



# 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: 17226

DATE: 11-12-2009

PREPARED FOR: RENOVA LIGHTING SYSTEMS

CATALOG NUMBER: ECS-WBW4-MN-232-UNV-12L

LUMINAIRE: FORMED WHITE ENAMEL STEEL HOUSING, FORMED SPECULAR REFLECTOR, CLEAR PRISMATIC PLASTIC ENCLOSURE WITH LINEAR PRISMATIC SIDES.

LAMP: TWO 32 WATT T8 LINEAR FLUORESCENT LAMPS RATED AT 2850 LUMENS EACH.

LAMP CATALOG NUMBER: PHILIPS F32T8/TL841/ALTO

BALLAST: ONE SYLVANIA "QUICKTRONIC" QHE2X32T8/UNV-ISL-SC

MOUNTING: SURFACE

ELECTRICAL VALUES: 120.0VAC, 0.4024A, 48.22W

**Candela Distribution**

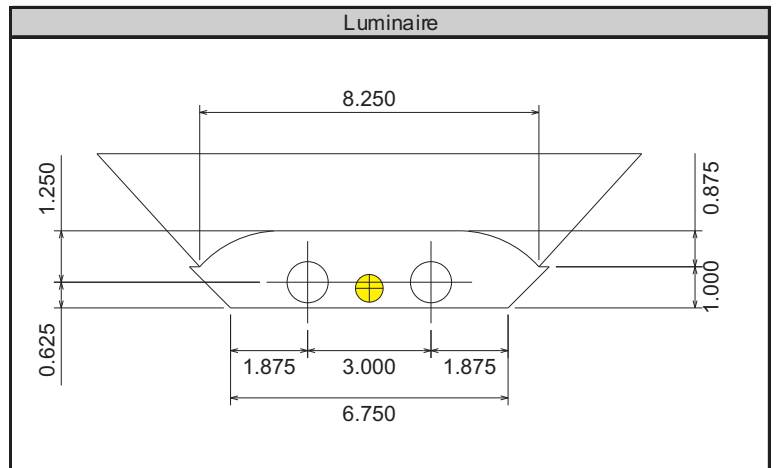
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	
5	1547	1550	1563	1563	1567	1563	1563	1550	1547	1550	1563	1563	1567	1563	1563	1550	149.2
15	1511	1533	1608	1670	1699	1670	1608	1533	1511	1533	1608	1670	1699	1670	1608	1533	455.0
25	1433	1494	1645	1719	1737	1719	1645	1494	1433	1494	1645	1719	1737	1719	1645	1494	741.6
35	1303	1388	1514	1540	1538	1540	1514	1388	1303	1388	1514	1540	1538	1540	1514	1388	914.8
45	1092	1141	1233	1262	1288	1262	1233	1141	1092	1141	1233	1262	1288	1262	1233	1141	927.3
55	674	760	868	909	892	909	868	760	674	760	868	909	892	909	868	760	745.5
65	336	432	553	579	579	579	553	432	336	432	553	579	579	579	553	432	504.0
75	182	225	314	366	399	366	314	225	182	225	314	366	399	366	314	225	318.9
85	61	92	156	226	261	226	156	92	61	92	156	226	261	226	156	92	173.1
90	1	40	103	158	183	158	103	40	1	40	103	158	183	158	103	40	
95	0	31	82	130	150	130	82	31	0	31	82	130	150	130	82	31	86.9
105	0	18	50	79	90	79	50	18	0	18	50	79	90	79	50	18	51.1
115	0	1	32	47	53	47	32	1	0	1	32	47	53	47	32	1	27.2
125	0	0	15	33	38	33	15	0	0	0	15	33	38	33	15	0	14.6
135	0	0	0	3	18	3	0	0	0	0	0	3	18	3	0	0	3.4
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	1345.8	23.6%	26.3%
0-40	2260.6	39.7%	44.2%
0-60	3933.4	69.0%	76.9%
0-90	4929.3	86.5%	96.4%
90-180	183.3	3.2%	3.6%
0-180	5112.6	89.7%	100.0%

Total luminaire efficiency: 89.7%

CIE Type: Direct  
 Spacing Criterion: 0 deg: 1.31    90 deg: 1.48  
                                   180 deg: 1.31    270 deg: 1.48



