Les Industries Spectralux Inc.
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2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025
NVLAP
NVLAP LAB CODE: 200899-0

Sphere Test Report

Standard(s) CIE 84-1989, IESNA LM-16-93, IESNA LM-58-94, IES LM-79-08, ANSI C82.77-2002

Customer Philips Lumec, 640 Curé Boivin, Boisbriand, Québec, Canada, J7G 2A7

General Information		Lamp Details: CY2425		Driver Details: CY1023	
Test Report	L1512182-C1	**Description**	(2) Clusters of 16 Luxeon T LED's	**Type**	Commercial
Test Date	18 December 2015	**Manufacturer**	Lumiled	**Description**	55 W
Report Date	18 December 2015	**Catalog No.**	SVM-48W32LED4K-G2-LE2	**Manufacturer**	Advance
Sphere Temperature	25.0	**Serial No.**	SRIS 2299.1	**Catalog No.**	XI075C053V140DNY1
Humidity	23.1 %	**LED Current**	530 mA	**Voltage**	120.00 V
Lamp Type	SSL	**Nominal CCT**	4000 K	**Power Factor**	0.9900

Stabilization Time: 1 hour 15 minutes

Tested By: Marc Viwonou Sena

Approved Signatory: Chrisnel Blot

Signature:

Notes

1) Field performance may differ from laboratory measurements. Results are valid for tested material only.

2) The original electronic file or paper report cannot be edited in whole or in part without written consent of Spectra Lux Industries Inc.

3) This test report describes the performance of a single product and does not necessarily represent the average performance of a group of the same SSL product.

Realization of Sphere Test

A 4π sphere-spectroradiometer equipped with auxiliary lamp to correct self-absorption was used during the measurements of electrical, photometric and colorimetric properties of the sample under test. The size of the integrating sphere used is large enough to ensure that the measurement errors due to effects of baffle and self-absorption by the sample test are not significant.

During the test, a commercial driver was used and adjusted to nominal electrical characteristics specified by the driver manufacturer or the client. Good electrical contacts have been used to ensure the control of electrical parameters of the commercial driver and an adequate stabilization period prior to collecting data. The self-absorbance was measured and a geometrical correction factor was applied to the luminous flux value to take into account the sphere configuration.

Results of the measurements are traceable to reference standards developed and maintained by the National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).

Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Auxiliary Power Supply	American Reliance	SPS150-7	B10155	N.P.C.R.	N.P.C.R.
Test Power Supply	iRDC	CIF-3000A	974997	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	91L236540	2015/10/22	2016/10/22
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Shunt Resistor	Fluke	Y5020	5675014	2015/08/06	2016/08/06
Current Multimeter	HP Agilent	HP34401A	US36121202	2015/08/06	2016/08/06
Voltage Multimeter	Fluke	Fluke8842A	4282317	2014/10/31	2016/10/31

Spectrometer Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrometer	Ocean Optics	USB2000N	USB2E3864	2015/08/24	2016/08/24

Environment Equipment

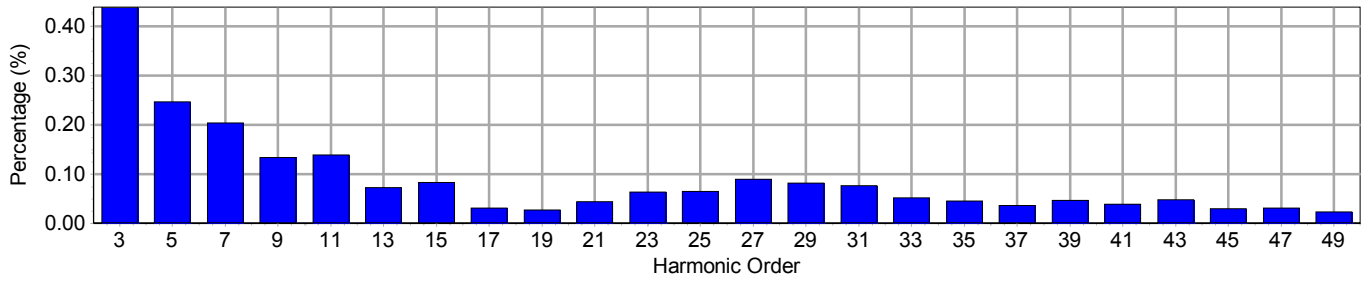
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504176	2014/04/16	2016/04/16

