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The importance of adhering to local electrical codes

When purchasing cable from United States (U.S.) or multi-national distributors, designers, contractors and installers need to be aware that acceptable wiring rules and product standards can differ significantly between Canada and the U.S., and even between provinces. They must also understand why cable that bears CSA, cUL or any other recognized certification marks can still be rejected by an inspector.

The Canadian Electrical Code (CEC) and the U.S. equivalent, The National Electrical Code (NEC) both exist to minimize the possibilities of fire and electrocution. But in many instances these codes tackle the same issue in a different way. For example, they provide different grounding conductor material specifications and take a different approach in determining minimum wire sizes and ampacities.

Electrical safety in Canada is the responsibility of individual provinces and territories, each with distinct legislation and regulations concerning electrical safety. Most provinces adopt the code without changes, while other provinces, such as Québec and Ontario, add their own amendments (e.g. Chapter 5 of the Québec Construction Code & the Ontario Electrical Safety Code). It's important for both designers and installers to understand the differences between the national and provincial codes.

Electrical Plans Not Up To Code

According to an article written by Peter Marcucci, Vice President of Regulatory Affairs for the Ontario Electrical Safety Authority (ESA), in the July/August 2005 issue of *Engineering Dimensions*, "over 60 percent of electrical plans submitted to the ESA do not meet the requirements of the Electrical Safety Code. Plans prepared and submitted by professional engineers for regulatory approval frequently contain errors and deficiencies associated with cable sizing, over-current protection and ground-fault protection." These disturbing results point to a general lack of knowledge or training among professional engineers responsible for electrical plans - a problem that provincial regulatory bodies are beginning to address.

Gilbert Montminy, the Québec Electrical Branch Manager of the Régie du bâtiment du Québec (RBQ) says that until recently it has been a bit of a grey area as to who is responsible for educating and informing designers about updates and requirements of Chapter Five of the Québec Construction Code, (Québec Electrical Code). "We've implemented some new initiatives to create a formal link between the RBQ and the Ordre des ingénieurs du Québec (Order of Quebec Engineers)," he said. The same kind of initiative has been made with l'Ordre des Technologues Professionnels du Québec, as well. "I'll be meeting with those designers at the beginning of next month to inform them of the most important requirements from the latest edition of the Québec Construction Code, Chapter 5, which came into effect on November 5th, 2007."

A Grassroots Approach

2002 saw the emergence of a different philosophy from the RBQ. "We realized that we can no longer afford to rely solely on the inspection process to improve safety," explained Mr. Montminy. "We need to ensure that everyone involved in the construction or installation of electrical products is not only aware of the requirements of the new regulations, but also understands what they must do to conform."

According to Mr. Montminy, the provincial regulator does not want to be perceived as a quality management system. Rather than just inspect projects, he says their priority is now to get out and meet people in the industry to ensure they are using the most up-to-date version of the electrical code. "We believe the responsibility for safety lies with the professionals and electricians who are designing and installing the projects," he continued. "We view our job more as facilitators, making sure that everyone has access to the information and tools they need to do their jobs properly."

RBQ inspectors now visit with contractors at their offices to ensure they have the latest version of the code and are familiar with its requirements rather than simply inspecting job sites and leaving a list of deficiencies that need to be corrected. They are also making efforts to visit trade schools and meet with instructors and professors to ensure that future electricians are being taught using the most current materials and resources.



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A Proven Fact

Electrical engineering, design, maintenance and construction professionals who understand the most current requirements of their local electrical code will:

- Work more safely and provide a greater degree of electrical protection for electrical system
- Work more productively.
- Make more money & save their clients money
- Prevent system incompatibilities from delaying a job
- Experience a higher rate of passing electrical inspection

Product Certification & Safety Standards

In Canada, the CEC not only mandates the requirements for electrical installations, but also the use of electrical equipment. Product certification marks, guaranteeing conformance to safety standards are issued by authorized agencies such as CSA (Canadian Standards Association), UL (Underwriters Laboratories), ETL (Intertek) and other certification bodies who receive accreditation from the Standards Council of Canada.

For a cable to be sold and installed in Canada, for example, the certification body must apply a Canadian Identifier to its registered trademark. This “c” mark signifies that the cable was in fact tested to the applicable Canadian cable standard of the Canadian Electrical Code (CEC). This is the reason why many wholesalers and distributors are ordered to remove equipment that is not appropriately marked. It should be noted that Rule 2-100 of the CEC, Part I lists markings that are required to be provided on each piece of electrical equipment to ensure that it is suitable for that particular purpose.

Rule 2-024 of the Canadian Electrical Code, Part I states that “Electrical equipment used in electrical installations within the jurisdiction of the inspection department shall be approved and shall be of a kind or type and rating approved for the specific purpose for which it is to be employed.”

This is a key point, since there have been several situations recently where inspectors have rejected cable installations, even though they displayed the necessary certification markings because in addition to the safety standards, cables must also be approved for the specific application they are being used for and marked accordingly.

Unfortunately, inspectors are encountering these types of situations more and more frequently. With a growing supply of offshore electrical products, many substandard or even outright counterfeits are finding their way to unsuspecting wholesalers, distributors and ultimately, to contractors. Therefore, engineers and contractors must be vigilant in specifying Canadian-made cable and electrical equipment that is designed for our unique national marketplace. They must also choose reputable and knowledgeable distributors who can help them navigate the requirements of local codes and avoid any unwelcome surprises when it comes time for inspection. There is a shared responsibility among all stakeholders to understand the facts and confusion surrounding “approved” equipment in an effort to uphold electrical safety in Canada.

(Source: Inspectors Corner, Canadian Perspective: Approved Electrical Equipment Facts and Confusion by Ark Tsisserev, September/October 2005 IAEI Magazine)

(Source: Do professional engineers know the Electrical Safety Code? By Peter Marcucci, P.Eng., VP Regulatory Affairs, Electrical Safety Authority, July/August 2005, Engineering Dimensions)

Should you have any questions or comments regarding this article, please call your Cerco Cable representative at 1-800-361-5961.