



UL Verification Services Inc.  
7036 Snowdrift Road  
Allentown, PA 18106  
610-774-1300

## Integrating Sphere Test Report

Relevant Standards  
IES LM-79-2008  
ANSI C78.377-2011, ANSI C82.77-2002  
CIE 13.3-1995, CIE 15-2004

Prepared For  
Elemental LED Inc, DBA Diode LED  
Wes Buck  
Suite 211, 1195 Park Ave.  
Emeryville, CA 94608  
United States

Catalog Number  
TRIAN™ 12V LED PUCK LIGHT DI-0333-XX

Order Number  
10461972  
Test Number  
748176

Test Date  
2014-09-22

Prepared By

*Javier Caban*

Javier Caban, Technician

Approved By

*Eric M. Gaudreau*

Eric Gaudreau, Engineering Project Handler

The results contained in this report pertain only to the tested sample.  
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Luminaire Description: Aluminum housing, no enclosure  
Catalog Number: TRIANT™ 12V LED PUCK LIGHT DI-0333-XX  
Lamp: Three white LEDs  
Mounting: Surface  
Ballast/Driver: One Meanwell LPV-60-12

Luminaire



#### Summary of Results

Radiant Flux:	1115 mW
Luminous Flux:	344.3 Lumens
Luminaire Efficacy:	66.9 Lumens/Watt
CCT:	6384 K
CRI (Ra):	74.5
Chromaticity (x):	0.3132
Chromaticity (y):	0.3424
Chromaticity (u):	0.1933
Chromaticity (v):	0.3169
Duv:	0.0095

#### Test Conditions

Test Temperature:	25.1 °C
Voltage:	120.0 VAC
Current:	0.1023 A
Power:	5.150 W
Power Factor:	0.419
Frequency:	60 Hz
Current THD:	191 %

Testing was performed in a 1-meter integrating sphere using the 4 $\pi$  geometry method.

Absorption correction was employed for this measurement.

