Halifax Regional Fire & Emergency

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Compact Fluorescent Lights

BACKGROUND

In an effort to develop a standard and informed response to questions from the public, as well as within the Fire Service itself concerning **CFL** ***(Compact Flourescent Lights)*** bulbs; I have researched some information that may be helpful.

Many times in our formal presentations, and as well, our Trade/Home Shows, we in the Public Education Division are asked about the safety of the **CFL** bulbs, and if they pose a fire or life safety hazard. In speaking with some of the Fire Inspectors, they too have indicated they are asked similar questions.

There are many stories circulating within the Fire Service both regionally and nationally, as well as many stories and reports in the media. Various electrical authorities and consumer safety groups have issued articles in response to public inquiries. They are various, and represent a wide spectrum of information. I have compiled as much information as possible from various sources, and this document is a ***condensed version*** of that research. By no means is it an *exhaustive representation* of everything available, however; it should prove to be useful to answer questions from the public with pertinent information and statistics, as well as resources to point the public towards.

GENERAL INFORMATION

First, some general information and background to the CFL bulbs. This technology was started as a response to the need for energy savings in the early 1980's. They have steadily increased in sales volume since then. The most important advance in flourescent bulb technology ***(including CFL's)*** has been the gradual replacement of magnetic ballasts with electronic ballasts. This has improved the "flickering" and slow starting traditionally associated with flourescent lighting. It also has created some of the issues that surround CFL's.

CFL's fit into any ordinary light bulb socket that a regular *incandescent* light bulb would have been inserted. In comparison to incandescent light bulbs, CFL's have a longer rated life, and use less electricity. ***(Modern CFL's typically have a life span of between 8,000 and 15,000 hours, compared to 1,000 hours for incandescent bulbs. CFL's use about 80% less power than regular incandescent light bulbs)***

A CFL rated as 11 watts is said to have as much lighting power *(lumens)* as a 60 watt incandescent light bulb. CFL's might save enough money in electricity costs to make up for their higher initial price within about 500 hours of use.

HOW THEY WORK

There are two main parts in a CFL: the *gas filled tube* (also called *bulb or burner*) and the *magnetic or electronic ballast*. Electrical energy in the form of current from the ballast flows through the gas, causing it to emit ultraviolet light. The ultraviolet light then excites a white phosphor coating on the inside of the tube. This coating emits visible light. CFL's that "flicker" when they start generally have a magnetic ballast. CFL's with electronic ballasts are now much more common.

ENVIRONMENTAL ISSUES

We have also been asked questions that relate to environmental issues concerning the CFL bulbs. The fact that they use considerably less power, in itself is a benefit to environmental issues and our atmosphere. Electrical generation is believed to be one of the highest contributors to emissions associated with nearly all air quality issues. CFL's do contain small amounts of mercury ***(approximately 5mg per unit of bulbs 25 watts and less)*** and is a concern for land fills and waste incinerators. Attempts have been made to limit mercury to acceptable levels. Some manufacturers such as **Philips** and **GE** make very low mercury content CFL's.

Safe disposal requires storing the bulbs unbroken until they can be processed. Consumers should seek advise from local authorities. Usually you can either:

> ***Return used CFL's to where they were purchased, so the store can recycle them correctly; or***
>
> ***Take used CFL's to a local recycling facility***.

"END OF LIFE" ISSUES

This issue is perhaps where the majority of the safety related questions originate. Both the ballast and the burner (tube) are subject to failure from normal use. It has been reported that some CFL's have reached *"end of life"* and have *"smoked;" "browned or darkened the base;"* and some have reportedly burned through the base exposing consumers to potentially high voltages. Some years back 14 watt ***"Luminous"*** brand lights sold through ***Costco*** were defective and started to smoke. There was no actual flame, but filled the fixture globe with acrid smoke. The bulb was extremely hot. There were some reports that *"Luminous"* brand CFL's burned out while flickering and smoking, and some cracked at the base and broken glass fell onto floors. *"Pricemark"* brand had some similar issues a few years ago as well.

Perhaps more familiar to us in the Fire Service is the *"Globe"* brand bulb. It carried a UL mark, but some of the components had not been tested by that laboratory. More on this in the next paragraph.

Some CFL's used in totally enclosed fixtures have been known to reach end of life cycle prematurely. Bulbs routinely used in sub freezing temperatures may also shorten bulb life expectancy.

