

10/29/2008

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## Tivoli product compliance with California Title 24

In an effort to reduce electrical power consumption, the Energy Code of California Title 24 requires high lighting efficiency and control for both indoor and outdoor lighting. Tivoli has a long history with energy efficient low voltage products including our newer products with advanced LED technology, high-efficiency power supplies and lighting control methods.

Tivoli products meet the strict requirements from the Energy Code which specify watts per square-foot for different lighting applications. Tivoli LED products incorporate high quality LED chips, such as, Nichia and Cree, into its lighting fixtures, greatly reducing their power consumption. Modern optical technologies were also introduced to increase the lighting efficacy. Tivoli's low voltage and LED lighting systems consume much less power than comparable incandescent, and even fluorescent systems. For example, the Covelum LED (Piranha) module at .75W/each and 36 lumens light output has an efficacy of 48 lumens per watt.

In order to utilize daylight, the Energy Code encourages applying dimmers to control lighting levels. All Tivoli lighting fixtures are dimmable for energy savings. Lighting efficacy increases with the use of dimming, increasing the lamp life and replacement costs.

Attached is a quick reference chart for lumens per watt/fixture for current Tivoli products.

<b>ARCHITECTURAL</b>	<b>LED Color</b>	<b>Watts / Unit</b>	<b>Total Watts</b>	<b>Number of Lamps</b>	<b>Total Lumens</b>	<b>Lumens / Lamp</b>	<b>Lumens / Watt</b>
<b>Tube Lighting</b>							
Light Tubing Incandescent (24")	N/A	0.453	6.8	15 @ 1.5" OC	7.32	0.488	1.076
360° LED Tubing (24")	White	0.231	3.7	16 @ 1.5" OC	31.01	1.938	8.381
Illumiline LED Tubing (20")	White	0.329	6.25	19 @ 1" OC	107.59	5.663	17.214
<b>Cove Lighting</b>							
Covelum Xenon (48")	N/A	4.773	76.37	16 @ 3" OC	266.06	16.629	3.484
Covelum LED (PIR) (12")	White	0.744	3.72	5 @ 2.5" OC	180.26	36.052	48.457
Covelum Designer 2400K	Warm White	0.74	0.74	1	33.5	33.5	45.27
Covelum Designer 2600K	Warm White	0.74	0.74	1	41.6	41.6	56.22
Covelum Designer 2800K	Warm White	0.74	0.74	1	41.81	41.81	56.5
Covelum Designer 3000K	Warm White	0.74	0.74	1	36	36	48.65
Covelum Designer 3200K	Warm White	0.74	0.74	1	38.18	38.18	51.59
Covelum Designer 4500K	White	0.74	0.74	1	32.66	32.66	44.14
Covelum Designer 5000K	White	0.74	0.74	1	30.86	30.86	41.7
Covelum Designer 5500K	White	0.74	0.74	1	40.33	40.33	54.5
Covelum Designer 6000K	White	0.74	0.74	1	40.04	40.04	54.11
Covelum Designer 7000K	Cool White	0.74	0.74	1	39.26	39.26	53.05
Covelum Designer 8000K	Cool White	0.74	0.74	1	36.25	36.25	48.99
Covelum Designer 9000K	Cool White	0.74	0.74	1	34.37	34.37	46.45
Platinum Cove (24")	Warm White	0.342	4.102	12 @ 2" OC	33.58	2.798	8.186
<b>Strand Lighting</b>							
Litesphere Xenon (24")	N/A	7.948	31.79	4 @ 6" OC	218.3	54.575	6.867

<b>VENUE</b>	<b>LED Color</b>	<b>Watts / Unit</b>	<b>Total Watts</b>	<b>Number of Lamps</b>	<b>Total Lumens</b>	<b>Lumens / Lamp</b>	<b>Lumens / Watt</b>
<b>Step Lighting</b>							
Softstep II (19")	Amber	N/A	2.82	5/top, 5/front @ 4" OC	2.89	N/A	1.025
<b>Wall Lighting</b>							
Usher Wall (24")	Amber	0.366	2.93	8 @ 3" OC	9.44	1.18	3.22
Fantasma Wall (24")	Amber	0.366	2.93	8 @ 3" OC	6.38	0.798	2.178
<b>Seat &amp; Rail Lighting</b>							
Fantasma Rail (24")	Amber	0.366	2.93	8 @ 3" OC	6.38	0.798	2.178
Usher Seat Light (9")	Warm White	0.348	2.78	8 @ 1" OC	14.14	1.768	5.086

Beacon Seat Light	Amber	0.076	0.688	9	3.4	0.378	4.942
Versiline (9")	White	0.118	0.94	8 @ 0.6 OC (2.4" module OC)	19.33	2.416	20.564

SPECIALITY	LED Color	Watts / Unit	Total Watts	Number of Lamps	Total Lumens	Lumens / Lamp	Lumens / Watt
<b>Borderline Lighting</b>							
TivoFlex (24")	White	0.0575	2.76	48 @ 0.5" OC	18.25	0.38	6.612
<b>Wall Wash Lighting</b>							
Colorwash	RGB	32.75	32.75	1	462.7	462.7	14.128