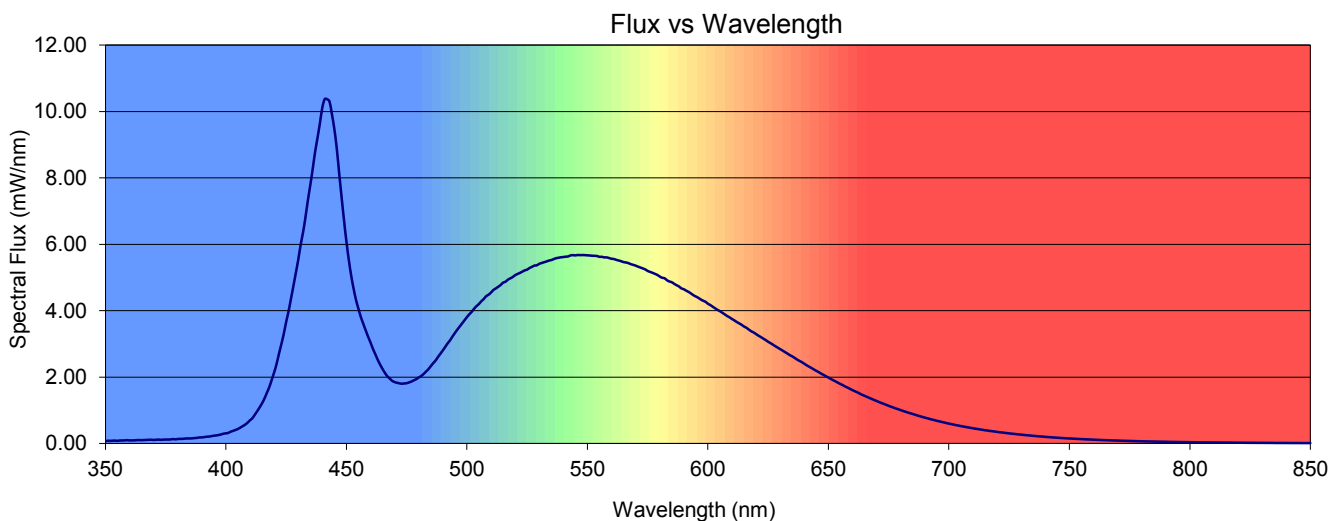
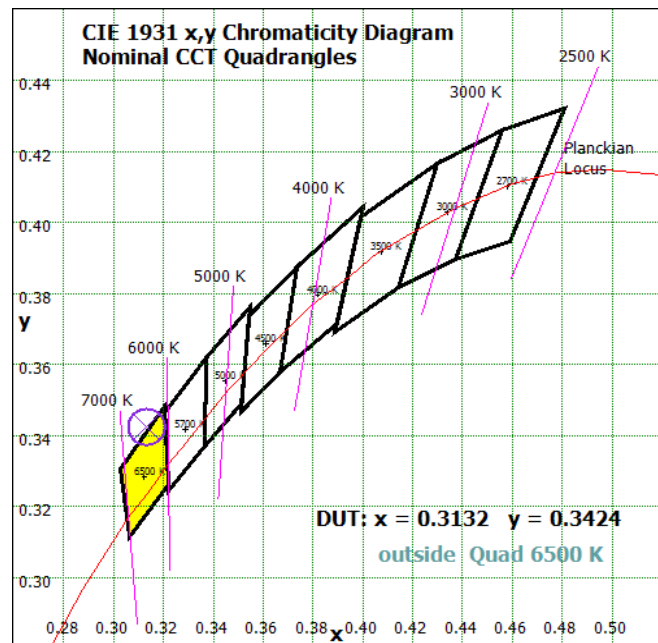
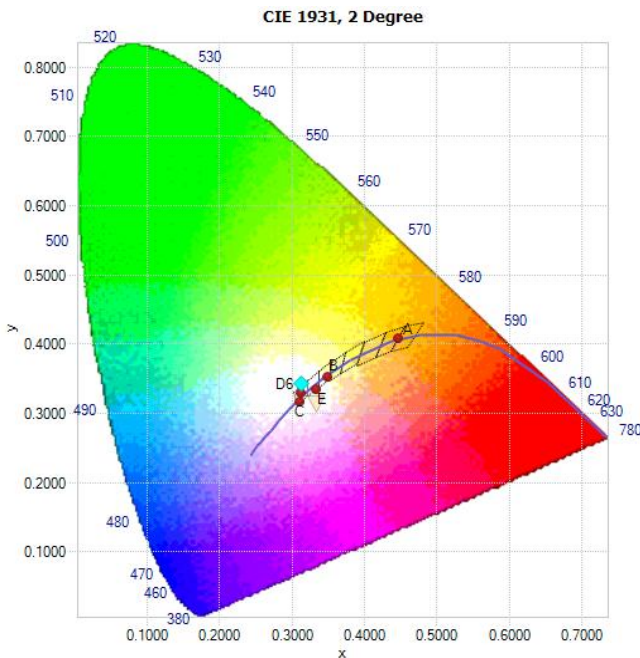


Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.3132	0.3424	0.1933	0.3169	0.1933	0.4754	0.0095

Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
74.5	71.4	76.3	82.1	75.7	74.2	71.5	80.9	63.6	-18.9	46.4	76.1	58.6	71.2	90.1





