

itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL70220

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ISSUE DATE: 11/21/11

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: LTP-01-X-4-X-OP/MPL-X-120-T5

LUMINAIRE: EXTRUDED SEMI-DIFFUSE METAL HOUSING WITH FABRICATED SEMI-DIFFUSE METAL END CAPS, ONE FORMED METAL FRONT AND REAR REFLECTOR WITH PREMIUM SPECULAR FINISH, ONE SEMI-SPECULAR REAR METAL REFLECTOR INSERT BEHIND LAMP WITH PREMIUM SPECULAR FINISHED TOP AND FORWARD SIDE, CLEAR FLAT MICRO-PRISMATIC PLASTIC LENS. LENS PRISMS DOWN. OPEN TOP.

LAMP: ONE 28-WATT T-5 SYLVANIA FP28/841/ECO LINEAR FLUORESCENT.

BALLAST: UNIVERSAL B228PUNV-C

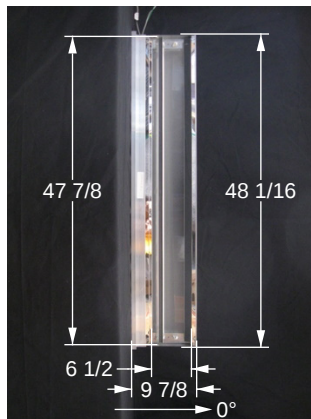
MOUNTING: WALL

THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMP.

TOTAL INPUT WATTS = 31.6 AT 120.0 VOLTS

LUMEN TO CANDELA RATIO USED = 9.17

REPORT IS BASED ON 2600 LUMENS PER LAMP. *



CANDELA DISTRIBUTION

FLUX

	0.0	45.0	90.0	135.0	180.0	
0	516	516	516	516	516	
5	515	518	517	509	501	49
15	568	540	500	465	457	143
25	574	551	454	416	385	218
35	573	498	384	283	212	247
45	369	360	245	157	143	198
55	158	135	112	72	64	100
65	78	73	53	46	38	59
75	49	45	34	27	23	38
85	21	22	16	9	8	16
90	0	0	0	0	0	
95	23	91	9	1	0	48
105	364	266	44	30	6	143
115	401	347	92	29	41	175
125	558	411	144	37	41	203
135	562	437	181	53	52	189
145	533	428	193	85	93	159
155	480	393	206	106	113	115
165	407	341	209	133	123	67
175	213	199	166	139	128	18
180	161	161	161	161	161	

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LAMP	%FIXT
0- 30	409	15.7	18.7
0- 40	656	25.2	30.0
0- 60	953	36.7	43.6
0- 90	1066	41.0	48.8
90-120	366	14.1	16.8
90-130	570	21.9	26.1
90-150	918	35.3	42.0
90-180	1118	43.0	51.2
0-180	2185	84.0	100.0

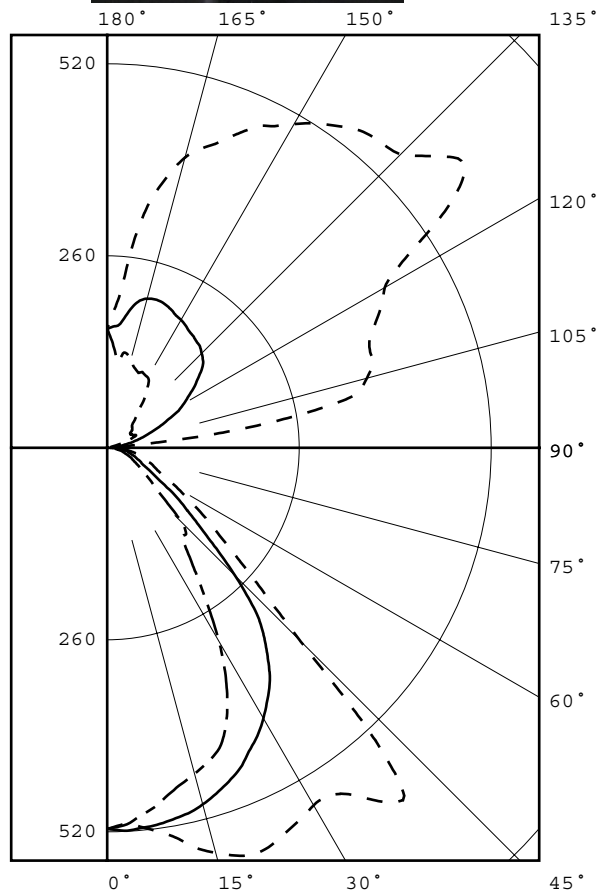
TOTAL LUMINAIRE EFFICIENCY = 84.0 % *

CIE TYPE - DIRECT-INDIRECT

PLANE : 0-DEG 90-DEG 180-DEG

SPACING CRITERIA : 1.73 1.22 1.00

SHIELDING ANGLES : 90 90



LEGEND:

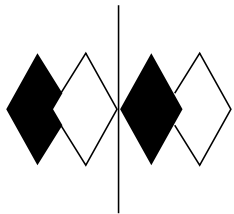
0-deg: - - - - -
90-deg: _____
180-deg: - - - - -

Checked B. HYRE

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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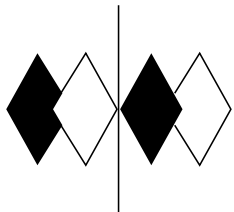
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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 5.563 44.375

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	3277.	2176.	1270.
55	1730.	1226.	701.
65	1159.	788.	565.
75	1189.	825.	558.
85	1513.	1153.	576.



