



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
12 B2-AL-L-358USD-A072000

Order Number
10520546
Test Number
785421

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".

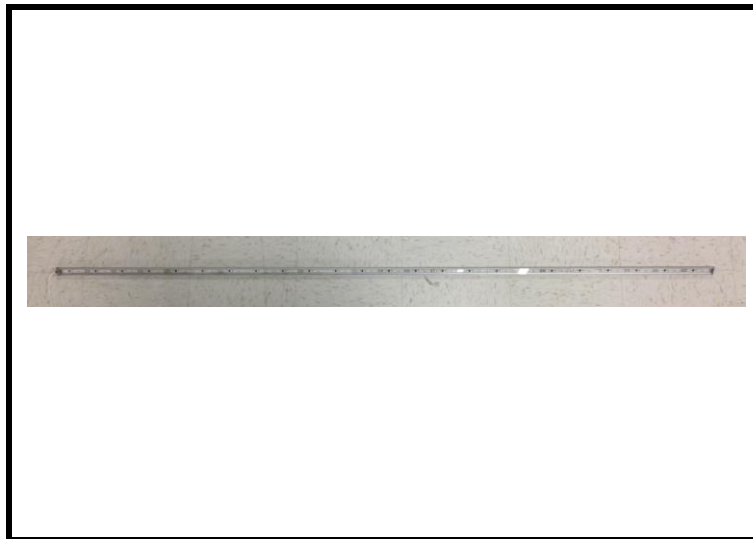
Zachary Mooney, Engineer Project Associate

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: 12 B2-AL-L-358USD-A072000
Lamp: 72 white LEDs
Mounting: Surface
Ballast/Driver: One High Perfection Tech. LP1090-24-GG-290

Luminaire



Summary of Results

| | |
|---------------------|------------------|
| Radiant Flux: | 9346 mW |
| Luminous Flux: | 2916 Lumens |
| Luminaire Efficacy: | 65.0 Lumens/Watt |
| CCT: | 3446 K |
| CRI (Ra): | 83.6 |
| Chromaticity (x): | 0.4061 |
| Chromaticity (y): | 0.3866 |
| Chromaticity (u): | 0.2379 |
| Chromaticity (v): | 0.3398 |
| Duv: | -0.0023 |

Test Conditions

| | |
|-------------------|-----------|
| Test Temperature: | 24.7 °C |
| Voltage: | 120.0 VAC |
| Current: | 0.3806 A |
| Power: | 44.85 W |
| Power Factor: | 0.982 |
| Frequency: | 60 Hz |
| Current THD: | 9.21 % |

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

Absorption correction was employed for this measurement.

