



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
HYDROLUME™ Plus 24V LED Strip Light DI-24V-HLP65-80-XX

Order Number
10460077
Test Number
758968

Test Date
2014-09-26

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: LED strip
Catalog Number: HYDROLUME™ Plus 24V LED Strip Light DI-24V-HLP65-80-XX
Lamp: 12 white LEDs
Mounting: Surface
Ballast/Driver: One Meanwell LPV-60-24

Luminaire



Summary of Results

Radiant Flux:	576.6 mW
Luminous Flux:	180.7 Lumens
Luminaire Efficacy:	55.1 Lumens/Watt
CCT:	6362 K
CRI (Ra):	74.7
Chromaticity (x):	0.3150
Chromaticity (y):	0.3315
Chromaticity (u):	0.1985
Chromaticity (v):	0.3133
Duv:	0.0032

Test Conditions

Test Temperature:	24.9 °C
Voltage:	120.0 VAC
Current:	0.07079 A
Power:	3.280 W
Power Factor:	0.386
Frequency:	60 Hz
Current THD:	186 %

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

Absorption correction was employed for this measurement.

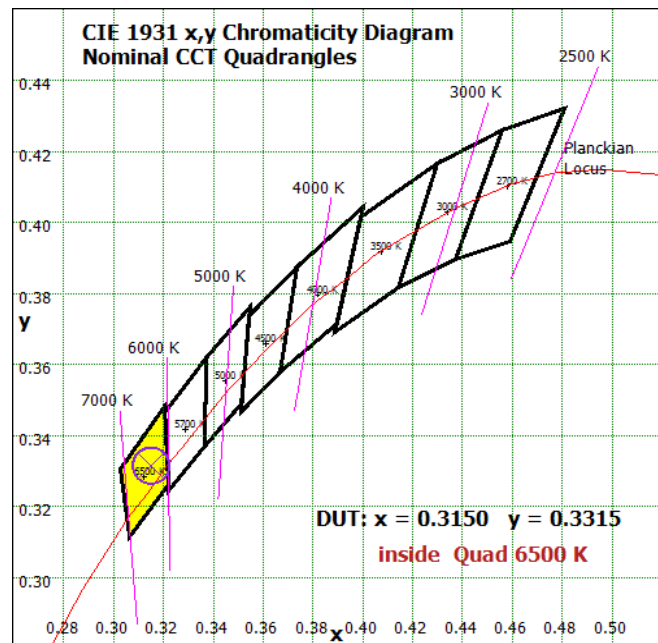
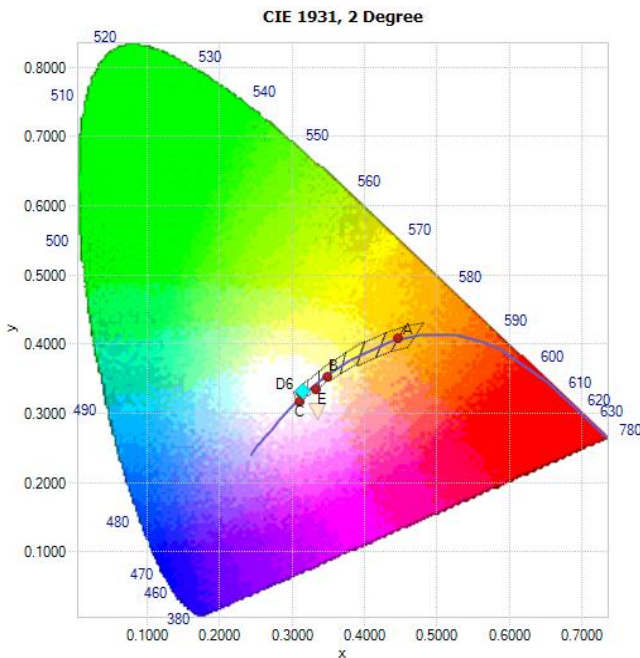


