x | y | u | v | u' | v' | Duv |
|--------|--------|--------|--------|--------|--------|---------|
| 0.4071 | 0.3867 | 0.2385 | 0.3399 | 0.2385 | 0.5099 | -0.0025 |

Color Rendering Index Detail

| Ra (CRI) | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 83.4 | 82.0 | 89.9 | 94.6 | 80.6 | 81.2 | 85.0 | 86.4 | 67.4 | 22.2 | 75.1 | 77.7 | 62.4 | 83.8 | 96.9 |





Spectral Power Distribution

| λ (nm) | mW/nm | λ (nm) | mW/nm | λ (nm) | mW/nm | λ (nm) | mW/nm | λ (nm) | mW/nm | λ (nm) | mW/nm | λ (nm) | mW/nm |
|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|
| 350 | 0.246 | 422 | 2.45 | 494 | 16.4 | 566 | 51.1 | 638 | 46.1 | 710 | 10.3 | 782 | 1.32 |
| 351 | 0.255 | 423 | 2.79 | 495 | 16.9 | 567 | 51.6 | 639 | 45.6 | 711 | 10.0 | 783 | 1.28 |
| 352 | 0.235 | 424 | 3.13 | 496 | 17.5 | 568 | 51.9 | 640 | 45.0 | 712 | 9.76 | 784 | 1.25 |
| 353 | 0.242 | 425 | 3.57 | 497 | 18.1 | 569 | 52.3 | 641 | 44.4 | 713 | 9.50 | 785 | 1.21 |
| 354 | 0.223 | 426 | 4.02 | 498 | 18.7 | 570 | 52.7 | 642 | 43.8 | 714 | 9.24 | 786 | 1.18 |
| 355 | 0.235 | 427 | 4.57 | 499 | 19.4 | 571 | 52.9 | 643 | 43.3 | 715 | 8.97 | 787 | 1.14 |
| 356 | 0.236 | 428 | 5.17 | 500 | 20.1 | 572 | 53.4 | 644 | 42.7 | 716 | 8.76 | 788 | 1.11 |
| 357 | 0.248 | 429 | 5.85 | 501 | 20.8 | 573 | 53.8 | 645 | 42.1 | 717 | 8.51 | 789 | 1.08 |
| 358 | 0.242 | 430 | 6.57 | 502 | 21.5 | 574 | 54.2 | 646 | 41.5 | 718 | 8.29 | 790 | 1.05 |
| 359 | 0.243 | 431 | 7.39 | 503 | 22.2 | 575 | 54.3 | 647 | 40.8 | 719 | 8.07 | 791 | 1.02 |
| 360 | 0.226 | 432 | 8.23 | 504 | 22.9 | 576 | 54.7 | 648 | 40.3 | 720 | 7.85 | 792 | 0.995 |
| 361 | 0.260 | 433 | 9.26 | 505 | 23.6 | 577 | 55.1 | 649 | 39.8 | 721 | 7.62 | 793 | 0.968 |
| 362 | 0.241 | 434 | 10.4 | 506 | 24.3 | 578 | 55.4 | 650 | 39.1 | 722 | 7.43 | 794 | 0.935 |
| 363 | 0.247 | 435 | 11.5 | 507 | 24.9 | 579 | 55.8 | 651 | 38.5 | 723 | 7.22 | 795 | 0.912 |
| 364 | 0.256 | 436 | 12.6 | 508 | 25.6 | 580 | 55.9 | 652 | 37.9 | 724 | 7.02 | 796 | 0.881 |
| 365 | 0.237 | 437 | 14.0 | 509 | 26.2 | 581 | 56.2 | 653 | 37.2 | 725 | 6.84 | 797 | 0.861 |
| 366 | 0.227 | 438 | 15.4 | 510 | 26.9 | 582 | 56.6 | 654 | 36.6 | 726 | 6.64 | 798 | 0.839 |
| 367 | 0.230 | 439 | 16.8 | 511 | 27.6 | 583 | 56.6 | 655 | 36.0 | 727 | 6.45 | 799 | 0.811 |
| 368 | 0.249 | 440 | 18.7 | 512 | 28.2 | 584 | 56.8 | 656 | 35.4 | 728 | 6.28 | 800 | 0.788 |
| 369 | 0.223 | 441 | 20.7 | 513 | 28.7 | 585 | 57.2 | 657 | 34.8 | 729 | 6.10 | 801 | 0.764 |
