



Photometric Indoor Test Report

Relevant Standards

IES LM-9-2009, IES LM-41-1998
ANSI C78.81-2010, ANSI C82.1-2004, ANSI C82.11, ANSI C82.2, ANSI C82.77
IEC 60081, IEC 60901, IEC 61347-2-3

Prepared For
Precision Architectural Lighting, Inc.
Fred Compton
4830 Timber Creek Drive
Houston, TX 77017

Catalog Number
DRS02-X-4-X-D46/MPL-X-120-T5

LTL Test Number
22915

Test Date
2011-04-01

Prepared By

Zachary Mooney, Technician III

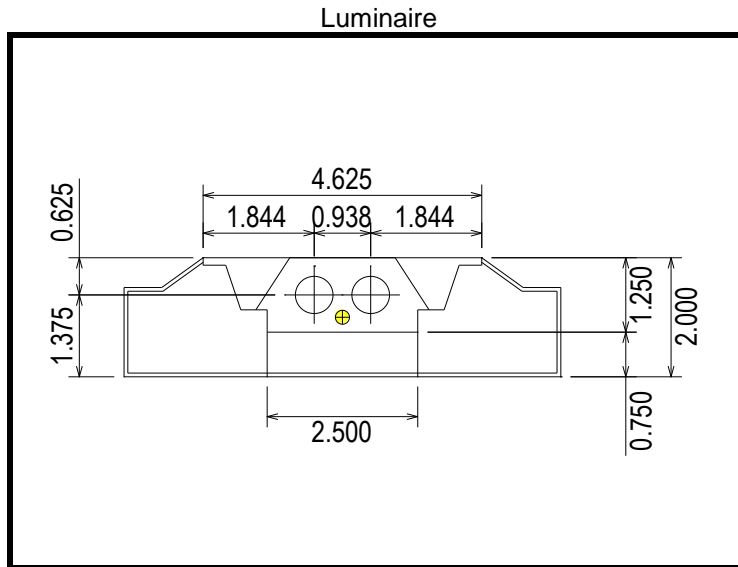
Approved By

Brian Moyer, Engineer

The results contained in this report pertain only to the tested sample.
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Luminaire Description: Extruded aluminum housing, formed white enamel aluminum side reflectors, formed white enamel slotted aluminum upper reflector, clear prismatic plastic lower lens
 Catalog Number: DRS02-X-4-X-D46/MPL-X-120-T5
 Lamp: Two 28 watt T5 linear fluorescent lamps rated at 2610 lumens each
 Lamp Catalog Number: Philips F28T5/841/ALTO
 Mounting: Pendant
 Ballast/Driver: One Ultra Save ER235120MHT



Zonal Lumen Summary

| Zone (Degrees) | Lumens | % of Lamp | % of Luminaire |
|----------------|--------|-----------|----------------|
| 0-30 | 926 | 17.7% | 24.4% |
| 0-40 | 1496 | 28.7% | 39.5% |
| 0-60 | 2121 | 40.6% | 56.0% |
| 0-90 | 2331 | 44.7% | 61.5% |
| 90-180 | 1459 | 27.9% | 38.5% |
| 0-180 | 3790 | 72.6% | 100.0% |

Test Conditions

Test Temperature: 25.3 °C
 Voltage: 120.0 VAC
 Current: 0.5181 A
 Power: 62.05 W
 Power Factor: 0.998
 Frequency: 60 Hz

Summary of Results

Luminaire Efficiency: 72.6 %

Spacing Criterion: 0 Degree: 1.23 90 Degree: 1.28
 180 Degree: 1.23 270 Degree: 1.28

CIE Type: Semi-Direct



Candela Tabulation
Horizontal Angle (Degrees)

| | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 |
|-----|------|------|------|------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| 0 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 | 1168 |
| 5 | 1158 | 1166 | 1171 | 1166 | 1171 | 1166 | 1171 | 1166 | 1158 | 1166 | 1171 | 1166 | 1171 | 1166 | 1171 | 1166 |
| 10 | 1149 | 1157 | 1164 | 1161 | 1168 | 1161 | 1164 | 1157 | 1149 | 1157 | 1164 | 1161 | 1168 | 1161 | 1164 | 1157 |
| 15 | 1126 | 1138 | 1149 | 1151 | 1158 | 1151 | 1149 | 1138 | 1126 | 1138 | 1149 | 1151 | 1158 | 1151 | 1149 | 1138 |
| 20 | 1087 | 1100 | 1118 | 1127 | 1135 | 1127 | 1118 | 1100 | 1087 | 1100 | 1118 | 1127 | 1135 | 1127 | 1118 | 1100 |
| 25 | 1033 | 1046 | 1075 | 1089 | 1095 | 1089 | 1075 | 1046 | 1033 | 1046 | 1075 | 1089 | 1095 | 1089 | 1075 | 1046 |
| 30 | 966 | 986 | 1020 | 1032 | 1034 | 1032 | 1020 | 986 | 966 | 986 | 1020 | 1032 | 1034 | 1032 | 1020 | 986 |
| 35 | 881 | 908 | 937 | 927 | 926 | 927 | 937 | 908 | 881 | 908 | 937 | 927 | 926 | 927 | 937 | 908 |
| 40 | 759 | 794 | 789 | 776 | 782 | 776 | 789 | 794 | 759 | 794 | 789 | 776 | 782 | 776 | 789 | 794 |
| 45 | 561 | 556 | 545 | 523 | 519 | 523 | 545 | 556 | 561 | 556 | 545 | 523 | 519 | 523 | 545 | 556 |
| 50 | 354 | 335 | 338 | 333 | 326 | 333 | 338 | 335 | 354 | 335 | 338 | 333 | 326 | 333 | 338 | 335 |
| 55 | 237 | 229 | 216 | 211 | 220 | 211 | 216 | 229 | 237 | 229 | 216 | 211 | 220 | 211 | 216 | 229 |
| 60 | 154 | 157 | 152 | 146 | 155 | 146 | 152 | 157 | 154 | 157 | 152 | 146 | 155 | 146 | 152 | 157 |
| 65 | 109 | 119 | 116 | 108 | 109 | 108 | 116 | 119 | 109 | 119 | 116 | 108 | 109 | 108 | 116 | 119 |
| 70 | 88 | 94 | 85 | 80 | 86 | 80 | 85 | 94 | 88 | 94 | 85 | 80 | 86 | 80 | 85 | 94 |
| 75 | 67 | 72 | 66 | 60 | 62 | 60 | 66 | 72 | 67 | 72 | 66 | 60 | 62 | 60 | 66 | 72 |
| 80 | 59 | 50 | 47 | 44 | 41 | 44 | 47 | 50 | 59 | 50 | 47 | 44 | 41 | 44 | 47 | 50 |
| 85 | 33 | 30 | 26 | 23 | 20 | 23 | 26 | 30 | 33 | 30 | 26 | 23 | 20 | 23 | 26 | 30 |
| 90 | 1 | 4 | 4 | 7 | 4 | 7 | 4 | 4 | 1 | 4 | 4 | 7 | 4 | 7 | 4 | 4 |
| 95 | 18 | 34 | 30 | 28 | 19 | 28 | 30 | 34 | 18 | 34 | 30 | 28 | 19 | 28 | 30 | 34 |
| 100 | 47 | 83 | 81 | 75 | 60 | 75 | 81 | 83 | 47 | 83 | 81 | 75 | 60 | 75 | 81 | 83 |
| 105 | 79 | 123 | 139 | 143 | 124 | 143 | 139 | 123 | 79 | 123 | 139 | 143 | 124 | 143 | 139 | 123 |
| 110 | 113 | 163 | 186 | 206 | 187 | 206 | 186 | 163 | 113 | 163 | 186 | 206 | 187 | 206 | 186 | 163 |
| 115 | 149 | 191 | 233 | 249 | 241 | 249 | 233 | 191 | 149 | 191 | 233 | 249 | 241 | 249 | 233 | 191 |
| 120 | 188 | 219 | 275 | 290 | 287 | 290 | 275 | 219 | 188 | 219 | 275 | 290 | 287 | 290 | 275 | 219 |
| 125 | 223 | 247 | 307 | 331 | 327 | 331 | 307 | 247 | 223 | 247 | 307 | 331 | 327 | 331 | 307 | 247 |
| 130 | 257 | 271 | 325 | 360 | 358 | 360 | 325 | 271 | 257 | 271 | 325 | 360 | 358 | 360 | 325 | 271 |
| 135 | 289 | 295 | 342 | 372 | 375 | 372 | 342 | 295 | 289 | 295 | 342 | 372 | 375 | 372 | 342 | 295 |
| 140 | 318 | 320 | 356 | 379 | 382 | 379 | 356 | 320 | 318 | 320 | 356 | 379 | 382 | 379 | 356 | 320 |
| 145 | 342 | 344 | 369 | 388 | 393 | 388 | 369 | 344 | 342 | 344 | 369 | 388 | 393 | 388 | 369 | 344 |
| 150 | 363 | 364 | 378 | 394 | 399 | 394 | 378 | 364 | 363 | 364 | 378 | 394 | 399 | 394 | 378 | 364 |
| 155 | 379 | 379 | 387 | 397 | 402 | 397 | 387 | 379 | 379 | 379 | 387 | 397 | 402 | 397 | 387 | 379 |
| 160 | 394 | 392 | 397 | 399 | 400 | 399 | 397 | 392 | 394 | 392 | 397 | 399 | 400 | 399 | 397 | 392 |
| 165 | 401 | 400 | 403 | 402 | 402 | 402 | 403 | 400 | 401 | 400 | 403 | 402 | 402 | 402 | 403 | 400 |
| 170 | 401 | 402 | 402 | 400 | 401 | 400 | 402 | 402 | 401 | 402 | 402 | 400 | 401 | 400 | 402 | 402 |
| 175 | 391 | 390 | 391 | 388 | 388 | 388 | 391 | 390 | 391 | 390 | 391 | 388 | 388 | 388 | 391 | 390 |
| 180 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 | 386 |

