

# 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: ITL78202

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ISSUE DATE: 07/25/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLS5-ASYM-D1-4-PB-120-T5

LUMINAIRE: EXTRUDED 3-PIECE METAL HOUSING WITH FABRICATED WHITE PAINTED METAL END CAPS, FORMED MULTI-FACETED METAL REFLECTOR WITH PREMIUM SPECULAR FINISH, FABRICATED SEMI-SPECULAR METAL PARABOLIC 31-CELL LOUVER.

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

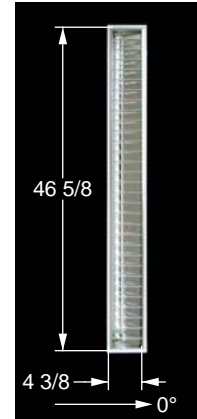
BALLAST: ADVANCE ICN-2S28

TOTAL INPUT WATTS = 31.6 AT 120.0 VOLTS

THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMP.

MOUNTING: RECESSED

REPORT IS BASED ON 2600 LUMENS PER LAMP. \*



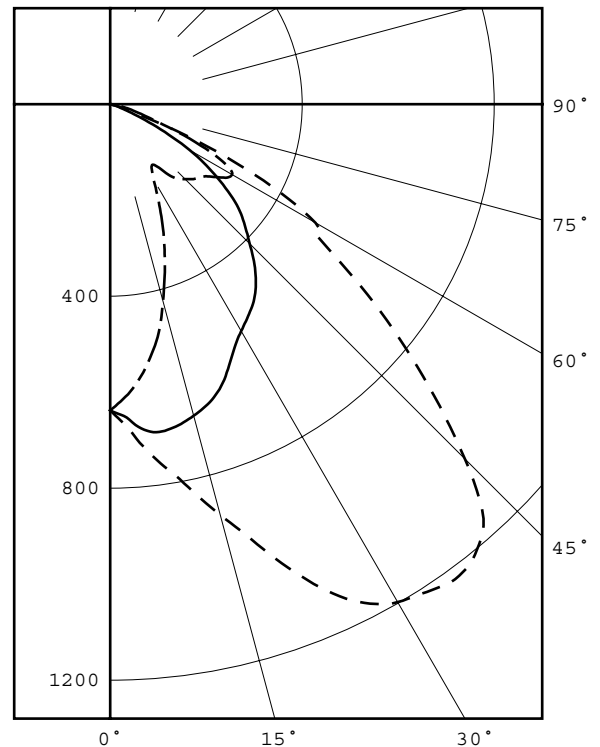
CANDELA DISTRIBUTION						FLUX
	0.0	45.0	90.0	135.0	180.0	
0	638	638	638	638	638	
5	708	707	675	629	589	64
15	886	828	672	562	425	193
25	1131	913	592	403	249	301
35	1221	951	515	237	154	374
45	1045	892	411	149	221	400
55	603	613	280	150	264	324
65	289	207	89	95	220	160
75	13	16	11	18	46	25
85	1	2	2	3	5	3
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY			
ZONE	LUMENS	%LAMP	%FIXT
0- 30	558	21.5	30.3
0- 40	932	35.9	50.5
0- 60	1657	63.7	89.8
0- 90	1845	71.0	100.0
90-180	0	0.0	0.0
0-180	1845	71.0	100.0

TOTAL LUMINAIRE EFFICIENCY = 71.0 % \*

CIE TYPE - DIRECT PLANE			
	0-DEG	90-DEG	180-DEG
SPACING CRITERIA	2.11	1.27	0.65
SHIELDING ANGLES	19	27	
LUMINOUS LENGTH	4.375	46.625	

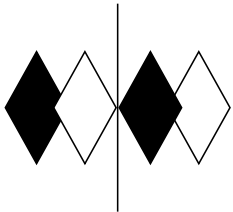
LUMINANCE DATA IN CANDELA/SQ M			
ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	11230.	4417.	2375.
55	7988.	3709.	3497.
65	5196.	1600.	3956.
75	382.	323.	1351.
85	87.	174.	436.



