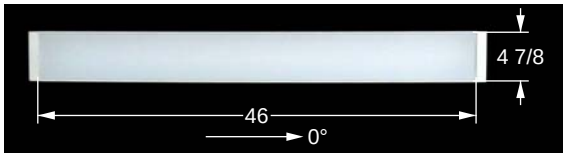
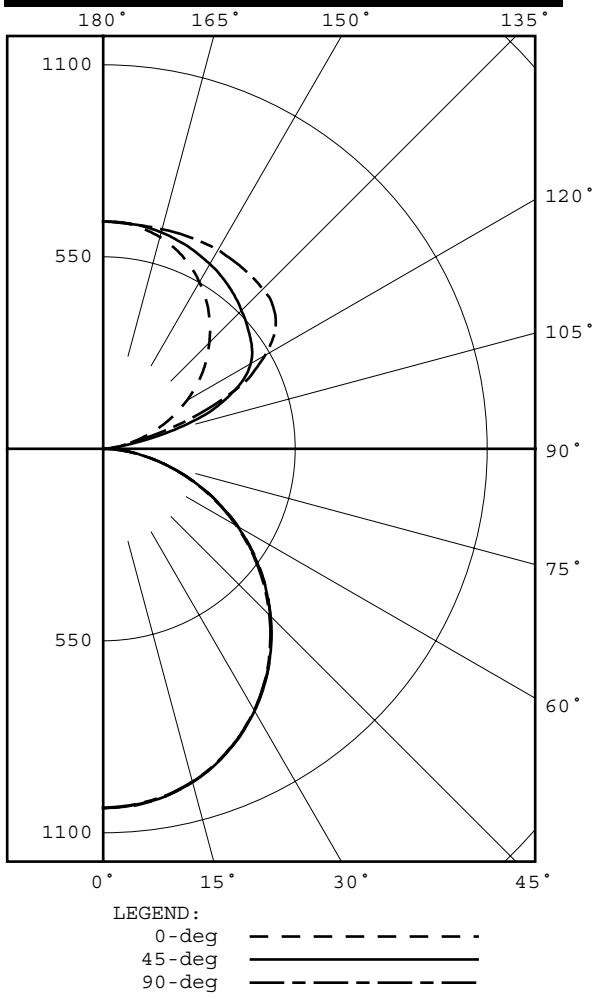
itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL78292
ISSUE DATE: 08/27/13
PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING
CATALOG NUMBER: MLS5-I1/D2-4-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 = 89.2 %
MOUNTING: SUSPENDED
TOTAL INPUT WATTS = 88.5 AT 120.0 VOLTS
NOTE: DIFFUSER MATERIAL INFORMATION PROVIDED BY CLIENT.
REPORT IS BASED ON 2600 LUMENS PER LAMP. *



CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1029	1029	1029	1029	1029	
5	1026	1019	1024	1026	1023	97
15	988	983	989	989	987	279
25	914	909	916	916	914	421
35	810	806	811	810	808	506
45	677	676	678	675	673	521
55	528	526	525	523	521	469
65	363	362	361	358	357	357
75	196	196	197	196	195	208
85	55	54	55	56	55	62
90	0	0	0	0	0	
95	16	26	28	30	31	35
105	106	232	211	164	145	195
115	221	332	429	446	443	375
125	332	405	519	587	602	440
135	430	475	560	625	647	425
145	516	540	597	641	655	370
155	582	592	623	648	656	287
165	628	628	642	649	651	181
175	650	646	650	650	649	62
180	651	651	651	651	651	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%LAMP	%FIXT
0- 30	797	10.2	15.1
0- 40	1303	16.7	24.6
0- 60	2293	29.4	43.3
0- 90	2920	37.4	55.2
90-120	604	7.7	11.4
90-130	1045	13.4	19.8
90-150	1841	23.6	34.8
90-180	2370	30.4	44.8
0-180	5290	67.8	100.0

TOTAL LUMINAIRE EFFICIENCY = 67.8 % *

CIE TYPE - GENERAL DIFFUSE

PLANE	: 0-DEG	90-DEG
SPACING CRITERIA	: 1.25	1.25
SHIELDING ANGLES	: 90	90

Checked *B HYRE*
Approved *R BEATTIE*
Lighting Engineer

* SEE ADDENDUM FOR FURTHER INFORMATION

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

ISSUE DATE: 08/27/13
PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

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	6618.	6627.	6579.
55	6363.	6327.	6278.
65	5937.	5904.	5839.
75	5234.	5261.	5208.
85	4362.	4362.	4362.

