

REPORT NUMBER: ITL70245

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ISSUE DATE: 10/27/11

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: LTS-03-X-4-X-OC2/MPL-X-120-T5

LUMINAIRE: EXTRUDED SEMI-DIFFUSE METAL HOUSING WITH FABRICATED SEMI-DIFFUSE METAL END CAPS, TWO FORMED METAL SIDE REFLECTORS WITH PREMIUM SPECULAR FINISH, FORMED WHITE PAINTED METAL UPPER REFLECTOR WITH 62 UPLIGHT APERTURES OF VARIOUS SHAPES AND SIZES, CLEAR FLAT MICRO-PRISMATIC PLASTIC LENS. LENS PRISMS DOWN.

LAMPS: THREE 28-WATT T-5 SYLVANIA FP28/841/ECO LINEAR FLUORESCENTS.

BALLASTS: TWO UNIVERSAL B228PUNV-C

MOUNTING: SUSPENDED

TOTAL REFLECTANCE OF PAINT = 89.7 %

THE 0 DEGREE PLANE IS PARALLEL WITH

THE LAMPS.

TOTAL INPUT WATTS = 95.9 AT 120.0 VOLTS

LUMEN TO CANDELA RATIO USED = 9.17

REPORT IS BASED ON 2600 LUMENS PER LAMP. \*

#### CANDELA DISTRIBUTION

#### FLUX

|     | 0.0  | 22.5 | 45.0 | 67.5 | 90.0 |      |
|-----|------|------|------|------|------|------|
| 0   | 2205 | 2205 | 2205 | 2205 | 2205 |      |
| 5   | 2207 | 2209 | 2206 | 2196 | 2194 | 210  |
| 15  | 2143 | 2151 | 2167 | 2173 | 2176 | 611  |
| 25  | 1972 | 1995 | 2039 | 2063 | 2060 | 934  |
| 35  | 1710 | 1750 | 1805 | 1861 | 1882 | 1121 |
| 45  | 1113 | 1169 | 1198 | 1187 | 1187 | 906  |
| 55  | 503  | 501  | 492  | 493  | 509  | 456  |
| 65  | 240  | 269  | 262  | 256  | 263  | 261  |
| 75  | 149  | 169  | 157  | 150  | 155  | 165  |
| 85  | 71   | 72   | 69   | 70   | 61   | 71   |
| 90  | 0    | 0    | 0    | 0    | 0    |      |
| 95  | 23   | 57   | 39   | 45   | 31   | 51   |
| 105 | 94   | 150  | 186  | 196  | 185  | 174  |
| 115 | 170  | 217  | 261  | 308  | 302  | 251  |
| 125 | 250  | 277  | 316  | 349  | 349  | 278  |
| 135 | 315  | 338  | 367  | 389  | 385  | 279  |
| 145 | 373  | 385  | 400  | 416  | 410  | 250  |
| 155 | 412  | 415  | 424  | 430  | 422  | 194  |
| 165 | 418  | 419  | 425  | 428  | 425  | 119  |
| 175 | 375  | 372  | 372  | 368  | 369  | 37   |
| 180 | 363  | 363  | 363  | 363  | 363  |      |

#### ZONAL LUMEN SUMMARY

| ZONE   | LUMENS | %LAMP | %FIXT |
|--------|--------|-------|-------|
| 0- 30  | 1755   | 22.5  | 27.6  |
| 0- 40  | 2876   | 36.9  | 45.2  |
| 0- 60  | 4238   | 54.3  | 66.5  |
| 0- 90  | 4736   | 60.7  | 74.4  |
| 90-120 | 476    | 6.1   | 7.5   |
| 90-130 | 754    | 9.7   | 11.8  |
| 90-150 | 1282   | 16.4  | 20.1  |
| 90-180 | 1633   | 20.9  | 25.6  |
| 0-180  | 6368   | 81.6  | 100.0 |

