Phase In of Linear Fluorescent Ballast and Lamp Technology Standards

Research Findings

September 27, 2011

Overview

- What is happening
  - Recent federal regulatory changes affecting commercial lighting technologies
  - What measures are affected
  - Lamp prices and raw materials in lamps
- What can and should be done
  - Program implications
  - Recommendations
- Market Knowledge
  - The voice of the contractor/distributor (5 interviews)

Federal Standards and Commercial Lighting

- There are two regulatory changes that are affecting the linear fluorescent lighting market:
  - A July 1, 2010 phase out on the manufacturing of ballasts that don't meet Ballast Efficacy Factor (BEF) minimums under US Department of Energy (DOE) Fluorescent Lamp Ballast Energy Conservation Standards (2000) and the Energy Policy Act of 2005.
  - An upcoming July 14, 2012 phase out on the manufacturing of linear fluorescent lamps that don't meet minimum lumens per watt (LPW) standards from a Department of Energy 2009 Rulemaking.

Ballast Regulations

- **Timing**:
  - First wave for ballasts serving the least efficient T12 linear fluorescent lamps began taking effect on April 1, 2005.
  - The second wave started phasing in on July 1, 2009 and applied to ballasts that serve energy efficient versions of T12 lamps.
  - All regulations were completely phased in on July 1, 2010.
- **Impact**: These regulations have effectively ended the manufacturing of magnetic ballasts, which were used primarily to start and power T12 lamps and fixtures. However, manufacturers still make *electronic* ballasts designed to serve T12 lighting that (just barely) meet these standards.

Lamp Regulations

- **Timing**: The US DOE issued new standards in July 2009 that are set to take effect on July 14, 2012.
  - They set minimum levels of lumens per watt (LPW) that lamps are required to produce when initially put into service. These standards apply to all linear and U-shaped T12, T8, and T5 lamps.
- **Impact**: These standards prohibit the manufacture of only the least efficient T12 lamps, as well as some of the least efficient T8 lamps.

New Lamp Regulations

Lamp Type	Technologies	LPW (lumens per watt) At lamp color temperatures of:	
		≤ 4500 K	>4500 K & <7000 K
4-foot Medium Bipin	T12, T8	89	88
2-foot U-shaped	T12, T8	84	81
8-foot Slimline	T12, T8	97	93
8-foot High Output (HO)	T12 HO, T8 HO	92	88
4-foot Miniature Bipin	T5	86	81
4-foot Miniature Bipin High Output	T5 HO	76	72

Characteristics of Lamps Meeting LPW Standards

The Lamps shaded below provide an example of those that meet the LPW Standards.

8-Foot Linear Fluorescent High Output Lamps for Sale (September 2011)

Lamp Type	Color T (K)	Lumens	Watt	LPW*	min LPW
F96T12 HO	6500	7800	110	70.9	88
F96T12 HO	4100	8800	110	80.0	92
F96T12 HO	5000	9695	110	88.1	88
F96T8 HO	3500	8000	86	93.0	92
F96T8 HO	4100	8000	86	93.0	92

Source: 1000bulbs.com

Raw Materials in Lamps

- Rare earth metals
  - Not really rare, but hard to extract, as well as polluting to mine and refine.
  - China mines 90% of the world supply and keeps it internally, but the US, Australia, and Greenland also have a supply.
  - Shortage may be a short term issue.
- Cost of lamps
  - 4 of 5 contractors have seen a 20% to 25% increase in price over the last month.
  - Example of one trade ally: $1.10/ lamp (28W T8 800 series) 3 months ago, $1.75 on his last order, $2.60 now.

Program Implications

- Customers can continue to purchase lamps for their current lighting systems even after the regulations are phased in.
- As lamp prices go up, the cost of the project increases and the customer is less likely to retrofit.
- Cost effectiveness/pay-back are affected by the price of a lamp (it appears more so than usual for the short term).

Recommendations

- Within this context, we recommend the following short term actions:
  - Watch lamp prices closely.
  - Consider extending the current 10% bonuses on T12 retrofits until July 14, 2012 (or the end of PY4) when the new linear fluorescent standards take effect .
  - Study the cost effectiveness of LED retrofit projects, and consider support for a pilot effort aimed at these types of retrofit projects.

Recommendations Continued

- After the regulations take affect (July 14, 2012 or the start of PY5):
  - Consider offering an incentive for T12 retrofits that reflects and necessary adjustments in savings based on changes in baseline and replacement wattages.
  - In November 2012, review program participation to date and determine how many T12 retrofits are taking place and what their contribution is to the program.
    - If limited, consider phasing out the incentive for T12 retrofits at the end of PY5.

Market Awareness

- Market actors are aware of the ballast changes, but there is limited knowledge among their customers.
- They see the continued use of T12 technology among their customer base - mainly driven by financial constraints.
- There is misunderstanding among market actors related to lamp changes:
  - Some believe all T12s are being phased out.
  - Some do now know that particular T8 lamps are affected.

Market Response

- **Changing stocking practices**: Trade allies have reduced stocking of T12 lamps. They are also not specifying jobs with new T12s, but some maintenance of existing fixtures.
- **No stockpiling**: Trade allies generally do not anticipate distributors or their customers stockpiling lamps.
- **Lighting upgrades**: The typical T8 lamp used is now the 32 W T8 800 series lamp, which meets the upcoming LPW standards.

Market Response (2)

- **Changing manufacturer practices**: No longer offering one year price contracts on lighting products with large customers. Only holding prices constant for one month.
- **Price concerns**: Recent increases in the price of linear fluorescent lamps are of great concern. Potential reduction in cost effectiveness of retrofit projects without the current bonus incentive offered by Ameren Illinois.

Attachments

Minimum Standards for Fluorescent Ballasts

Ballast-Lamp System (number of bulbs per ballast)	**Nominal Lamp Wattage (W)**	**Voltage (V)**	**Ballast Efficacy Factor (BEF)**
(1) F40T12 lamp	40	120/277	2.29
(2) F40T12 lamps	80	120/277	1.17
(2) F96T12 lamps	150	120/277	0.63
(2) F96T12HO lamps	220	120/277	0.39
(1) F34T12 lamp	34	120/277	2.61
(2) F34T12 lamps	68	120/277	1.35
(2) F96T12/ES lamps	120	120/277	0.77
(2) F96T12HO/ES lamps	190	120/277	0.42