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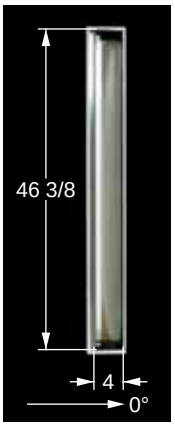
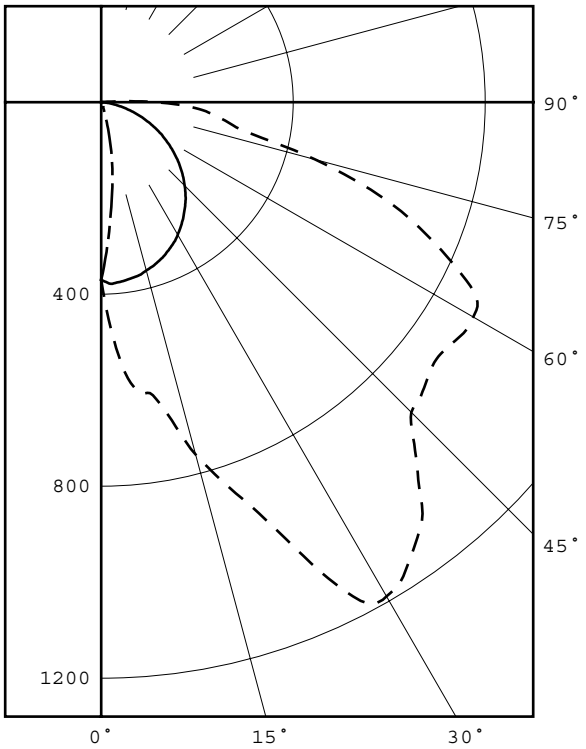
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL79784
ISSUE DATE: 11/22/13
PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING
CATALOG NUMBER: MLS5-WW-1-4-120-T5
LUMINAIRE: EXTRUDED 3-PIECE METAL HOUSING WITH FABRICATED METAL END CAPS, EXTRUDED SPECULAR METAL REFLECTOR INSERT WITH FABRICATED BLACK PAINTED METAL END CAPS AND FABRICATED BLACK PAINTED RIBBED METAL FORWARD BAFFLE. OPEN BOTTOM.
LAMP: ONE 28-WATT T-5 SYLVANIA FP28/841/ECO LINEAR FLUORESCENT.
BALLAST: UNIVERSAL B228PUNV-C
TOTAL INPUT WATTS = 31.4 AT 120.0 VOLTS
MOUNTING: RECESSED
THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMP.
REPORT IS BASED ON 2600 LUMENS PER LAMP. *



CANDELA DISTRIBUTION					FLUX
	0.0	45.0	90.0	135.0 180.0	
0	370	370	370	370 370	
5	564	513	377	267 231	37
15	760	617	363	117 50	109
25	1078	794	337	16 10	197
35	1135	1001	297	10 7	286
45	914	929	246	7 5	311
55	885	700	186	5 4	316
65	817	631	121	4 4	296
75	462	452	57	3 2	197
85	219	151	8	0 0	79
90	113	71	0	0 0	
95	4	0	0	0 0	7
105	0	0	0	0 0	0
115	0	0	0	0 0	0
125	0	0	0	0 0	0
135	0	0	0	0 0	0
145	0	0	0	0 0	0
155	0	0	0	0 0	0
165	0	0	0	0 0	0
175	0	0	0	0 0	0
180	0	0	0	0	



LEGEND:
0-deg
90-deg
180-deg

ZONAL LUMEN SUMMARY			
ZONE	LUMENS	%LAMP	%FIXT
0- 30	343	13.2	18.7
0- 40	629	24.2	34.3
0- 60	1256	48.3	68.5
0- 90	1827	70.3	99.6
90-120	7	0.3	0.4
90-130	7	0.3	0.4
90-150	7	0.3	0.4
90-180	7	0.3	0.4
0-180	1834	70.5	100.0

TOTAL LUMINAIRE EFFICIENCY = 70.5 % *

CIE TYPE - DIRECT

PLANE	: 0-DEG	90-DEG	180-DEG
SPACING CRITERIA	: 2.71	1.27	0.24
SHIELDING ANGLES	: 15	2	

* SEE ADDENDUM FOR FURTHER INFORMATION

Checked *S BERGIN*
Approved *R BEATTIE*
Lighting Engineer

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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 4.000 46.375

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	10801.	2907.	59.
55	12893.	2710.	58.
65	16153.	2392.	79.
75	14915.	1840.	65.
85	20996.	767.	0.

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CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	370	370	370	370	370	370	370	370	370
5.0	564	555	513	455	377	310	267	243	231
10.0	620	614	601	525	372	250	185	147	131
15.0	760	724	617	568	363	204	117	68	50
20.0	888	844	716	569	352	160	57	14	13
25.0	1078	992	794	560	337	119	16	11	10
30.0	1189	1153	878	587	319	80	12	9	8
35.0	1135	1132	1001	618	297	45	10	7	7
40.0	1028	1047	1010	626	273	18	8	6	6
45.0	914	915	929	623	246	12	7	5	5
50.0	889	855	813	642	217	10	6	5	5
55.0	885	826	700	635	186	8	5	4	4
60.0	895	832	655	549	154	6	4	4	4
65.0	817	795	631	450	121	5	4	4	4
70.0	665	650	591	347	88	4	3	3	3
75.0	462	466	452	293	57	3	3	2	2
80.0	279	264	259	231	29	3	2	1	1
85.0	219	203	151	91	8	1	0	0	0
90.0	113	104	71	29	0	0	0	0	0
95.0	4	2	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
110.0	0	0	0	0	0	0	0	0	0
115.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
125.0	0	0	0	0	0	0	0	0	0
130.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
140.0	0	0	0	0	0	0	0	0	0
145.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
155.0	0	0	0	0	0	0	0	0	0
160.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
170.0	0	0	0	0	0	0	0	0	0
175.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	9
5- 10	28
10- 15	45
15- 20	64
20- 25	85
25- 30	111
30- 35	135
35- 40	151
40- 45	155
45- 50	156
50- 55	158
55- 60	158
60- 65	155
65- 70	141
70- 75	116
75- 80	81
80- 85	50
85- 90	29
90- 95	7
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	37
0- 20	146
0- 30	343
0- 40	629
0- 50	940
0- 60	1256
0- 70	1551
0- 80	1748
0- 90	1827
0-100	1834
0-110	1834
0-120	1834
0-130	1834
0-140	1834
0-150	1834
0-160	1834
0-170	1834
0-180	1834

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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	84	84	84	84	82	82	82	82	78	78	78	75	75	75	72	72	72	70
1	75	71	67	64	73	69	66	63	66	63	61	63	61	59	61	59	57	56
2	67	61	55	50	65	59	54	50	56	52	48	54	50	47	52	49	46	44
3	61	52	46	40	59	51	45	40	49	44	39	47	42	38	45	41	38	36
4	55	46	39	33	53	45	38	33	43	37	33	41	36	32	39	35	31	30
5	50	40	33	28	49	39	33	28	38	32	27	36	31	27	35	30	27	25
6	46	36	29	24	45	35	29	24	34	28	24	32	27	23	31	27	23	21
7	42	32	25	21	41	32	25	21	30	25	20	29	24	20	28	24	20	19
8	39	29	23	18	38	29	22	18	28	22	18	27	22	18	26	21	18	16
9	37	27	20	16	36	26	20	16	25	20	16	24	19	16	24	19	16	14
10	34	24	18	14	33	24	18	14	23	18	14	22	18	14	22	17	14	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 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