LEGEND:  
 0-deg -----  
 90-deg =====  
 180-deg -----

Checked       M KLOPF        
 Approved       R BEATTIE        
 Lighting Engineer

\* SEE ADDENDUM FOR FURTHER INFORMATION



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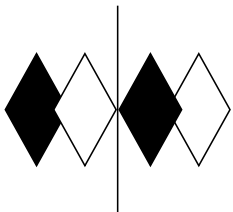
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## CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	638	638	638	638	638	638	638	638	638
2.5	666	665	662	654	650	635	630	620	615
5.0	708	708	707	691	675	650	629	602	589
7.5	748	754	750	718	689	656	627	583	556
10.0	786	796	783	734	689	650	615	561	519
12.5	834	844	807	742	682	635	592	535	477
15.0	886	892	828	745	672	618	562	495	425
17.5	941	941	850	746	660	594	527	453	377
20.0	1008	992	870	743	644	568	483	413	332
22.5	1073	1043	890	737	621	537	442	369	290
25.0	1131	1087	913	724	592	500	403	326	249
27.5	1173	1118	932	711	565	460	362	284	212
30.0	1198	1136	945	701	546	420	321	244	181
32.5	1209	1139	951	696	530	385	277	212	161
35.0	1221	1137	951	692	515	358	237	191	154
37.5	1219	1131	946	686	496	332	202	179	167
40.0	1196	1110	936	677	472	310	177	183	195
42.5	1147	1071	920	663	443	284	160	195	211
45.0	1045	1006	892	642	411	253	149	201	221
47.5	931	902	849	618	383	221	146	205	231
50.0	819	790	790	585	356	192	151	209	240
52.5	710	680	715	541	322	169	152	212	247
55.0	603	582	613	486	280	149	150	215	264
57.5	511	484	508	417	238	127	145	223	285
60.0	494	405	406	333	191	103	136	226	293
62.5	401	353	307	242	138	81	120	211	272
65.0	289	258	207	147	89	61	95	174	220
67.5	172	160	128	79	53	42	68	127	154
70.0	68	78	60	43	29	27	44	84	97
72.5	29	31	28	24	17	17	28	54	67
75.0	13	17	16	15	11	11	18	36	46
77.5	8	10	10	9	7	8	12	22	31
80.0	5	6	6	6	5	5	8	12	18
82.5	3	3	4	4	3	3	5	7	10
85.0	1	2	2	2	2	2	3	4	5
87.5	0	1	1	1	1	1	1	2	3
90.0	0	0	0	0	0	0	0	0	0



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5-DEGREE

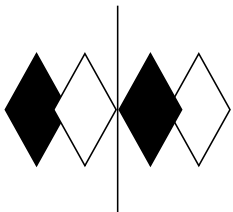
ZONAL LUMEN SUMMARY

0- 5	16
5- 10	48
10- 15	81
15- 20	112
20- 25	139
25- 30	162
30- 35	180
35- 40	195
40- 45	203
45- 50	197
50- 55	177
55- 60	147
60- 65	107
65- 70	53
70- 75	18
75- 80	7
80- 85	3
85- 90	1

10-DEGREE

ZONAL LUMEN SUMMARY

0- 10	64
0- 20	257
0- 30	558
0- 40	932
0- 50	1333
0- 60	1657
0- 70	1817
0- 80	1842
0- 90	1845



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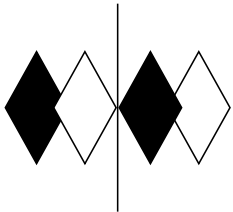
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	83	83	83	83	79	79	79	75	75	75	72	72	72	71	71
1	79	76	73	71	77	74	72	70	71	69	68	68	67	65	66	65	64	62	62
2	72	67	63	59	70	66	62	59	63	60	57	61	58	56	59	57	55	53	53
3	66	59	54	50	65	58	54	50	56	52	49	54	51	48	53	50	47	46	46
4	61	53	47	43	59	52	47	43	50	46	42	49	45	41	47	44	41	39	39
5	56	47	42	37	55	47	41	37	45	40	37	44	40	36	43	39	36	34	34
6	52	43	37	32	50	42	36	32	41	36	32	40	35	32	39	35	31	30	30
7	48	39	33	29	47	38	33	29	37	32	28	36	32	28	35	31	28	27	27
8	45	35	30	26	44	35	29	25	34	29	25	33	28	25	32	28	25	24	24
9	42	32	27	23	41	32	27	23	31	26	23	30	26	23	30	26	23	21	21
10	39	30	24	21	38	29	24	21	29	24	21	28	24	21	28	23	20	19	19

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

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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