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

ISSUE DATE: 08/27/13
PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1029	1029	1029	1029	1029
5.0	1026	1019	1024	1026	1023
10.0	1012	1006	1012	1012	1010
15.0	988	983	989	989	987
20.0	956	951	957	957	955
25.0	914	909	916	916	914
30.0	866	862	867	866	865
35.0	810	806	811	810	808
40.0	746	744	747	745	743
45.0	677	676	678	675	673
50.0	605	603	604	600	599
55.0	528	526	525	523	521
60.0	447	445	445	442	440
65.0	363	362	361	358	357
70.0	279	278	277	276	275
75.0	196	196	197	196	195
80.0	120	121	121	122	122
85.0	55	54	55	56	55
90.0	0	0	0	0	0
95.0	16	26	28	30	31
100.0	55	134	80	59	58
105.0	106	232	211	164	145
110.0	163	295	341	313	294
115.0	221	332	429	446	443
120.0	277	369	488	530	535
125.0	332	405	519	587	602
130.0	383	441	540	614	635
135.0	430	475	560	625	647
140.0	475	509	580	634	652
145.0	516	540	597	641	655
150.0	551	568	611	646	658
155.0	582	592	623	648	656
160.0	608	612	633	649	654
165.0	628	628	642	649	651
170.0	642	639	648	650	649
175.0	650	646	650	650	649
180.0	651	651	651	651	651

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

ISSUE DATE: 08/27/13
PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	25
5- 10	73
10- 15	118
15- 20	160
20- 25	196
25- 30	225
30- 35	246
35- 40	259
40- 45	263
45- 50	258
50- 55	245
55- 60	224
60- 65	195
65- 70	161
70- 75	124
75- 80	85
80- 85	48
85- 90	14
90- 95	7
95-100	28
100-105	69
105-110	125
110-115	172
115-120	203
120-125	218
125-130	222
130-135	218
135-140	208
140-145	194
145-150	176
150-155	155
155-160	131
160-165	105
165-170	76
170-175	46
175-180	16

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	97
0- 20	376
0- 30	797
0- 40	1303
0- 50	1824
0- 60	2293
0- 70	2649
0- 80	2858
0- 90	2920
0-100	2954
0-110	3149
0-120	3524
0-130	3965
0-140	4390
0-150	4760
0-160	5047
0-170	5228
0-180	5290

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

ISSUE DATE: 08/27/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

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	73	73	73	73	68	68	68	68	58	58	58	50	50	50	41	41	41	37
1	67	64	61	59	62	59	57	55	51	49	48	43	42	41	36	35	35	31
2	61	56	51	48	56	52	48	45	45	42	39	38	36	34	32	30	29	26
3	55	49	44	40	51	46	41	37	39	36	33	33	31	29	28	26	24	22
4	51	43	38	33	47	40	35	32	35	31	28	30	27	24	25	23	21	19
5	46	38	33	29	43	36	31	27	31	27	24	27	24	21	22	20	18	16
6	43	34	29	25	40	32	27	23	28	24	21	24	21	18	20	18	16	14
7	40	31	26	22	37	29	24	21	25	21	18	22	19	16	19	16	14	12
8	37	28	23	19	34	26	22	18	23	19	16	20	17	14	17	15	13	11
9	34	26	21	17	32	24	19	16	21	17	15	18	15	13	16	13	11	10
10	32	24	19	15	30	22	18	15	19	16	13	17	14	12	15	12	10	9

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.

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

ISSUE DATE: 08/27/13
PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

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