Chromaticity Coordinates

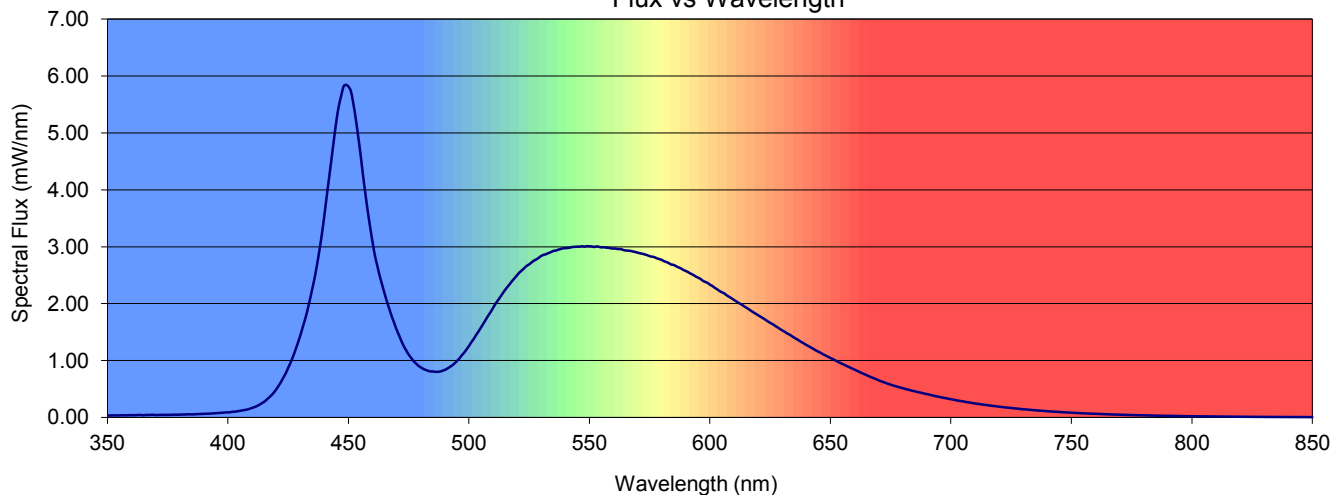
x	y	u	v	u'	v'	Duv
0.3150	0.3315	0.1985	0.3133	0.1985	0.4700	0.0032

Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
74.7	73.0	77.8	79.3	75.9	73.9	69.4	83.3	65.1	-13.8	45.6	73.1	44.9	73.5	88.3