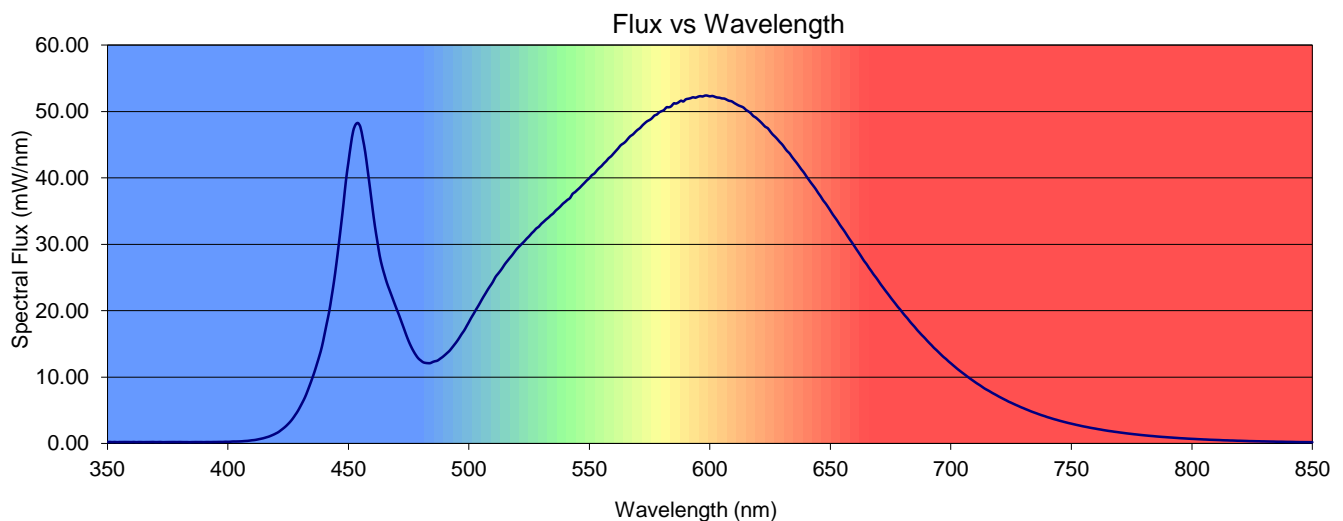
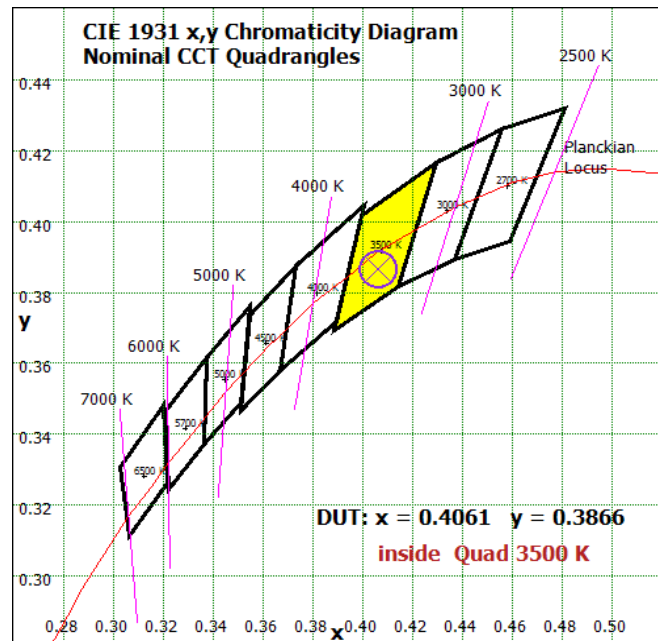
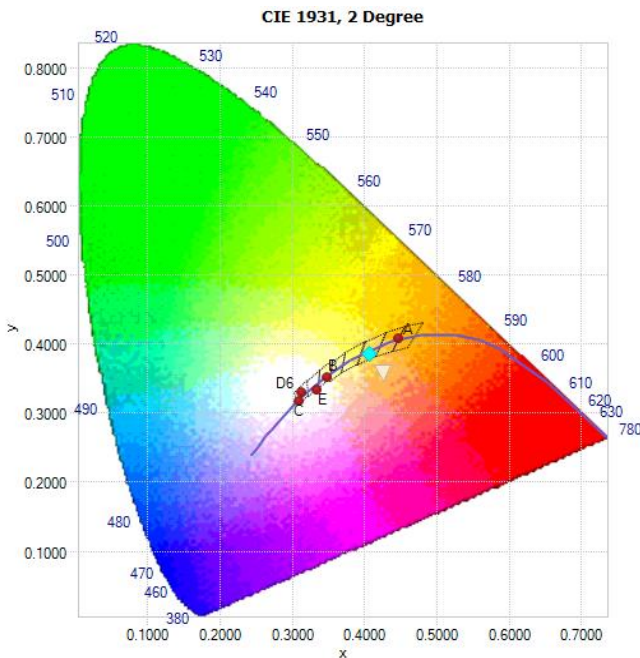


Chromaticity Coordinates

| x | y | u | v | u' | v' | Duv |
|--------|--------|--------|--------|--------|--------|---------|
| 0.4061 | 0.3866 | 0.2379 | 0.3398 | 0.2379 | 0.5097 | -0.0023 |

Color Rendering Index Detail

| Ra (CRI) | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 83.6 | 82.3 | 90.1 | 94.7 | 80.8 | 81.4 | 85.2 | 86.6 | 67.8 | 23.1 | 75.5 | 78.0 | 62.2 | 84.1 | 97.0 |