Spectral Power Distribution

λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm
350	0.0699	422	2.70	494	3.22	566	5.45	638	2.49	710	0.460	782	0.0631		
351	0.0838	423	2.99	495	3.32	567	5.43	639	2.45	711	0.446	783	0.0613		
352	0.0806	424	3.30	496	3.43	568	5.40	640	2.40	712	0.436	784	0.0600		
353	0.0849	425	3.66	497	3.52	569	5.38	641	2.36	713	0.423	785	0.0589		
354	0.0885	426	3.98	498	3.62	570	5.36	642	2.31	714	0.412	786	0.0580		
355	0.0814	427	4.36	499	3.71	571	5.33	643	2.27	715	0.400	787	0.0563		
356	0.0917	428	4.74	500	3.80	572	5.30	644	2.23	716	0.391	788	0.0545		
357	0.0914	429	5.13	501	3.89	573	5.27	645	2.19	717	0.379	789	0.0530		
358	0.0937	430	5.52	502	3.96	574	5.24	646	2.15	718	0.371	790	0.0522		
359	0.101	431	5.98	503	4.06	575	5.20	647	2.10	719	0.360	791	0.0503		
360	0.0932	432	6.35	504	4.14	576	5.17	648	2.07	720	0.351	792	0.0489		
361	0.0939	433	6.80	505	4.20	577	5.14	649	2.03	721	0.340	793	0.0474		
362	0.0963	434	7.31	506	4.28	578	5.11	650	1.99	722	0.333	794	0.0466		
363	0.101	435	7.77	507	4.35	579	5.08	651	1.95	723	0.323	795	0.0453		
364	0.105	436	8.25	508	4.44	580	5.03	652	1.91	724	0.314	796	0.0439		
365	0.100	437	8.77	509	4.48	581	4.99	653	1.87	725	0.306	797	0.0430		
366	0.105	438	9.20	510	4.55	582	4.98	654	1.83	726	0.297	798	0.0420		
367	0.108	439	9.64	511	4.62	583	4.92	655	1.79	727	0.290	799	0.0411		
368	0.113	440	10.1	512	4.67	584	4.88	656	1.76	728	0.282	800	0.0400		
369	0.114	441	10.4	513	4.72	585	4.86	657	1.72	729	0.274	801	0.0393		
370	0.108	442	10.4	514	4.77	586	4.81	658	1.68	730	0.267	802	0.0378		
371	0.112	443	10.3	515	4.84	587	4.77	659	1.64	731	0.259	803	0.0371		
372	0.119	444	9.92	516	4.87	588	4.73	660	1.61	732	0.252	804	0.0359		
373	0.112	445	9.47	517	4.93	589	4.67	661	1.57	733	0.245	805	0.0346		
374	0.117	446	8.89	518	4.97	590	4.65	662	1.54	734	0.238	806	0.0344		
375	0.120	447	8.15	519	5.01	591	4.60	663	1.50	735	0.231	807	0.0338		
376	0.119	448	7.42	520	5.07	592	4.56	664	1.47	736	0.226	808	0.0332		
377	0.123	449	6.73	521	5.11	593	4.52	665	1.44	737	0.219	809	0.0325		
378	0.133	450	6.09	522	5.14	594	4.47	666	1.40	738	0.213	810	0.0317		
379	0.127	451	5.53	523	5.18	595	4.43	667	1.37	739	0.208	811	0.0304		
380	0.136	452	5.05	524	5.21	596	4.39	668	1.34	740	0.201	812	0.0297		
381	0.140	453	4.66	525	5.24	597	4.34	669	1.31	741	0.195	813	0.0292		
382	0.140	454	4.32	526	5.29	598	4.30	670	1.28	742	0.190	814	0.0282		
383	0.149	455	4.06	527	5.32	599	4.27	671	1.25	743	0.185	815	0.0279		
384	0.152	456	3.81	528	5.36	600	4.21	672	1.22	744	0.179	816	0.0271		