Flux vs Wavelength





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	0.0306	422	0.621	494	0.950	566	2.93	638	1.33	710	0.247	782	0.0358		
351	0.0372	423	0.701	495	0.991	567	2.93	639	1.30	711	0.240	783	0.0344		
352	0.0361	424	0.776	496	1.04	568	2.92	640	1.27	712	0.235	784	0.0342		
353	0.0384	425	0.871	497	1.09	569	2.91	641	1.25	713	0.229	785	0.0334		
354	0.0362	426	0.963	498	1.14	570	2.90	642	1.23	714	0.223	786	0.0325		
355	0.0373	427	1.07	499	1.19	571	2.89	643	1.20	715	0.218	787	0.0315		
356	0.0394	428	1.18	500	1.25	572	2.88	644	1.18	716	0.212	788	0.0308		
357	0.0382	429	1.31	501	1.32	573	2.86	645	1.16	717	0.206	789	0.0301		
358	0.0397	430	1.43	502	1.38	574	2.85	646	1.14	718	0.201	790	0.0291		
359	0.0414	431	1.58	503	1.45	575	2.83	647	1.11	719	0.196	791	0.0289		
360	0.0405	432	1.72	504	1.51	576	2.83	648	1.09	720	0.190	792	0.0278		
361	0.0417	433	1.88	505	1.58	577	2.82	649	1.07	721	0.186	793	0.0271		
362	0.0418	434	2.07	506	1.65	578	2.80	650	1.05	722	0.180	794	0.0266		
363	0.0448	435	2.26	507	1.72	579	2.78	651	1.03	723	0.176	795	0.0259		
364	0.0440	436	2.45	508	1.79	580	2.77	652	1.00	724	0.172	796	0.0250		
365	0.0395	437	2.69	509	1.85	581	2.74	653	0.983	725	0.168	797	0.0246		
366	0.0457	438	2.94	510	1.92	582	2.73	654	0.961	726	0.163	798	0.0238		
367	0.0446	439	3.22	511	1.99	583	2.71	655	0.941	727	0.158	799	0.0232		
368	0.0469	440	3.54	512	2.06	584	2.69	656	0.921	728	0.154	800	0.0227		
369	0.0480	441	3.88	513	2.11	585	2.68	657	0.901	729	0.150	801	0.0223		
370	0.0441	442	4.21	514	2.18	586	2.66	658	0.881	730	0.145	802	0.0211		
371	0.0445	443	4.54	515	2.24	587	2.64	659	0.861	731	0.143	803	0.0209		
372	0.0464	444	4.88	516	2.29	588	2.62	660	0.842	732	0.138	804	0.0202		
373	0.0457	445	5.21	517	2.35	589	2.59	661	0.822	733	0.134	805	0.0198		
374	0.0460	446	5.47	518	2.40	590	2.57	662	0.802	734	0.131	806	0.0196		
375	0.0475	447	5.65	519	2.45	591	2.55	663	0.781	735	0.127	807	0.0191		
376	0.0475	448	5.82	520	2.50	592	2.53	664	0.763	736	0.124	808	0.0186		
377	0.0475	449	5.84	521	2.55	593	2.51	665	0.745	737	0.120	809	0.0184		
378	0.0502	450	5.81	522	2.58	594	2.48	666	0.725	738	0.117	810	0.0179		
379	0.0491	451	5.74	523	2.63	595	2.46	667	0.708	739	0.114	811	0.0172		
380	0.0499	452	5.53	524	2.66	596	2.44	668	0.690	740	0.111	812	0.0168		
381	0.0534	453	5.26	525	2.69	597	2.41	669	0.673	741	0.108	813	0.0163		
382	0.0526	454	4.96	526	2.72	598	2.38	670	0.654	742	0.105	814	0.0162		
383	0.0552	455	4.64	527	2.76	599	2.37	671	0.638	743	0.102	815	0.0155		
384	0.0553	456	4.28	528	2.78	600	2.33	672	0.622	744	0.0996	816	0.0152		
385	0.0556	457	3.95	529	2.81	601	2.31	673	0.607	745	0.0969	817	0.0147		
386	0.0552	458	3.63	530	2.84	602	2.28	674	0.592	746	0.0939	818	0.0145		
387	0.0596	459	3.35	531	2.86	603	2.25	675	0.578	747	0.0916	819	0.0143		
388	0.0610	460	3.09	532	2.87	604	2.22	676	0.564	748	0.0890	820	0.0136		
389	0.0629	461	2.85	533	2.89	605	2.20	677	0.552	749	0.0868	821	0.0137		
390	0.0641	462	2.67	534	2.90	606	2.18	678	0.539	750	0.0844	822	0.0130		
391	0.0665	463	2.49	535	2.93	607	2.15	679	0.527	751	0.0822	823	0.0128		
392	0.0680	464	2.33	536	2.93	608	2.12	680	0.516	752	0.0798	824	0.0127		
393	0.0699	465	2.18	537	2.95	609	2.09	681	0.502	753	0.0781	825	0.0120		
394	0.0732	466	2.04	538	2.96	610	2.06	682	0.492	754	0.0758	826	0.0118		
395	0.0763	467	1.90	539	2.97	611	2.04	683	0.481	755	0.0740	827	0.0116		
396	0.0795	468	1.78	540	2.98	612	2.01	684	0.470	756	0.0723	828	0.0113		
397	0.0812	469	1.66	541	2.98	613	1.99	685	0.461	757	0.0703	829	0.0111		
398	0.0852	470	1.54	542	2.98	614	1.96	686	0.450	758	0.0684	830	0.0109		
399	0.0889	471	1.45	543	3.00	615	1.93	687	0.441	759	0.0668	831	0.0103		
400	0.0905	472	1.34	544	3.00	616	1.91	688	0.432	760	0.0655	832	0.0102		
401	0.0934	473	1.25	545	3.00	617	1.88	689	0.421	761	0.0639	833	0.0100		
402	0.101	474	1.18	546	3.00	618	1.85	690	0.411	762	0.0620	834	0.00982		
403	0.103	475	1.11	547	3.01	619	1.82	691	0.403	763	0.0600	835	0.00946		
404	0.111	476	1.05	548	3.00	620	1.80	692	0.392	764	0.0582	836	0.00946		
405	0.117	477	0.993	549	3.01	621	1.77	693	0.382	765	0.0573	837	0.00913		
406	0.125	478	0.951	550	3.01	622	1.75	694	0.373	766	0.0552	838	0.00892		
407	0.133	479	0.911	551	3.01	623	1.72	695	0.363	767	0.0538	839	0.00880		
408	0.141	480	0.883	552	3.00	624	1.69	696	0.355	768	0.0518	840	0.00896		
409	0.153	481	0.856	553	3.01	625	1.66	697	0.346	769	0.0514	841	0.00832		
410	0.168	482	0.837	554	3.00	626	1.64	698	0.339	770	0.0498	842	0.00830		
411	0.182	483	0.821	555	2.99	627	1.61	699	0.329	771	0.0481	843	0.00793		
412	0.201	484	0.810	556	2.99	628	1.59	700	0.322	772	0.0472	844	0.00783		
413	0.223	485	0.809	557	2.98	629	1.56	701	0.314	773	0.0460	845	0.00796		
414	0.249	486	0.804	558	2.98	630	1.53	702	0.305	774	0.0447	846	0.00738		
415	0.275	487	0.802	559	2.97	631	1.51	703	0.297	775	0.0433	847	0.00779		
416	0.310	488	0.808	560	2.97	632	1.48	704	0.290	776	0.0419	848	0.00743		
417	0.349	489	0.820	561	2.97	633	1.46	705	0.284	777	0.0411	849	0.00688		
418	0.388	490	0.836	562	2.96	634	1.43	706	0.275	778	0.0400	850	0.00671		
419	0.436	491	0.858	563	2.96	635	1.40	707	0.268	779	0.0390				
420	0.491	492	0.885	564	2.94	636	1.38	708	0.262	780	0.0382				
421	0.555	493	0.913	565	2.93	637	1.35	709	0.254	781	0.0372				



