



Summer 2004  
Volume 3, Issue 3

### Inside this issue...

- 1 Fire equipment services near you
- 1 Did you know...
- 2 What's hot...
- 3 A computational analysis of an apartment fire studies vertical flame spread
- 4 FPD's outreach to fire protection stakeholders

Underwriters Laboratories Inc.  
333 Pfingsten Road  
Northbrook, Illinois 60062-2096  
United States of America

# FireTalk

## Fire equipment services near you

By Tom Hillenbrand

Underwriters Laboratories Fire Equipment Services Group provides the North American Fire Service with a testing and certification program that automotive fire apparatus manufacturers and fire departments have been utilizing for over 22 years. UL tests and certifies:

- aerial devices
- fire pumps
- electrical systems
- foam systems
- breathing air

UL also offers a testing and certification program for fire departments that includes aerial devices, in-service fire pumps and fire department ground ladders.

### Automotive Fire Apparatus

In August 2003, NFPA 1901, *Standard for Automotive Fire Apparatus 2003 Edition*, went into effect. This standard describes the way a fire apparatus is manufactured in the United States. For the first time, the standard outlines requirements that manufacturers must adhere to when it comes to testing and certifying the apparatus. The Standard dictates the use of a third party certification organization to test aerial devices, fire pumps greater than 750 gpm, fixed power sources and breathing air systems.

NFPA requires that all certification shall be performed by an organization that is accredited for testing systems on fire apparatus in accordance with

the ANSI Standard. Additionally, the certification organization must witness all tests and shall decline to certify any test results for a system if all the necessary components do not pass the requirements. The Standard requires that the manufacturer not control the

*See FES on page 2*



*FES staff tests a pumper on location in a fire department's parking lot.*

### Did you know...

The average home contains 125 UL-certified products

By Joe Hirschmugl

Each year, UL tests more than 18,850 types of products and more than 19 billion UL Marks appear on products. UL scientifically investigates and tests thousands of products, materials, constructions and systems to evaluate electric, fire and casualty hazards; burglar resistance; or ability to detect, control or limit fires. Behind the UL Mark is a staff of more than 5,000 engineers, scientists, chemists, technicians, field representatives and

*See UL Mark on page 2*

## FES:

*Continued from page 1*

certification organization. The certification organization must be primarily engaged in certification work and have no financial interest in the profitability of the products. UL meets all the requirements for a certifying organization required by the NFPA 1901 Standard. With the ANSI certification, UL's FES group performs all the tests required by the Standard.

### Aerial Devices & Ground Ladders

Since 1982, the FES Group has been testing aerial devices and fire department ground ladders for fire departments throughout the United States and Canada. These tests are described in NFPA 1914, *Standard for Testing Fire Department Aerial Devices 2002 Edition*, and NFPA 1932, *Standard on Use, Maintenance, and Testing of Fire Department Ground Ladders*. Both Standards require annual testing of aerials and ground ladders. Mobile laboratories with specialized test equipment and

## UL Mark:

*Continued from page 1*

support staff dedicated to working for a safer world.

The U.S. laboratories are located in Northbrook, IL; Melville, NY; Santa Clara, Calif.; Research Triangle Park, NC; and Camas, Wash. Worldwide, the UL family of companies and its network of service providers include more than 60 laboratory, testing and certification facilities.



Various UL Marks include: 1.) Registered Firm Mark; 2.) Recognized Component Mark for US & Canada; 3.) Gas-Fired Listing Mark.

trained personnel perform the necessary tests at the fire department locations making the process convenient and time efficient.

In 2003, UL's FES group introduced a new In-Service Pump Testing Program to fire departments. Using a 3000-gal portable tank and a completely equipped pump trailer, UL field personnel are able to test up to a 2000 gpm fire pump at the fire department's location. These tests are conducted in accordance to the requirements of NFPA 1911, *Standard for Service Tests of Fire Pump Systems on Fire Apparatus, 2002 Edition*.

