LTL 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

Photometric Indoor Test Report

Relevant Standards
IES LM-9-2009, IES LM-41-1998
ANSI C78.81-2010, ANSI C82.1-2004, ANSI C82.11, ANSI C82.2, ANSI C82.77
IEC 60081, IEC 60901, IEC 61347-2-3

Prepared For
Renova Lighting Systems, Inc.
Rick Edwards
15 Wellstown Road
Ashaway, RI 02804

Catalog Number
ECS-SGI4-MN-132-UNV-11L

LTL Test Number
23041

Test Date

2011-04-13

Prepared By

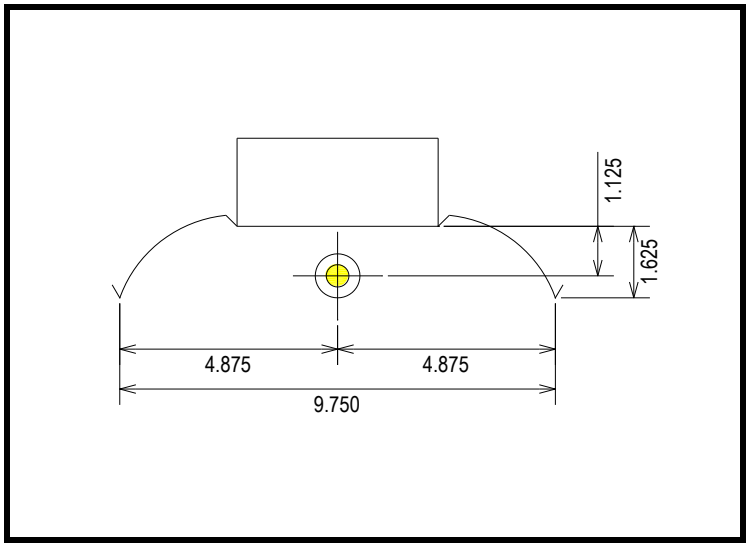
Zachary Mooney, Project Coordinator

Approved By

Brian Moyer, Engineer

Luminaire Description:	Formed white enamel steel housing, formed specular aluminum reflector, no enclosure
Catalog Number:	ECS-SGI4-MN-132-UNV-11L
Lamp:	One horizontal 32 Watt T8 linear fluorescent lamp rated at 2850 lumens
Lamp Catalog Number:	Philips F32T8/TL841/ALTO
Mounting:	Surface / Pendant
Ballast/Driver:	One Sylvania "Quicktronic" QHE-1X32T8/UNV-ISL-SC

Luminaire



Zonal Lumen Summary

Zone (Degrees)	Lumens	% of Lamp	% of Luminaire
0-30	704	24.7%	25.1%
0-40	1173	41.2%	41.8%
0-60	2142	75.2%	76.4%
0-90	2798	98.2%	99.8%
90-180	5	0.2%	0.2%
0-180	2803	98.4%	100.0%

Test Conditions

Test Temperature:	24.2	°C
Voltage:	120.0	VAC
Current:	0.2180	A
Power:	25.92	W
Power Factor:	0.991	
Frequency:	60	Hz

Summary of Results

Luminaire Efficiency: 98.4 %

Spacing Criterion: 0 Degree: 1.23 90 Degree: 1.04
180 Degree: 1.23 270 Degree: 1.04