Electrical Measurements

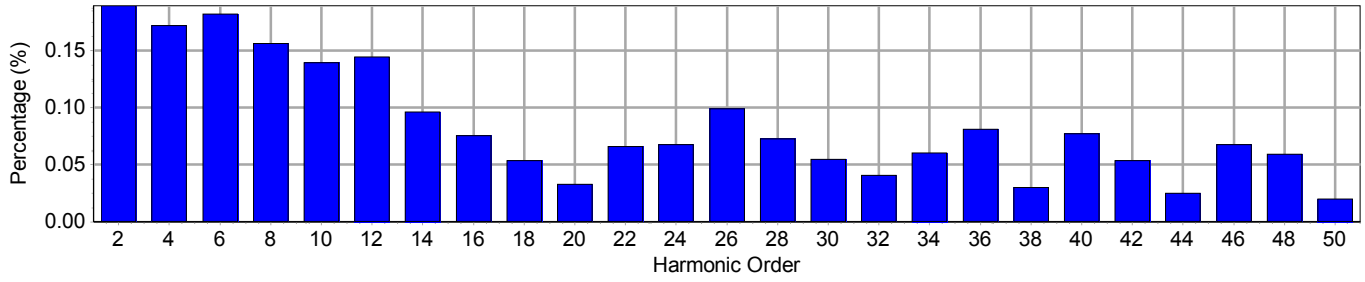
Input

Frequency	60 Hz	Active Power	52.79 W	THDV [ANSI]	0.78 %
Voltage	120.1 V(rms)	Apparent Power	53.41 VA	THDA [ANSI]	7.58 %
Current	0.4449 A(rms)	Power Factor	0.988	Max. Harmonic At	5th order

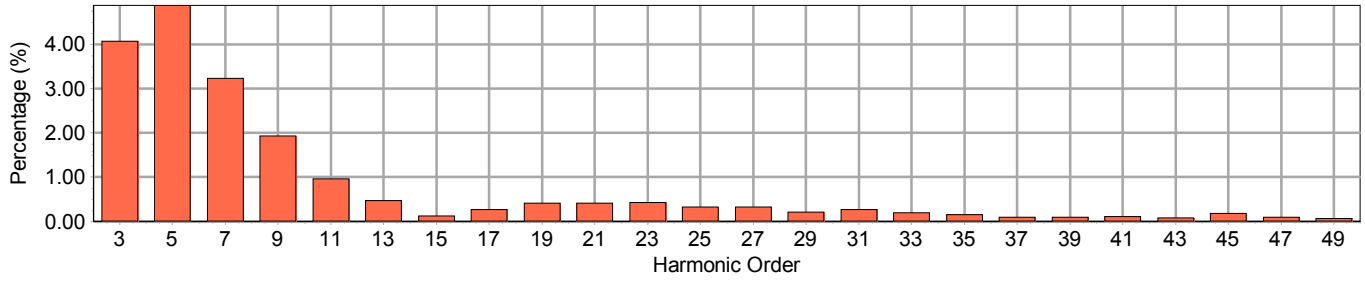
Input Voltage Harmonics (Odd)



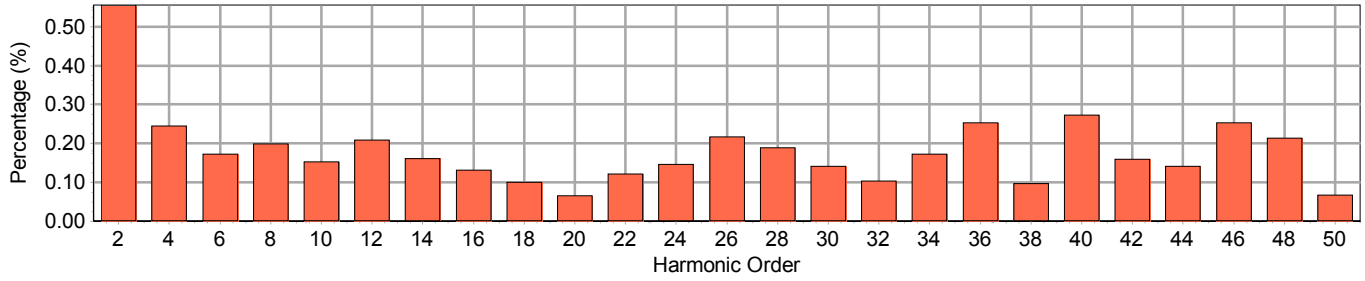
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)



Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.190	0.557
3	180	0.439	4.065	4	240	0.172	0.245
5	300	0.245	4.884	6	360	0.182	0.172
7	420	0.204	3.224	8	480	0.156	0.199
9	540	0.134	1.923	10	600	0.140	0.153
11	660	0.138	0.961	12	720	0.145	0.208
13	780	0.072	0.476	14	840	0.097	0.161
15	900	0.083	0.118	16	960	0.075	0.131
17	1020	0.031	0.266	18	1080	0.053	0.100
19	1140	0.026	0.411	20	1200	0.033	0.065
21	1260	0.043	0.407	22	1320	0.066	0.122
23	1380	0.063	0.429	24	1440	0.068	0.145
25	1500	0.064	0.324	26	1560	0.099	0.217
27	1620	0.089	0.318	28	1680	0.073	0.189
29	1740	0.081	0.213	30	1800	0.055	0.140
31	1860	0.076	0.262	32	1920	0.041	0.102
33	1980	0.052	0.197	34	2040	0.060	0.172
35	2100	0.044	0.154	36	2160	0.081	0.253
37	2220	0.036	0.090	38	2280	0.030	0.097
39	2340	0.047	0.099	40	2400	0.077	0.272
41	2460	0.038	0.102	42	2520	0.054	0.159
43	2580	0.048	0.074	44	2640	0.025	0.140
45	2700	0.029	0.180	46	2760	0.068	0.253
47	2820	0.031	0.090	48	2880	0.060	0.213
49	2940	0.023	0.065	50	3000	0.020	0.067

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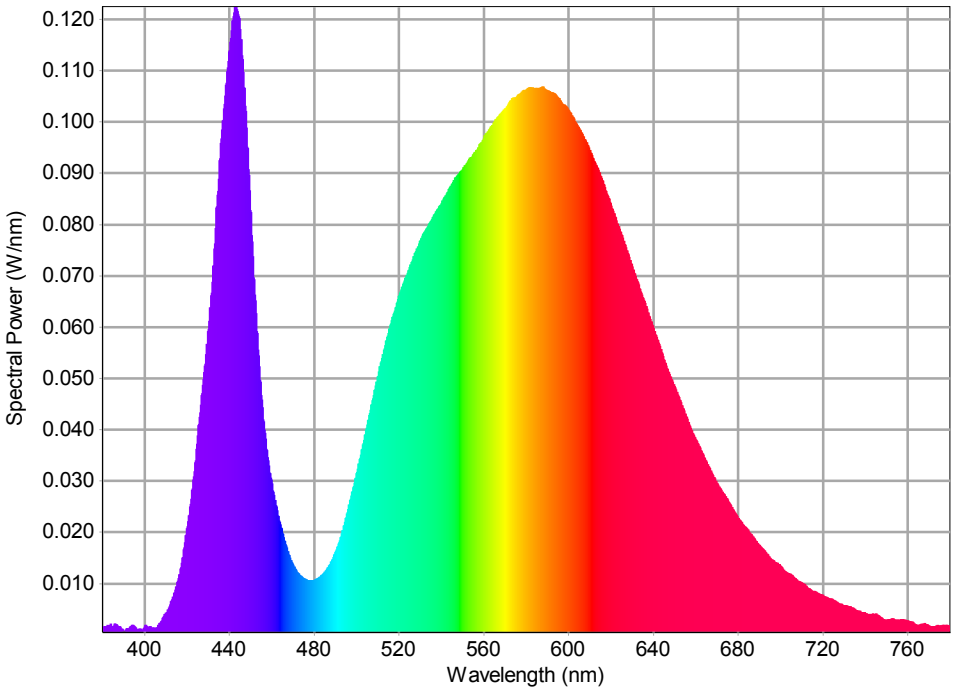
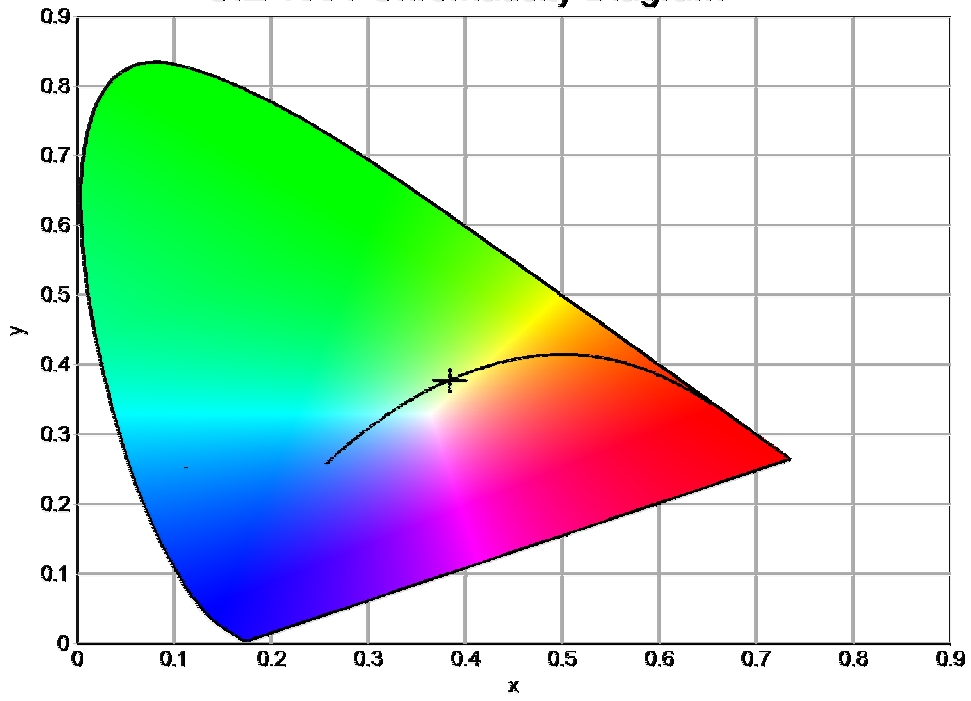
Spectral Power Distribution



