



REPORT NUMBER: ITL77182
ISSUE DATE: 05/31/13
PREPARED FOR: OXYGEN LIGHTING
CATALOG NUMBER: 2-5141-24

PAGE: 1 OF 5

LUMINAIRE: FABRICATED SEMI-SPECULAR METAL HOUSING, FABRICATED SEMI-SPECULAR METAL LAMP MOUNTING BRACKET, TRANSLUCENT WHITE CYLINDRICAL ACRYLIC DIFFUSER WITH FABRICATED SEMI-SPECULAR METAL END CAPS.

LAMP: ONE 21-WATT T-5 SYLVANIA FP21/841/ECO LINEAR FLUORESCENT.

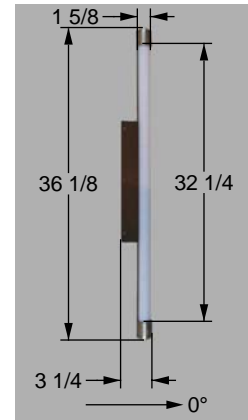
BALLAST: ANTRON ELECTRONICS ESD-A21T5
THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMP.

MOUNTING: WALL

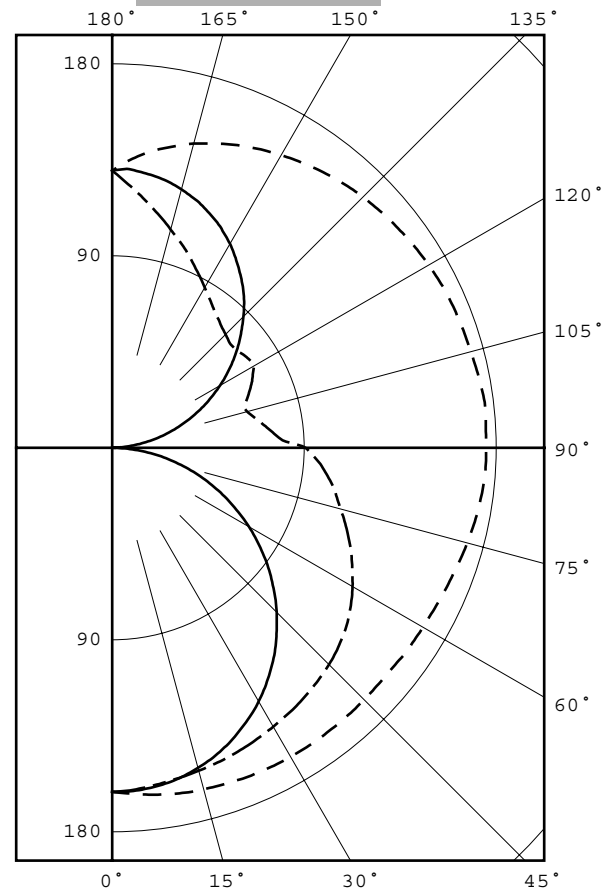
TOTAL INPUT WATTS = 23.2 AT 120.0 VOLTS

NOTE: ACRYLIC MATERIAL INFORMATION PROVIDED BY CLIENT.

