



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: ITL78294

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ISSUE DATE: 08/24/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLS5-I2/D1-4-TWA-120-T5

LUMINAIRE: EXTRUDED 2-PIECE METAL HOUSING WITH WHITE PAINTED GENERAL INTERIOR FINISH, FABRICATED WHITE PAINTED METAL END CAPS AND 2 DISTINCT OPTICAL COMPARTMENTS, TOP OPTICAL COMPARTMENT CONSISTS OF: FORMED WHITE PAINTED METAL REFLECTOR, FORMED SPECULAR METAL SOCKET MOUNTING BRACKETS. BOTTOM OPTICAL COMPARTMENT CONSISTS OF: FORMED WHITE PAINTED METAL REFLECTOR AND SOCKET MOUNTING BRACKETS, EXTRUDED TRANSLUCENT WHITE FROSTED ACRYLIC DIFFUSER. DIFFUSER FROSTED BOTH SIDES. OPEN TOP.

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

BALLAST: UNIVERSAL B228PUNV-C, UNIVERSAL B228PUNV-N

THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.

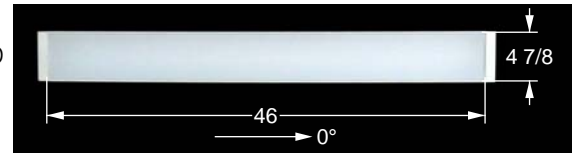
TOTAL REFLECTANCE OF PAINT = 89.9 %

MOUNTING: SUSPENDED/WALL

TOTAL INPUT WATTS = 95.0 AT 120.0 VOLTS

NOTE: DIFFUSER MATERIAL INFORMATION PROVIDED BY CLIENT.

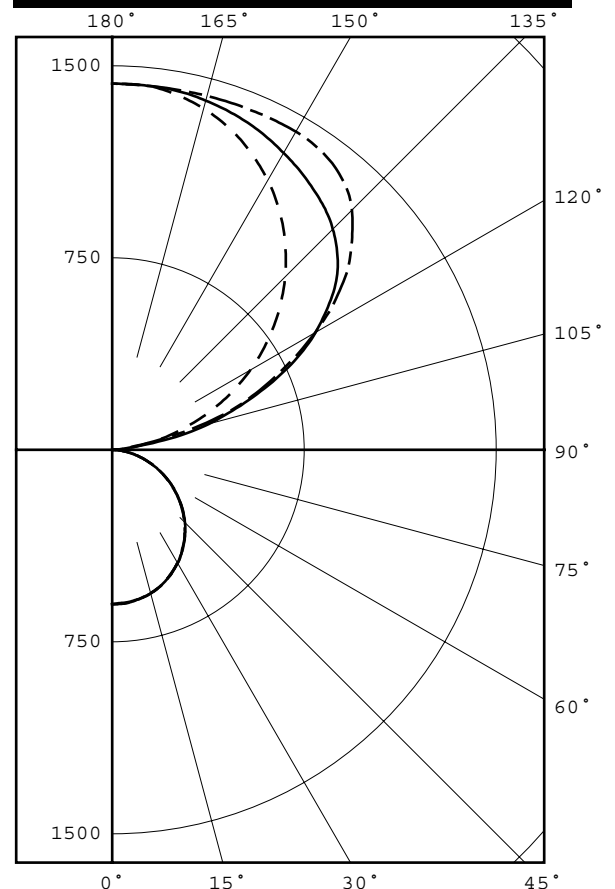
REPORT IS BASED ON 2600 LUMENS PER LAMP. *



CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	603	603	603	603	603
5	602	597	601	601	599
15	580	576	581	581	580
25	537	535	539	540	539
35	476	474	478	479	478
45	399	398	402	401	399
55	311	310	311	310	309
65	215	214	214	213	213
75	117	118	117	117	117
85	31	33	33	32	33
90	0	0	0	0	0
95	39	56	39	46	47
105	252	406	392	358	334
115	501	710	756	740	727
125	740	891	1049	1088	1085
135	955	1047	1219	1310	1324
145	1139	1191	1306	1399	1424
155	1281	1304	1370	1419	1435
165	1380	1382	1412	1430	1431
175	1429	1421	1429	1430	1428
180	1430	1430	1430	1430	1430

FLUX



LEGEND:
 0-deg - - - - -
 45-deg = = = = =
 90-deg - - - - -

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LAMP	%FIXT
0- 30	468	6.0	7.1
0- 40	767	9.8	11.6
0- 60	1353	17.3	20.4
0- 90	1725	22.1	26.1
90-120	1136	14.6	17.2
90-130	2013	25.8	30.4
90-150	3732	47.8	56.4
90-180	4895	62.8	73.9
0-180	6620	84.9	100.0

TOTAL LUMINAIRE EFFICIENCY = 84.9 % *

CIE TYPE - SEMI-INDIRECT
 PLANE : 0-DEG 90-DEG
 SHIELDING ANGLES : 90 90

Checked S. BERGIN
 Approved R. BEATTIE
 Lighting Engineer

* SEE ADDENDUM FOR FURTHER INFORMATION

THIS REPORT IS BASED ON PUBLISHED INDUSTRY PROCEDURES. FIELD PERFORMANCE MAY DIFFER FROM LABORATORY PERFORMANCE.