385	0.153	457	3.61	529	5.37	601	4.17	673	1.19	745	0.175	817	0.0269		
386	0.156	458	3.41	530	5.41	602	4.12	674	1.17	746	0.169	818	0.0262		
387	0.164	459	3.22	531	5.43	603	4.07	675	1.14	747	0.165	819	0.0258		
388	0.169	460	3.04	532	5.46	604	4.02	676	1.11	748	0.161	820	0.0252		
389	0.183	461	2.85	533	5.48	605	3.99	677	1.08	749	0.156	821	0.0242		
390	0.184	462	2.69	534	5.51	606	3.94	678	1.06	750	0.152	822	0.0236		
391	0.194	463	2.52	535	5.52	607	3.89	679	1.03	751	0.149	823	0.0228		
392	0.204	464	2.38	536	5.55	608	3.84	680	1.01	752	0.144	824	0.0217		
393	0.208	465	2.24	537	5.58	609	3.80	681	0.981	753	0.140	825	0.0218		
394	0.222	466	2.13	538	5.59	610	3.75	682	0.957	754	0.137	826	0.0212		
395	0.235	467	2.03	539	5.61	611	3.71	683	0.932	755	0.133	827	0.0211		
396	0.243	468	1.96	540	5.62	612	3.66	684	0.911	756	0.129	828	0.0204		
397	0.257	469	1.89	541	5.63	613	3.62	685	0.890	757	0.125	829	0.0201		
398	0.273	470	1.85	542	5.63	614	3.58	686	0.866	758	0.123	830	0.0202		
399	0.296	471	1.83	543	5.66	615	3.52	687	0.843	759	0.119	831	0.0194		
400	0.307	472	1.81	544	5.67	616	3.49	688	0.822	760	0.116	832	0.0188		
401	0.320	473	1.80	545	5.67	617	3.43	689	0.802	761	0.112	833	0.0188		
402	0.357	474	1.81	546	5.68	618	3.38	690	0.780	762	0.109	834	0.0181		
403	0.381	475	1.82	547	5.67	619	3.34	691	0.762	763	0.106	835	0.0175		
404	0.409	476	1.84	548	5.68	620	3.30	692	0.740	764	0.103	836	0.0162		
405	0.439	477	1.87	549	5.67	621	3.25	693	0.722	765	0.101	837	0.0169		
406	0.479	478	1.90	550	5.67	622	3.21	694	0.706	766	0.0985	838	0.0166		
407	0.524	479	1.94	551	5.66	623	3.16	695	0.684	767	0.0957	839	0.0158		
408	0.569	480	1.99	552	5.66	624	3.12	696	0.668	768	0.0928	840	0.0160		
409	0.627	481	2.03	553	5.65	625	3.06	697	0.651	769	0.0903	841	0.0151		
410	0.700	482	2.09	554	5.65	626	3.02	698	0.635	770	0.0881	842	0.0149		
411	0.762	483	2.16	555	5.62	627	2.98	699	0.616	771	0.0856	843	0.0147		
412	0.867	484	2.23	556	5.62	628	2.93	700	0.600	772	0.0830	844	0.0145		
413	0.974	485	2.33	557	5.60	629	2.89	701	0.585	773	0.0807	845	0.0141		
414	1.09	486	2.42	558	5.61	630	2.84	702	0.569	774	0.0794	846	0.0135		
415	1.21	487	2.50	559	5.59	631	2.80	703	0.554	775	0.0771	847	0.0133		
416	1.35	488	2.60	560	5.56	632	2.75	704	0.540	776	0.0752	848	0.0127		
417	1.53	489	2.70	561	5.56	633	2.71	705	0.526	777	0.0729	849	0.0133		
418	1.70	490	2.80	562	5.53	634	2.66	706	0.512	778	0.0710	850	0.0128		
419	1.91	491	2.91	563	5.51	635	2.62	707	0.498	779	0.0687				
420	2.14	492	3.01	564	5.49	636	2.58	708	0.486	780	0.0674				
421	2.39	493	3.11	565	5.46	637	2.53	709	0.472	781	0.0650				