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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	516	516	516	516	516	516	516	516	516
5.0	515	515	518	516	517	515	509	506	501
10.0	536	534	526	514	511	504	491	481	477
15.0	568	561	540	511	500	484	465	459	457
20.0	585	578	553	508	481	456	441	442	437
25.0	574	572	551	500	454	422	416	401	385
30.0	559	552	529	489	423	388	362	324	303
35.0	573	551	498	462	384	344	283	228	212
40.0	623	593	503	407	329	264	190	165	158
45.0	369	371	360	329	245	170	157	144	143
50.0	227	238	215	193	160	120	106	98	88
55.0	158	149	135	132	112	88	72	65	64
60.0	111	101	94	92	73	63	56	48	49
65.0	78	76	73	69	53	53	46	40	38
70.0	64	57	55	54	43	42	34	30	30
75.0	49	45	45	43	34	34	27	24	23
80.0	37	37	34	30	29	24	20	17	15
85.0	21	24	22	19	16	12	9	8	8
90.0	0	0	0	0	0	0	0	0	0
95.0	23	67	91	101	9	2	1	0	0
100.0	276	305	237	131	24	19	2	2	2
105.0	364	349	266	194	44	18	30	10	6
110.0	379	363	289	224	66	29	31	38	32
115.0	401	387	347	247	92	42	29	37	41
120.0	434	424	439	268	120	58	33	34	37
125.0	558	567	411	286	144	66	37	37	41
130.0	612	553	428	301	168	73	40	41	44
135.0	562	529	437	306	181	85	53	49	52
140.0	553	526	437	309	188	99	73	66	67
145.0	533	509	428	307	193	111	85	91	93
150.0	506	483	414	302	200	124	92	104	110
155.0	480	457	393	296	206	136	106	107	113
160.0	440	424	371	289	211	148	120	113	113
165.0	407	390	341	275	209	159	133	125	123
170.0	341	328	293	244	193	158	139	131	131
175.0	213	209	199	184	166	151	139	130	128
180.0	161	161	161	161	161	161	161	161	161



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5-DEGREE

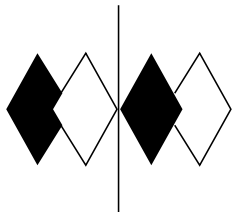
ZONAL LUMEN SUMMARY

0- 5	12.
5- 10	37.
10- 15	60.
15- 20	83.
20- 25	102.
25- 30	116.
30- 35	122.
35- 40	124.
40- 45	116.
45- 50	82.
50- 55	58.
55- 60	42.
60- 65	33.
65- 70	26.
70- 75	21.
75- 80	17.
80- 85	12.
85- 90	5.
90- 95	7.
95-100	40.
100-105	65.
105-110	78.
110-115	83.
115-120	92.
120-125	100.
125-130	103.
130-135	98.
135-140	92.
140-145	84.
145-150	75.
150-155	64.
155-160	52.
160-165	40.
165-170	27.
170-175	14.
175-180	4.

10-DEGREE

ZONAL LUMEN SUMMARY

0- 10	49.
0- 20	191.
0- 30	409.
0- 40	656.
0- 50	854.
0- 60	953.
0- 70	1012.
0- 80	1050.
0- 90	1066.
0-100	1114.
0-110	1257.
0-120	1432.
0-130	1636.
0-140	1825.
0-150	1985.
0-160	2100.
0-170	2167.
0-180	2185.



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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	90	90	90	90	83	83	83	83	69	69	69	57	57	57	46	46	46	41
1	83	79	76	73	76	73	71	68	62	60	58	51	50	49	42	41	40	36
2	76	70	65	61	70	65	61	57	55	52	50	46	44	42	38	36	35	31
3	70	62	57	52	64	58	53	49	49	46	43	41	39	37	34	32	31	27
4	64	56	49	45	59	52	46	42	44	40	37	37	34	32	31	29	27	24
5	59	50	44	39	55	47	41	37	40	36	32	34	31	28	28	26	24	22
6	55	45	39	34	50	42	36	32	36	32	29	31	28	25	26	24	22	19
7	51	41	35	30	47	38	33	29	33	29	26	28	25	23	24	21	20	17
8	47	37	31	27	44	35	29	26	30	26	23	26	23	20	22	20	18	16
9	44	34	28	24	41	32	27	23	28	24	21	24	21	18	21	18	16	14
10	41	31	26	22	38	30	24	21	26	22	19	22	19	17	19	17	15	13

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.



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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 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