| 370 | 0.242 | 442 | 22.6 | 514 | 29.2 | 586 | 57.3 | 658 | 34.2 | 730 | 5.93 | 802 | 0.748 |
| 371 | 0.243 | 443 | 25.1 | 515 | 29.8 | 587 | 57.4 | 659 | 33.6 | 731 | 5.76 | 803 | 0.728 |
| 372 | 0.256 | 444 | 27.7 | 516 | 30.3 | 588 | 57.7 | 660 | 33.0 | 732 | 5.58 | 804 | 0.708 |
| 373 | 0.238 | 445 | 30.6 | 517 | 30.8 | 589 | 57.7 | 661 | 32.3 | 733 | 5.43 | 805 | 0.688 |
| 374 | 0.254 | 446 | 33.8 | 518 | 31.3 | 590 | 57.9 | 662 | 31.8 | 734 | 5.28 | 806 | 0.672 |
| 375 | 0.261 | 447 | 36.9 | 519 | 31.8 | 591 | 58.1 | 663 | 31.2 | 735 | 5.14 | 807 | 0.657 |
| 376 | 0.247 | 448 | 40.4 | 520 | 32.4 | 592 | 58.1 | 664 | 30.5 | 736 | 4.98 | 808 | 0.637 |
| 377 | 0.238 | 449 | 43.9 | 521 | 32.8 | 593 | 58.3 | 665 | 30.0 | 737 | 4.84 | 809 | 0.620 |
| 378 | 0.246 | 450 | 46.8 | 522 | 33.3 | 594 | 58.2 | 666 | 29.4 | 738 | 4.71 | 810 | 0.598 |
| 379 | 0.238 | 451 | 49.5 | 523 | 33.7 | 595 | 58.4 | 667 | 28.8 | 739 | 4.58 | 811 | 0.582 |
| 380 | 0.244 | 452 | 51.4 | 524 | 34.1 | 596 | 58.4 | 668 | 28.2 | 740 | 4.44 | 812 | 0.568 |
| 381 | 0.245 | 453 | 52.3 | 525 | 34.5 | 597 | 58.4 | 669 | 27.7 | 741 | 4.31 | 813 | 0.558 |
| 382 | 0.228 | 454 | 52.6 | 526 | 35.0 | 598 | 58.6 | 670 | 27.1 | 742 | 4.20 | 814 | 0.543 |
| 383 | 0.234 | 455 | 51.7 | 527 | 35.4 | 599 | 58.5 | 671 | 26.5 | 743 | 4.07 | 815 | 0.527 |
| 384 | 0.237 | 456 | 49.8 | 528 | 35.8 | 600 | 58.4 | 672 | 26.0 | 744 | 3.95 | 816 | 0.513 |
| 385 | 0.240 | 457 | 47.5 | 529 | 36.1 | 601 | 58.4 | 673 | 25.5 | 745 | 3.84 | 817 | 0.507 |
| 386 | 0.247 | 458 | 44.7 | 530 | 36.6 | 602 | 58.3 | 674 | 24.9 | 746 | 3.74 | 818 | 0.487 |
| 387 | 0.270 | 459 | 41.7 | 531 | 37.0 | 603 | 58.2 | 675 | 24.4 | 747 | 3.63 | 819 | 0.470 |
| 388 | 0.256 | 460 | 38.7 | 532 | 37.3 | 604 | 58.1 | 676 | 23.8 | 748 | 3.52 | 820 | 0.458 |
| 389 | 0.251 | 461 | 35.7 | 533 | 37.6 | 605 | 58.1 | 677 | 23.4 | 749 | 3.42 | 821 | 0.451 |
| 390 | 0.246 | 462 | 33.3 | 534 | 38.1 | 606 | 58.0 | 678 | 22.9 | 750 | 3.34 | 822 | 0.436 |
| 391 | 0.254 | 463 | 30.8 | 535 | 38.4 | 607 | 57.8 | 679 | 22.4 | 751 | 3.24 | 823 | 0.427 |
| 392 | 0.242 | 464 | 29.2 | 536 | 38.9 | 608 | 57.6 | 680 | 21.8 | 752 | 3.14 | 824 | 0.411 |
| 393 | 0.260 | 465 | 27.7 | 537 | 39.2 | 609 | 57.5 | 681 | 21.3 | 753 | 3.06 | 825 | 0.403 |
| 394 | 0.250 | 466 | 26.4 | 538 | 39.6 | 610 | 57.2 | 682 | 20.9 | 754 | 2.97 | 826 | 0.395 |
| 395 | 0.269 | 467 | 25.3 | 539 | 40.1 | 611 | 57.0 | 683 | 20.4 | 755 | 2.88 | 827 | 0.387 |
