



Lighting Sciences

An Advanced Lighting Technologies Joint Venture Company

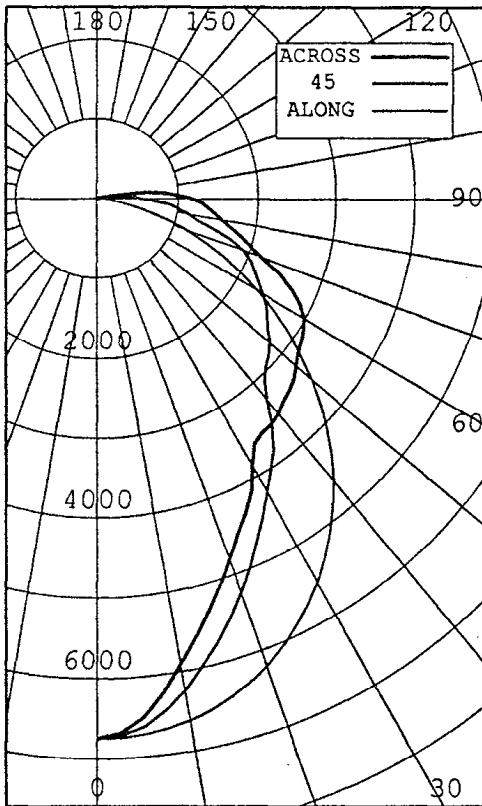
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CERTIFIED TEST REPORT NO. LSI 14194

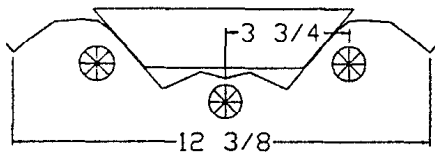
ENERGY SOLUTIONS 1 X 8 FLUORESCENT LUMINAIRE WITH SPECULAR REFLECTOR AND NO LENS

SIX PHILIPS 32 WATT LAMPS, CAT# F32T8/TL841. LUMEN RATING = 3000 LMS.
TWO ADVANCE REL-3P32-RH-TP BALLASTS OPERATING AT 120 VAC AND 180 WATTS

CANDLEPOWER SUMMARY OUTPUT LUMENS



ANGLE	ALONG	22.5	45	67.5	ACROSS	
0	6754	6754	6754	6754	6754	
5	6718	6663	6621	6559	6501	628
15	6442	6174	5729	5448	5329	1628
25	5886	5304	4697	4432	4351	2247
35	5096	4305	3822	3546	3564	2505
45	4080	3262	2959	3267	3378	2557
55	2905	2286	2575	2975	3110	2425
65	1708	1521	2159	2602	2681	2081
75	683	1021	1478	1734	1832	1460
85	134	446	902	1262	1380	902
90	8	145	534	1042	1155	
95	0	35	400	716	824	410
105	0	0	0	0	5	30
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0



ZONE	LUMENS	% LAMP	% LUMINAIRE
0-30	4502	25.01	26.69
0-40	7007	38.93	41.53
0-60	11989	66.61	71.06
0-90	16431	91.29	97.39
40-90	9424	52.36	55.86
60-90	4442	24.68	26.33
90-180	439	2.44	2.61
0-180	16871	93.73	100.00

** EFFICIENCY = 93.7% **

LUMINANCE SUMMARY - CD./SQ.M.

ANGLE	ALONG	45	ACROSS
45	7607	5542	6344
55	6676	5960	7217
65	5328	6807	8432
75	3480	7516	8244
85	2031	7718	9121

S/MH = .9
SC(ALONG) = 1.2, SC(ACROSS) = .9

CERTIFIED BY:

DATE:
JUN 22, 1999

PREPARED FOR:

ENERGY MASTERS
ST. PAUL, MN

TESTED IN ACCORDANCE TO IES PROCEDURES.