Zonal Lumen Tabulation (5 degree zones)

| Zone (Degrees) | Lumens | Zone (Degrees) | Lumens | Zone (Degrees) | Lumens | Zone (Degrees) | Lumens |
|----------------|--------|----------------|--------|----------------|--------|----------------|--------|
| 0-5 | 27.9 | 45-50 | 171.3 | 90-95 | 8.0 | 135-140 | 127.0 |
| 5-10 | 83.3 | 50-55 | 119.2 | 95-100 | 26.4 | 140-145 | 119.9 |
| 10-15 | 136.8 | 55-60 | 84.5 | 100-105 | 53.2 | 145-150 | 109.9 |
| 15-20 | 186.3 | 60-65 | 63.8 | 105-110 | 79.3 | 150-155 | 97.1 |
| 20-25 | 229.0 | 65-70 | 49.8 | 110-115 | 99.6 | 155-160 | 82.3 |
| 25-30 | 263.2 | 70-75 | 39.8 | 115-120 | 114.9 | 160-165 | 65.8 |
| 30-35 | 284.7 | 75-80 | 30.3 | 120-125 | 126.2 | 165-170 | 47.8 |
| 35-40 | 285.0 | 80-85 | 20.2 | 125-130 | 131.9 | 170-175 | 28.4 |
| 40-45 | 249.9 | 85-90 | 6.5 | 130-135 | 131.7 | 175-180 | 9.3 |



Coefficients of Utilization - Zonal Cavity Method

| Effective Floor Cavity Reflectance 20% | | | | | | | | | | | | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Ceiling Cavity Reflectance | 90 | | | | 80 | | | | 70 | | | |
| Wall Reflectance | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 |
| Room Cavity Ratio (RCR) | | | | | | | | | | | | |
| 0 | 0.8514 | 0.8514 | 0.8514 | 0.8514 | 0.7978 | 0.7978 | 0.7978 | 0.7978 | 0.7468 | 0.7468 | 0.7468 | 0.7468 |
| 1 | 0.7871 | 0.7541 | 0.7246 | 0.6983 | 0.7373 | 0.7088 | 0.6833 | 0.6603 | 0.6900 | 0.6656 | 0.6435 | 0.6235 |
| 2 | 0.7257 | 0.6691 | 0.6228 | 0.5842 | 0.6795 | 0.6305 | 0.5899 | 0.5557 | 0.6359 | 0.5935 | 0.5580 | 0.5279 |
| 3 | 0.6691 | 0.5966 | 0.5412 | 0.4977 | 0.6266 | 0.5633 | 0.5144 | 0.4753 | 0.5864 | 0.5314 | 0.4882 | 0.4534 |
| 4 | 0.6176 | 0.5345 | 0.4746 | 0.4295 | 0.5785 | 0.5057 | 0.4524 | 0.4116 | 0.5418 | 0.4780 | 0.4306 | 0.3939 |
| 5 | 0.5709 | 0.4811 | 0.4196 | 0.3747 | 0.5352 | 0.4561 | 0.4008 | 0.3600 | 0.5015 | 0.4320 | 0.3825 | 0.3455 |
| 6 | 0.5289 | 0.4354 | 0.3738 | 0.3302 | 0.4962 | 0.4134 | 0.3578 | 0.3179 | 0.4654 | 0.3922 | 0.3422 | 0.3058 |
| 7 | 0.4913 | 0.3959 | 0.3353 | 0.2934 | 0.4613 | 0.3765 | 0.3216 | 0.2830 | 0.4331 | 0.3578 | 0.3080 | 0.2727 |
| 8 | 0.4574 | 0.3616 | 0.3026 | 0.2626 | 0.4300 | 0.3444 | 0.2906 | 0.2536 | 0.4041 | 0.3278 | 0.2788 | 0.2448 |
| 9 | 0.4271 | 0.3318 | 0.2746 | 0.2365 | 0.4019 | 0.3165 | 0.2641 | 0.2288 | 0.3781 | 0.3016 | 0.2538 | 0.2211 |
| 10 | 0.3998 | 0.3057 | 0.2505 | 0.2142 | 0.3766 | 0.2919 | 0.2412 | 0.2074 | 0.3547 | 0.2785 | 0.2321 | 0.2007 |