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Photometric Indoor Test Report

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Prepared For
Elemental LED Inc, DBA Diode LED
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Catalog Number
HYDROLUME™ Plus 24V LED Strip Light DI-24V-HLP65-80-XX
Project Number
10460077
Test Number
758967

Test Date

2014-09-24

Prepared By

Javier Caban

Javier Caban, Technician

Approved By

Eric M. Gaudreau

Eric Gaudreau, Engineering Project Handler

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Luminaire Description: LED strip
Catalog Number: HYDROLUME™ Plus 24V LED Strip Light DI-24V-HLP65-80-XX
Lamp: 12 white LEDs
Mounting: Surface
Ballast/Driver: One Meanwell LPV-60-24

Luminaire

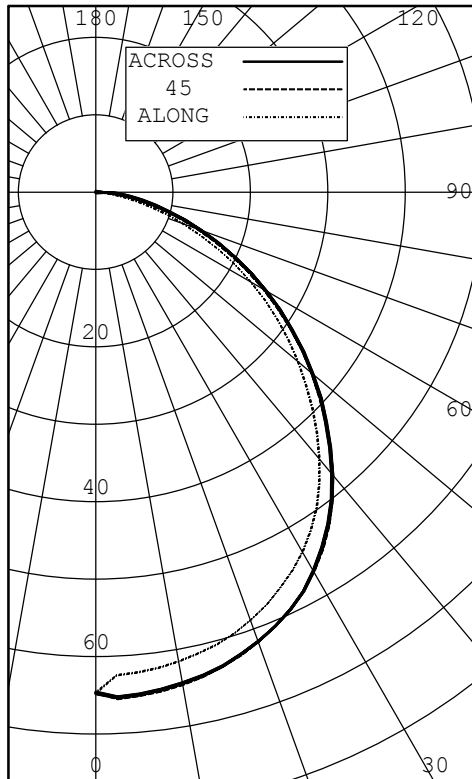


Test Conditions

Test Temperature:	24.8 °C
Voltage:	120.0 VAC
Current:	0.06625 A
Power:	3.244 W
Power Factor:	0.408
Frequency:	60 Hz
Current THD:	174 %



INTENSITY (CANDLEPOWER) SUMMARY OUTPUT LUMENS



ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	65	65	65	65	65	
5	62	65	65	65	65	6
10	62	64	65	64	64	
15	61	63	64	63	63	18
20	59	61	62	61	62	
25	56	59	59	59	60	27
30	54	56	57	56	56	
35	50	52	53	52	52	32
40	45	47	48	47	48	
45	40	42	42	42	42	32
50	34	36	36	36	37	
55	29	30	31	30	31	27
60	23	24	25	25	25	
65	18	19	19	19	20	19
70	12	13	14	14	15	
75	8	8	9	10	10	10
80	4	4	5	6	6	
85	1	2	2	3	3	3
90	0	0	0	0	0	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	51	29.39
0-40	83	48.04
0-60	142	82.07
0-90	173	100.00
40-90	90	51.96
60-90	31	17.93
90-180	0	0.00
0-180	173	100.00

EFFICACY (LUMENS PER WATT): 54.2

*** THIS IS AN ABSOLUTE TEST ***

LUMINOUS LENGTH: 12.000 INS
 WIDTH: 0.500 INS

LUMINANCE SUMMARY CD./SQ.M.

