



LUMINAIRE TESTING LABORATORY, INC.

SUSTAINING
MEMBER
of the
IESNA

905 Harrison Street · Allentown, PA 18103 · 610-770-1044 · Fax 610-770-8912 · www.LuminaireTesting.com

LTL NUMBER: 18437

DATE: 03-30-2010

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLR-1-4-X-TWA-120-T5

LUMINAIRE: EXTRUDED ALUMINUM HOUSING WITH STEEL END CAPS, FORMED WHITE ENAMEL ALUMINUM REFLECTOR, TRANSLUCENT WHITE PLASTIC ENCLOSURE.

LAMP: ONE 28 WATT T5 LINEAR FLUORESCENT LAMP RATED AT 2610 LUMENS.

LAMP CATALOG NUMBER: PHILIPS F28T5/841

BALLAST: ONE UNIVERSAL LIGHTING TECHNOLOGIES "ACCU START" B228PUNV-C

MOUNTING: RECESSED

ELECTRICAL VALUES: 120.0VAC, 0.2522A, 30.16W

Candela Distribution

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
5	536	538	537	538	538	538	537	538	536	538	537	538	538	538	537	538	51.1
15	516	518	517	518	519	518	517	518	516	518	517	518	519	518	517	518	146.1
25	476	479	478	479	480	479	478	479	476	479	478	479	480	479	478	479	220.5
35	420	423	422	421	420	421	422	423	420	423	422	421	420	421	422	423	263.7
45	352	353	351	349	348	349	351	353	352	353	351	349	348	349	351	353	270.5
55	272	273	270	268	267	268	270	273	272	273	270	268	267	268	270	273	241.6
65	186	185	183	183	182	183	183	185	186	185	183	183	182	183	183	185	181.9
75	95	95	96	97	98	97	96	95	95	95	96	97	98	97	96	95	101.9
85	16	19	22	25	25	25	22	19	16	19	22	25	25	25	22	19	25.8
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

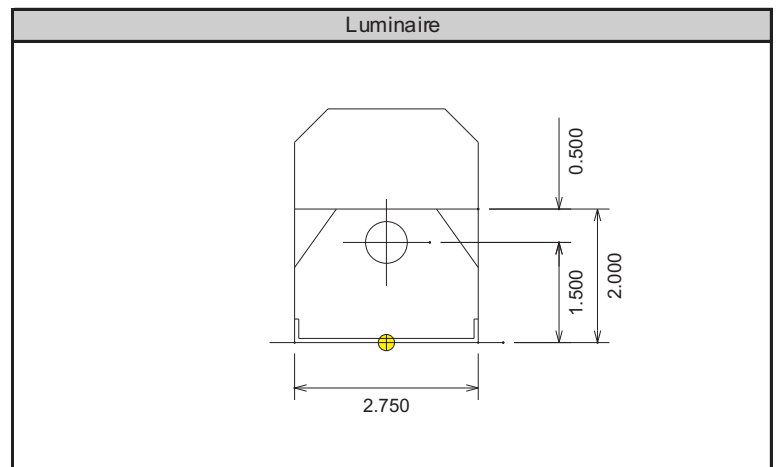
Zonal Lumen Summary

Zone	Lumens	% of Lamp	% of Luminaire
0-30	417.7	16.0%	27.8%
0-40	681.3	26.1%	45.3%
0-60	1193.4	45.7%	79.4%
0-90	1503.1	57.6%	100.0%
90-180	0.0	0.0%	0.0%
0-180	1503.1	57.6%	100.0%

Total luminaire efficiency: 57.6%

CIE Type: Direct

Spacing Criterion: 0 deg: 1.24 90 deg: 1.24
180 deg: 1.24 270 deg: 1.24



Approved By: MG

THIS REPORT BASED ON LM-41 AND OTHER PERTINENT IESNA PROCEDURES.



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Candela Tabulation (5 degree Vertical Increments)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540
5	536	538	537	538	538	538	537	538	536	538	537	538	538	538	537	538
10	528	531	530	531	531	531	530	531	528	531	530	531	531	531	530	531
15	516	518	517	518	519	518	517	518	516	518	517	518	519	518	517	518
20	498	501	500	501	502	501	500	501	498	501	500	501	502	501	500	501
25	476	479	478	479	480	479	478	479	476	479	478	479	480	479	478	479
30	450	453	452	453	452	453	452	453	450	453	452	453	452	453	452	453
35	420	423	422	421	420	421	422	423	420	423	422	421	420	421	422	423
40	387	389	388	386	385	386	388	389	387	389	388	386	385	386	388	389
45	352	353	351	349	348	349	351	353	352	353	351	349	348	349	351	353
50	313	315	311	309	308	309	311	315	313	315	311	309	308	309	311	315
55	272	273	270	268	267	268	270	273	272	273	270	268	267	268	270	273
60	230	230	227	226	225	226	227	230	230	230	227	226	225	226	227	230
65	186	185	183	183	182	183	183	185	186	185	183	183	182	183	183	185
70	140	140	139	139	139	139	139	140	140	140	139	139	139	139	139	140
75	95	95	96	97	98	97	96	95	95	95	96	97	98	97	96	95
80	52	53	56	58	59	58	56	53	52	53	56	58	59	58	56	53
85	16	19	22	25	25	25	22	19	16	19	22	25	25	25	22	19
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Zonal Lumen Tabulation (5 degree zones)

