

# How Reliable are Electronic Ballasts for Fluorescent Lighting Systems?

While end-users have responded with a number of concerns in using electronic ballast technology throughout the history of the electronic ballast, today's electronic ballast technology addresses these concerns for most applications.

## 1. Reliability

- The reliability of electronic ballasts has been of concern since they were introduced to the market in 1981. Many of the initial products did, in fact, fail prematurely. Those manufacturers who were unable to improve their products are no longer producing electronic ballasts. Other manufacturers have pursued the technology and have been producing electronic ballasts for over ten years with documented failure rates of less than 1% after five years of operation.
- If failures do occur with electronic ballasts, they usually occur within the first six months of operation. After the first six month period, the life expectancy of the electronic ballast meets or exceeds ten to twelve years. Premature ballast failure is usually due to poor quality control in the manufacturing process or improper installation.
- Specifiers and/or end-users can avoid reliability problems with electronic ballasts by researching the track record of manufacturers, obtaining verification of any reliability claims, and requiring a three-year warranty period which covers product and labor costs for replacement.

## 2. Availability

- During the last several years, the supply of electronic ballasts has at times not kept up with the demand. However, the market has settled quite a bit and for most lamp types, availability is generally not an issue.
- Availability may be a concern for some compact fluorescent lamp wattages and newer fluorescent lamps as they are introduced.

## 3. Vendor Claims

- Historically, many vendors made exaggerated performance claims that often were unachievable, creating dissatisfaction in the performance of electronic ballasts. Most vendors today are more factual in portraying performance characteristics, but the customer still has the responsibility of investigating the accuracy of any claims.
- Fundamentally, there is a linear relationship between light output and wattage consumed. Low wattage electronic ballasts also have low light output and vice versa.

- Setting minimum standards for each project using electronic ballasts will ensure that you will be satisfied with the resulting performance.

#### 4. Harmonics

- Harmonics result from the use of non-sinusoidal wave form devices. Harmonics are generally measured in terms of Total Harmonic Distortion (THD), which is a measure of how much the higher multiple frequencies vary from the fundamental frequency of 60 Hz. PG&E rebates require ballasts with THD values less than 20%.
- Much of the equipment used in buildings today generates harmonics. This equipment includes variable speed drives, uninterruptible power supplies, personal computers, ballasts for fluorescent or HID systems, and high-speed switching systems. When any of this equipment makes up a significant portion of the building's electrical load, many undesirable effects may result:
  - Overloading of transformers.
  - Overloading of the neutral wire in three-phase systems.
  - Current or voltage surges and/or spikes due to circuit resonance with one or more of the harmonic frequencies.
  - Interference with electrical or communications equipment on the same circuit.
  - Distortion of the electrical service for the building.
- With proper design, many of these adverse effects can be avoided.
- It is important to recognize that the electronic ballast is not the only device which generates harmonics. In fact, many of the magnetic ballasts in use today generate as much as 37% THD without creating any problems associated with the electrical distribution system. The potential for problems primarily depends upon the size of the load which generates harmonics as a proportion of the total building load. The 20% THD maximum set for qualifying for PG&E Rebate Programs will ensure more than acceptable performance for most projects.

#### 5. Interference with Other Equipment

- Two types of electromagnetic interference can occur. Interference can occur over the power lines themselves or be transmitted through the air.
- Ballasts that conform to FCC Rules and Regulations, Part 18C will have sufficient filtering and protection from interference to avoid problems for most applications.
- For sensitive equipment, compatibility should be thoroughly investigated, since the standard filtering and protection may not be sufficient.

- Using electronic ballasts with powerline carrier lighting control systems is generally problematic.

#### 6. Lack of Quality Assurance Standards

- Until recently, quality assurance standards did not exist for electronic ballasts. CBM (Certified Ballast Manufacturers) currently tests and labels electronic ballasts for 4ft T8, 4ft T12, 4ft T12/ES 8ft T12 Slimline, 8ft T12 Slimline/ES, 8ft HO, and 40 Watt Compact Fluorescent lamps.
- For other lamp types, or to consider ballasts which have not yet been CBM certified, write your own quality assurance standards to ensure satisfactory performance.