| Ceiling Cavity Reflectance | 50 | | | | 30 | | | 10 | | | 0 |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Wall Reflectance | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| Room Cavity Ratio (RCR) | | | | | | | | | | | |
| 0 | 0.6515 | 0.6515 | 0.6515 | 0.6515 | 0.5643 | 0.5643 | 0.5643 | 0.4843 | 0.4843 | 0.4843 | 0.4466 |
| 1 | 0.6023 | 0.5846 | 0.5684 | 0.5536 | 0.5102 | 0.4986 | 0.4879 | 0.4416 | 0.4336 | 0.4261 | 0.3937 |
| 2 | 0.5553 | 0.5240 | 0.4973 | 0.4742 | 0.4599 | 0.4403 | 0.4230 | 0.4007 | 0.3866 | 0.3740 | 0.3455 |
| 3 | 0.5125 | 0.4714 | 0.4382 | 0.4108 | 0.4158 | 0.3908 | 0.3697 | 0.3642 | 0.3458 | 0.3300 | 0.3046 |
| 4 | 0.4741 | 0.4258 | 0.3887 | 0.3593 | 0.3773 | 0.3488 | 0.3257 | 0.3322 | 0.3108 | 0.2930 | 0.2702 |
| 5 | 0.4397 | 0.3863 | 0.3470 | 0.3169 | 0.3438 | 0.3131 | 0.2890 | 0.3041 | 0.2806 | 0.2617 | 0.2412 |
| 6 | 0.4088 | 0.3520 | 0.3118 | 0.2818 | 0.3145 | 0.2826 | 0.2583 | 0.2794 | 0.2546 | 0.2352 | 0.2165 |
| 7 | 0.3812 | 0.3222 | 0.2817 | 0.2523 | 0.2888 | 0.2564 | 0.2322 | 0.2575 | 0.2320 | 0.2124 | 0.1954 |
| 8 | 0.3564 | 0.2961 | 0.2559 | 0.2273 | 0.2663 | 0.2337 | 0.2100 | 0.2383 | 0.2123 | 0.1929 | 0.1773 |
| 9 | 0.3342 | 0.2732 | 0.2336 | 0.2059 | 0.2464 | 0.2141 | 0.1909 | 0.2212 | 0.1951 | 0.1760 | 0.1616 |
| 10 | 0.3142 | 0.2530 | 0.2142 | 0.1875 | 0.2288 | 0.1969 | 0.1743 | 0.2060 | 0.1801 | 0.1613 | 0.1480 |

Average Luminance Table (cd/m²)

| | | Horizontal Angle (Degrees) | | |
|-------------------------|----|----------------------------|-------|-------|
| | | 0 | 45 | 90 |
| Vertical Angle (Degree) | 0 | 16420 | 16420 | 16420 |
| | 45 | 11150 | 10830 | 10320 |
| | 55 | 5796 | 5282 | 5390 |
| | 65 | 3635 | 3839 | 3614 |
| | 75 | 3657 | 3587 | 3376 |
| | 85 | 5319 | 3162 | 3162 |

This test was conducted using photometry techniques according to standard IES procedures. The user must therefore use caution in the following situations: 1) This test was performed using a specific ballast/lamp combination. Extrapolation of this data for other ballast/lamp combinations may produce erroneous results. 2) According to IESNA procedures, the ballast(s) and lamp(s) are presumed to produce 100% of rated output. An appropriate ballast factor must be applied to the lumen output ratings and luminous intensity values given. This test was conducted in a controlled laboratory environment where the ambient temperature was held at 25°C ±1°C. Field performance may differ particularly in regards to change in luminous output as a result of difference in ambient temperature and method of mounting the luminaire.



Polar Plot (Candela)