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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 46.000 4.875

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	3900.	3930.	3900.
55	3748.	3748.	3724.
65	3516.	3500.	3484.
75	3125.	3125.	3125.
85	2458.	2617.	2617.



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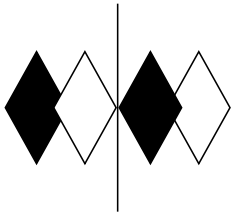
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CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	603	603	603	603	603
5.0	602	597	601	601	599
10.0	593	589	593	594	592
15.0	580	576	581	581	580
20.0	561	558	563	563	562
25.0	537	535	539	540	539
30.0	509	506	511	512	511
35.0	476	474	478	479	478
40.0	440	438	442	442	441
45.0	399	398	402	401	399
50.0	357	355	358	356	355
55.0	311	310	311	310	309
60.0	264	262	263	262	262
65.0	215	214	214	213	213
70.0	165	165	165	165	164
75.0	117	118	117	117	117
80.0	71	73	73	72	72
85.0	31	33	33	32	33
90.0	0	0	0	0	0
95.0	39	56	39	46	47
100.0	135	225	183	126	110
105.0	252	406	392	358	334
110.0	375	572	567	560	551
115.0	501	710	756	740	727
120.0	623	810	918	922	915
125.0	740	891	1049	1088	1085
130.0	851	970	1150	1209	1218
135.0	955	1047	1219	1310	1324
140.0	1051	1122	1268	1366	1391
145.0	1139	1191	1306	1399	1424
150.0	1216	1252	1339	1412	1435
155.0	1281	1304	1370	1419	1435
160.0	1337	1348	1394	1426	1433
165.0	1380	1382	1412	1430	1431
170.0	1411	1407	1425	1431	1429
175.0	1429	1421	1429	1430	1428
180.0	1430	1430	1430	1430	1430



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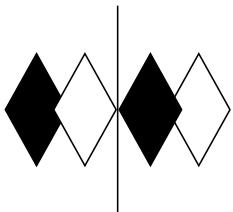
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5-DEGREE
 ZONAL LUMEN SUMMARY

0- 5	14
5- 10	43
10- 15	70
15- 20	94
20- 25	115
25- 30	133
30- 35	145
35- 40	153
40- 45	156
45- 50	153
50- 55	145
55- 60	132
60- 65	116
65- 70	96
70- 75	74
75- 80	51
80- 85	28
85- 90	8
90- 95	11
95-100	53
100-105	140
105-110	236
110-115	315
115-120	379
120-125	426
125-130	452
130-135	459
135-140	449
140-145	424
145-150	387
150-155	341
155-160	289
160-165	230
165-170	168
170-175	102
175-180	34

10-DEGREE
 ZONAL LUMEN SUMMARY

0- 10	57
0- 20	221
0- 30	468
0- 40	767
0- 50	1075
0- 60	1353
0- 70	1564
0- 80	1688
0- 90	1725
0-100	1789
0-110	2166
0-120	2860
0-130	3738
0-140	4646
0-150	5456
0-160	6086
0-170	6484
0-180	6620



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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	86	86	86	86	77	77	77	77	59	59	59	44	44	44	29	29	29	22	
1	78	75	72	69	70	67	64	62	52	50	48	38	37	36	25	25	24	18	
2	71	65	60	56	63	58	54	50	45	42	40	33	31	30	22	21	20	15	
3	65	57	51	46	58	51	46	42	40	36	33	29	27	25	20	18	17	13	
4	59	50	44	39	53	45	40	35	35	31	28	26	23	21	17	16	15	11	
5	54	45	38	33	48	40	34	30	31	27	24	23	21	18	16	14	13	9	
6	50	40	33	29	44	36	30	26	28	24	21	21	18	16	14	12	11	8	
7	46	36	29	25	41	32	27	23	25	21	18	19	16	14	13	11	10	7	
8	43	32	26	22	38	29	24	20	23	19	16	17	14	12	12	10	9	7	
9	39	29	23	19	35	27	21	18	21	17	14	16	13	11	11	9	8	6	
10	37	27	21	17	33	24	19	16	19	15	13	15	12	10	10	8	7	5	

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

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