S/MH: 1.3
 SC (ALONG): 1.2, SC (ACROSS): 1.3

ANGLE	ALONG	45	ACROSS
45	14467	15421	15439
55	12903	13834	13992
65	10727	11777	12210
75	7535	9193	9969
85	3853	6983	9521

TESTED IN ACCORDANCE WITH IES PROCEDURES.



INTENSITY (CANDLEPOWER) DATA
 IN 2.5 DEGREE STEPS

ANGLE	PLANE					AVERAGE	OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS		
0.0	65	65	65	65	65	65	
2.5	63	65	66	65	65	65	
5.0	62	65	65	65	65	65	6
7.5	62	65	65	64	65	64	
10.0	62	64	65	64	64	64	
12.5	61	64	64	63	64	63	
15.0	61	63	64	63	63	63	18
17.5	60	62	63	62	63	62	
20.0	59	61	62	61	62	61	
22.5	58	60	61	60	61	60	
25.0	56	59	59	59	60	59	27
27.5	55	58	58	57	58	57	
30.0	54	56	57	56	56	56	
32.5	52	54	55	54	54	54	
35.0	50	52	53	52	52	52	32
37.5	47	50	50	50	50	50	
40.0	45	47	48	47	48	47	
42.5	42	45	45	44	45	44	
45.0	40	42	42	42	42	42	32
47.5	37	39	39	39	39	39	
50.0	34	36	36	36	37	36	
52.5	31	33	34	33	34	33	
55.0	29	30	31	30	31	30	27
57.5	26	27	28	28	28	27	
60.0	23	24	25	25	25	25	
62.5	20	22	22	22	23	22	
65.0	18	19	19	19	20	19	19
67.5	15	16	17	17	17	16	
70.0	12	13	14	14	15	14	
72.5	10	11	12	12	12	11	
75.0	8	8	9	10	10	9	10
77.5	6	6	7	8	8	7	
80.0	4	4	5	6	6	5	
82.5	2	3	4	4	5	4	
85.0	1	2	2	3	3	2	3
87.5	1	1	2	2	2	1	
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	1.131	.081	.041	.00	1.101	.061	.020	.99	1.071	.041	.000	.97	0.990	.960	.94	0.950	.930	.91	0.920	.900	.88	0.86			
	2	1.040	.960	.900	.84	1.010	.940	.880	.83	0.990	.920	.870	.82	0.890	.840	.80	0.860	.820	.78	0.830	.790	.77	0.75			
	3	0.950	.850	.770	.71	0.930	.840	.760	.70	0.910	.820	.750	.70	0.790	.730	.69	0.770	.720	.67	0.740	.700	.66	0.64			
	4	0.880	.760	.680	.62	0.860	.750	.670	.61	0.840	.740	.670	.61	0.720	.650	.60	0.690	.640	.59	0.670	.620	.58	0.56			
	5	0.820	.690	.600	.53	0.790	.680	.590	.53	0.770	.660	.580	.53	0.640	.570	.52	0.620	.560	.52	0.610	.550	.51	0.49			
	6	0.750	.620	.530	.47	0.730	.610	.520	.46	0.710	.600	.520	.46	0.580	.510	.46	0.560	.500	.45	0.550	.490	.45	0.43			
	7	0.690	.550	.460	.41	0.670	.540	.460	.40	0.660	.540	.460	.40	0.520	.450	.40	0.510	.440	.39	0.490	.440	.39	0.37			
	8	0.640	.500	.420	.36	0.630	.490	.410	.36	0.610	.490	.410	.35	0.470	.400	.35	0.460	.400	.35	0.450	.390	.35	0.33			
	9	0.590	.460	.370	.31	0.580	.450	.370	.31	0.570	.440	.370	.31	0.430	.360	.31	0.420	.360	.31	0.410	.350	.31	0.29			
	10	0.550	.420	.330	.28	0.540	.410	.330	.28	0.530	.400	.330	.28	0.390	.320	.28	0.390	.320	.27	0.380	.320	.27	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	4.07	5.09
6.00	1.81	7.63
8.00	1.02	10.2
10.0	0.652	12.7
12.0	0.453	15.3
14.0	0.333	17.8
16.0	0.255	20.3

Cone of Light Plot