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 | 0.215 | 422 | 2.00 | 494 | 14.9 | 566 | 45.9 | 638 | 41.3 | 710 | 9.26 | 782 | 1.17 |
| 351 | 0.236 | 423 | 2.28 | 495 | 15.4 | 567 | 46.3 | 639 | 40.8 | 711 | 9.01 | 783 | 1.14 |
| 352 | 0.207 | 424 | 2.59 | 496 | 15.9 | 568 | 46.5 | 640 | 40.3 | 712 | 8.79 | 784 | 1.11 |
| 353 | 0.233 | 425 | 2.94 | 497 | 16.5 | 569 | 46.9 | 641 | 39.7 | 713 | 8.53 | 785 | 1.08 |
| 354 | 0.203 | 426 | 3.34 | 498 | 17.0 | 570 | 47.2 | 642 | 39.2 | 714 | 8.28 | 786 | 1.04 |
| 355 | 0.223 | 427 | 3.80 | 499 | 17.6 | 571 | 47.5 | 643 | 38.8 | 715 | 8.08 | 787 | 1.02 |
| 356 | 0.219 | 428 | 4.33 | 500 | 18.3 | 572 | 47.9 | 644 | 38.3 | 716 | 7.88 | 788 | 0.989 |
| 357 | 0.227 | 429 | 4.88 | 501 | 19.0 | 573 | 48.2 | 645 | 37.7 | 717 | 7.66 | 789 | 0.965 |
| 358 | 0.223 | 430 | 5.54 | 502 | 19.5 | 574 | 48.5 | 646 | 37.2 | 718 | 7.46 | 790 | 0.934 |
| 359 | 0.224 | 431 | 6.23 | 503 | 20.2 | 575 | 48.7 | 647 | 36.6 | 719 | 7.26 | 791 | 0.912 |
| 360 | 0.211 | 432 | 6.97 | 504 | 20.8 | 576 | 49.0 | 648 | 36.2 | 720 | 7.05 | 792 | 0.885 |
| 361 | 0.231 | 433 | 7.86 | 505 | 21.4 | 577 | 49.4 | 649 | 35.6 | 721 | 6.87 | 793 | 0.859 |
| 362 | 0.203 | 434 | 8.82 | 506 | 22.1 | 578 | 49.5 | 650 | 35.1 | 722 | 6.68 | 794 | 0.834 |
| 363 | 0.224 | 435 | 9.81 | 507 | 22.7 | 579 | 49.9 | 651 | 34.5 | 723 | 6.50 | 795 | 0.806 |
| 364 | 0.220 | 436 | 10.9 | 508 | 23.3 | 580 | 50.0 | 652 | 34.0 | 724 | 6.30 | 796 | 0.786 |
| 365 | 0.208 | 437 | 12.0 | 509 | 23.8 | 581 | 50.2 | 653 | 33.5 | 725 | 6.14 | 797 | 0.766 |
| 366 | 0.216 | 438 | 13.2 | 510 | 24.4 | 582 | 50.6 | 654 | 32.9 | 726 | 5.97 | 798 | 0.742 |
| 367 | 0.218 | 439 | 14.6 | 511 | 25.1 | 583 | 50.6 | 655 | 32.4 | 727 | 5.81 | 799 | 0.721 |
| 368 | 0.223 | 440 | 16.3 | 512 | 25.5 | 584 | 50.8 | 656 | 31.9 | 728 | 5.65 | 800 | 0.704 |
| 369 | 0.231 | 441 | 18.0 | 513 | 26.0 | 585 | 51.2 | 657 | 31.3 | 729 | 5.48 | 801 | 0.688 |
| 370 | 0.211 | 442 | 19.8 | 514 | 26.5 | 586 | 51.2 | 658 | 30.8 | 730 | 5.34 | 802 | 0.666 |
| 371 | 0.219 | 443 | 22.0 | 515 | 27.0 | 587 | 51.4 | 659 | 30.2 | 731 | 5.18 | 803 | 0.648 |
| 372 | 0.229 | 444 | 24.3 | 516 | 27.5 | 588 | 51.6 | 660 | 29.7 | 732 | 5.04 | 804 | 0.631 |
| 373 | 0.204 | 445 | 27.0 | 517 | 27.9 | 589 | 51.5 | 661 | 29.2 | 733 | 4.88 | 805 | 0.612 |