| 396 | 0.278 | 468 | 24.2 | 540 | 40.4 | 612 | 56.8 | 684 | 19.9 | 756 | 2.80 | 828 | 0.375 |
| 397 | 0.283 | 469 | 23.1 | 541 | 40.8 | 613 | 56.6 | 685 | 19.5 | 757 | 2.72 | 829 | 0.363 |
| 398 | 0.300 | 470 | 22.1 | 542 | 41.1 | 614 | 56.4 | 686 | 19.0 | 758 | 2.65 | 830 | 0.355 |
| 399 | 0.302 | 471 | 21.1 | 543 | 41.7 | 615 | 56.1 | 687 | 18.5 | 759 | 2.57 | 831 | 0.346 |
| 400 | 0.309 | 472 | 20.0 | 544 | 42.1 | 616 | 55.8 | 688 | 18.1 | 760 | 2.50 | 832 | 0.330 |
| 401 | 0.320 | 473 | 18.9 | 545 | 42.4 | 617 | 55.5 | 689 | 17.7 | 761 | 2.43 | 833 | 0.330 |
| 402 | 0.331 | 474 | 17.8 | 546 | 42.8 | 618 | 55.0 | 690 | 17.3 | 762 | 2.36 | 834 | 0.322 |
| 403 | 0.337 | 475 | 16.8 | 547 | 43.2 | 619 | 54.8 | 691 | 16.8 | 763 | 2.29 | 835 | 0.311 |
| 404 | 0.362 | 476 | 15.9 | 548 | 43.6 | 620 | 54.4 | 692 | 16.4 | 764 | 2.22 | 836 | 0.307 |
| 405 | 0.391 | 477 | 15.2 | 549 | 44.0 | 621 | 54.1 | 693 | 16.0 | 765 | 2.16 | 837 | 0.297 |
| 406 | 0.426 | 478 | 14.6 | 550 | 44.4 | 622 | 53.7 | 694 | 15.6 | 766 | 2.11 | 838 | 0.294 |
| 407 | 0.458 | 479 | 14.1 | 551 | 44.9 | 623 | 53.3 | 695 | 15.2 | 767 | 2.04 | 839 | 0.286 |
| 408 | 0.498 | 480 | 13.7 | 552 | 45.2 | 624 | 53.0 | 696 | 14.8 | 768 | 1.98 | 840 | 0.278 |
| 409 | 0.545 | 481 | 13.5 | 553 | 45.7 | 625 | 52.5 | 697 | 14.5 | 769 | 1.92 | 841 | 0.272 |
| 410 | 0.601 | 482 | 13.4 | 554 | 46.1 | 626 | 52.0 | 698 | 14.1 | 770 | 1.87 | 842 | 0.260 |
| 411 | 0.641 | 483 | 13.3 | 555 | 46.5 | 627 | 51.6 | 699 | 13.8 | 771 | 1.81 | 843 | 0.253 |
| 412 | 0.727 | 484 | 13.3 | 556 | 46.9 | 628 | 51.2 | 700 | 13.4 | 772 | 1.76 | 844 | 0.249 |
| 413 | 0.818 | 485 | 13.5 | 557 | 47.3 | 629 | 50.8 | 701 | 13.1 | 773 | 1.71 | 845 | 0.245 |
| 414 | 0.924 | 486 | 13.6 | 558 | 47.8 | 630 | 50.3 | 702 | 12.8 | 774 | 1.67 | 846 | 0.239 |
| 415 | 1.02 | 487 | 13.7 | 559 | 48.1 | 631 | 49.8 | 703 | 12.4 | 775 | 1.62 | 847 | 0.231 |
| 416 | 1.15 | 488 | 14.0 | 560 | 48.6 | 632 | 49.2 | 704 | 12.1 | 776 | 1.57 | 848 | 0.231 |
| 417 | 1.29 | 489 | 14.3 | 561 | 49.1 | 633 | 48.8 | 705 | 11.8 | 777 | 1.52 | 849 | 0.229 |
| 418 | 1.47 | 490 | 14.6 | 562 | 49.4 | 634 | 48.3 | 706 | 11.5 | 778 | 1.48 | 850 | 0.217 |
| 419 | 1.66 | 491 | 15.0 | 563 | 49.9 | 635 | 47.8 | 707 | 11.2 | 779 | 1.44 | | |
| 420 | 1.89 | 492 | 15.4 | 564 | 50.3 | 636 | 47.2 | 708 | 10.9 | 780 | 1.39 | | |
| 421 | 2.13 | 493 | 15.9 | 565 | 50.6 | 637 | 46.7 | 709 | 10.6 | 781 | 1.36 | | |