



# 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: 21376 DATE: 10/29/2010  
 PREPARED FOR: RENOVA LIGHTING  
 CATALOG NUMBER: ECS-WVT4-MN-454-UNV-22H-CAL  
 LUMINAIRE: MOLDED PLASTIC AND FORMED STEEL HOUSING, FORMED "MIRO 4"  
 SPECULAR ALUMINUM REFLECTOR, CLEAR ACRYLIC ENCLOSURE WITH  
 CLEAR LINEAR PRISMATIC SIDES AND FROSTED ENDS.  
 LAMP: FOUR 54 WATT T5HO LINEAR FLUORESCENT LAMPS RATED AT 4400 LUMENS  
 EACH.  
 LAMP CATALOG NUMBER: PHILIPS F54T5/841/ALTO  
 BALLAST: TWO SYLVANIA "QUICKTRONIC" QHE2X54T5HO/UNV-PSN-HT  
 MOUNTING: PENDANT  
 ELECTRICAL VALUES: 120.0V, 1.739A, 208.21W

**Candela Distribution**

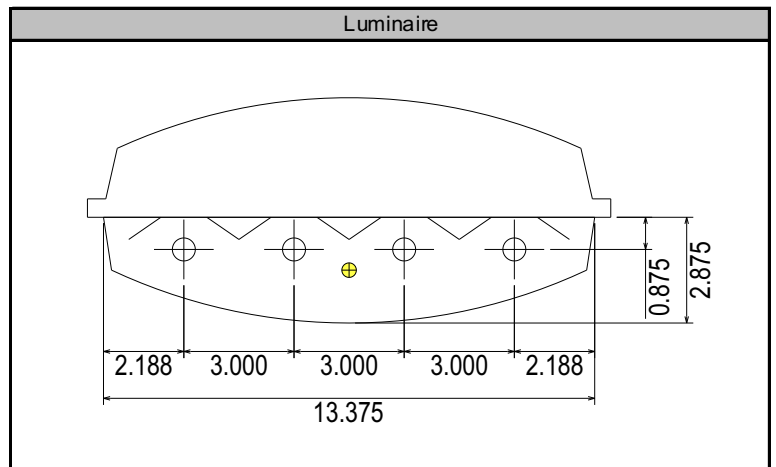
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	
5	6261	6263	6281	6268	6260	6268	6281	6263	6261	6263	6281	6268	6260	6268	6281	6263	592.6
15	6014	5989	5678	5186	5001	5186	5678	5989	6014	5989	5678	5186	5001	5186	5678	5989	1566.1
25	5526	5252	4307	3785	3556	3785	4307	5252	5526	5252	4307	3785	3556	3785	4307	5252	2047.9
35	4826	3972	2918	2751	2799	2751	2918	3972	4826	3972	2918	2751	2799	2751	2918	3972	2119.1
45	3927	2863	2306	2012	1974	2012	2306	2863	3927	2863	2306	2012	1974	2012	2306	2863	1951.7
55	2851	1636	1510	1719	1865	1719	1510	1636	2851	1636	1510	1719	1865	1719	1510	1636	1623.9
65	1717	1043	1275	1569	1686	1569	1275	1043	1717	1043	1275	1569	1686	1569	1275	1043	1379.4
75	683	556	974	1164	1298	1164	974	556	683	556	974	1164	1298	1164	974	556	989.6
85	113	299	586	924	1039	924	586	299	113	299	586	924	1039	924	586	299	667.6
90	45	232	611	775	804	775	611	232	45	232	611	775	804	775	611	232	
95	48	197	329	431	471	431	329	197	48	197	329	431	471	431	329	197	365.8
105	64	80	175	283	324	283	175	80	64	80	175	283	324	283	175	80	194.4
115	37	64	120	121	123	121	120	64	37	64	120	121	123	121	120	64	99.6
125	18	26	97	115	127	115	97	26	18	26	97	115	127	115	97	26	70.6
135	10	10	39	46	55	46	39	10	10	10	39	46	55	46	39	10	28.2
145	3	3	12	29	36	29	12	3	3	3	12	29	36	29	12	3	10.3
155	0	0	2	9	11	9	2	0	0	0	2	9	11	9	2	0	1.9
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
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	