REPORT IS BASED ON 1900 LUMENS PER LAMP. *



| CANDELA DISTRIBUTION | | | | | | FLUX |
|----------------------|-----|------|------|-------|-------|------|
| | 0.0 | 45.0 | 90.0 | 135.0 | 180.0 | |
| 0 | 161 | 161 | 161 | 161 | 161 | |
| 5 | 163 | 162 | 161 | 160 | 160 | 15 |
| 15 | 166 | 162 | 155 | 155 | 157 | 45 |
| 25 | 167 | 158 | 144 | 148 | 153 | 70 |
| 35 | 167 | 151 | 129 | 138 | 149 | 90 |
| 45 | 167 | 142 | 109 | 126 | 144 | 103 |
| 55 | 168 | 132 | 86 | 114 | 136 | 108 |
| 65 | 169 | 124 | 61 | 99 | 124 | 107 |
| 75 | 172 | 119 | 36 | 83 | 111 | 101 |
| 85 | 175 | 117 | 11 | 68 | 99 | 93 |
| 90 | 175 | 117 | 1 | 60 | 91 | |
| 95 | 176 | 117 | 7 | 48 | 76 | 84 |
| 105 | 174 | 120 | 27 | 45 | 66 | 83 |
| 115 | 173 | 125 | 48 | 53 | 72 | 86 |
| 125 | 170 | 131 | 68 | 58 | 76 | 85 |
| 135 | 166 | 136 | 87 | 69 | 75 | 80 |
| 145 | 161 | 140 | 103 | 82 | 82 | 70 |
| 155 | 155 | 142 | 117 | 96 | 93 | 55 |
| 165 | 148 | 141 | 125 | 110 | 106 | 36 |
| 175 | 137 | 135 | 130 | 124 | 121 | 12 |
| 180 | 130 | 130 | 130 | 130 | 130 | |



| ZONAL LUMEN SUMMARY | | | |
|---------------------|--------|-------|-------|
| ZONE | LUMENS | %LAMP | %FIXT |
| 0- 30 | 130 | 6.9 | 9.9 |
| 0- 40 | 221 | 11.6 | 16.7 |
| 0- 60 | 432 | 22.7 | 32.7 |
| 0- 90 | 733 | 38.6 | 55.4 |
| 90-120 | 253 | 13.3 | 19.1 |
| 90-130 | 338 | 17.8 | 25.5 |
| 90-150 | 487 | 25.6 | 36.8 |
| 90-180 | 590 | 31.1 | 44.6 |
| 0-180 | 1323 | 69.6 | 100.0 |

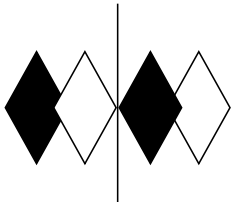
TOTAL LUMINAIRE EFFICIENCY = 69.6 % *

CIE TYPE - GENERAL DIFFUSE
PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.58 1.26 1.42
SHIELDING ANGLES : 90 90

LEGEND:
0-deg -----
90-deg =====
180-deg - - - - -

Checked B. HYRE
Approved R. BEATTIE
Lighting Engineer

* SEE ADDENDUM FOR FURTHER INFORMATION



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

INDEPENDENT TESTING LABORATORIES, INC.
 4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL77182