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## Photometric Indoor Test Report

Relevant Standards  
IES LM-79-2008  
ANSI C82.77-2002

Prepared For  
Elemental LED Inc, DBA Diode LED  
Wes Buck  
Suite 211, 1195 Park Ave.  
Emeryville, CA 94608  
United States

Catalog Number  
TRIAN<sup>TM</sup> 12V LED PUCK LIGHT DI-0333-XX  
Project Number  
10461972  
Test Number  
748175

Test Date

2014-09-18

Prepared By

A handwritten signature in black ink that reads "Javier Caban".

Javier Caban, Technician

Approved By

A handwritten signature in black ink that reads "Eric M. Gaudreau".

Eric Gaudreau, Engineering Project Handler

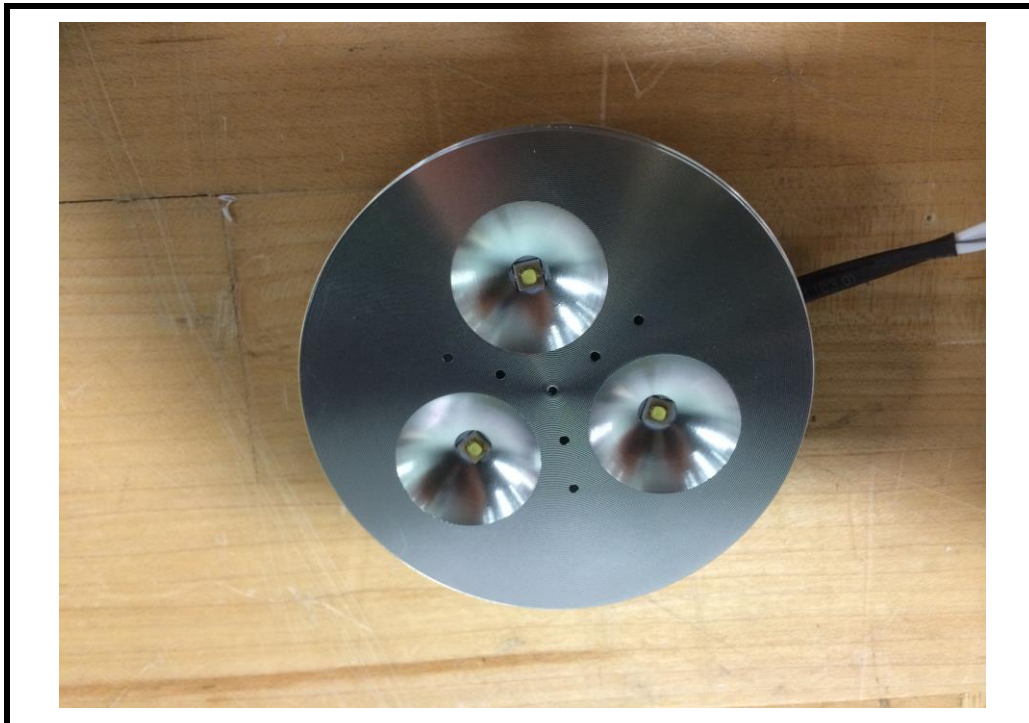
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Luminaire Description: Aluminum housing, no enclosure  
Catalog Number: TRIANT™ 12V LED PUCK LIGHT DI-0333-XX  
Lamp: Three white LEDs  
Mounting: Surface  
Ballast/Driver: One Meanwell LPV-60-12

Luminaire

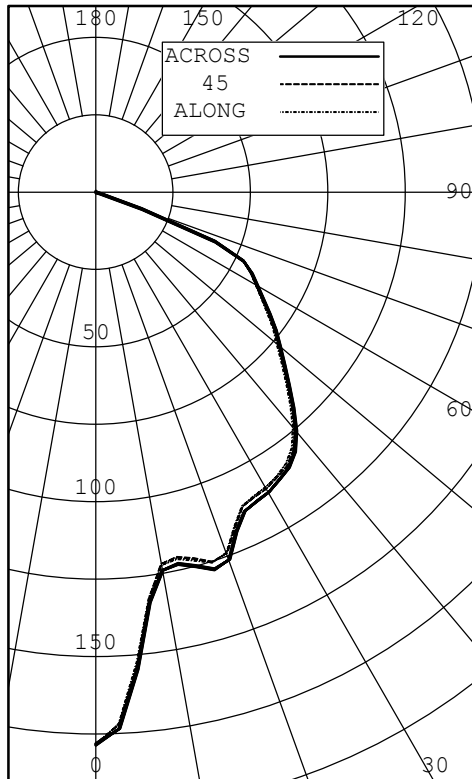


#### Test Conditions

Test Temperature:	24.7 °C
Voltage:	120.0 VAC
Current:	0.09699 A
Power:	5.164 W
Power Factor:	0.444
Frequency:	60 Hz
Current THD:	180 %



INTENSITY (CANDLEPOWER) SUMMARY OUTPUT LUMENS



ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	178	178	178	178	178	
5	152	154	154	154	155	14
10	123	124	122	123	124	
15	123	125	123	124	125	35
20	124	125	124	125	126	
25	112	113	112	113	114	53
30	110	112	111	111	112	
35	107	109	108	108	109	67
40	99	101	100	100	101	
45	87	89	88	88	88	68
50	77	78	78	77	78	
55	68	69	68	68	69	61
60	60	61	60	59	60	
65	53	54	53	52	53	47
70	15	16	15	15	16	
75	0	0	0	0	0	3
80	0	0	0	0	0	
85	0	0	0	0	0	0
90	0	0	0	0	0	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	102	29.31
0-40	169	48.61
0-60	298	85.81
0-90	348	100.00
40-90	179	51.39
60-90	49	14.19
90-180	0	0.00
0-180	348	100.00

EFFICACY (LUMENS PER WATT): 66.9

\*\*\* THIS IS AN ABSOLUTE TEST \*\*\*

LUMINOUS DIAMETER: 1.875 INS

LUMINANCE SUMMARY CD./SQ.M.

S/MH: 0.9  
 SC: 0.9

ANGLE	ALONG	45	ACROSS
45	69106	70327	70287
55	66208	67247	67345
65	70066	70114	70334
75	650	651	653
85	644	968	646

TESTED IN ACCORDANCE WITH IES PROCEDURES.