| 374 | 0.212 | 446 | 29.9 | 518 | 28.4 | 590 | 51.8 | 662 | 28.6 | 734 | 4.74 | 806 | 0.599 |
| 375 | 0.218 | 447 | 33.0 | 519 | 28.9 | 591 | 51.9 | 663 | 28.1 | 735 | 4.61 | 807 | 0.577 |
| 376 | 0.222 | 448 | 36.2 | 520 | 29.3 | 592 | 52.0 | 664 | 27.5 | 736 | 4.48 | 808 | 0.563 |
| 377 | 0.223 | 449 | 39.6 | 521 | 29.7 | 593 | 52.1 | 665 | 27.0 | 737 | 4.35 | 809 | 0.550 |
| 378 | 0.223 | 450 | 42.3 | 522 | 30.1 | 594 | 52.1 | 666 | 26.5 | 738 | 4.23 | 810 | 0.537 |
| 379 | 0.218 | 451 | 44.9 | 523 | 30.4 | 595 | 52.2 | 667 | 26.0 | 739 | 4.11 | 811 | 0.525 |
| 380 | 0.229 | 452 | 47.1 | 524 | 30.9 | 596 | 52.3 | 668 | 25.4 | 740 | 3.98 | 812 | 0.508 |
| 381 | 0.218 | 453 | 48.0 | 525 | 31.2 | 597 | 52.3 | 669 | 25.0 | 741 | 3.87 | 813 | 0.489 |
| 382 | 0.213 | 454 | 48.3 | 526 | 31.6 | 598 | 52.4 | 670 | 24.4 | 742 | 3.76 | 814 | 0.480 |
| 383 | 0.216 | 455 | 47.6 | 527 | 32.0 | 599 | 52.4 | 671 | 23.9 | 743 | 3.65 | 815 | 0.469 |
| 384 | 0.203 | 456 | 45.9 | 528 | 32.4 | 600 | 52.3 | 672 | 23.4 | 744 | 3.55 | 816 | 0.455 |
| 385 | 0.211 | 457 | 43.9 | 529 | 32.6 | 601 | 52.3 | 673 | 22.9 | 745 | 3.44 | 817 | 0.448 |
| 386 | 0.218 | 458 | 41.1 | 530 | 33.1 | 602 | 52.2 | 674 | 22.5 | 746 | 3.35 | 818 | 0.433 |
| 387 | 0.223 | 459 | 38.4 | 531 | 33.4 | 603 | 52.1 | 675 | 22.0 | 747 | 3.25 | 819 | 0.418 |
| 388 | 0.216 | 460 | 35.5 | 532 | 33.7 | 604 | 52.1 | 676 | 21.5 | 748 | 3.16 | 820 | 0.412 |
| 389 | 0.223 | 461 | 32.7 | 533 | 34.0 | 605 | 52.0 | 677 | 21.1 | 749 | 3.07 | 821 | 0.400 |
| 390 | 0.210 | 462 | 30.5 | 534 | 34.4 | 606 | 51.9 | 678 | 20.6 | 750 | 2.99 | 822 | 0.390 |
| 391 | 0.223 | 463 | 28.3 | 535 | 34.6 | 607 | 51.8 | 679 | 20.2 | 751 | 2.90 | 823 | 0.376 |
| 392 | 0.223 | 464 | 26.7 | 536 | 35.1 | 608 | 51.6 | 680 | 19.7 | 752 | 2.82 | 824 | 0.363 |
| 393 | 0.218 | 465 | 25.4 | 537 | 35.4 | 609 | 51.5 | 681 | 19.2 | 753 | 2.74 | 825 | 0.357 |
| 394 | 0.228 | 466 | 24.2 | 538 | 35.7 | 610 | 51.3 | 682 | 18.8 | 754 | 2.66 | 826 | 0.349 |
| 395 | 0.229 | 467 | 23.2 | 539 | 36.1 | 611 | 51.1 | 683 | 18.4 | 755 | 2.58 | 827 | 0.342 |
| 396 | 0.235 | 468 | 22.2 | 540 | 36.4 | 612 | 50.9 | 684 | 17.9 | 756 | 2.51 | 828 | 0.335 |
| 397 | 0.241 | 469 | 21.2 | 541 | 36.7 | 613 | 50.8 | 685 | 17.6 | 757 | 2.44 | 829 | 0.320 |