Zone	Lumens	Zone	Lumens	Zone	Lumens	Zone	Lumens
0-5	12.9	45-50	133.8	90-95	0.0	135-140	0.0
5-10	38.2	50-55	126.5	95-100	0.0	140-145	0.0
10-15	62.2	55-60	115.1	100-105	0.0	145-150	0.0
15-20	83.9	60-65	100.0	105-110	0.0	150-155	0.0
20-25	102.7	65-70	81.9	110-115	0.0	155-160	0.0
25-30	117.8	70-75	61.5	115-120	0.0	160-165	0.0
30-35	128.7	75-80	40.4	120-125	0.0	165-170	0.0
35-40	135.0	80-85	20.6	125-130	0.0	170-175	0.0
40-45	136.7	85-90	5.2	130-135	0.0	175-180	0.0



Coefficients of Utilization - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
Wall Reflectance	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)												
0	0.702	0.702	0.702	0.702	0.686	0.686	0.686	0.686	0.67	0.67	0.67	0.67
1	0.643	0.613	0.586	0.562	0.627	0.599	0.575	0.553	0.611	0.586	0.564	0.544
2	0.586	0.534	0.491	0.456	0.57	0.523	0.483	0.45	0.555	0.512	0.476	0.445
3	0.535	0.468	0.418	0.378	0.52	0.459	0.412	0.375	0.505	0.45	0.406	0.371
4	0.49	0.415	0.361	0.32	0.476	0.407	0.356	0.317	0.463	0.399	0.352	0.315
5	0.45	0.37	0.315	0.275	0.438	0.363	0.312	0.273	0.425	0.357	0.308	0.272
6	0.416	0.333	0.278	0.24	0.404	0.327	0.276	0.239	0.393	0.322	0.273	0.238
7	0.385	0.302	0.248	0.212	0.375	0.297	0.246	0.211	0.365	0.292	0.244	0.21
8	0.358	0.275	0.224	0.189	0.349	0.271	0.222	0.188	0.34	0.267	0.22	0.187
9	0.335	0.252	0.203	0.17	0.326	0.249	0.201	0.169	0.318	0.245	0.2	0.169
10	0.313	0.233	0.185	0.154	0.306	0.229	0.184	0.153	0.298	0.226	0.183	0.153

Ceiling Cavity Reflectance	50				30			10			0
Wall Reflectance	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)											
0	0.64	0.64	0.64	0.64	0.613	0.613	0.613	0.588	0.588	0.588	0.576
1	0.582	0.562	0.543	0.527	0.539	0.524	0.51	0.519	0.506	0.495	0.483
2	0.527	0.491	0.461	0.435	0.472	0.447	0.425	0.455	0.434	0.415	0.403
3	0.479	0.433	0.395	0.365	0.417	0.385	0.358	0.402	0.375	0.352	0.339
4	0.438	0.384	0.343	0.311	0.371	0.335	0.306	0.359	0.328	0.302	0.29
5	0.403	0.345	0.302	0.269	0.333	0.295	0.266	0.323	0.29	0.263	0.251
6	0.373	0.311	0.268	0.235	0.302	0.263	0.233	0.292	0.258	0.231	0.219
7	0.346	0.283	0.24	0.208	0.275	0.236	0.207	0.267	0.232	0.205	0.194
8	0.323	0.259	0.217	0.186	0.252	0.213	0.185	0.245	0.21	0.184	0.173
9	0.303	0.239	0.197	0.168	0.232	0.194	0.167	0.226	0.192	0.166	0.156
10	0.284	0.221	0.18	0.152	0.215	0.178	0.152	0.21	0.176	0.151	0.141

Average Luminance Table (cd/m²)

	0	45	90
0	6213	6213	6213
45	5719	5708	5660
55	5464	5415	5358
65	5050	4991	4961
75	4210	4258	4345
85	2139	2944	3348

THIS TEST WAS CONDUCTED USING RELATIVE PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IESNA PROCEDURES. THE USER MUST THEREFORE USE CAUTION IN THE FOLLOWING SITUATIONS: 1) THIS TEST WAS PERFORMED USING A SPECIFIC BALLAST/LAMP COMBINATION. EXTRAPOLATION OF THESE DATA FOR OTHER BALLAST/LAMP COMBINATIONS MAY PRODUCE ERRONEOUS RESULTS. 2) ACCORDING TO IESNA PROCEDURES, THE BALLAST(S) AND LAMP(S) ARE PRESUMED TO PRODUCE 100% OF RATED OUTPUT. AN APPROPRIATE BALLAST FACTOR MUST BE APPLIED TO THE LUMEN OUTPUT RATINGS AND LUMINOUS INTENSITY VALUES GIVEN. 3) THIS TEST WAS CONDUCTED IN A CONTROLLED LABORATORY ENVIRONMENT WHERE THE AMBIENT TEMPERATURE WAS HELD AT 25 °C ±1°C. FIELD PERFORMANCE MAY DIFFER PARTICULARLY IN REGARDS TO CHANGE IN LUMINOUS OUTPUT AS A RESULT OF DIFFERENCE IN AMBIENT TEMPERATURE AND METHOD OF MOUNTING THE LUMINAIRE.