INTENSITY (CANDLEPOWER) DATA  
 IN 2.5 DEGREE STEPS

ANGLE	PLANE						OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS	AVERAGE	
0.0	178	178	178	178	178	178	
2.5	172	173	172	172	174	173	
5.0	152	154	154	154	155	154	14
7.5	132	134	132	133	134	133	
10.0	123	124	122	123	124	123	
12.5	121	123	121	122	123	122	
15.0	123	125	123	124	125	124	35
17.5	126	127	125	126	128	126	
20.0	124	125	124	125	126	125	
22.5	117	119	117	118	119	118	
25.0	112	113	112	113	114	113	53
27.5	111	112	111	112	113	112	
30.0	110	112	111	111	112	111	
32.5	109	111	109	110	110	110	
35.0	107	109	108	108	109	108	67
37.5	104	106	105	105	106	105	
40.0	99	101	100	100	101	100	
42.5	93	95	94	94	95	94	
45.0	87	89	88	88	88	88	68
47.5	82	83	83	82	83	83	
50.0	77	78	78	77	78	77	
52.5	72	73	73	73	73	73	
55.0	68	69	68	68	69	68	61
57.5	63	65	64	63	64	64	
60.0	60	61	60	59	60	60	
62.5	56	58	57	56	57	57	
65.0	53	54	53	52	53	53	47
67.5	42	43	41	41	42	42	
70.0	15	16	15	15	16	16	
72.5	2	2	1	2	2	2	
75.0	0	0	0	0	0	0	3
77.5	0	0	0	0	0	0	
80.0	0	0	0	0	0	0	
82.5	0	0	0	0	0	0	
85.0	0	0	0	0	0	0	0
87.5	0	0	0	0	0	0	
90.0	0	0	0	0	0	0	





COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50				30				10				0	
	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0	
RCR	0	1.221	.221	.221	.22	1.191	.191	.191	.19	1.161	.161	.161	.16	1.111	.111	.111	.11	1.061	.061	.061	.06	1.021	.021	.021	.02	1.00
	1	1.141	.091	.061	.03	1.111	.071	.041	.01	1.091	.051	.020	.99	1.010	.980	.96	0.970	.950	.93	0.940	.920	.90	0.89			
	2	1.050	.980	.930	.87	1.030	.960	.910	.86	1.010	.940	.890	.85	0.910	.870	.83	0.880	.850	.81	0.850	.820	.80	0.78			
	3	0.970	.870	.800	.74	0.950	.860	.790	.73	0.930	.840	.780	.73	0.820	.760	.72	0.790	.740	.70	0.770	.730	.69	0.67			
	4	0.900	.780	.700	.64	0.870	.770	.690	.63	0.850	.760	.690	.63	0.730	.670	.62	0.710	.660	.61	0.690	.640	.61	0.59			
	5	0.830	.700	.610	.55	0.800	.690	.610	.55	0.780	.680	.600	.54	0.660	.590	.54	0.640	.580	.53	0.620	.570	.53	0.51			
	6	0.760	.630	.540	.48	0.740	.620	.530	.47	0.720	.610	.530	.47	0.590	.520	.47	0.570	.510	.46	0.560	.500	.46	0.44			
	7	0.690	.560	.470	.42	0.680	.550	.470	.41	0.660	.540	.460	.41	0.530	.450	.41	0.510	.450	.40	0.500	.440	.40	0.38			
	8	0.640	.510	.420	.36	0.630	.500	.420	.36	0.610	.490	.410	.36	0.480	.410	.36	0.470	.400	.35	0.450	.400	.35	0.33			
	9	0.600	.460	.370	.32	0.580	.450	.370	.32	0.570	.450	.370	.32	0.430	.360	.32	0.420	.360	.31	0.410	.350	.31	0.29			
	10	0.550	.420	.330	.28	0.540	.410	.330	.28	0.530	.410	.330	.28	0.400	.330	.28	0.390	.320	.28	0.380	.320	.28	0.26			

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS  
 BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN.  
 LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD  
 THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.  
 BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST  
 LUMINOUS OPENING OF LUMINAIRE.



## Cone of Light

**Cone Of Light Tabulation**

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	11.1	3.48
6.00	4.94	5.22
8.00	2.78	6.96
10.0	1.78	8.71
12.0	1.23	10.4
14.0	0.907	12.2
16.0	0.695	13.9

**Cone of Light Plot**