PAGE: 2 OF 5

ISSUE DATE: 05/31/13

PREPARED FOR: OXYGEN LIGHTING

CANDELA DISTRIBUTION
 LATERAL ANGLE

| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 | 112.5 | 135.0 | 157.5 | 180.0 |
|-------|-----|------|------|------|------|-------|-------|-------|-------|
| 0.0 | 161 | 161 | 161 | 161 | 161 | 161 | 161 | 161 | 161 |
| 5.0 | 163 | 163 | 162 | 161 | 161 | 160 | 160 | 160 | 160 |
| 10.0 | 165 | 164 | 162 | 160 | 159 | 158 | 158 | 159 | 158 |
| 15.0 | 166 | 165 | 162 | 158 | 155 | 154 | 155 | 157 | 157 |
| 20.0 | 166 | 165 | 160 | 154 | 151 | 150 | 151 | 154 | 155 |
| 25.0 | 167 | 165 | 158 | 150 | 144 | 144 | 148 | 152 | 153 |
| 30.0 | 167 | 164 | 154 | 144 | 137 | 137 | 143 | 149 | 151 |
| 35.0 | 167 | 163 | 151 | 137 | 129 | 130 | 138 | 146 | 149 |
| 40.0 | 167 | 162 | 147 | 130 | 119 | 122 | 132 | 142 | 146 |
| 45.0 | 167 | 160 | 142 | 121 | 109 | 113 | 126 | 139 | 144 |
| 50.0 | 167 | 159 | 137 | 113 | 98 | 103 | 120 | 135 | 140 |
| 55.0 | 168 | 158 | 132 | 103 | 86 | 94 | 114 | 130 | 136 |
| 60.0 | 168 | 157 | 128 | 94 | 74 | 84 | 107 | 124 | 130 |
| 65.0 | 169 | 157 | 124 | 85 | 61 | 74 | 99 | 117 | 124 |
| 70.0 | 171 | 157 | 121 | 76 | 49 | 65 | 91 | 110 | 118 |
| 75.0 | 172 | 158 | 119 | 68 | 36 | 56 | 83 | 103 | 111 |
| 80.0 | 174 | 159 | 118 | 63 | 23 | 47 | 75 | 97 | 105 |
| 85.0 | 175 | 160 | 117 | 59 | 11 | 38 | 68 | 90 | 99 |
| 90.0 | 175 | 160 | 117 | 58 | 1 | 30 | 60 | 82 | 91 |
| 95.0 | 176 | 160 | 117 | 60 | 7 | 21 | 48 | 69 | 76 |
| 100.0 | 175 | 160 | 119 | 63 | 17 | 22 | 44 | 63 | 70 |
| 105.0 | 174 | 159 | 120 | 68 | 27 | 26 | 45 | 59 | 66 |
| 110.0 | 173 | 159 | 122 | 74 | 38 | 32 | 50 | 62 | 67 |
| 115.0 | 173 | 160 | 125 | 81 | 48 | 38 | 53 | 67 | 72 |
| 120.0 | 171 | 159 | 128 | 89 | 58 | 45 | 55 | 70 | 77 |
| 125.0 | 170 | 159 | 131 | 96 | 68 | 54 | 58 | 69 | 76 |
| 130.0 | 168 | 159 | 134 | 103 | 78 | 62 | 63 | 70 | 74 |
| 135.0 | 166 | 158 | 136 | 110 | 87 | 71 | 69 | 73 | 75 |
| 140.0 | 164 | 157 | 139 | 116 | 96 | 79 | 75 | 77 | 78 |
| 145.0 | 161 | 156 | 140 | 121 | 103 | 88 | 82 | 82 | 82 |
| 150.0 | 158 | 154 | 142 | 126 | 110 | 96 | 89 | 87 | 87 |
| 155.0 | 155 | 152 | 142 | 130 | 117 | 103 | 96 | 94 | 93 |
| 160.0 | 152 | 149 | 142 | 132 | 122 | 110 | 103 | 100 | 99 |
| 165.0 | 148 | 146 | 141 | 133 | 125 | 116 | 110 | 107 | 106 |
| 170.0 | 143 | 142 | 138 | 133 | 128 | 122 | 117 | 114 | 113 |
| 175.0 | 137 | 136 | 135 | 132 | 130 | 126 | 124 | 122 | 121 |
| 180.0 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 |



INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL77182
ISSUE DATE: 05/31/13
PREPARED FOR: OXYGEN LIGHTING

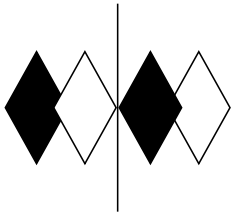
PAGE: 3 OF 5

5-DEGREE
ZONAL LUMEN SUMMARY

| | |
|---------|----|
| 0- 5 | 4 |
| 5- 10 | 11 |
| 10- 15 | 19 |
| 15- 20 | 26 |
| 20- 25 | 32 |
| 25- 30 | 38 |
| 30- 35 | 43 |
| 35- 40 | 47 |
| 40- 45 | 50 |
| 45- 50 | 53 |
| 50- 55 | 54 |
| 55- 60 | 54 |
| 60- 65 | 54 |
| 65- 70 | 53 |
| 70- 75 | 51 |
| 75- 80 | 50 |
| 80- 85 | 48 |
| 85- 90 | 45 |
| 90- 95 | 42 |
| 95-100 | 41 |
| 100-105 | 41 |
| 105-110 | 42 |
| 110-115 | 43 |
| 115-120 | 43 |
| 120-125 | 43 |
| 125-130 | 42 |
| 130-135 | 41 |
| 135-140 | 39 |
| 140-145 | 37 |
| 145-150 | 33 |
| 150-155 | 30 |
| 155-160 | 25 |
| 160-165 | 20 |
| 165-170 | 15 |
| 170-175 | 9 |
| 175-180 | 3 |