| 398 | 0.239 | 470 | 20.3 | 542 | 37.0 | 614 | 50.6 | 686 | 17.1 | 758 | 2.37 | 830 | 0.321 |
| 399 | 0.266 | 471 | 19.4 | 543 | 37.6 | 615 | 50.2 | 687 | 16.7 | 759 | 2.30 | 831 | 0.308 |
| 400 | 0.252 | 472 | 18.4 | 544 | 37.8 | 616 | 50.0 | 688 | 16.3 | 760 | 2.24 | 832 | 0.302 |
| 401 | 0.267 | 473 | 17.4 | 545 | 38.2 | 617 | 49.7 | 689 | 16.0 | 761 | 2.17 | 833 | 0.292 |
| 402 | 0.302 | 474 | 16.4 | 546 | 38.5 | 618 | 49.3 | 690 | 15.5 | 762 | 2.11 | 834 | 0.288 |
| 403 | 0.301 | 475 | 15.4 | 547 | 38.9 | 619 | 49.1 | 691 | 15.2 | 763 | 2.05 | 835 | 0.274 |
| 404 | 0.308 | 476 | 14.6 | 548 | 39.3 | 620 | 48.8 | 692 | 14.8 | 764 | 1.98 | 836 | 0.270 |
| 405 | 0.320 | 477 | 13.9 | 549 | 39.6 | 621 | 48.4 | 693 | 14.4 | 765 | 1.92 | 837 | 0.268 |
| 406 | 0.342 | 478 | 13.3 | 550 | 40.0 | 622 | 48.1 | 694 | 14.1 | 766 | 1.87 | 838 | 0.260 |
| 407 | 0.373 | 479 | 12.8 | 551 | 40.4 | 623 | 47.7 | 695 | 13.7 | 767 | 1.82 | 839 | 0.250 |
| 408 | 0.395 | 480 | 12.5 | 552 | 40.6 | 624 | 47.5 | 696 | 13.4 | 768 | 1.77 | 840 | 0.245 |
| 409 | 0.436 | 481 | 12.2 | 553 | 41.1 | 625 | 47.0 | 697 | 13.0 | 769 | 1.72 | 841 | 0.243 |
| 410 | 0.489 | 482 | 12.1 | 554 | 41.5 | 626 | 46.6 | 698 | 12.7 | 770 | 1.67 | 842 | 0.235 |
| 411 | 0.523 | 483 | 12.1 | 555 | 41.8 | 627 | 46.2 | 699 | 12.4 | 771 | 1.62 | 843 | 0.225 |
| 412 | 0.587 | 484 | 12.1 | 556 | 42.2 | 628 | 45.8 | 700 | 12.1 | 772 | 1.57 | 844 | 0.220 |
| 413 | 0.662 | 485 | 12.3 | 557 | 42.5 | 629 | 45.4 | 701 | 11.8 | 773 | 1.53 | 845 | 0.215 |
| 414 | 0.737 | 486 | 12.4 | 558 | 43.0 | 630 | 45.0 | 702 | 11.5 | 774 | 1.48 | 846 | 0.213 |
| 415 | 0.825 | 487 | 12.5 | 559 | 43.2 | 631 | 44.5 | 703 | 11.1 | 775 | 1.44 | 847 | 0.209 |
| 416 | 0.935 | 488 | 12.8 | 560 | 43.6 | 632 | 44.1 | 704 | 10.9 | 776 | 1.40 | 848 | 0.209 |
| 417 | 1.04 | 489 | 13.0 | 561 | 44.1 | 633 | 43.7 | 705 | 10.6 | 777 | 1.36 | 849 | 0.204 |
| 418 | 1.19 | 490 | 13.3 | 562 | 44.5 | 634 | 43.2 | 706 | 10.3 | 778 | 1.32 | 850 | 0.196 |
| 419 | 1.35 | 491 | 13.6 | 563 | 44.9 | 635 | 42.7 | 707 | 10.0 | 779 | 1.28 | | |
| 420 | 1.53 | 492 | 14.0 | 564 | 45.2 | 636 | 42.3 | 708 | 9.77 | 780 | 1.24 | | |
| 421 | 1.73 | 493 | 14.4 | 565 | 45.5 | 637 | 41.8 | 709 | 9.52 | 781 | 1.21 | | |