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COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	80				70				50				30				10				0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																					
0	1.111	1.111	1.111	1.11	1.081	1.081	1.081	1.08	1.031	1.031	1.03	.98	.98	.98	.93	.93	.93	.91			
1	1.01	.96	.92	.88	.98	.94	.90	.86	.89	.86	.83	.85	.82	.80	.81	.79	.77	.75			
2	.91	.84	.77	.71	.89	.82	.75	.70	.78	.73	.68	.74	.70	.66	.71	.68	.65	.62			
3	.84	.74	.66	.60	.81	.72	.65	.59	.69	.63	.58	.66	.61	.57	.63	.59	.55	.53			
4	.77	.66	.57	.51	.75	.64	.57	.50	.61	.55	.50	.59	.53	.49	.57	.52	.48	.46			
5	.70	.58	.50	.43	.68	.57	.49	.43	.55	.47	.42	.52	.46	.41	.50	.45	.41	.39			
6	.65	.52	.44	.38	.63	.51	.43	.37	.49	.42	.37	.47	.41	.36	.46	.40	.36	.34			
7	.60	.47	.39	.33	.58	.46	.38	.33	.44	.37	.32	.43	.37	.32	.41	.36	.31	.30			
8	.55	.42	.34	.29	.54	.42	.34	.29	.40	.33	.28	.39	.32	.28	.37	.32	.28	.26			
9	.51	.38	.30	.25	.50	.38	.30	.25	.36	.29	.25	.35	.29	.24	.34	.28	.24	.22			
10	.47	.35	.27	.22	.46	.34	.27	.22	.33	.27	.22	.32	.26	.22	.31	.26	.21	.20			

LUMINAIRE INPUT WATTS = 180.0

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.

BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

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AVERAGE LUMINANCE DATA

ANGLE	ALONG	CD./SQ.M.		(FOOTLAMBERTS)		ACROSS
		22.5	45	67.5		
0	8904 (2598)	8904 (2598)	8904 (2598)	8904 (2598)	8904 (2598)	8904 (2598)
30	8409 (2454)	7363 (2149)	6440 (1879)	6109 (1783)	5831 (1702)	5831 (1702)
40	7934 (2315)	6491 (1894)	5626 (1642)	5924 (1729)	6054 (1767)	6054 (1767)
45	7607 (2220)	6089 (1777)	5542 (1617)	6132 (1789)	6344 (1851)	6344 (1851)
50	7183 (2096)	5695 (1662)	5750 (1678)	6514 (1901)	6653 (1942)	6653 (1942)
55	6676 (1948)	5249 (1532)	5960 (1739)	6885 (2009)	7217 (2106)	7217 (2106)
60	6050 (1765)	4793 (1398)	6257 (1826)	7547 (2202)	7937 (2316)	7937 (2316)
65	5328 (1555)	4768 (1391)	6807 (1986)	8197 (2392)	8432 (2461)	8432 (2461)
70	4456 (1300)	4855 (1417)	7512 (2192)	8235 (2403)	8340 (2434)	8340 (2434)
75	3480 (1015)	5250 (1532)	7516 (2193)	8074 (2356)	8244 (2406)	8244 (2406)
80	2565 (748)	5701 (1664)	7336 (2141)	8181 (2387)	8466 (2470)	8466 (2470)
85	2031 (592)	5533 (1615)	7718 (2252)	8861 (2586)	9121 (2662)	9121 (2662)

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CANDLEPOWER DATA

ANGLE	PLANE						OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS	AVERAGE	
0	6754	6754	6754	6754	6754	6754	
5	6718	6663	6621	6559	6501	6613	628
10	6615	6483	6237	6010	5902	6247	
15	6442	6174	5729	5448	5329	5809	1628
20	6205	5771	5226	4899	4781	5347	
25	5886	5304	4697	4432	4351	4888	2247
30	5524	4823	4221	4013	3842	4435	
35	5096	4305	3822	3546	3564	4001	2505
40	4610	3761	3275	3424	3502	3629	
45	4080	3262	2959	3267	3378	3304	2557
50	3502	2770	2791	3159	3237	3022	
55	2905	2286	2575	2975	3110	2711	2425
60	2294	1813	2364	2831	2980	2411	
65	1708	1521	2159	2602	2681	2119	2081
70	1156	1251	1929	2134	2173	1745	
75	683	1021	1478	1734	1832	1373	1460
80	338	745	1130	1440	1557	1066	
85	134	446	902	1262	1380	842	902
90	8	145	534	1042	1155	576	
95	0	35	400	716	824	391	410
100	0	0	32	289	378	128	
105	0	0	0	0	5	1	30
110	0	0	0	0	0	0	
115	0	0	0	0	0	0	0
120	0	0	0	0	0	0	
125	0	0	0	0	0	0	0
130	0	0	0	0	0	0	
135	0	0	0	0	0	0	0
140	0	0	0	0	0	0	
145	0	0	0	0	0	0	0
150	0	0	0	0	0	0	
155	0	0	0	0	0	0	0
160	0	0	0	0	0	0	
165	0	0	0	0	0	0	0
170	0	0	0	0	0	0	
175	0	0	0	0	0	0	0
180	0	0	0	0	0	0	