10-DEGREE
ZONAL LUMEN SUMMARY

| | |
|-------|------|
| 0- 10 | 15 |
| 0- 20 | 60 |
| 0- 30 | 130 |
| 0- 40 | 221 |
| 0- 50 | 324 |
| 0- 60 | 432 |
| 0- 70 | 539 |
| 0- 80 | 640 |
| 0- 90 | 733 |
| 0-100 | 817 |
| 0-110 | 900 |
| 0-120 | 986 |
| 0-130 | 1071 |
| 0-140 | 1150 |
| 0-150 | 1220 |
| 0-160 | 1275 |
| 0-170 | 1311 |
| 0-180 | 1323 |



REPORT NUMBER: ITL77182

PAGE: 4 OF 5

ISSUE DATE: 05/31/13

PREPARED FOR: OXYGEN LIGHTING

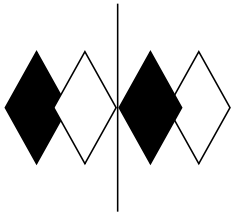
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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 | 76 | 76 | 76 | 76 | 70 | 70 | 70 | 70 | 60 | 60 | 60 | 51 | 51 | 51 | 43 | 43 | 43 | 39 |
| 1 | 67 | 63 | 59 | 56 | 62 | 58 | 55 | 52 | 49 | 47 | 45 | 41 | 40 | 38 | 34 | 33 | 31 | 28 |
| 2 | 60 | 53 | 48 | 44 | 55 | 49 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 30 | 29 | 27 | 25 | 22 |
| 3 | 54 | 46 | 40 | 36 | 50 | 43 | 38 | 33 | 36 | 32 | 29 | 30 | 27 | 24 | 25 | 22 | 20 | 17 |
| 4 | 49 | 41 | 34 | 30 | 45 | 38 | 32 | 28 | 32 | 27 | 24 | 27 | 23 | 20 | 22 | 19 | 17 | 14 |
| 5 | 45 | 36 | 30 | 25 | 41 | 33 | 28 | 23 | 28 | 24 | 20 | 24 | 20 | 17 | 19 | 17 | 14 | 12 |
| 6 | 41 | 32 | 26 | 21 | 38 | 30 | 24 | 20 | 25 | 21 | 17 | 21 | 18 | 15 | 17 | 15 | 12 | 10 |
| 7 | 38 | 29 | 23 | 19 | 35 | 27 | 21 | 17 | 23 | 18 | 15 | 19 | 16 | 13 | 16 | 13 | 11 | 9 |
| 8 | 35 | 26 | 20 | 16 | 33 | 24 | 19 | 15 | 21 | 16 | 13 | 18 | 14 | 11 | 15 | 12 | 10 | 8 |
| 9 | 33 | 24 | 18 | 14 | 30 | 22 | 17 | 14 | 19 | 15 | 12 | 16 | 13 | 10 | 13 | 11 | 9 | 7 |
| 10 | 31 | 22 | 16 | 13 | 28 | 20 | 15 | 12 | 17 | 13 | 11 | 15 | 12 | 9 | 12 | 10 | 8 | 6 |

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.

NOTE: THE ZONAL CAVITY CALCULATION TECHNIQUE IS ACCURATE WHEN LUMINAIRES WITH SYMMETRIC CANDELA DISTRIBUTIONS ARE EMPLOYED AND WHEN THE LUMINAIRES ARE LOCATED SYMMETRICALLY THROUGHOUT THE ROOM. THIS UNIT HAS SPECIAL CHARACTERISTICS AND THEREFORE THESE COEFFICIENTS SHOULD BE USED WITH CAUTION.



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL77182
ISSUE DATE: 05/31/13
PREPARED FOR: OXYGEN LIGHTING

PAGE: 5 OF 5

ADDENDUM

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

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 on the 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