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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: ITL78290

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ISSUE DATE: 08/21/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLS5-I1/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: TWO 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 = 63.6 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	FLUX
0	622	622	622	622	622	
5	621	616	619	620	618	59
15	598	595	599	600	598	169
25	553	551	556	557	555	256
35	491	489	494	494	493	308
45	412	411	413	413	412	318
55	321	320	321	319	318	286
65	221	220	220	219	219	218
75	119	120	120	119	120	127
85	33	34	34	34	34	38
90	0	0	0	0	0	
95	17	27	30	32	32	37
105	112	241	224	174	155	205
115	233	348	447	466	468	393
125	347	425	541	611	627	460
135	451	498	586	653	676	445
145	540	565	626	671	685	388
155	611	620	653	678	687	300
165	657	657	671	679	681	189
175	680	676	680	680	679	65
180	681	681	681	681	681	

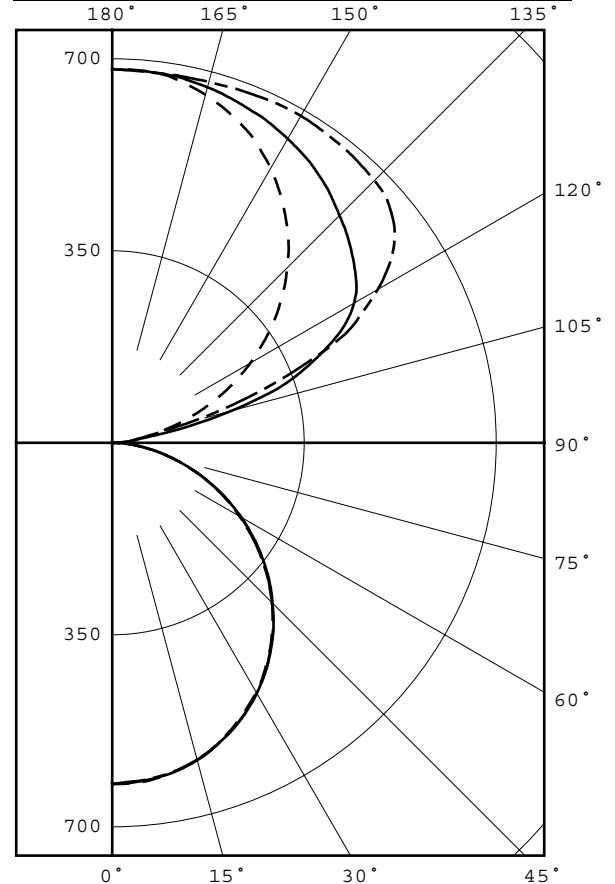
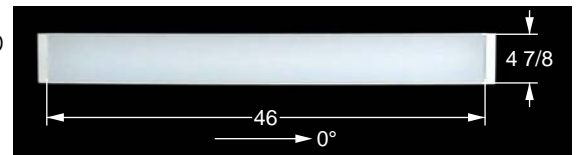
ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LAMP	%FIXT
0- 30	483	9.3	11.3
0- 40	791	15.2	18.6
0- 60	1395	26.8	32.8
0- 90	1777	34.2	41.7
90-120	635	12.2	14.9
90-130	1095	21.1	25.7
90-150	1927	37.1	45.3
90-180	2481	47.7	58.3
0-180	4258	81.9	100.0

TOTAL LUMINAIRE EFFICIENCY = 81.9 % *

CIE TYPE - GENERAL DIFFUSE
PLANE : 0-DEG 90-DEG
SPACING CRITERIA : 1.25 1.26
SHIELDING ANGLES : 90 90

* SEE ADDENDUM FOR FURTHER INFORMATION



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

Checked M KLOPF
Approved R BEATTIE
Lighting Engineer



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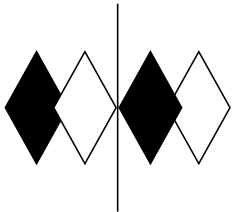
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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 46.000 4.875

LUMINANCE DATA IN CANDELA/SQ M			
ANGLE	AVERAGE	AVERAGE	AVERAGE
IN DEG	0-DEG	45-DEG	90-DEG
45	4027.	4037.	4027.
55	3868.	3868.	3832.
65	3614.	3598.	3582.
75	3178.	3205.	3205.
85	2617.	2696.	2696.