CIE Type: Direct

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Candela Tabulation

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	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	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156	1156
5	1148	1125	1087	1031	1011	1031	1087	1125	1148	1125	1087	1031	1011	1031	1087	1125
10	1132	1048	893	817	811	817	893	1048	1132	1048	893	817	811	817	893	1048
15	1104	921	792	774	766	774	792	921	1104	921	792	774	766	774	792	921
20	1065	798	747	738	775	738	747	798	1065	798	747	738	775	738	747	798
25	1016	728	703	794	829	794	703	728	1016	728	703	794	829	794	703	728
30	956	683	735	808	813	808	735	683	956	683	735	808	813	808	735	683
35	886	620	749	786	814	786	749	620	886	620	749	786	814	786	749	620
40	808	564	703	768	777	768	703	564	808	564	703	768	777	768	703	564
45	720	558	680	710	715	710	680	558	720	558	680	710	715	710	680	558
50	627	537	625	630	614	630	625	537	627	537	625	630	614	630	625	537
55	530	477	550	502	488	502	550	477	530	477	550	502	488	502	550	477
60	429	425	439	408	414	408	439	425	429	425	439	408	414	408	439	425
65	329	361	331	322	326	322	331	361	329	361	331	322	326	322	331	361
70	230	280	249	298	325	298	249	280	230	280	249	298	325	298	249	280
75	137	173	219	297	325	297	219	173	137	173	219	297	325	297	219	173
80	60	107	205	211	209	211	205	107	60	107	205	211	209	211	205	107
85	12	87	82	67	62	67	82	87	12	87	82	67	62	67	82	87
90	0	15	6	0	0	0	6	15	0	15	6	0	0	0	6	15
95	0	11	4	0	0	0	4	11	0	11	4	0	0	0	4	11
100	0	6	3	0	0	0	3	6	0	6	3	0	0	0	3	6
105	0	2	1	0	0	0	1	2	0	2	1	0	0	0	1	2
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 (Degrees)	Lumens	Zone (Degrees)	Lumens	Zone (Degrees)	Lumens	Zone (Degrees)	Lumens
0-5	26.8	45-50	257.0	90-95	2.4	135-140	0
5-10	71.1	50-55	242.3	95-100	1.5	140-145	0
10-15	105.3	55-60	214.9	100-105	0.7	145-150	0
15-20	135.7	60-65	184.7	105-110	0.2	150-155	0
20-25	166.0	65-70	154.6	110-115	0	155-160	0
25-30	199.1	70-75	130.8	115-120	0	160-165	0
30-35	225.1	75-80	108.4	120-125	0	165-170	0
35-40	243.6	80-85	64.1	125-130	0	170-175	0
40-45	254.8	85-90	13.9	130-135	0	175-180	0

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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	1.199	1.199	1.199	1.199	1.170	1.170	1.170	1.170	1.143	1.143	1.143	1.143
1	1.091	1.036	0.987	0.943	1.062	1.012	0.967	0.927	1.035	0.990	0.949	0.912
2	0.990	0.897	0.820	0.757	0.962	0.877	0.807	0.747	0.936	0.858	0.793	0.738
3	0.901	0.784	0.694	0.623	0.875	0.767	0.683	0.617	0.850	0.751	0.674	0.611
4	0.824	0.691	0.596	0.524	0.799	0.677	0.588	0.520	0.776	0.664	0.581	0.516
5	0.757	0.616	0.519	0.449	0.734	0.604	0.513	0.446	0.713	0.593	0.507	0.443
6	0.698	0.553	0.457	0.390	0.677	0.543	0.453	0.388	0.658	0.533	0.448	0.386
7	0.646	0.500	0.407	0.343	0.627	0.491	0.403	0.342	0.610	0.483	0.400	0.340
8	0.600	0.455	0.366	0.305	0.584	0.448	0.363	0.304	0.568	0.441	0.359	0.303
9	0.560	0.417	0.331	0.274	0.545	0.411	0.328	0.273	0.531	0.405	0.326	0.272
10	0.524	0.384	0.302	0.248	0.511	0.379	0.300	0.247	0.498	0.373	0.298	0.246

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	1.092	1.092	1.092	1.092	1.045	1.045	1.045	1.002	1.002	1.002	0.982
1	0.984	0.947	0.913	0.882	0.908	0.880	0.855	0.872	0.850	0.829	0.808
2	0.886	0.822	0.768	0.721	0.790	0.744	0.704	0.759	0.721	0.688	0.665
3	0.803	0.721	0.655	0.600	0.693	0.637	0.589	0.668	0.620	0.578	0.556
4	0.733	0.639	0.566	0.509	0.615	0.552	0.501	0.593	0.539	0.494	0.472
5	0.674	0.571	0.496	0.438	0.551	0.485	0.433	0.533	0.475	0.428	0.406
6	0.622	0.515	0.439	0.382	0.498	0.430	0.379	0.482	0.422	0.375	0.354
7	0.578	0.468	0.392	0.337	0.453	0.385	0.335	0.439	0.378	0.332	0.312
8	0.539	0.428	0.354	0.301	0.415	0.348	0.299	0.403	0.342	0.297	0.277
9	0.504	0.393	0.321	0.270	0.382	0.316	0.269	0.372	0.312	0.267	0.249
10	0.474	0.363	0.293	0.245	0.354	0.289	0.244	0.345	0.286	0.243	0.225

Average Luminance Table (cd/m²)

Horizontal Angle (Degrees)

Vertical Angle (Degree)	0	45	90
0	7464	7464	7464
45	6282	4115	4425
55	5581	4062	3726
65	4546	3266	3379
75	2893	3408	5489
85	573	3132	3132

This test was conduted using photometry techniques according to standard IES procedures. The user must therefore use caution in the following situations: 1) This test was performed using a specific ballast/lamp combination. Extrapolation of this 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. This test was conducted in a controlled laboratory environment where the ambient temperature was held at 25^0C $\pm 1^0$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.

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Polar Plot (Candela)