

## **GREEN CHOICE PHILIPPINES**

### **NELP-GCP 20070011 PRODUCT CRITERIA FOR ELECTRONIC BALLASTS**

#### **Environmental Scenario**

Operation of fluorescent lamps is only possible with special control gear. Referred to as ballast, sometimes still as chokes, the conventional inductive ballast made from an iron core wound with copper wire is a technology which requires considerable power consumption. It is possible however, to reduce energy consumption significantly if electronic ballast also known as electronic control gear is used.

Electronic control gear generates a high-frequency alternating voltage with frequencies of >20KHz. This increases the luminous efficiency of fluorescent lamps which is approximately 10% in comparison to operation at 50 – 60 Hz. The physical reason for this increase in luminous efficiency is that, at increasing frequencies, the ionization state within the discharge tube does not have to be built up again with current zero crossing of the lamp's current, unlike in the case of inductive ballast operating at low frequency of 50-60Hz wherein at high voltage the lamp has to be reignited virtually with every current zero crossing. Operating at high frequency these re-ignition peaks are missing and the lamp voltage approaches the sinusoidal wave.

Aside from the light output, the power consumption of the system that includes both the lamp and ballasts plays a significant role in the evaluation of the system efficiency. If conventional ballast is used for a fluorescent lamp with a nominal load of 36W or 40W, the system has a power requirement of approximately 46W and 50W, respectively. If an electronic control gear is used, it has a power requirement of only 39W and 43W, respectively.

The diversity of lighting markets poses a challenge to the design of a common specification for linear fluorescent lighting which requires high frequency electronic ballasts. These specifications recognize the different technologies that may be appropriate for market transformation activities of energy efficient lightings. Likewise, restriction on the use of certain hazardous substances in electrical and electronic equipment contributes to the environmental conservation.

## **Definition of Terms**

1. **Electronic Fluorescent Ballast** – a device used with a linear fluorescent lamp to obtain the necessary circuit conditions (voltage, current and waveform) for starting and operating. Electronic ballasts are made of solid-state electronic components and operate at higher frequencies than AC main.
2. **Ballast Factor** – the ratio of a fluorescent lamp's light output on a specific ballast compared to the fluorescent lamp's output as measured on a reference ballast.
3. **PNS IEC 60 928: Philippine National Standards – General Requirements for Safety**
4. **PNS IEC 60 929: 2006 Philippine National Standards for AC supplied Electronic Ballasts for Fluorescent Lamps**

## **Scope**

These criteria shall apply to electronic ballasts used for linear fluorescent lamps.

## **Green Choice Requirements**

To carry the Green Choice Philippines seal, the product must meet the following requirements:

1. The product shall comply with the corresponding Philippine National Standards (PNS) on performance and safety specifications. These are PNS IEC 60 928 and PNC IEC 60 929.
2. Specifically, the products must meet the following requirements:
  - a. the ballast must guarantee a service life of at least 50,000 operating hours at the maximum permissible measuring-point temperature and under standard network conditions.
  - b. the ballast must be designed for lamp-operating frequency of >20 KHz but <50KHz.
  - c. the ballast must be designed for a wide range of nominal voltages ranging from 15 % higher or lower than rated operating voltage without reduction on rated life.
  - d. the ballast must have a ballast factor of  $\geq 0.90$ .
  - e. the ballast components must be easily dismountable into case, to allow a material-specific recycling.
3. The production process of the product shall meet the requirements of all applicable environmental laws and regulations.

## **Verification Methods**

1. On product requirement number 1, the applicant should get a certification from the Bureau of Product Standards that the product passed the corresponding PNS.
2. On product requirement number 2.1 to 2.5, the applicant shall declare compliance to the requirements and present corresponding information pursuant to the requirements.
3. On product requirement number 3, the applicant shall submit environmental compliance certificates from the Department of Environment and Natural Resources and other concerned government agencies.

## **Effectivity and Validity**

These product criteria shall be in effect for three (3) years from the date of its approval, and are subject to change or withdrawal by the National Ecolabelling Programme of the Philippines Board when deemed necessary.