Approved By: \_\_\_\_\_

**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	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556	1556
5	1547	1550	1563	1563	1567	1563	1563	1550	1547	1550	1563	1563	1567	1563	1563	1550
10	1534	1544	1576	1601	1613	1601	1576	1544	1534	1544	1576	1601	1613	1601	1576	1544
15	1511	1533	1608	1670	1699	1670	1608	1533	1511	1533	1608	1670	1699	1670	1608	1533
20	1477	1518	1641	1722	1751	1722	1641	1518	1477	1518	1641	1722	1751	1722	1641	1518
25	1433	1494	1645	1719	1737	1719	1645	1494	1433	1494	1645	1719	1737	1719	1645	1494
30	1376	1455	1605	1650	1660	1650	1605	1455	1376	1455	1605	1650	1660	1650	1605	1455
35	1303	1388	1514	1540	1538	1540	1514	1388	1303	1388	1514	1540	1538	1540	1514	1388
40	1211	1280	1387	1397	1404	1397	1387	1280	1211	1280	1387	1397	1404	1397	1387	1280
45	1092	1141	1233	1262	1288	1262	1233	1141	1092	1141	1233	1262	1288	1262	1233	1141
50	918	966	1056	1111	1124	1111	1056	966	918	966	1056	1111	1124	1111	1056	966
55	674	760	868	909	892	909	868	760	674	760	868	909	892	909	868	760
60	460	581	702	726	703	726	702	581	460	581	702	726	703	726	702	581
65	336	432	553	579	579	579	553	432	336	432	553	579	579	579	553	432
70	249	314	423	459	475	459	423	314	249	314	423	459	475	459	423	314
75	182	225	314	366	399	366	314	225	182	225	314	366	399	366	314	225
80	125	152	226	292	337	292	226	152	125	152	226	292	337	292	226	152
85	61	92	156	226	261	226	156	92	61	92	156	226	261	226	156	92
90	1	40	103	158	183	158	103	40	1	40	103	158	183	158	103	40
95	0	31	82	130	150	130	82	31	0	31	82	130	150	130	82	31
100	0	24	65	102	116	102	65	24	0	24	65	102	116	102	65	24
105	0	18	50	79	90	79	50	18	0	18	50	79	90	79	50	18
110	0	11	39	59	68	59	39	11	0	11	39	59	68	59	39	11
115	0	1	32	47	53	47	32	1	0	1	32	47	53	47	32	1
120	0	0	24	40	45	40	24	0	0	0	24	40	45	40	24	0
125	0	0	15	33	38	33	15	0	0	0	15	33	38	33	15	0
130	0	0	1	26	30	26	1	0	0	0	1	26	30	26	1	0
135	0	0	0	3	18	3	0	0	0	0	0	3	18	3	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	37.2	45-50	454.8	90-95	48.6	135-140	0.3
5-10	112.0	50-55	406.5	95-100	38.3	140-145	0.0
10-15	188.5	55-60	339.0	100-105	29.3	145-150	0.0
15-20	266.5	60-65	278.7	105-110	21.7	150-155	0.0
20-25	340.0	65-70	225.3	110-115	15.5	155-160	0.0
25-30	401.6	70-75	179.2	115-120	11.7	160-165	0.0
30-35	445.8	75-80	139.7	120-125	9.0	165-170	0.0
35-40	469.0	80-85	104.4	125-130	5.6	170-175	0.0
40-45	472.5	85-90	68.7	130-135	3.1	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	1.09	1.09	1.09	1.09	1.06	1.06	1.06	1.06	1.032	1.032	1.032	1.032
1	0.994	0.946	0.902	0.863	0.965	0.921	0.881	0.846	0.937	0.897	0.861	0.829
2	0.907	0.825	0.758	0.702	0.879	0.804	0.743	0.691	0.852	0.784	0.728	0.68
3	0.829	0.725	0.646	0.584	0.802	0.708	0.635	0.576	0.777	0.691	0.624	0.569
4	0.759	0.642	0.558	0.495	0.735	0.628	0.549	0.49	0.712	0.614	0.541	0.484
5	0.699	0.574	0.488	0.426	0.676	0.561	0.481	0.422	0.655	0.549	0.474	0.418
6	0.645	0.516	0.431	0.371	0.624	0.505	0.426	0.368	0.605	0.495	0.42	0.365
7	0.597	0.467	0.384	0.327	0.579	0.458	0.38	0.325	0.561	0.449	0.375	0.323
8	0.555	0.425	0.345	0.291	0.538	0.417	0.341	0.289	0.522	0.41	0.338	0.287
9	0.518	0.389	0.312	0.261	0.502	0.383	0.309	0.26	0.488	0.376	0.306	0.258
10	0.484	0.358	0.285	0.236	0.471	0.352	0.282	0.235	0.458	0.347	0.279	0.233

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	0.979	0.979	0.979	0.979	0.93	0.93	0.93	0.886	0.886	0.886	0.865
1	0.885	0.853	0.824	0.797	0.813	0.789	0.767	0.775	0.756	0.738	0.717
2	0.803	0.747	0.7	0.659	0.713	0.674	0.64	0.682	0.649	0.621	0.6
3	0.731	0.66	0.602	0.555	0.631	0.582	0.541	0.604	0.563	0.528	0.507
4	0.669	0.587	0.524	0.474	0.563	0.508	0.464	0.54	0.493	0.455	0.434
5	0.616	0.527	0.461	0.411	0.506	0.448	0.403	0.486	0.436	0.396	0.376
6	0.57	0.476	0.409	0.36	0.458	0.399	0.354	0.441	0.389	0.348	0.329
7	0.529	0.432	0.366	0.318	0.417	0.358	0.313	0.402	0.349	0.309	0.291
8	0.493	0.395	0.33	0.284	0.382	0.323	0.28	0.369	0.316	0.276	0.259
9	0.462	0.363	0.3	0.255	0.351	0.294	0.252	0.34	0.288	0.249	0.232
10	0.433	0.336	0.274	0.231	0.325	0.268	0.228	0.315	0.263	0.226	0.21

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

	0	45	90
0	6281	6281	6281
45	6231	6824	6827
55	4744	5658	5485
65	3206	4558	4398
75	2833	3674	4133
85	2837	3304	4458

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.