Peak Wavelength	443 nm
Luminous Flux	6035 lm
Input Power	52.79 W
Lumens/Watt	114.3
Full Width/Half Maximum	22.22
Center Wavelength	442 nm
Centroid Wavelength	362 nm
Dominant Wavelength	487 nm
Excitation Purity	0.1654
Colorimeric Purity	0.1001

CIE 1931 Chromaticity Diagram



x	0.3836	CCT	3922 K
y	0.3778	CRI	72
u	0.2268	L*	25.67
v	0.3350	a*	-4.65
u'	0.2268	b*	-15.13
v'	0.5025	Duv	0.0004

R1	70.3	R9	-21.4
R2	77.0	R10	46.1
R3	82.6	R11	70.4
R4	72.9	R12	46.1
R5	70.0	R13	70.5
R6	68.4	R14	89.9
R7	79.3		
R8	55.4		

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Spectral Power Distribution Table (1/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
380	0.00145	405	0.00133	430	0.05917	455	0.04681
381	0.00170	406	0.00152	431	0.06380	456	0.04203
382	0.00159	407	0.00232	432	0.06880	457	0.03823
383	0.00179	408	0.00273	433	0.07528	458	0.03461
384	0.00216	409	0.00371	434	0.08331	459	0.03170
385	0.00167	410	0.00431	435	0.08896	460	0.02960
386	0.00223	411	0.00490	436	0.09591	461	0.02725
387	0.00203	412	0.00592	437	0.10023	462	0.02529
388	0.00171	413	0.00694	438	0.10512	463	0.02326
389	0.00120	414	0.00817	439	0.10994	464	0.02153
390	0.00066	415	0.00949	440	0.11374	465	0.01990
391	0.00093	416	0.01111	441	0.11792	466	0.01842
392	0.00127	417	0.01292	442	0.12056	467	0.01701
393	0.00157	418	0.01513	443	0.12252	468	0.01573
394	0.00192	419	0.01805	444	0.12101	469	0.01456
395	0.00181	420	0.02080	445	0.11813	470	0.01369
396	0.00126	421	0.02331	446	0.11304	471	0.01296
397	0.00100	422	0.02649	447	0.10677	472	0.01223
398	0.00123	423	0.03033	448	0.09895	473	0.01176
399	0.00100	424	0.03367	449	0.09079	474	0.01139
400	0.00164	425	0.03894	450	0.08282	475	0.01103
401	0.00174	426	0.04252	451	0.07381	476	0.01087
402	0.00163	427	0.04677	452	0.06634	477	0.01071
403	0.00150	428	0.05122	453	0.05929	478	0.01066
404	0.00148	429	0.05475	454	0.05234	479	0.01061