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CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	622	622	622	622	622
5.0	621	616	619	620	618
10.0	612	608	612	613	611
15.0	598	595	599	600	598
20.0	578	576	579	580	579
25.0	553	551	556	557	555
30.0	525	523	527	528	527
35.0	491	489	494	494	493
40.0	453	452	456	456	455
45.0	412	411	413	413	412
50.0	368	366	369	367	366
55.0	321	320	321	319	318
60.0	272	271	271	270	268
65.0	221	220	220	219	219
70.0	170	169	169	168	169
75.0	119	120	120	119	120
80.0	73	74	74	74	75
85.0	33	34	34	34	34
90.0	0	0	0	0	0
95.0	17	27	30	32	32
100.0	58	142	84	63	61
105.0	112	241	224	174	155
110.0	172	309	357	330	309
115.0	233	348	447	466	468
120.0	291	386	509	552	559
125.0	347	425	541	611	627
130.0	401	462	565	640	662
135.0	451	498	586	653	676
140.0	498	533	608	663	682
145.0	540	565	626	671	685
150.0	578	595	640	676	688
155.0	611	620	653	678	687
160.0	636	641	662	679	684
165.0	657	657	671	679	681
170.0	673	669	678	680	680
175.0	680	676	680	680	679
180.0	681	681	681	681	681



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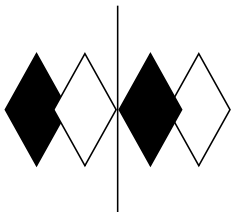
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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	15
5- 10	44
10- 15	72
15- 20	97
20- 25	119
25- 30	137
30- 35	150
35- 40	158
40- 45	160
45- 50	158
50- 55	149
55- 60	136
60- 65	119
65- 70	98
70- 75	75
75- 80	52
80- 85	29
85- 90	9
90- 95	7
95-100	30
100-105	73
105-110	132
110-115	181
115-120	212
120-125	228
125-130	232
130-135	227
135-140	217
140-145	203
145-150	185
150-155	163
155-160	137
160-165	110
165-170	80
170-175	48
175-180	16

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	59
0- 20	227
0- 30	483
0- 40	791
0- 50	1109
0- 60	1395
0- 70	1612
0- 80	1739
0- 90	1777
0-100	1814
0-110	2019
0-120	2412
0-130	2872
0-140	3316
0-150	3704
0-160	4004
0-170	4194
0-180	4258



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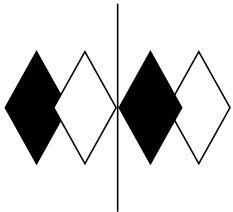
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	79	79	79	79	64	64	64	52	52	52	40	40	40	34	
1	78	75	72	69	71	68	66	63	56	54	53	45	44	43	35	34	33	28	
2	71	65	60	56	65	60	55	52	49	46	43	39	37	35	31	29	28	24	
3	65	57	51	46	59	52	47	43	43	39	36	35	32	30	27	25	24	20	
4	59	51	44	39	54	46	41	36	38	34	31	31	28	25	24	22	20	17	
5	54	45	38	33	49	41	35	31	34	30	26	28	24	22	22	19	17	15	
6	50	40	34	29	45	37	31	27	31	26	23	25	22	19	20	17	15	13	
7	46	36	30	25	42	33	28	23	28	23	20	23	19	17	18	15	14	11	
8	43	33	26	22	39	30	25	21	25	21	18	21	17	15	16	14	12	10	
9	40	30	24	20	36	28	22	18	23	19	16	19	16	13	15	13	11	9	
10	37	27	21	18	34	25	20	16	21	17	14	17	14	12	14	12	10	8	

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