



# 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: ITL78293

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ISSUE DATE: 08/27/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLS5-I1/D2-4-PB-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, FABRICATED SEMI-DIFFUSE METAL PARABOLIC 31-CELL LOUVER. 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 = 89.2 %

MOUNTING: SUSPENDED

TOTAL INPUT WATTS = 90.6 AT 120.0 VOLTS

REPORT IS BASED ON 2600 LUMENS PER LAMP. \*

### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	FLUX
0	1311	1311	1311	1311	1311	
5	1308	1298	1310	1315	1312	125
15	1241	1247	1289	1331	1345	365
25	1136	1162	1261	1366	1413	584
35	999	1057	1194	1302	1362	738
45	816	906	1008	1085	1154	768
55	563	650	729	876	1006	663
65	169	199	285	326	346	282
75	21	24	31	46	50	44
85	2	3	4	5	6	6
90	0	0	0	0	0	
95	16	26	28	30	31	34
105	105	228	206	160	144	191
115	217	328	423	439	436	369
125	325	399	511	577	593	434
135	424	468	552	616	638	419
145	508	531	588	631	646	365
155	574	583	614	639	647	282
165	618	618	632	640	642	178
175	641	636	641	640	639	61
180	642	642	642	642	642	

### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LAMP	%FIXT
0- 30	1074	13.8	18.2
0- 40	1812	23.2	30.7
0- 60	3243	41.6	54.9
0- 90	3575	45.8	60.5
90-120	594	7.6	10.1
90-130	1028	13.2	17.4
90-150	1811	23.2	30.7
90-180	2333	29.9	39.5
0-180	5908	75.7	100.0

TOTAL LUMINAIRE EFFICIENCY = 75.7 % \*

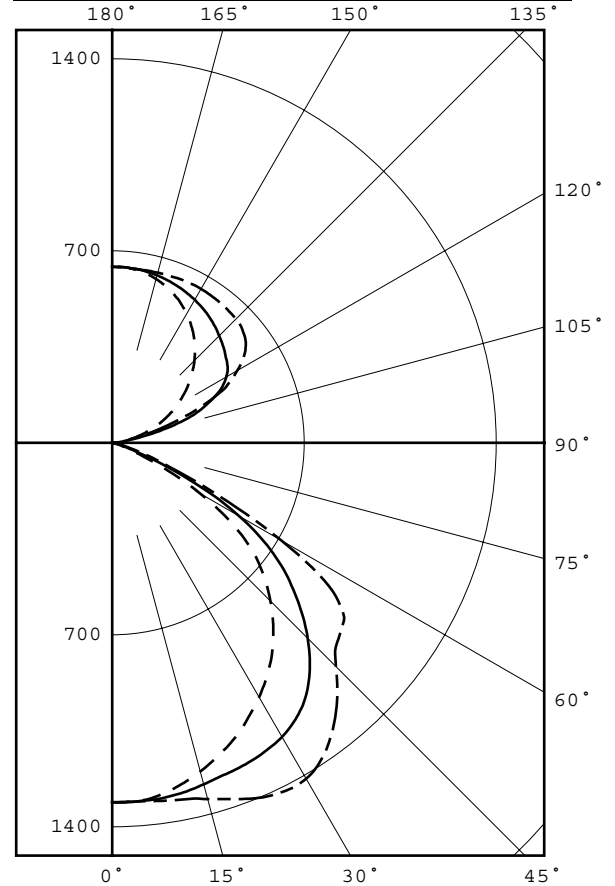
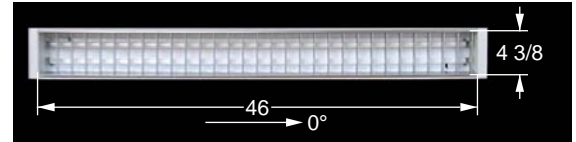
CIE TYPE - SEMI-DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.22 1.54

SHIELDING ANGLES : 27 22

\* SEE ADDENDUM FOR FURTHER INFORMATION



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

Checked B. HYRE  
 Approved R. BEATTIE  
 Lighting Engineer



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PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH : 46.000 4.375

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	8888.	10979.	12569.
55	7560.	9789.	13508.
65	3080.	5194.	6306.
75	625.	922.	1488.
85	177.	353.	530.