**Zonal Lumen Summary**

Zone	Lumens	% of Lamp	% of Luminaire
0-30	4206.7	23.9%	30.7%
0-40	6325.7	35.9%	46.1%
0-60	9901.4	56.3%	72.2%
0-90	12938.0	73.5%	94.4%
90-180	770.8	4.4%	5.6%
0-180	13708.8	77.9%	100.0%

Total luminaire efficiency: 77.9%

CIE Type: Direct  
 Spacing Criterion: 0 deg: 1.23 90 deg: 0.83  
 180 deg: 1.23 270 deg: 0.83



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	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284	6284
5	6261	6263	6281	6268	6260	6268	6281	6263	6261	6263	6281	6268	6260	6268	6281	6263
10	6167	6175	6117	5980	5916	5980	6117	6175	6167	6175	6117	5980	5916	5980	6117	6175
15	6014	5989	5678	5186	5001	5186	5678	5989	6014	5989	5678	5186	5001	5186	5678	5989
20	5802	5696	4888	4483	4367	4483	4888	5696	5802	5696	4888	4483	4367	4483	4888	5696
25	5526	5252	4307	3785	3556	3785	4307	5252	5526	5252	4307	3785	3556	3785	4307	5252
30	5203	4654	3679	3074	3020	3074	3679	4654	5203	4654	3679	3074	3020	3074	3679	4654
35	4826	3972	2918	2751	2799	2751	2918	3972	4826	3972	2918	2751	2799	2751	2918	3972
40	4392	3411	2539	2526	2395	2526	2539	3411	4392	3411	2539	2526	2395	2526	2539	3411
45	3927	2863	2306	2012	1974	2012	2306	2863	3927	2863	2306	2012	1974	2012	2306	2863
50	3401	2191	1884	1753	1809	1753	1884	2191	3401	2191	1884	1753	1809	1753	1884	2191
55	2851	1636	1510	1719	1865	1719	1510	1636	2851	1636	1510	1719	1865	1719	1510	1636
60	2284	1339	1324	1691	1770	1691	1324	1339	2284	1339	1324	1691	1770	1691	1324	1339
65	1717	1043	1275	1569	1686	1569	1275	1043	1717	1043	1275	1569	1686	1569	1275	1043
70	1165	726	1146	1464	1510	1464	1146	726	1165	726	1146	1464	1510	1464	1146	726
75	683	556	974	1164	1298	1164	974	556	683	556	974	1164	1298	1164	974	556
80	320	436	756	1070	1162	1070	756	436	320	436	756	1070	1162	1070	756	436
85	113	299	586	924	1039	924	586	299	113	299	586	924	1039	924	586	299
90	45	232	611	775	804	775	611	232	45	232	611	775	804	775	611	232
95	48	197	329	431	471	431	329	197	48	197	329	431	471	431	329	197
100	65	123	257	368	409	368	257	123	65	123	257	368	409	368	257	123
105	64	80	175	283	324	283	175	80	64	80	175	283	324	283	175	80
110	51	72	104	172	208	172	104	72	51	72	104	172	208	172	104	72
115	37	64	120	121	123	121	120	64	37	64	120	121	123	121	120	64
120	26	39	107	143	148	143	107	39	26	39	107	143	148	143	107	39
125	18	26	97	115	127	115	97	26	18	26	97	115	127	115	97	26
130	13	15	44	105	125	105	44	15	13	15	44	105	125	105	44	15
135	10	10	39	46	55	46	39	10	10	10	39	46	55	46	39	10
140	7	8	24	44	46	44	24	8	7	8	24	44	46	44	24	8
145	3	3	12	29	36	29	12	3	3	3	12	29	36	29	12	3
150	0	2	8	15	19	15	8	2	0	2	8	15	19	15	8	2
155	0	0	2	9	11	9	2	0	0	0	2	9	11	9	2	0
160	0	0	0	2	9	2	0	0	0	0	0	2	9	2	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	150.2	45-50	937.1	90-95	217.0	135-140	10.6
5-10	442.4	50-55	840.8	95-100	148.7	140-145	6.9
10-15	693.6	55-60	783.1	100-105	115.7	145-150	3.4
15-20	872.6	60-65	727.6	105-110	78.7	150-155	1.4
20-25	996.3	65-70	651.8	110-115	52.2	155-160	0.5
25-30	1051.6	70-75	541.4	115-120	47.4	160-165	0.1
30-35	1061.8	75-80	448.3	120-125	40.6	165-170	0.0
35-40	1057.3	80-85	354.9	125-130	29.9	170-175	0.0
40-45	1014.7	85-90	312.8	130-135	17.6	175-180	0.0



