

E-Notes

Energy Efficiency Notes

Exit Sign Energy Efficiency Upgrade

Background

Exit signs in commercial buildings are required to be on 24 hours per day and can be a significant user of electrical energy. The most common type of exit sign is rectangular with two incandescent bulbs (Figure 1.).

Figure 1. Typical exit sign

The rectangular exit signs usually have two 15 or 25 watt bulbs.

An attractive retrofit that recently became available is the use of light emitting diode (LED) bulbs to replace the incandescent bulbs. The light emitting diode bulbs have the following features:

1. Very low energy consumption (typically 1 or 2 watts per bulb)
2. Very long life (manufacturers expect a 10 to 15 year bulb life)

A sketch of a light emitting diode replacement bulb is shown in Figure 2.

Figure 2. Light emitting diode replacement bulb for exit signs

Savings from retrofit

The savings from retrofit of the exit sign bulbs are attractive, with a simple payback on the energy savings of less than three years. The cost of each LED bulb as of 1997 was approximately \$21 including taxes. A conventional exit sign with two 15 watt bulbs will use \$18 a year of electricity at 7.0 cents per kilowatt-hour. A retrofitted sign with two 1 watt LED bulbs will use only \$1.20 per year. Thus, on an investment of \$42 for the two LED bulbs, the annual electricity saving will be \$16.80 a year at an electricity price of 7.0 cents per kWh.

A significant added advantage of the LED bulbs is the reduced maintenance, and avoided cost of replacement incandescent bulbs. Conventional incandescent bulbs must be changed every six months or so due to burn-out.

Points to watch

1. When purchasing the LED bulbs, it is important to match the base of the bulb to that of the fixture. There are four types of bulb bases--intermediate, medium, candelabra, and bayonet. The candelabra and medium bases are commonly found in many fixtures in Saskatchewan. An electrician is not needed to replace the incandescent bulbs with the efficient LED bulbs.
2. Some exit signs have a diode in series with the incandescent lamps. The diode reduces the voltage by 50%. With these types of exit signs, a licensed electrician will be needed to remove the diode so that the light emitting diode lamps can function. (The light emitting diodes will not work at the reduced voltage.)

Availability

All of the major electrical wholesalers stock the light emitting diode bulbs.

Reference

Lighting Reference Guide, Canadian Electrical Association, 1991, Suite 1600, 1 Westmount Square, Montreal, Quebec, H3Z 2P9

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