

# Low Loss Electromagnetic Ballast

## 1. Outline of Technology

Fluorescent lamps are discharge lamps that require ballast to limit their current and thus their power. Ballasts can be classified as electromagnetic type and electronic type. Electromagnetic ballasts have been used since their invention in 1940's and are basically consisting of recyclable magnetic core and copper winding. The expected lifetime is 15 years.

Since 2000's, electronic ballasts have emerged as a more energy efficient solution for operating T5 fluorescent lamps at a high frequency. Compared with traditional electromagnetic ballasts, electronic ballasts have higher energy efficiency and no flickering effects in the lamps. However, the expected lifetime of electronic ballasts is about 5 years depending on the operating life of electronic components, especially electrolytic capacitors.

Low loss electromagnetic ballasts (LLEBs) have recently been developed to drive T5 fluorescent tubes. The power loss of LLEBs is similar to that of electronic ballasts. LLEBs have the characteristics of controlled flicker free start-up, long designed product life (>10 years as claimed) and recyclable (>80% materials such as steel sheet and copper wires are recyclable as claimed).

## 2. Product Range and Physical Dimensions

Based on market information, the product range of low loss electromagnetic ballasts covers 1 x 14W, 1 x 21W, 1 x 28W and 1 x 35W.

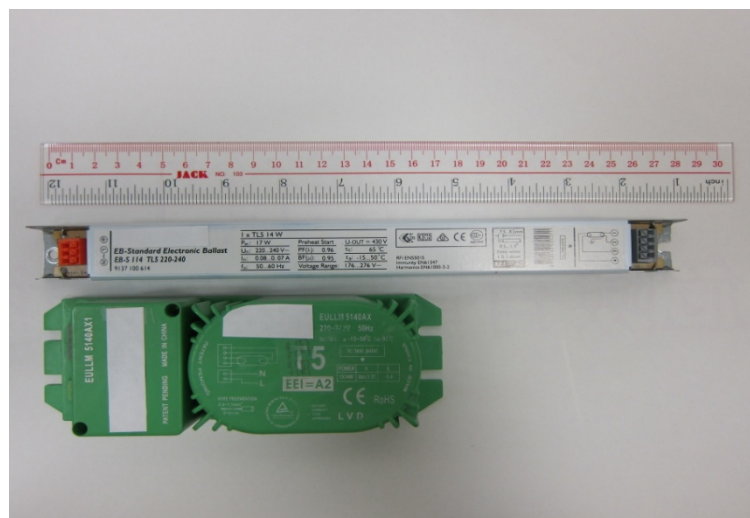


Photo 1 – Physical sizes of a 1x14W electronic ballast (top) and 1x14W low loss electromagnetic ballast (bottom)

Low loss electromagnetic ballasts are much heavier than standard electronic ballasts, i.e., 538 grams for 1 x14W, 838 grams for 1 x 28W and over 1,300 grams for 1 x 35W. Whereas, the weight of typical electronic ballasts of similar ratings is about 200 grams. Photo 2 below shows disassembly of the 1 x 14W LLEB. When selecting and using LLEB, key considerations include product range, physical size and weight. Moreover, as LLEBs are in general thicker than their electronic ballast counterparts, LLEBs may not be suitable for some existing modular T5 lighting fittings with limited space.

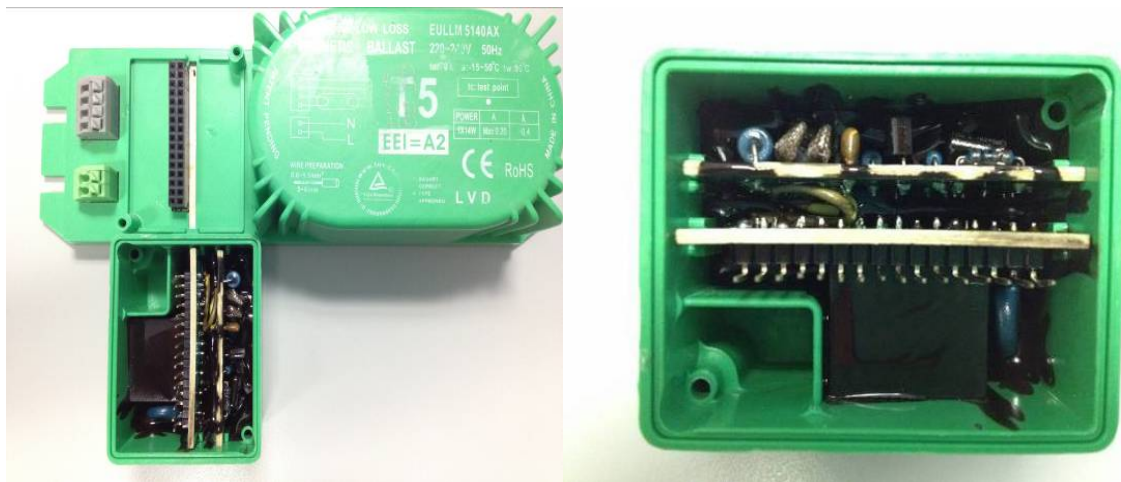


Photo 2 – Disassembly of the 1 x 14W Low Loss Electromagnetic ballast

### **3. Energy Performance of Low Loss Electromagnetic Ballasts**

Study was conducted on energy saving potential of 1x 14W and 1 x 28W low loss electromagnetic ballasts in comparison with standard electronic ballasts of same ratings. It is found that the energy saving potential of the low loss electromagnetic ballasts under study is comparable with standard electronic ballasts. For information, both types of low loss electromagnetic and electronic ballasts under study are certified to Class A2 in the classification of Energy Efficiency Index (EEI)<sup>1</sup> and have similar energy saving performance.

### **4. Summary**

Low loss electromagnetic ballasts have been developed to drive T5 fluorescent tubes. They are claimed to be more sustainable than its electronic ballasts counterparts as

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<sup>1</sup> Energy Efficiency Index (EEI) is based on the classification scheme of Federation of National Manufacturers Associations for Luminaires and Electrotechnical Components for Luminaires in the European Union (CELMA).

over 80% of the product materials of low loss electromagnetic ballasts, such as iron core and copper winding etc. can be recycled. The main advantages of low loss electromagnetic ballasts are its recyclability, long product life time and their energy efficiency are comparable to their electronic ballast counterparts. When selecting and using low loss electromagnetic ballasts, product range, physical size and weight are key considerations.

## **Reference**

- 1) <http://www.ke.hku.hk/eng/highlights/2012/Environmentally%20Friendly%20Ballast>