TOTAL LUMINAIRE EFFICIENCY = 81.6 % \*

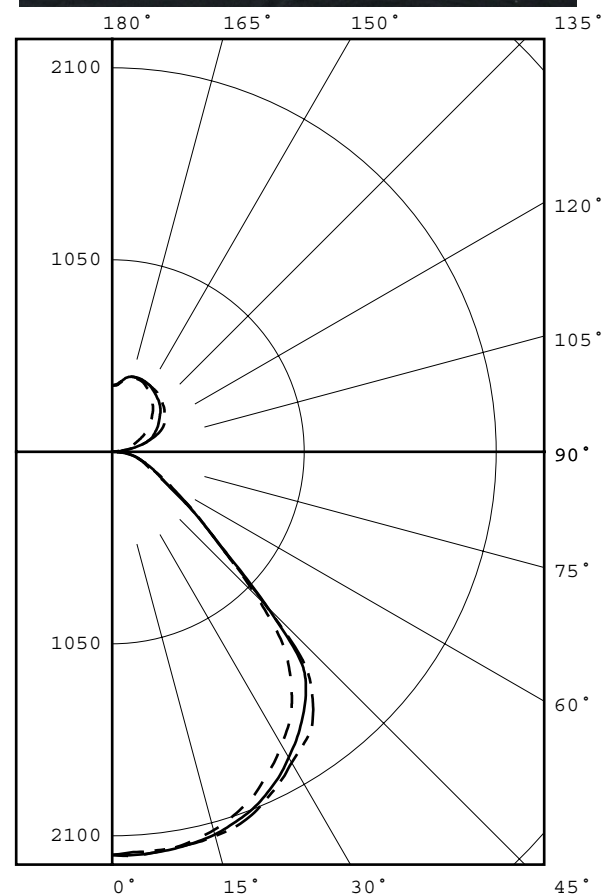
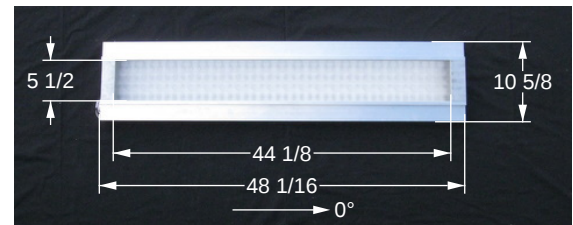
CIE TYPE - SEMI-DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.25 1.33

SHIELDING ANGLES : 90 90

\* SEE ADDENDUM FOR FURTHER INFORMATION

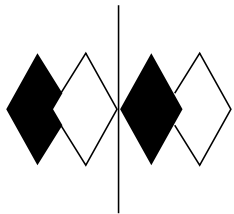


#### LEGEND:

0-deg: - - - - -  
45-deg: \_\_\_\_\_  
90-deg: - - - - -

Checked .....S.BERGIN.....

Approved .....R.BEATTIE.....  
Lighting Engineer



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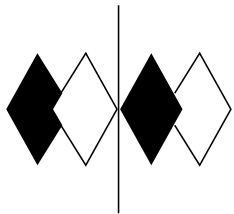
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PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH : 44.125 5.500

LUMINANCE DATA IN CANDELA/SQ M

| ANGLE<br>IN DEG | AVERAGE<br>0-DEG | AVERAGE<br>45-DEG | AVERAGE<br>90-DEG |
|-----------------|------------------|-------------------|-------------------|
| 45              | 10053.           | 10821.            | 10722.            |
| 55              | 5601.            | 5479.             | 5668.             |
| 65              | 3627.            | 3960.             | 3975.             |
| 75              | 3677.            | 3874.             | 3825.             |
| 85              | 5203.            | 5056.             | 4470.             |