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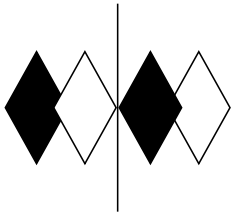
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CANDELA DISTRIBUTION  
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1311	1311	1311	1311	1311
5.0	1308	1298	1310	1315	1312
10.0	1281	1279	1304	1322	1323
15.0	1241	1247	1289	1331	1345
20.0	1192	1208	1275	1351	1382
25.0	1136	1162	1261	1366	1413
30.0	1071	1111	1238	1355	1414
35.0	999	1057	1194	1302	1362
40.0	914	990	1117	1205	1271
45.0	816	906	1008	1085	1154
50.0	706	798	877	969	1084
55.0	563	650	729	876	1006
60.0	373	439	536	647	712
65.0	169	199	285	326	346
70.0	54	65	90	129	143
75.0	21	24	31	46	50
80.0	8	10	12	16	19
85.0	2	3	4	5	6
90.0	0	0	0	0	0
95.0	16	26	28	30	31
100.0	54	132	75	59	58
105.0	105	228	206	160	144
110.0	160	291	335	306	286
115.0	217	328	423	439	436
120.0	273	363	480	521	527
125.0	325	399	511	577	593
130.0	376	434	532	605	625
135.0	424	468	552	616	638
140.0	467	500	571	625	643
145.0	508	531	588	631	646
150.0	543	559	602	637	648
155.0	574	583	614	639	647
160.0	599	602	624	639	644
165.0	618	618	632	640	642
170.0	632	629	638	640	640
175.0	641	636	641	640	639
180.0	642	642	642	642	642



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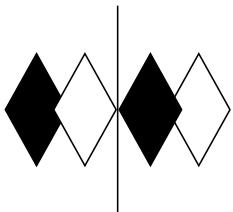
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5-DEGREE  
 ZONAL LUMEN SUMMARY

0- 5	31
5- 10	93
10- 15	154
15- 20	212
20- 25	267
25- 30	317
30- 35	357
35- 40	382
40- 45	389
45- 50	380
50- 55	359
55- 60	304
60- 65	195
65- 70	87
70- 75	32
75- 80	12
80- 85	4
85- 90	1
90- 95	7
95-100	28
100-105	68
105-110	123
110-115	170
115-120	200
120-125	215
125-130	219
130-135	214
135-140	205
140-145	191
145-150	174
150-155	153
155-160	129
160-165	103
165-170	75
170-175	46
175-180	15

10-DEGREE  
 ZONAL LUMEN SUMMARY

0- 10	125
0- 20	490
0- 30	1074
0- 40	1812
0- 50	2581
0- 60	3243
0- 70	3526
0- 80	3569
0- 90	3575
0-100	3609
0-110	3800
0-120	4169
0-130	4603
0-140	5022
0-150	5386
0-160	5669
0-170	5847
0-180	5908



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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	83	83	83	83	78	78	78	78	68	68	68	58	58	58	50	50	50	46
1	77	74	71	68	72	69	67	65	60	59	57	53	51	50	45	44	44	40
2	70	65	61	57	66	61	57	54	54	51	48	47	45	43	40	39	38	35
3	64	57	52	48	60	54	49	45	48	44	41	42	39	37	36	34	32	30
4	59	51	45	41	55	48	43	39	42	38	35	37	34	31	32	30	28	26
5	54	45	39	35	50	43	37	33	38	34	30	33	30	27	29	27	24	22
6	50	41	35	30	47	38	33	29	34	30	26	30	27	24	26	24	21	19
7	46	37	31	27	43	35	29	25	31	27	23	27	24	21	24	21	19	17
8	43	33	28	23	40	32	26	23	28	24	21	25	21	19	22	19	17	15
9	40	30	25	21	37	29	24	20	26	22	18	23	19	17	20	17	15	14
10	37	28	22	19	35	26	21	18	24	20	17	21	18	15	19	16	14	12

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 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