

## Compact Fluorescent Lamps

Compact Fluorescent Lamp (CFL) (俗稱慳電膽) is an assembly of a discharge tube and ballast. When a discharge current passes through the mercury vapour in the tube, ultraviolet light is generated to excite the phosphor coating adhered to the inside wall of the discharge tube and hence visible light is emitted. The ballast is for limiting discharge tube current during starting. In the development of CFL technology, the ballast has evolved from electromagnetic to electronic type. The latter type is lighter and smaller and is more energy efficient due to its lower loss and higher working frequency. CFLs can be classified into integrated and non-integrated types. Integrated type CFLs integrate both the discharge tube and the ballast into a single unit with an aim to directly replace incandescent lamps.

Using CFLs instead of incandescent lamps have a number of advantages. CFL is more energy efficient and consumed less energy than those in incandescent lamp, e.g. incandescent lamps generated 7% of light and 93% of heat while CFL generates 25% - 30% of light for a given unit of power. CFL has a longer lamp life than incandescent lamp. Many CFL products have lifetime of 8,000 to 10,000 hours, which is 8 to 10 times longer than the traditional incandescent lamps. Hence, the quantity of spent lamps over a given service period can be reduced significantly.

CFL contains small traces of mercury essential for its operation. EC RoHS Directive 2002/95/EC limits mercury content of CFL to not more than 5 mg/lamp. In Hong Kong, disposal of bulk quantity of spent CFLs shall comply with the Waste Disposal (Chemical Waste) (General) Regulation. An EC study on life cycle analysis for lamps shows that 90% of the environmental impact of a lamp occurs in the use phase, with the remaining 10% due to production and disposal. So the total environmental impact of a lamp is effectively determined by its energy consumption in use.

---

The Electrical Blog is contributed by Electrical Division. If you would like to know more about this topic please contact the Division Hon. Secretary Ir S.K. Ho, [hosk@emsd.gov.hk](mailto:hosk@emsd.gov.hk).