Coefficients of Utilization - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)												
0	0.945	0.945	0.945	0.945	0.917	0.917	0.917	0.917	0.89	0.89	0.89	0.89
1	0.858	0.814	0.774	0.739	0.83	0.79	0.755	0.722	0.804	0.768	0.736	0.706
2	0.783	0.711	0.652	0.603	0.757	0.692	0.637	0.592	0.732	0.673	0.623	0.581
3	0.718	0.628	0.559	0.505	0.693	0.611	0.548	0.498	0.67	0.596	0.537	0.49
4	0.66	0.56	0.487	0.433	0.638	0.546	0.479	0.427	0.617	0.533	0.47	0.422
5	0.61	0.504	0.43	0.377	0.59	0.492	0.423	0.373	0.57	0.481	0.417	0.369
6	0.566	0.456	0.384	0.333	0.547	0.446	0.379	0.33	0.53	0.437	0.373	0.327
7	0.527	0.416	0.346	0.298	0.51	0.408	0.341	0.295	0.494	0.399	0.337	0.292
8	0.492	0.382	0.314	0.268	0.477	0.375	0.31	0.266	0.462	0.367	0.306	0.264
9	0.461	0.352	0.287	0.244	0.447	0.346	0.284	0.242	0.434	0.34	0.281	0.24
10	0.433	0.327	0.264	0.223	0.421	0.321	0.261	0.222	0.409	0.316	0.259	0.22

Ceiling Cavity Reflectance	50				30			10			0
	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)											
0	0.841	0.841	0.841	0.841	0.796	0.796	0.796	0.755	0.755	0.755	0.735
1	0.756	0.727	0.7	0.676	0.689	0.667	0.648	0.654	0.637	0.621	0.601
2	0.686	0.638	0.597	0.561	0.606	0.572	0.542	0.576	0.548	0.523	0.504
3	0.628	0.566	0.517	0.476	0.539	0.497	0.462	0.514	0.479	0.449	0.43
4	0.578	0.508	0.454	0.412	0.485	0.439	0.401	0.463	0.424	0.391	0.373
5	0.535	0.459	0.404	0.361	0.439	0.391	0.353	0.421	0.379	0.346	0.328
6	0.498	0.418	0.362	0.32	0.401	0.352	0.314	0.385	0.342	0.308	0.292
7	0.465	0.384	0.328	0.287	0.369	0.319	0.282	0.355	0.311	0.278	0.262
8	0.436	0.354	0.299	0.26	0.341	0.292	0.256	0.329	0.285	0.252	0.237
9	0.41	0.328	0.274	0.237	0.316	0.268	0.234	0.306	0.262	0.23	0.216
10	0.387	0.305	0.253	0.217	0.295	0.248	0.214	0.286	0.243	0.212	0.198

Average Luminance Table (cd/m<sup>2</sup>)

	0	45	90
0	14630	14630	14630
45	12283	6543	5477
55	10746	4927	5915
65	8462	5080	6468
75	5091	5186	6554
85	1842	4927	8042

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.