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#### CANDELA DISTRIBUTION

|       | 0.0  | 22.5 | 45.0 | 67.5 | 90.0 |
|-------|------|------|------|------|------|
| 0.0   | 2205 | 2205 | 2205 | 2205 | 2205 |
| 5.0   | 2207 | 2209 | 2206 | 2196 | 2194 |
| 10.0  | 2185 | 2189 | 2193 | 2190 | 2190 |
| 15.0  | 2143 | 2151 | 2167 | 2173 | 2176 |
| 20.0  | 2074 | 2086 | 2117 | 2137 | 2140 |
| 25.0  | 1972 | 1995 | 2039 | 2063 | 2060 |
| 30.0  | 1851 | 1886 | 1930 | 1963 | 1963 |
| 35.0  | 1710 | 1750 | 1805 | 1861 | 1882 |
| 40.0  | 1494 | 1551 | 1646 | 1686 | 1696 |
| 45.0  | 1113 | 1169 | 1198 | 1187 | 1187 |
| 50.0  | 724  | 721  | 729  | 749  | 724  |
| 55.0  | 503  | 501  | 492  | 493  | 509  |
| 60.0  | 337  | 353  | 340  | 335  | 365  |
| 65.0  | 240  | 269  | 262  | 256  | 263  |
| 70.0  | 189  | 208  | 202  | 191  | 207  |
| 75.0  | 149  | 169  | 157  | 150  | 155  |
| 80.0  | 126  | 116  | 115  | 113  | 110  |
| 85.0  | 71   | 72   | 69   | 70   | 61   |
| 90.0  | 0    | 0    | 0    | 0    | 0    |
| 95.0  | 23   | 57   | 39   | 45   | 31   |
| 100.0 | 58   | 115  | 111  | 116  | 108  |
| 105.0 | 94   | 150  | 186  | 196  | 185  |
| 110.0 | 132  | 178  | 234  | 267  | 251  |
| 115.0 | 170  | 217  | 261  | 308  | 302  |
| 120.0 | 212  | 247  | 290  | 329  | 329  |
| 125.0 | 250  | 277  | 316  | 349  | 349  |
| 130.0 | 281  | 308  | 345  | 366  | 371  |
| 135.0 | 315  | 338  | 367  | 389  | 385  |
| 140.0 | 343  | 366  | 384  | 408  | 401  |
| 145.0 | 373  | 385  | 400  | 416  | 410  |
| 150.0 | 394  | 402  | 416  | 424  | 416  |
| 155.0 | 412  | 415  | 424  | 430  | 422  |
| 160.0 | 421  | 420  | 428  | 432  | 425  |
| 165.0 | 418  | 419  | 425  | 428  | 425  |
| 170.0 | 407  | 405  | 408  | 405  | 408  |
| 175.0 | 375  | 372  | 372  | 368  | 369  |
| 180.0 | 363  | 363  | 363  | 363  | 363  |



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5-DEGREE

ZONAL LUMEN SUMMARY

|         |      |
|---------|------|
| 0- 5    | 53.  |
| 5- 10   | 157. |
| 10- 15  | 258. |
| 15- 20  | 352. |
| 20- 25  | 435. |
| 25- 30  | 500. |
| 30- 35  | 548. |
| 35- 40  | 573. |
| 40- 45  | 530. |
| 45- 50  | 376. |
| 50- 55  | 264. |
| 55- 60  | 192. |
| 60- 65  | 146. |
| 65- 70  | 116. |
| 70- 75  | 93.  |
| 75- 80  | 72.  |
| 80- 85  | 51.  |
| 85- 90  | 20.  |
| 90- 95  | 10.  |
| 95-100  | 40.  |
| 100-105 | 74.  |
| 105-110 | 101. |
| 110-115 | 120. |
| 115-120 | 131. |
| 120-125 | 137. |
| 125-130 | 140. |
| 130-135 | 141. |
| 135-140 | 138. |
| 140-145 | 130. |
| 145-150 | 119. |
| 150-155 | 105. |
| 155-160 | 89.  |
| 160-165 | 70.  |
| 165-170 | 49.  |
| 170-175 | 28.  |
| 175-180 | 9.   |

10-DEGREE

ZONAL LUMEN SUMMARY

|       |       |
|-------|-------|
| 0- 10 | 210.  |
| 0- 20 | 820.  |
| 0- 30 | 1755. |
| 0- 40 | 2876. |
| 0- 50 | 3782. |
| 0- 60 | 4238. |
| 0- 70 | 4499. |
| 0- 80 | 4665. |
| 0- 90 | 4736. |
| 0-100 | 4786. |
| 0-110 | 4961. |
| 0-120 | 5212. |
| 0-130 | 5490. |
| 0-140 | 5768. |
| 0-150 | 6018. |
| 0-160 | 6212. |
| 0-170 | 6332. |
| 0-180 | 6368. |