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Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
480	0.01075	505	0.04098	530	0.07687	555	0.09369
481	0.01092	506	0.04290	531	0.07776	556	0.09419
482	0.01113	507	0.04483	532	0.07857	557	0.09471
483	0.01148	508	0.04670	533	0.07924	558	0.09565
484	0.01186	509	0.04857	534	0.08002	559	0.09604
485	0.01231	510	0.05032	535	0.08070	560	0.09684
486	0.01289	511	0.05237	536	0.08150	561	0.09775
487	0.01353	512	0.05402	537	0.08223	562	0.09812
488	0.01430	513	0.05564	538	0.08291	563	0.09892
489	0.01520	514	0.05738	539	0.08358	564	0.09935
490	0.01621	515	0.05892	540	0.08419	565	0.10008
491	0.01722	516	0.06049	541	0.08502	566	0.10061
492	0.01842	517	0.06201	542	0.08563	567	0.10121
493	0.01976	518	0.06321	543	0.08637	568	0.10161
494	0.02124	519	0.06472	544	0.08728	569	0.10220
495	0.02286	520	0.06612	545	0.08793	570	0.10263
496	0.02452	521	0.06731	546	0.08868	571	0.10306
497	0.02631	522	0.06844	547	0.08935	572	0.10386
498	0.02792	523	0.06959	548	0.08981	573	0.10433
499	0.02971	524	0.07055	549	0.09034	574	0.10472
500	0.03150	525	0.07171	550	0.09074	575	0.10477
501	0.03335	526	0.07267	551	0.09153	576	0.10526
502	0.03518	527	0.07379	552	0.09196	577	0.10551
503	0.03714	528	0.07486	553	0.09276	578	0.10591
504	0.03906	529	0.07575	554	0.09315	579	0.10625

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Spectral Power Distribution Table (3/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
580	0.10626	605	0.09875	630	0.07189	655	0.04317
581	0.10660	606	0.09805	631	0.07065	656	0.04209
582	0.10675	607	0.09724	632	0.06945	657	0.04096
583	0.10672	608	0.09636	633	0.06833	658	0.03996
584	0.10650	609	0.09554	634	0.06699	659	0.03904
585	0.10666	610	0.09459	635	0.06586	660	0.03820
586	0.10659	611	0.09353	636	0.06468	661	0.03737
587	0.10672	612	0.09240	637	0.06357	662	0.03650
588	0.10687	613	0.09164	638	0.06220	663	0.03549
589	0.10641	614	0.09070	639	0.06107	664	0.03461
590	0.10617	615	0.08957	640	0.05987	665	0.03377
591	0.10601	616	0.08864	641	0.05867	666	0.03295
592	0.10575	617	0.08735	642	0.05757	667	0.03209
593	0.10569	618	0.08603	643	0.05638	668	0.03119
594	0.10534	619	0.08516	644	0.05508	669	0.03050
595	0.10480	620	0.08375	645	0.05373	670	0.02966
596	0.10428	621	0.08271	646	0.05256	671	0.02896
597	0.10360	622	0.08159	647	0.05141	672	0.02834
598	0.10339	623	0.08021	648	0.05040	673	0.02765
599	0.10299	624	0.07924	649	0.04936	674	0.02706
600	0.10237	625	0.07808	650	0.04847	675	0.02638
601	0.10172	626	0.07682	651	0.04743	676	0.02567
602	0.10104	627	0.07558	652	0.04635	677	0.02492
603	0.10013	628	0.07441	653	0.04535	678	0.02421
604	0.09946	629	0.07309	654	0.04427	679	0.02358

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Spectral Power Distribution Table (4/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
680	0.02280	706	0.01139	732	0.00562	758	0.00300
681	0.02227	707	0.01102	733	0.00553	759	0.00292
682	0.02173	708	0.01060	734	0.00531	760	0.00281
683	0.02121	709	0.01041	735	0.00510	761	0.00269
684	0.02076	710	0.01022	736	0.00483	762	0.00257
685	0.02023	711	0.00998	737	0.00473	763	0.00225
686	0.01973	712	0.00964	738	0.00451	764	0.00202
687	0.01918	713	0.00913	739	0.00450	765	0.00203
688	0.01858	714	0.00890	740	0.00424	766	0.00210
689	0.01799	715	0.00863	741	0.00410	767	0.00210
690	0.01757	716	0.00858	742	0.00414	768	0.00229
691	0.01711	717	0.00831	743	0.00406	769	0.00207
692	0.01667	718	0.00807	744	0.00412	770	0.00189
693	0.01615	719	0.00796	745	0.00416	771	0.00167
694	0.01563	720	0.00780	746	0.00384	772	0.00172
695	0.01504	721	0.00748	747	0.00353	773	0.00166
696	0.01465	722	0.00732	748	0.00321	774	0.00196
697	0.01434	723	0.00713	749	0.00301	775	0.00182
698	0.01412	724	0.00705	750	0.00292	776	0.00186
699	0.01388	725	0.00680	751	0.00309	777	0.00192
700	0.01340	726	0.00661	752	0.00302	778	0.00192
701	0.01299	727	0.00630	753	0.00324	779	0.00181
702	0.01249	728	0.00607	754	0.00299	780	0.00161
703	0.01216	729	0.00600	755	0.00296		
704	0.01201	730	0.00581	756	0.00298		
705	0.01179	731	0.00579	757	0.00307		