On **November 24, 2005**, the ***Electrical Safety Authority*** in Mississauga, On. Issued a safety alert.

> ***The Electrical Safety Authority has joined forces with Underwriters Laboratories Inc. (UL) to issue a public notice to consumers who purchased a compact flourescent 13 watt mini-spiral lamp between January 2002 and April 2003. The lights are manufactured by Fujian Joinluck Enterprise Co. ltd. and distributed by Globe Electric under the brand name Globe Mini-Spiral 13 W.***

Based on a notice released by UL on October 26, 2004, these lights were manufactured with parts that UL did not investigate. These parts can fail and melt a hole in the enclosure, posing a fire hazard and exposing the user to hazardous voltage. These lights are not authorized to bear the "cUL" Mark.

Consumers should check any Globe Mini-Spiral 13 W lights they purchased to see whether or not they were manufactured from January 2002 through April 2003. Check the base of the bulb for the following date codes:

0402	***BH 0803***	***BH1402***	***BH342***
BH0103	***BH0903***	***BH1403***	***BH3502***
BH 0203	***BH1003***	***BH1503***	***BH4102***
BH0403	***BH103***	***BH1603***	***BH4802***
BH043	***BH1103***	***BH1703***	***BH4902***
BH052	***BH113***	***BH183***	***BH492***
BH0603	***BH1203***	***BH193***	***BH5002***
BH0702	***BH123***	***BH2002***	***BH5102***
BH072	***BH1302***	***BH203***	***BH512***
BH073	***BH1303***		***BH5202***

On **March 21, 2007** ***CBC*** carried a story about the CFL's. It mentioned in it's report:

"Ontario's Electrical Safety Authority will issue a warning later this week to notify users of the unexpected way compact flourescent light bulbs expire at the end of their long lifespan.

Ted Olchena, a provincial code engineer with the authority said he plans to post the warning on its website. The bulbs come to an end by charring around the base, producing smoke and emitting a bad smell.

That has scared some homeowners into calling fire departments, he said. But there have been no reports of fires resulting from flourescent bulbs in Ontario, Olchena said. The upcoming advisory will explain that this is a normal way for those energy-efficient bulbs, (which can last up to 10,000 hours) die.

It will also explain do's and don't's for using the bulbs. For example, they

need to be used in an open-light fixture rather than a closed-light fixture since they generate heat the Authority stated. They said the warning will be handy for homeowners, particularly since several provinces are considering banning incandescent bulbs in favour of flourescent ones to save energy and reduce greenhouse gas emissions."

On **March 23, 2007** the Electrical Safety Authority issued an advisory; the following is an excerpt:

"CFL's may emit smoke, an odour or a popping sound when they expire, and the plastic base may become discoloured, charred or deformed. Certification Agencies have advised that this failure does not present a shock or fire hazard for approved products." As a precautionary measure, the Advisory encourages customers to replace bulbs at the first signs of failure or aging, (signs include flickering lights, a bright orange or red glow, popping sounds, an odour, and the browning of the ballast enclosure at the base of the lamp.) in part to prevent problems distinguishing between normal expiry and dangerous situations. The Authority added that bulbs should not be used in totally enclosed fixtures, recessed fixtures, with dimmer switches, in touch lights, with photo cells or electronic timers, or where exposed to weather or water."

Manitoba Hydro received complaints from customers about melting and smoking in compact fluorescent light bulbs, but officials say ***"they consider the bulbs safe and will continue to use them."***

For more information on the *"numerous"* topics of CFL's; staff may consider referring the public to the ***Natural Resources Canada Website***. It covers various frequently asked questions on the CFL issues. That website is:

http://www.oee.nrcan.gc.ca/energystar/english/consumers/questions-answers.cfm

The following resources were used in researching this issue:

http://www.esainspection.net/ (Electrical Safety Authority)

www.oee.nrcan.gc.ca/energystar/english/consumers (Natural Resources Canada)

www.cbc.ca/canada/manitoba/story/2007/o3/23/spiral-bulbs.html (CBC)

www.gnb.ca/cnb/news/ps/2004e1412ps.htm (Government of New Brunswick)

www.execulink.com/~impact/fluorescent_lights.htm

www.en.wikipedia.org

http://news.sympatico.msn.cbc.ca

Also used **Philips Canada**, **General Electric**, **Globe**, **Commercial Electric**, **Sylvania**, **Luminous**, Website's.

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