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# COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

| RC | 80 |    |    |    | 70 |    |    |    | 50 |    |    | 30 |    |    | 10 |    |    | 0  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| 0  | 92 | 92 | 92 | 92 | 88 | 88 | 88 | 88 | 79 | 79 | 79 | 71 | 71 | 71 | 64 | 64 | 64 | 61 |
| 1  | 85 | 82 | 79 | 76 | 81 | 78 | 75 | 73 | 71 | 69 | 67 | 64 | 63 | 61 | 58 | 57 | 56 | 53 |
| 2  | 79 | 73 | 68 | 64 | 75 | 70 | 65 | 62 | 63 | 60 | 57 | 58 | 55 | 53 | 53 | 51 | 49 | 46 |
| 3  | 72 | 65 | 59 | 55 | 69 | 62 | 57 | 53 | 57 | 53 | 50 | 52 | 49 | 46 | 48 | 45 | 43 | 40 |
| 4  | 67 | 58 | 52 | 48 | 64 | 56 | 50 | 46 | 51 | 47 | 43 | 47 | 44 | 41 | 43 | 40 | 38 | 36 |
| 5  | 62 | 53 | 46 | 42 | 59 | 51 | 45 | 41 | 47 | 42 | 38 | 43 | 39 | 36 | 40 | 36 | 34 | 32 |
| 6  | 57 | 48 | 41 | 37 | 55 | 46 | 40 | 36 | 43 | 38 | 34 | 39 | 35 | 32 | 36 | 33 | 30 | 28 |
| 7  | 53 | 44 | 37 | 33 | 51 | 42 | 36 | 32 | 39 | 34 | 30 | 36 | 32 | 29 | 33 | 30 | 27 | 25 |
| 8  | 50 | 40 | 34 | 29 | 47 | 38 | 33 | 29 | 36 | 31 | 27 | 33 | 29 | 26 | 31 | 27 | 25 | 23 |
| 9  | 47 | 37 | 31 | 27 | 44 | 35 | 30 | 26 | 33 | 28 | 25 | 31 | 27 | 24 | 29 | 25 | 22 | 21 |
| 10 | 44 | 34 | 28 | 24 | 42 | 33 | 27 | 24 | 31 | 26 | 23 | 29 | 24 | 22 | 27 | 23 | 21 | 19 |

ALL CANDELA, LUMENS, LUMINANCE, COEFFICIENT OF UTILIZATION AND VCP VALUES IN THIS REPORT ARE BASED ON RELATIVE PHOTOMETRY WHICH ASSUMES A BALLAST FACTOR OF 1.000. ANY CALCULATIONS PREPARED FROM THESE DATA SHOULD INCLUDE AN APPROPRIATE BALLAST FACTOR.



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#### ADDENDUM

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#### SPECIAL TEST PROCEDURES FOR T-5 LAMPS INCLUDING EXPLANATION OF THE IMPORTANCE OF LAMP LUMEN RATINGS.

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This test was performed using standard relative photometric practices in accordance with recommendations of the Illuminating Engineering Society of North America. Fluorescent testing using the guidelines of relative photometric practice presupposes that the lamps will be operated at their nominal electrical characteristics (e.g., a 40 watt lamp will operate very nearly at 40 watts, and at the voltage and current required for 40-watt operation). Fluorescent lamps in general are temperature sensitive, the lumen output varies with ambient temperature and follows a characteristic curve. The T-5 fluorescent lamps used in this test produce maximum light output in an ambient temperature other than 25 degrees C. A critical step in relative photometric testing involves measurement of the total flux output from the lamp(s) suspended in free air at a 25 degree C ambient temperature per IES LM41-1998. This measurement process is a separate step from the photometric exploration of the luminaire itself. This "bare lamp" measurement is made with the lamp(s) operated by the same ballast(s) which are to be used in the luminaire. Since the test procedure involves measuring the bare lamp flux output at 25 degrees C and this lamp type peaks at a temperature other than 25 degrees C, the flux measured for this lamp type will be less than the maximum output the lamp is designed to produce.

As a result, the measurement of the "bare lamp" total flux output is lower than it would be if the lamps were operated at their optimum operating temperature and at nominal electrical characteristics. When this "bare lamp" measurement is incorporated into the luminaire test report, the net effect is that total luminaire efficiency on the report is higher than what the lighting industry would expect this luminaire to produce. These lighting industry expectations are based on comparisons to the total luminaire efficiency of the same luminaire with T-12 or T-8 lamps.

On this particular test, the lamp lumen rating shown is for a 25 degree C ambient temperature. Since this report was based the lumen lamp lumen rating at 25 degrees C, the candela values in this report should be accurate, as long as the lamp(s) used for this test follow the manufacturer's light output vs. temperature curve.

T5TEMP3.DIS