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## **The Characterization of Fires in Low Rise Multi-Suite Dwellings**

### **Objective**

To determine the characteristics of residential fires and typical fire loads, and to express this information in the form of design fires.

### **Background**

Fires in residential buildings result in substantial property losses and are often fatal. Designing buildings so as to minimize the occurrence of fires and their impact requires the use of computational tools that rely on suitable quantitative characteristics of fires, or design fires, which must be realistic to produce credible results.

### **Statement of Work**

This project studies the characteristics of fires in living rooms, bedrooms and kitchens in low-rise multi-suite residential dwellings of light-frame construction by using computer simulations and full-scale fire experiments in realistically furnished rooms. The experiments will be instrumented to measure the heat release rate, products of combustion such as smoke, soot and gas species, and other parameters. Computer modelling of various fire scenarios will be used to assist in designing experiments, as well as to allow extrapolation from the experimental data.

### **Expected Outcomes**

This project will provide a comprehensive analysis of fire characteristics in various areas within multi-suite residential dwellings and a greater understanding of the main features of these fires. The design fires and calculation methods that will be developed may be used in the development of design guides, codes and standards by industry, regulatory authorities, and other agencies. A database of experimental results will also be made available.

### **Partners**

Canadian Automatic Sprinkler Association, Canadian Concrete Masonry Producers Association, Canadian Wood Council, City of Calgary, Forintek Canada Corp., Masonry Worx, Ontario Ministry of Municipal Affairs and Housing, and la Régie du bâtiment du Québec. Other partners, particularly from the home furnishing industry, are being sought.

### **Start/Expected Completion Dates**

This project began in 2006 and will be completed in 2010.

### **Project Manager**

Dr. Alex Bwalya: 613-993- 993-9739; Alex.Bwalya@nrc-cnrc.gc.ca

For more information, see [http://irc.nrc-cnrc.gc.ca/fr/ddf/multisuite\\_e.html](http://irc.nrc-cnrc.gc.ca/fr/ddf/multisuite_e.html)

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Researchers draw on information obtained from real fires, such as this one in Kemano, BC, to develop realistic simulated fires to use in their studies of fire safety issues.