For more information, please call the Fire Equipment Service Group at 1.800.677.5227.



Example of a through-penetration firestop test.

## What's hot...

### Water tightness requirement added to UL Standard

UL tests and Classifies firestops for performance of preventing fire from propagating from the point of origin to an adjacent compartment. A similar concern exists for the passage of water from one floor to another. Water passage may result from exposure to weather during construction, sprinkler activation / fire fighting operations, or from a failure of the domestic water supply system.

In response, UL has developed requirements for the evaluation of a water tightness test, and has established a W rating system to indicate the level of water tightness achieved during testing.

The W-rating system is as follows:

- Class 1 – System resistant to 3-ft of water pressure head
- Class 2 – System resistant to 20-ft of water pressure head
- Class 3 – System resistant to 50-ft of water pressure head

A W rating is intended to assist Authorities Having Jurisdiction, and others, in determining the suitability of firestop systems and smoke barriers for restriction of water passage to maintain the buildings protective envelope.

The W rating joins the family of ratings UL currently offers for firestop products. These rating also include:

- **F rating** for passage of flame and required by building codes
- **T rating** which covers both fire and temperature rating and is also required by building codes
- Optional **L rating** for leakage of smoke around the firestop

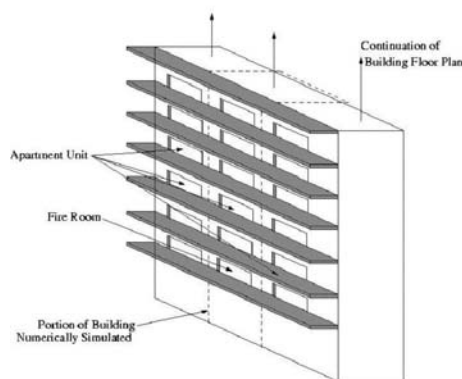
For more information on the W rating program and UL's other certification services for firestops, please contact Monica Keeler, Section Manager – Firestops & Dampers at 847-664-2308 or [Monica.A.Keeler@us.ul.com](mailto:Monica.A.Keeler@us.ul.com).

# A computational analysis of an apartment fire studies vertical flame spread

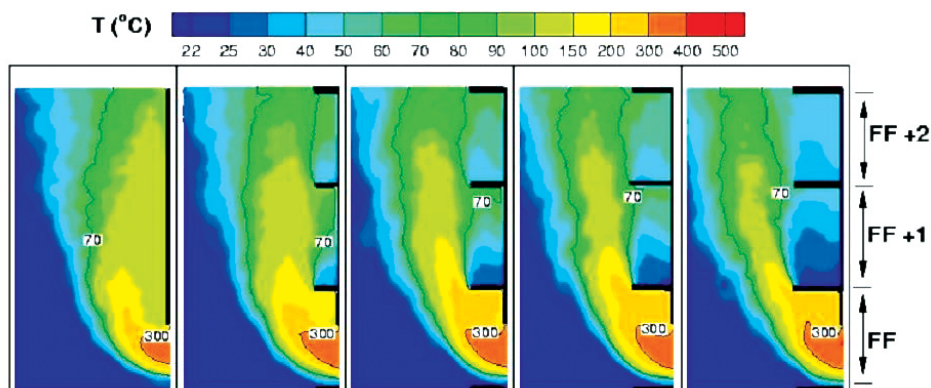
By John Mammoser &  
Francine Battaglia

High-rise apartment fires are perhaps the most dangerous residential fires. Within high-rise buildings, flames and smoke can travel through ductwork, between interior walls and up elevator shafts and stairwells. One of the fastest ways a fire spreads to other floors is along the exterior of the building due to open windows. Flame spread up vertical walls has been studied experimentally and computationally for years in the U.S. and abroad. Preventing or reducing fire spread on the exterior of buildings allows fire fighters more time to evacuate the occupants above the fire, and more time to control the fire from spreading to other floors or neighboring buildings.

A numerical study was undertaken to examine the reduction of flame spread due to the presence of a balcony. Using *Fire Dynamics Simulator*, a computational code developed by the National Institute of Standards and Technology, the effects of balcony depth and geometry were studied.



*Schematic of apartment building illustrating which portion was numerically simulated.*



*Average gas temperature contours for increasing (from left to right) balcony depths.*

The computational findings not only supported experimental research in Japan and Sweden, but also produced some other interesting results. Balconies with a depth of 3 feet or greater resulted in significant reduction in temperatures in areas where occupants may be standing on the floor above the fire floor. As the balcony depth increased, flames, smoke and hot gasses were projected away from the façade of the building, reducing the heat flux to the surface and thus delaying vertical fire spread.

Keeping the balcony depth constant, various balcony geometries were computationally studied as well. Results suggest that a balcony with

open, non-combustible balustrades and without separation walls provided enhanced protection from vertical fire spread. Balconies with solid balustrades and solid separation walls trap the heat from the fire below, resulting in increased heat flux.

The entire journal article can be found in Volume 39 2004 issue of the *Fire Safety Journal* (pp. 277-296) written by John Mammoser (Underwriters Laboratories Inc.) and Francine Battaglia (Iowa State University).

For more information, please contact John Mammoser, Associate Project Engineer, at 847-664-2385 or [John.Mammoser@us.ul.com](mailto:John.Mammoser@us.ul.com).

## In the next issue...

- Third-party certification versus self-declaration
- Fire Protection Strategic Business Unit expands to include personal protection equipment and personal flotation devices

# FIRETALK

Published by the Fire Protection Division of Underwriters Laboratories Inc.

**Managing Editor:**

Bob Backstrom  
E-Mail: [Robert.G.Backstrom@us.ul.com](mailto:Robert.G.Backstrom@us.ul.com)

**Editor:**

Nora-Cay Ryan  
E-Mail: [Nora-Cay.Ryan@us.ul.com](mailto:Nora-Cay.Ryan@us.ul.com)

Underwriters Laboratories Inc.  
333 Pfingsten Road  
Northbrook, Illinois 60062-2096  
United States of America

Phone: (847) 272-8800  
Fax: (847) 509-6391

**Address changes and additions:**

E-Mail: [Nora-Cay.Ryan@us.ul.com](mailto:Nora-Cay.Ryan@us.ul.com)

**Advisory Board:**

Tom Chapin, Ph.D.  
Kerry Bell, P.E.  
Pravinray Gandhi, Ph.D., P.E.  
Kevin Faltin

## FPD's outreach to current and future fire protection stakeholders

### Chicago Fire Prevention Bureau

On April 29, UL's Fire Protection Division hosted a training session for the Chicago Fire Prevention Bureau. The training session included a discussion of firestop system ratings and requirements, a discussion of UL's role with the Regulatory Community and a tour of UL's Fire Protection



*Members of the Chicago Fire Prevention Bureau with the UL hosts.*

facilities. The session was attended by 20 trainees from the Bureau.

### LifeSmarts

The National Consumers League's LifeSmarts 2004 National Competition was recently held in Chicago. As part of the extracurricular activity options for any of the 28 state champions, a tour of UL complete with extinguisher certification was offered. UL made an impact on these very bright individuals and future leaders, within our own community and also from other parts of the country.

LifeSmarts is a national competition hosted annually by the National Consumers League. The program teaches consumer knowledge to more than 8,000 high school students each year.

- Fire equipment services near you
  - Did you know... A computational analysis of an apartment fire studies vertical flame spread
  - FPD's outreach to current and future fire protection stakeholders
- Inside this issue...**

ADDRESS CORRECTION REQUESTED

Underwriters Laboratories Inc.  
333 Pfingsten Road  
Northbrook, Illinois 60062-2096  
United States of America